## Contents

1 Introduction to Salt

1.1 The 30 second summary ........................................... 1
1.2 Simplicity ............................................................... 1
1.3 Parallel execution ...................................................... 1
1.4 Building on proven technology .................................... 2
1.5 Python client interface ............................................. 2
1.6 Fast, flexible, scalable ................................................ 2
1.7 Open ........................................................................ 2
1.8 Salt Community .......................................................... 2
1.9 Mailing List ................................................................ 2
1.10 IRC .......................................................................... 3
1.11 Follow on GitHub ........................................................ 3
1.12 Blogs ........................................................................ 3
1.13 Example Salt States ...................................................... 3
1.14 Follow on ohloh .......................................................... 3
1.15 Other community links ................................................ 4
1.16 Hack the Source ........................................................ 4

2 Installation ..................................................................... 5

2.1 Quick Install ............................................................... 5
2.2 Platform-specific Installation Instructions ...................... 5
2.3 Dependencies .............................................................. 25
2.4 Optional Dependencies ................................................ 26
2.5 Upgrading Salt ............................................................ 26

3 Tutorials ........................................................................ 27

3.1 Introduction ............................................................... 27
3.2 Basics ........................................................................ 29
3.3 States ......................................................................... 38
3.4 Advanced Topics ........................................................ 64
3.5 Salt Virt ...................................................................... 119
3.6 LXC ......................................................................... 124
3.7 Using Salt at scale ........................................................ 132

4 Targeting Minions ......................................................... 137

4.1 Matching the minion id ............................................... 137
4.2 Grains ....................................................................... 138
4.3 Subnet/IP Address Matching ....................................... 141
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.2</td>
<td>Additional Job Cache Options</td>
<td>179</td>
</tr>
<tr>
<td>12</td>
<td>Storing Job Results in an External System</td>
<td>181</td>
</tr>
<tr>
<td>12.1</td>
<td>External Job Cache - Minion-Side Returner</td>
<td>181</td>
</tr>
<tr>
<td>12.2</td>
<td>Master Job Cache - Master-Side Returner</td>
<td>182</td>
</tr>
<tr>
<td>12.3</td>
<td>Configure an External or Master Job Cache</td>
<td>182</td>
</tr>
<tr>
<td>13</td>
<td>Storing Data in Other Databases</td>
<td>185</td>
</tr>
<tr>
<td>13.1</td>
<td>SDB Configuration</td>
<td>185</td>
</tr>
<tr>
<td>13.2</td>
<td>SDB URIs</td>
<td>185</td>
</tr>
<tr>
<td>13.3</td>
<td>Writing SDB Modules</td>
<td>186</td>
</tr>
<tr>
<td>14</td>
<td>Salt Event System</td>
<td>187</td>
</tr>
<tr>
<td>14.1</td>
<td>Event types</td>
<td>187</td>
</tr>
<tr>
<td>14.2</td>
<td>Listening for Events</td>
<td>190</td>
</tr>
<tr>
<td>14.3</td>
<td>Firing Events</td>
<td>192</td>
</tr>
<tr>
<td>14.4</td>
<td>Firing Events from Python</td>
<td>192</td>
</tr>
<tr>
<td>15</td>
<td>Beacons</td>
<td>195</td>
</tr>
<tr>
<td>15.1</td>
<td>Configuring Beacons</td>
<td>195</td>
</tr>
<tr>
<td>15.2</td>
<td>Beacon Example</td>
<td>196</td>
</tr>
<tr>
<td>15.3</td>
<td>Writing Beacon Plugins</td>
<td>197</td>
</tr>
<tr>
<td>16</td>
<td>Running Custom Master Processes</td>
<td>199</td>
</tr>
<tr>
<td>16.1</td>
<td>Example Configuration</td>
<td>199</td>
</tr>
<tr>
<td>16.2</td>
<td>Example Process Class</td>
<td>199</td>
</tr>
<tr>
<td>17</td>
<td>High Availability Features in Salt</td>
<td>201</td>
</tr>
<tr>
<td>17.1</td>
<td>Multimaster</td>
<td>201</td>
</tr>
<tr>
<td>17.2</td>
<td>Multimaster with Failover</td>
<td>201</td>
</tr>
<tr>
<td>17.3</td>
<td>Syndic</td>
<td>201</td>
</tr>
<tr>
<td>17.4</td>
<td>Syndic with Multimaster</td>
<td>202</td>
</tr>
<tr>
<td>18</td>
<td>Salt Syndic</td>
<td>203</td>
</tr>
<tr>
<td>18.1</td>
<td>Configuring the Syndic</td>
<td>203</td>
</tr>
<tr>
<td>18.2</td>
<td>Configuring the Syndic with Multimaster</td>
<td>204</td>
</tr>
<tr>
<td>18.3</td>
<td>Running the Syndic</td>
<td>204</td>
</tr>
<tr>
<td>18.4</td>
<td>Topology</td>
<td>205</td>
</tr>
<tr>
<td>18.5</td>
<td>Syndic wait</td>
<td>205</td>
</tr>
<tr>
<td>18.6</td>
<td>Syndic config options</td>
<td>205</td>
</tr>
<tr>
<td>19</td>
<td>Salt Proxy Minion</td>
<td>207</td>
</tr>
<tr>
<td>19.1</td>
<td>New in 2015.8</td>
<td>207</td>
</tr>
<tr>
<td>19.2</td>
<td>Getting Started</td>
<td>207</td>
</tr>
<tr>
<td>19.3</td>
<td>The <strong>proxyenabled</strong> directive</td>
<td>214</td>
</tr>
<tr>
<td>20</td>
<td>Salt Package Manager</td>
<td>217</td>
</tr>
<tr>
<td>20.1</td>
<td>Building Packages</td>
<td>217</td>
</tr>
<tr>
<td>20.2</td>
<td>Building Repositories</td>
<td>219</td>
</tr>
<tr>
<td>20.3</td>
<td>Configuring Remote Repositories</td>
<td>219</td>
</tr>
<tr>
<td>20.4</td>
<td>Installing Packages</td>
<td>219</td>
</tr>
<tr>
<td>20.5</td>
<td>Pillars</td>
<td>219</td>
</tr>
<tr>
<td>20.6</td>
<td>Loader Modules</td>
<td>220</td>
</tr>
<tr>
<td>20.7</td>
<td>Removing Packages</td>
<td>220</td>
</tr>
<tr>
<td>20.8</td>
<td>Technical Information</td>
<td>220</td>
</tr>
</tbody>
</table>
27.2 Rule Two: Colons ......................................................... 381
27.3 Rule Three: Dashes ....................................................... 382
27.4 Learning More ............................................................. 382

28 Master Tops System .......................................................... 383

29 Salt SSH ................................................................. 385
29.1 Getting Started ......................................................... 385
29.2 Salt SSH Roster ............................................................ 385
29.3 Calling Salt SSH .......................................................... 386
29.4 States Via Salt SSH ........................................................ 386
29.5 Targeting with Salt SSH .................................................... 386
29.6 Configuring Salt SSH ....................................................... 386
29.7 Running Salt SSH as non-root user ..................................... 387
29.8 Define CLI Options with Saltfile ...................................... 387

30 Salt Rosters ................................................................. 389
30.1 How Rosters Work .......................................................... 389

31 Reference ................................................................. 391
31.1 Full list of builtin auth modules ........................................... 391
31.2 Command Line Reference .................................................. 396
31.3 Client ACL system .......................................................... 422
31.4 Python client API ............................................................ 423
31.5 Full list of Salt Cloud modules .......................................... 432
31.6 Configuration file examples ............................................... 504
31.7 Configuring Salt ............................................................. 528
31.8 Configuring the Salt Master ................................................. 531
31.9 Configuring the Salt Minion ............................................... 564
31.10 Running the Salt Master/Minion as an Unprivileged User ........ 579
31.11 Logging ................................................................. 579
31.12 External Logging Handlers ................................................. 581
31.13 Salt File Server ............................................................. 584
31.14 Full list of builtin fileservserver modules .............................. 589
31.15 Salt code and internals .................................................... 595
31.16 Full list of builtin execution modules .................................. 602
31.17 Full list of netapi modules ............................................... 1321
31.18 Full list of builtin output modules ....................................... 1347
31.19 Peer Communication ...................................................... 1353
31.20 Pillars ................................................................. 1355
31.21 Full list of builtin pillar modules ........................................ 1355
31.22 Renderers ............................................................... 1376
31.23 Returners ............................................................... 1399
31.24 Full list of builtin roster modules ...................................... 1436
31.25 Salt Runners .............................................................. 1440
31.26 State Enforcement ......................................................... 1469
31.27 Full list of builtin state modules ........................................ 1516
31.28 Execution Modules ......................................................... 1774
31.29 Master Tops .............................................................. 1781
31.30 Full list of builtin master tops modules ............................... 1781
31.31 Full list of builtin wheel modules ...................................... 1784
31.32 Full list of builtin beacon modules ..................................... 1786
31.33 Full list of builtin engine modules ...................................... 1791
31.34 Full list of builtin sdh modules .......................................... 1792
31.35 Full list of builtin serializers ............................................. 1795
37 Security disclosure policy
  37.1 Security response procedure ........................................... 2138
  37.2 Receiving security announcements .................................... 2138

38 Frequently Asked Questions ............................................. 2139
  38.1 Is Salt open-core? .......................................................... 2139
  38.2 I think I found a bug! What should I do? .............................. 2139
  38.3 What ports should I open on my firewall? ............................ 2140
  38.4 I'm seeing weird behavior (including but not limited to packages not installing their users properly) 2140
  38.5 My script runs every time I run a state.highstate. Why? .......... 2140
  38.6 When I run test.ping, why don't the Minions that aren't responding return anything? Returning False would be helpful. ...................................................... 2140
  38.7 How does Salt determine the Minion's id? ........................... 2141
  38.8 I'm trying to manage packages/services but I get an error saying that the state is not available. Why? 2141
  38.9 I'm using gitfs and my custom modules/states/etc are not syncing. Why? ...................................................... 2141
  38.10 Why aren't my custom modules/states/etc available on my Minions? ...................................................... 2141
  38.11 Module X isn't available, even though the shell command it uses is installed. Why? ...................................................... 2141
  38.12 Can I run different versions of Salt on my Master and Minion? ...................................................... 2142
  38.13 Does Salt support backing up managed files? ........................ 2142
  38.14 What is the best way to restart a Salt daemon using Salt? ........ 2142
  38.15 Salting the Salt Master .................................................. 2143

39 Glossary ................................................................. 2145

Salt Module Index .......................................................... 2149

Index ................................................................. 2157
We're not just talking about NaCl.

1.1 The 30 second summary

Salt is:

- a configuration management system, capable of maintaining remote nodes in defined states (for example, ensuring that specific packages are installed and specific services are running)
- a distributed remote execution system used to execute commands and query data on remote nodes, either individually or by arbitrary selection criteria

It was developed in order to bring the best solutions found in the world of remote execution together and make them better, faster, and more malleable. Salt accomplishes this through its ability to handle large loads of information, and not just dozens but hundreds and even thousands of individual servers quickly through a simple and manageable interface.

1.2 Simplicity

Providing versatility between massive scale deployments and smaller systems may seem daunting, but Salt is very simple to set up and maintain, regardless of the size of the project. The architecture of Salt is designed to work with any number of servers, from a handful of local network systems to international deployments across different data centers. The topology is a simple server/client model with the needed functionality built into a single set of daemons. While the default configuration will work with little to no modification, Salt can be fine tuned to meet specific needs.

1.3 Parallel execution

The core functions of Salt:

- enable commands to remote systems to be called in parallel rather than serially
- use a secure and encrypted protocol
- use the smallest and fastest network payloads possible
- provide a simple programming interface

Salt also introduces more granular controls to the realm of remote execution, allowing systems to be targeted not just by hostname, but also by system properties.
1.4 Building on proven technology

Salt takes advantage of a number of technologies and techniques. The networking layer is built with the excellent ZeroMQ networking library, so the Salt daemon includes a viable and transparent AMQ broker. Salt uses public keys for authentication with the master daemon, then uses faster AES encryption for payload communication; authentication and encryption are integral to Salt. Salt takes advantage of communication via msgpack, enabling fast and light network traffic.

1.5 Python client interface

In order to allow for simple expansion, Salt execution routines can be written as plain Python modules. The data collected from Salt executions can be sent back to the master server, or to any arbitrary program. Salt can be called from a simple Python API, or from the command line, so that Salt can be used to execute one-off commands as well as operate as an integral part of a larger application.

1.6 Fast, flexible, scalable

The result is a system that can execute commands at high speed on target server groups ranging from one to very many servers. Salt is very fast, easy to set up, amazingly malleable and provides a single remote execution architecture that can manage the diverse requirements of any number of servers. The Salt infrastructure brings together the best of the remote execution world, amplifies its capabilities and expands its range, resulting in a system that is as versatile as it is practical, suitable for any network.

1.7 Open

Salt is developed under the Apache 2.0 license, and can be used for open and proprietary projects. Please submit your expansions back to the Salt project so that we can all benefit together as Salt grows. Please feel free to sprinkle Salt around your systems and let the deliciousness come forth.

1.8 Salt Community

Join the Salt!

There are many ways to participate in and communicate with the Salt community.

Salt has an active IRC channel and a mailing list.

1.9 Mailing List

Join the salt-users mailing list. It is the best place to ask questions about Salt and see what’s going on with Salt development! The Salt mailing list is hosted by Google Groups. It is open to new members.

https://groups.google.com/forum/#!forum/salt-users

There is also a low-traffic list used to announce new releases called salt-announce

https://groups.google.com/forum/#!forum/salt-announce
1.10 IRC

The #salt IRC channel is hosted on the popular Freenode network. You can use the Freenode webchat client right from your browser.

Logs of the IRC channel activity are being collected courtesy of Moritz Lenz.

If you wish to discuss the development of Salt itself join us in #salt-devel.

1.11 Follow on GitHub

The Salt code is developed via GitHub. Follow Salt for constant updates on what is happening in Salt development:
https://github.com/saltstack/salt

1.12 Blogs

SaltStack Inc. keeps a blog with recent news and advancements:
http://www.saltstack.com/blog/

Thomas Hatch also shares news and thoughts on Salt and related projects in his personal blog The Red45:
http://red45.wordpress.com/

1.13 Example Salt States

The official salt-states repository is: https://github.com/saltstack/salt-states

A few examples of salt states from the community:

- https://github.com/blast-hardcheese/blast-salt-states
- https://github.com/kevingranade/kevingranade-salt-state
- https://github.com/mattmcclean/salt-openstack/tree/master/salt
- https://github.com/rentalita/ubuntu-setup/
- https://github.com/brutasse/states
- https://github.com/bclermont/states
- https://github.com/pcrews/salt-data

1.14 Follow on ohloh

https://www.ohloh.net/p/salt
1.15 Other community links

- Salt Stack Inc.
- Subreddit
- Google+
- YouTube
- Facebook
- Twitter
- Wikipedia page

1.16 Hack the Source

If you want to get involved with the development of source code or the documentation efforts, please review the 
*hacking section*!
Installation

See also:

*Installing Salt for development* and contributing to the project.

## 2.1 Quick Install

On most distributions, you can set up a Salt Minion with the Salt Bootstrap.

## 2.2 Platform-specific Installation Instructions

These guides go into detail how to install Salt on a given platform.

### 2.2.1 Arch Linux

**Installation**

Salt (stable) is currently available via the Arch Linux Official repositories. There are currently -git packages available in the Arch User repositories (AUR) as well.

**Stable Release**

Install Salt stable releases from the Arch Linux Official repositories as follows:

```
pacman -S salt-zmq
```

To install Salt stable releases using the RAET protocol, use the following:

```
pacman -S salt-raet
```

**Note:** transports

Unlike other Linux distributions, please be aware that Arch Linux’s package manager pacman defaults to RAET as the Salt transport. If you want to use ZeroMQ instead, make sure to enter the associated number for the salt-zmq repository when prompted.
Tracking development

To install the bleeding edge version of Salt (may include bugs!), use the -git package. Installing the -git package as follows:

```
wget https://aur.archlinux.org/packages/sa/salt-git/salt-git.tar.gz
tar xf salt-git.tar.gz
cd salt-git/
makepkg -is
```

Note: `yaourt`

If a tool such as `Yaourt` is used, the dependencies will be gathered and built automatically.

The command to install salt using the `yaourt` tool is:

```
yaourt salt-git
```

Post-installation tasks

```
systemctl
```

Activate the Salt Master and/or Minion via `systemctl` as follows:

```
systemctl enable salt-master.service
systemctl enable salt-minion.service
```

Start the Master

Once you’ve completed all of these steps you’re ready to start your Salt Master. You should be able to start your Salt Master now using the command seen here:

```
systemctl start salt-master
```

Now go to the `Configuring Salt` page.

### 2.2.2 Debian Installation

#### Installation from the SaltStack Repository

Debian 8 packages are available in the SaltStack Debian repository.

To install using the SaltStack Debian repository:

1. Run the following command to import the SaltStack repository key:

   ```
   wget -O - https://repo.saltstack.com/apt/debian/SALTSTACK-GPG-KEY.pub | sudo apt-key add -
   ```

2. Add the following line to `/etc/apt/sources.list`:

   ```
   deb http://repo.saltstack.com/apt/debian jessie contrib
   ```

3. Run `sudo apt-get update`

4. Install the salt-minion, salt-master, or other Salt components:

   ```
   • apt-get install salt-master
   ```
- `apt-get install salt-minion`
- `apt-get install salt-ssh`
- `apt-get install salt-syndic`
- `apt-get install salt-cloud`

**Configure Apt**

Currently the latest packages for Debian Old Stable, Stable, and Unstable (Squeeze, Wheezy, and Sid) are published in our (saltstack.com) Debian repository.

**Squeeze (Old Old Stable)**

For squeeze, you will need to enable the Debian backports repository as well as the debian.saltstack.com repository. To do so, add the following to `/etc/apt/sources.list` or a file in `/etc/apt/sources.list.d`:

```
deb http://debian.saltstack.com/debian squeeze-saltstack main
deb http://backports.debian.org/debian-backports squeeze-backports main
```

**Wheezy (Old Stable)**

For wheezy, the following line is needed in either `/etc/apt/sources.list` or a file in `/etc/apt/sources.list.d`:

```
deb http://debian.saltstack.com/debian wheezy-saltstack main
```

**Jessie (Stable)**

For jessie, the following line is needed in either `/etc/apt/sources.list` or a file in `/etc/apt/sources.list.d`:

```
deb http://debian.saltstack.com/debian jessie-saltstack main
```

**Sid (Unstable)**

For sid, the following line is needed in either `/etc/apt/sources.list` or a file in `/etc/apt/sources.list.d`:

```
deb http://debian.saltstack.com/debian unstable main
```

**Import the repository key.**

You will need to import the key used for signing.

```
wget -q -O- "http://debian.saltstack.com/debian-salt-team-joehealy.gpg.key" | apt-key add -
```

**Note:** You can optionally verify the key integrity with `sha512sum` using the public key signature shown here. E.g:
echo "b782969447140d5553e31e9701be13ca11cc0a7ed5fe2b30ac8b491567560ee62f834772b5b90d735e1f7ecc2384a5c1a20045f52861c417f50b68dd5ff4660e6 debian-salt-team-joehealy.gpg.key"

Update the package database

apt-get update

Install packages

Install the Salt master, minion, or syndic from the repository with the apt-get command. These examples each install one daemon, but more than one package name may be given at a time:

apt-get install salt-master

apt-get install salt-minion

apt-get install salt-syndic

Post-installation tasks

Now, go to the Configuring Salt page.

2.2.3 Fedora

Beginning with version 0.9.4, Salt has been available in the primary Fedora repositories and EPEL. It is installable using yum. Fedora will have more up to date versions of Salt than other members of the Red Hat family, which makes it a great place to help improve Salt!

WARNING: Fedora 19 comes with systemd 204. Systemd has known bugs fixed in later revisions that prevent the salt-master from starting reliably or opening the network connections that it needs to. It’s not likely that a salt-master will start or run reliably on any distribution that uses systemd version 204 or earlier. Running salt-minions should be OK.

Installation

Salt can be installed using yum and is available in the standard Fedora repositories.

Stable Release

Salt is packaged separately for the minion and the master. It is necessary only to install the appropriate package for the role the machine will play. Typically, there will be one master and multiple minions.

yum install salt-master
yum install salt-minion
Installing from `updates-testing`

When a new Salt release is packaged, it is first admitted into the `updates-testing` repository, before being moved to the stable repo.

To install from `updates-testing`, use the `enablerepo` argument for `yum`:

```
yum --enablerepo=updates-testing install salt-master
yum --enablerepo=updates-testing install salt-minion
```

Installation Using `pip`

Since Salt is on PyPI, it can be installed using pip, though most users prefer to install using a package manager.

Installing from pip has a few additional requirements:

- Install the group `Development Tools`, `dnf groupinstall 'Development Tools'
- Install the `zeromq-devel` package if it fails on linking against that afterwards as well.

A pip install does not make the init scripts or the `/etc/salt` directory, and you will need to provide your own systemd service unit.

Installation from pip:

```
pip install salt
```

**Warning:** If installing from pip (or from source using `setup.py install`), be advised that the `yum-utils` package is needed for Salt to manage packages. Also, if the Python dependencies are not already installed, then you will need additional libraries/tools installed to build some of them. More information on this can be found [here](#).

Post-installation tasks

**Master**

To have the Master start automatically at boot time:

```
systemctl enable salt-master.service
```

To start the Master:

```
systemctl start salt-master.service
```

**Minion**

To have the Minion start automatically at boot time:

```
systemctl enable salt-minion.service
```

To start the Minion:

```
systemctl start salt-minion.service
```

Now go to the *Configuring Salt* page.
2.2.4 FreeBSD

Salt was added to the FreeBSD ports tree Dec 26th, 2011 by Christer Edwards <christer.edwards@gmail.com>. It has been tested on FreeBSD 7.4, 8.2, 9.0, 9.1, 10.0 and later releases.

Installation

Salt is available in binary package form from both the FreeBSD pkgng repository or directly from SaltStack. The instructions below outline installation via both methods:

FreeBSD repo

The FreeBSD pkgng repository is preconfigured on systems 10.x and above. No configuration is needed to pull from these repositories.

```
pkg install py27-salt
```

These packages are usually available within a few days of upstream release.

SaltStack repo

SaltStack also hosts internal binary builds of the Salt package, available from http://repo.saltstack.org/freebsd/. To make use of this repository, add the following file to your system:

```
/usr/local/etc/pkg/repos/saltstack.conf:

saltstack: {
    url: "http://repo.saltstack.com/freebsd/${ABI}/",
    mirror_type: "http",
    enabled: yes
    priority: 10
}
```

You should now be able to install Salt from this new repository:

```
pkg install py27-salt
```

These packages are usually available earlier than upstream FreeBSD. Also available are release candidates and development releases. Use these pre-release packages with caution.

Post-installation tasks

Master

Copy the sample configuration file:

```
cp /usr/local/etc/salt/master.sample /usr/local/etc/salt/master
```

rc.conf

Activate the Salt Master in /etc/rc.conf:

```
sysrc salt_master_enable="YES"
```
Start the Master

Start the Salt Master as follows:

```
service salt_master start
```

Minion

Copy the sample configuration file:

```
cp /usr/local/etc/salt/minion.sample /usr/local/etc/salt/minion
```

Activate the Salt Minion in `/etc/rc.conf`:

```
sysrc salt_minion_enable="YES"
```

Start the Minion

Start the Salt Minion as follows:

```
service salt_minion start
```

Now go to the Configuring Salt page.

### 2.2.5 Gentoo

Salt can be easily installed on Gentoo via Portage:

```
emerge app-admin/salt
```

Post-installation tasks

Now go to the Configuring Salt page.

### 2.2.6 OpenBSD

Salt was added to the OpenBSD ports tree on Aug 10th 2013. It has been tested on OpenBSD 5.5 onwards.

Salt is dependent on the following additional ports. These will be installed as dependencies of the `sysutils/salt` port:

```
/net/py-msgpack
/net/py-zmq
/security/py-M2Crypto
/security/py-crypto
/textproc/py-MarkupSafe
/textproc/py-yaml
/www/py-jinja2
/www/py-requests
```

Installation

To install Salt from the OpenBSD pkg repo, use the command:
pkg_add salt

Post-installation tasks

Master
To have the Master start automatically at boot time:

```bash
rcctl enable salt_master
```

To start the Master:

```bash
rcctl start salt_master
```

Minion
To have the Minion start automatically at boot time:

```bash
rcctl enable salt_minion
```

To start the Minion:

```bash
rcctl start salt_minion
```

Now go to the Configuring Salt page.

2.2.7 OS X

Dependency Installation

It should be noted that Homebrew explicitly discourages the use of sudo:

Homebrew is designed to work without using sudo. You can decide to use it but we strongly recommend not to do so. If you have used sudo and run into a bug then it is likely to be the cause. Please don’t file a bug report unless you can reproduce it after reinstalling Homebrew from scratch without using sudo

So when using Homebrew, if you want support from the Homebrew community, install this way:

```bash
brew install saltstack
```

When using MacPorts, install this way:

```bash
sudo port install salt
```

When only using the OS X system’s pip, install this way:

```bash
sudo pip install salt
```

Salt-Master Customizations

To run salt-master on OS X, the root user maxfiles limit must be increased:

Note: On OS X 10.10 (Yosemite) and higher, maxfiles should not be adjusted. The default limits are sufficient in all but the most extreme scenarios. Overriding these values with the setting below will cause system instability!
sudo launchctl limit maxfiles 4096 8192

And sudo add this configuration option to the /etc/salt/master file:

```
max_open_files: 8192
```

Now the salt-master should run without errors:

`sudo salt-master --log-level=all`

Post-installation tasks

Now go to the Configuring Salt page.

## 2.2.8 RHEL / CentOS / Scientific Linux / Amazon Linux / Oracle Linux

### Installation from the SaltStack Repository

To install using the SaltStack yum repository:

1. Run one of the following commands based on your version to import the SaltStack repository key:

   **Version 7:**
   
   ```bash
   wget https://repo.saltstack.com/yum/rhel7/SALTSTACK-GPG-KEY.pub
   rpm --import SALTSTACK-GPG-KEY.pub
   rm -f SALTSTACK-GPG-KEY.pub
   ```

   **Version 6:**
   
   ```bash
   wget https://repo.saltstack.com/yum/rhel6/SALTSTACK-GPG-KEY.pub
   rpm --import SALTSTACK-GPG-KEY.pub
   rm -f SALTSTACK-GPG-KEY.pub
   ```

   **Version 5:**
   
   ```bash
   wget https://repo.saltstack.com/yum/rhel5/SALTSTACK-EL5-GPG-KEY.pub
   rpm --import SALTSTACK-EL5-GPG-KEY.pub
   rm -f SALTSTACK-EL5-GPG-KEY.pub
   ```

2. Save the following file to `/etc/yum.repos.d/saltstack.repo`:

   **Versions 6 / 7:**
   
   ```
   ####################
   # Enable SaltStack's package repository
   [saltstack-repo]
   name=SaltStack repo for RHEL/CentOS $releasever
   baseurl=https://repo.saltstack.com/yum/rhel$releasever
   enabled=1
   gpgcheck=1
   gpgkey=https://repo.saltstack.com/yum/rhel$releasever/SALTSTACK-GPG-KEY.pub
   ```

   **Version 5:**
   
   ```
   ```
### Enable SaltStack's package repository

```
[saltstack-repo]
name=SaltStack repo for RHEL/CentOS $releasever
baseurl=https://repo.saltstack.com/yum/rhel$releasever
enabled=1
gpgcheck=1
gpgkey=https://repo.saltstack.com/yum/rhel$releasever/SALTSTACK-EL5-GPG-KEY.pub
```

3. Run `sudo yum clean expire-cache`
4. Run `sudo yum update`
5. Install the salt-minion, salt-master, or other Salt components:
   • `yum install salt-master`
   • `yum install salt-minion`
   • `yum install salt-ssh`
   • `yum install salt-syndic`
   • `yum install salt-cloud`

**Note:** EPEL support is not required when installing using the SaltStack repository on Red Hat 6 and 7. EPEL must be enabled when installing on Red Hat 5.

### Installation from Repository

**RHEL/CentOS 6 and 7, Scientific Linux, etc.**

**Warning:** Salt 2015.8 requires `python-crypto` 2.6.1 or higher, and `python-tornado` version 4.2.1 or higher. These packages are not currently available in EPEL for Red Hat 5 and 6. You must install these dependencies from another location or use the SaltStack repository documented above.

Beginning with version 0.9.4, Salt has been available in EPEL. It is installable using yum. Salt should work properly with all mainstream derivatives of RHEL, including CentOS, Scientific Linux, Oracle Linux and Amazon Linux. Report any bugs or issues on the [issue tracker](https://github.com/saltstack/salt/issues).

On RHEL6, the proper Jinja package `python-jinja2` was moved from EPEL to the `RHEL Server Optional Channel`. Verify this repository is enabled before installing salt on RHEL6.

**RHEL/CentOS 5**

Due to the removal of some of Salt's dependencies from EPEL5, we recommend using the SaltStack Repository or the repository on Fedora COPR.

**Enabling EPEL** If the EPEL repository is not installed on your system, you can download the RPM from [here](https://fedorahosted.org/releases/epel/) for RHEL/CentOS 6 (or [here](https://fedorahosted.org/releases/epel/) for RHEL/CentOS 7) and install it using the following command:

```
rpm -Uvh epel-release-X-Y.rpm
```

Replace `epel-release-X-Y.rpm` with the appropriate filename.
Installing Stable Release  Salt is packaged separately for the minion and the master. It is necessary only to install the appropriate package for the role the machine will play. Typically, there will be one master and multiple minions.

On the salt-master, run this:

```
yum install salt-master
```

On each salt-minion, run this:

```
yum install salt-minion
```

Installing from `epel-testing`  When a new Salt release is packaged, it is first admitted into the `epel-testing` repository, before being moved to the stable repo.

To install from `epel-testing`, use the `enablerepo` argument for `yum`:

```
yum --enablerepo=epel-testing install salt-minion
```

Installation Using `pip`  Since Salt is on PyPI, it can be installed using pip, though most users prefer to install using RPMs (which can be installed from EPEL).

Installing from pip has a few additional requirements:

- Install the group `Development Tools`, `yum groupinstall 'Development Tools'`
- Install the `zeromq-devel` package if it fails on linking against that afterwards as well.

A pip install does not make the init scripts or the `/etc/salt` directory, and you will need to provide your own systemd service unit.

Installation from pip:

```
pip install salt
```

**Warning:** If installing from pip (or from source using `setup.py install`), be advised that the `yum-utils` package is needed for Salt to manage packages. Also, if the Python dependencies are not already installed, then you will need additional libraries/tools installed to build some of them. More information on this can be found [here](#).

**ZeroMQ 4**

We recommend using ZeroMQ 4 where available. SaltStack provides ZeroMQ 4.0.4 and pyzmq 14.3.1 in the SaltStack Repository as well as a COPR repository.

If this repo is added before Salt is installed, then installing either `salt-master` or `salt-minion` will automatically pull in ZeroMQ 4.0.4, and additional states to upgrade ZeroMQ and pyzmq are unnecessary.

**Warning:** RHEL/CentOS 5 Users Using COPR repos on RHEL/CentOS 5 requires that the `python-hashlib` package be installed. Not having it present will result in checksum errors because YUM will not be able to process the SHA256 checksums used by COPR.

**Note:** For RHEL/CentOS 5 installations, if using the new repository to install Salt (as detailed above), then it is not necessary to enable the zeromq4 COPR, as the new EL5 repository includes ZeroMQ 4.
Package Management

Salt’s interface to yum makes heavy use of the repoquery utility, from the yum-utils package. This package will be installed as a dependency if salt is installed via EPEL. However, if salt has been installed using pip, or a host is being managed using salt-ssh, then as of version 2014.7.0 yum-utils will be installed automatically to satisfy this dependency.

Post-installation tasks

Master

To have the Master start automatically at boot time:

chkconfig salt-master on

To start the Master:

service salt-master start

Minion

To have the Minion start automatically at boot time:

chkconfig salt-minion on

To start the Minion:

service salt-minion start

Now go to the Configuring Salt page.

2.2.9 Solaris

Salt was added to the OpenCSW package repository in September of 2012 by Romeo Theriault <romeot@hawaii.edu> at version 0.10.2 of Salt. It has mainly been tested on Solaris 10 (sparc), though it is built for and has been tested minimally on Solaris 10 (x86), Solaris 9 (sparc/x86) and 11 (sparc/x86). (Please let me know if you’re using it on these platforms!) Most of the testing has also just focused on the minion, though it has verified that the master starts up successfully on Solaris 10.

Comments and patches for better support on these platforms is very welcome.

As of version 0.10.4, Solaris is well supported under salt, with all of the following working well:

1. remote execution
2. grain detection
3. service control with SMF
4. `pkg` states with `pkgadd` and `pkgutil` modules
5. cron modules/states
6. user and group modules/states
7. shadow password management modules/states

Salt is dependent on the following additional packages. These will automatically be installed as dependencies of the py_salt package:

- py_yam1
• py_pyzmq
• py_jinja2
• py_msgpack_python
• py_m2crypto
• py_crypto
• python

**Installation**

To install Salt from the OpenCSW package repository you first need to install `pkgutil` assuming you don't already have it installed:

On Solaris 10:
```
pkgadd -d http://get.opencsw.org/now
```

On Solaris 9:
```
wget http://mirror.opencsw.org/opencsw/pkgutil.pkg
pkgadd -d pkgutil.pkg all
```

Once `pkgutil` is installed you'll need to edit it's config file `/etc/opt/csw/pkgutil.conf` to point it at the unstable catalog:

```
- #mirror=http://mirror.opencsw.org/opencsw/testing
+ mirror=http://mirror.opencsw.org/opencsw/unstable
```

OK, time to install salt.

```
# Update the catalog
root> /opt/csw/bin/pkgutil -U
# Install salt
root> /opt/csw/bin/pkgutil -i -y py_salt
```

**Minion Configuration**

Now that salt is installed you can find it's configuration files in `/etc/opt/csw/salt/`.

You'll want to edit the minion config file to set the name of your salt master server:

```
- #master: salt
+ master: your-salt-server
```

If you would like to use `pkgutil` as the default package provider for your Solaris minions, you can do so using the `providers` option in the minion config file.

You can now start the salt minion like so:

On Solaris 10:
```
svcadm enable salt-minion
```

On Solaris 9:
/etc/init.d/salt-minion start

You should now be able to log onto the salt master and check to see if the salt-minion key is awaiting acceptance:
salt-key -l un

Accept the key:
salt-key -a <your-salt-minion>

Run a simple test against the minion:
salt '<<your-salt-minion>>' test.ping

Troubleshooting

Logs are in /var/log/salt

2.2.10 Ubuntu Installation

Add repository

The latest packages for Ubuntu are published in the saltstack PPA. If you have the add-apt-repository utility, you can add the repository and import the key in one step:
sudo add-apt-repository ppa:saltstack/salt

In addition to the main repository, there are secondary repositories for each individual major release. These repositories receive security and point releases but will not upgrade to any subsequent major release. There are currently four available repos: salt16, salt17, salt2014-1, salt2014-7. For example to follow 2014.7.x releases:
sudo add-apt-repository ppa:saltstack/salt2014-7

add-apt-repository: command not found?
The add-apt-repository command is not always present on Ubuntu systems. This can be fixed by installing python-software-properties:
sudo apt-get install python-software-properties

The following may be required as well:
sudo apt-get install software-properties-common

Note that since Ubuntu 12.10 (Raring Ringtail), add-apt-repository is found in the software-properties-common package, and is part of the base install. Thus, add-apt-repository should be able to be used out-of-the-box to add the PPA.

Alternately, manually add the repository and import the PPA key with these commands:
echo deb http://ppa.launchpad.net/saltstack/salt/ubuntu `lsb_release -sc` main | sudo tee /etc/apt/sources.list.d/saltstack.list
wget -q -O- "http://keyserver.ubuntu.com:11371/pks/lookup?op=get&search=0x4759FA960E27C0A6" | sudo apt-key add -

After adding the repository, update the package management database:
Install packages

Install the Salt master, minion, or syndic from the repository with the apt-get command. These examples each install one daemon, but more than one package name may be given at a time:

```
sudo apt-get install salt-master
```

```
sudo apt-get install salt-minion
```

```
sudo apt-get install salt-syndic
```

Some core components are packaged separately in the Ubuntu repositories. These should be installed as well: salt-cloud, salt-ssh, salt-api

```
sudo apt-get install salt-cloud
```

```
sudo apt-get install salt-ssh
```

```
sudo apt-get install salt-api
```

ZeroMQ 4

ZeroMQ 4 is available by default for Ubuntu 14.04 and newer. However, for Ubuntu 12.04 LTS, starting with Salt version 2014.7.5, ZeroMQ 4 is included with the Salt installation package and nothing additional needs to be done.

Post-installation tasks

Now go to the Configuring Salt page.

2.2.11 Windows

Salt has full support for running the Salt Minion on Windows.

There are no plans for the foreseeable future to develop a Salt Master on Windows. For now you must run your Salt Master on a supported operating system to control your Salt Minions on Windows.

Many of the standard Salt modules have been ported to work on Windows and many of the Salt States currently work on Windows, as well.

Windows Installer

Salt Minion Windows installers can be found here. The output of `md5sum <salt minion exe>` should match the contents of the corresponding md5 file.

Latest stable build from the selected branch:

Earlier builds from supported branches

Archived builds from unsupported branches
Note: The installation executable installs dependencies that the Salt minion requires.

The 64bit installer has been tested on Windows 7 64bit and Windows Server 2008R2 64bit. The 32bit installer has been tested on Windows 2003 Server 32bit. Please file a bug report on our GitHub repo if issues for other platforms are found.

The installer asks for 2 bits of information; the master hostname and the minion name. The installer will update the minion config with these options and then start the minion.

The `salt-minion` service will appear in the Windows Service Manager and can be started and stopped there or with the command line program `sc` like any other Windows service.

If the minion won't start, try installing the Microsoft Visual C++ 2008 x64 SP1 redistributable. Allow all Windows updates to run salt-minion smoothly.

Silent Installer Options

The installer can be run silently by providing the `/S` option at the command line. The options `/master` and `/minion-name` allow for configuring the master hostname and minion name, respectively. Here's an example of using the silent installer:

```
Salt-Minion-0.17.8-Setup-amd64.exe /S /master=yoursaltmaster /minion-name=yourminionname
```

Setting up a Windows build environment

This document will explain how to set up a development environment for salt on Windows. The development environment allows you to work with the source code to customize or fix bugs. It will also allow you to build your own installation.

The Easy Way

Prerequisite Software To do this the easy way you only need to install Git for Windows.

Create the Build Environment

1. Clone the Salt-Windows-Dev repo from github.
   
   Open a command line and type:
   ```
   git clone https://github.com/saltstack/salt-windows-dev
   ```

2. Build the Python Environment
   
   Go into the salt-windows-dev directory. Right-click the file named `dev_env.ps1` and select Run with Powershell
   
   If you get an error, you may need to change the execution policy.
   
   Open a powershell window and type the following:
   ```
   Set-ExecutionPolicy RemoteSigned
   ```

   This will download and install Python with all the dependencies needed to develop and build salt.
3. Build the Salt Environment

Right-click on the file named `dev_env_salt.ps1` and select **Run with Powershell**

This will clone salt into `C:\Salt-Dev\salt` and set it to the 2015.5 branch. You could optionally run the command from a powershell window with a `-Version` switch to pull a different version. For example:

```
dev_env_salt.ps1 -Version '2014.7'
```

To view a list of available branches and tags, open a command prompt in your `C:Salt-Dev\salt` directory and type:

```
git branch -a  
git tag -n
```

**The Hard Way**

**Prerequisite Software**  Install the following software:

1. Git for Windows
2. Nullsoft Installer

Download the Prerequisite zip file for your CPU architecture from the SaltStack download site:

- Salt32.zip
- Salt64.zip

These files contain all software required to build and develop salt. Unzip the contents of the file to `C:\Salt-Dev\temp`.

**Create the Build Environment**

1. Build the Python Environment
   - Install Python:
     
     Browse to the `C:\Salt-Dev\temp` directory and find the Python installation file for your CPU Architecture under the corresponding subfolder. Double-click the file to install python.
     
     Make sure the following are in your `PATH` environment variable:

     ```
     C:\Python27
     C:\Python27\Scripts
     ```

   - Install Pip
     
     Open a command prompt and navigate to `C:\Salt-Dev\temp` Run the following command:

     ```
     python get-pip.py
     ```

   - Easy Install compiled binaries.
     
     M2Crypto, PyCrypto, and PyWin32 need to be installed using Easy Install. Open a command prompt and navigate to `C:\Salt-Dev\temp\<cpuarch>`. Run the following commands:

     ```
     easy_install -Z <M2Crypto file name>
     easy_install -Z <PyCrypto file name>
     easy_install -Z <PyWin32 file name>
     ```

2.2. Platform-specific Installation Instructions
Note: You can type the first part of the file name and then press the tab key to auto-complete the name of the file.

- Pip Install Additional Prerequisites

All remaining prerequisites need to be pip installed. These prerequisites are as follow:

- MarkupSafe
- Jinja
- MsgPack
- PSUtil
- PyYAML
- PyZMQ
- WMI
- Requests
- Certifi

Open a command prompt and navigate to `C:\Salt-Dev\temp`. Run the following commands:

```
pip install <cpuarch>\<MarkupSafe file name>
pip install <Jinja file name>
pip install <cpuarch>\<MsgPack file name>
pip install <cpuarch>\<psutil file name>
pip install <cpuarch>\<PyYAML file name>
pip install <cpuarch>\<pyzmq file name>
pip install <WMI file name>
pip install <requests file name>
pip install <certifi file name>
```

2. Build the Salt Environment

- Clone Salt

Open a command prompt and navigate to `C:\Salt-Dev`. Run the following command to clone salt:

```
git clone https://github.com/saltstack/salt
```

- Checkout Branch

Checkout the branch or tag of salt you want to work on or build. Open a command prompt and navigate to `C:\Salt-Dev\salt`. Get a list of available tags and branches by running the following commands:

```
git fetch --all
```

To view a list of available branches:
```
git branch -a
```

To view a list of available tags:
```
git tag -n
```

Checkout the branch or tag by typing the following command:

```
git checkout <branch/tag name>
```
• Clean the Environment

When switching between branches residual files can be left behind that will interfere with the functionality of salt. Therefore, after you check out the branch you want to work on, type the following commands to clean the salt environment:

Developing with Salt

There are two ways to develop with salt. You can run salt’s setup.py each time you make a change to source code or you can use the setup tools develop mode.

Configure the Minion

Both methods require that the minion configuration be in the C:\salt directory. Copy the conf and var directories from C:\Salt-Dev\salt\pkg\windows\buildenv to C:\salt. Now go into the C:\salt\conf directory and edit the file name minion (no extension). You need to configure the master and id parameters in this file. Edit the following lines:

master: <ip or name of your master>
id: <name of your minion>

Setup.py Method

Go into the C:\Salt-Dev\salt directory from a cmd prompt and type:

```bash
python setup.py install --force
```

This will install python into your python installation at C:\Python27. Everytime you make an edit to your source code, you’ll have to stop the minion, run the setup, and start the minion.

To start the salt-minion go into C:\Python27\Scripts from a cmd prompt and type:

```bash
salt-minion
```

For debug mode type:

```bash
salt-minion -l debug
```

To stop the minion press Ctrl+C.

Setup Tools Develop Mode (Preferred Method)

To use the Setup Tools Develop Mode go into C:\Salt-Dev\salt from a cmd prompt and type:

```bash
pip install -e .
```

This will install pointers to your source code that resides at C:\Salt-Dev\salt. When you edit your source code you only have to restart the minion.

Build the windows installer

This is the method of building the installer as of version 2014.7.4.
Clean the Environment

Make sure you don’t have any leftover salt files from previous versions of salt in your Python directory.
1. Remove all files that start with salt in the C:\Python27\Scripts directory
2. Remove all files and directorys that start with salt in the C:\Python27\Lib\site-packages directory

Install Salt

Install salt using salt’s setup.py. From the C:\Salt-Dev\salt directory type the following command:

```bash
python setup.py install --force
```

Build the Installer

From cmd prompt go into the C:\Salt-Dev\salt\pkg\windows directory. Type the following command for the branch or tag of salt you’re building:

```
BuildSalt.bat <branch or tag>
```

This will copy python with salt installed to the buildenv\bin directory, make it portable, and then create the windows installer. The .exe for the windows installer will be placed in the installer directory.

Testing the Salt minion

1. Create the directory C:salt (if it doesn’t exist already)
2. Copy the example conf and var directories from pkg/windows/buildenv/ into C:salt
3. Edit C:salt\conf\minion

```
master: ipaddress or hostname of your salt-master
```

4. Start the salt-minion

```
cd C:\Python27\Scripts
python salt-minion
```

5. On the salt-master accept the new minion’s key

```
sudo salt-key -A
```

This accepts all unaccepted keys. If you’re concerned about security just accept the key for this specific minion.

6. Test that your minion is responding

On the salt-master run:

```
sudo salt '*' test.ping
```

You should get the following response: {"your minion hostname": True}
Single command bootstrap script

On a 64 bit Windows host the following script makes an unattended install of salt, including all dependencies:

```powershell
# (All in one line.)
```

You can execute the above command remotely from a Linux host using winexe:

```powershell
winexe -U "administrator" //fqdn "PowerShell (New-Object ......);"
```

For more info check http://csa-net.dk/salt

Packages management under Windows 2003

On windows Server 2003, you need to install optional component `"wmi windows installer provider"` to have full list of installed packages. If you don't have this, salt-minion can't report some installed softwares.

2.2.12 SUSE Installation

With openSUSE 13.2, Salt 2014.1.11 is available in the primary repositories. The devel:language:python repo will have more up to date versions of salt, all package development will be done there.

Installation

Salt can be installed using `zypper` and is available in the standard openSUSE repositories.

Stable Release

Salt is packaged separately for the minion and the master. It is necessary only to install the appropriate package for the role the machine will play. Typically, there will be one master and multiple minions.

```bash
zypper install salt-master
zypper install salt-minion
```

Post-installation tasks openSUSE

Master

To have the Master start automatically at boot time:

```bash
systemctl enable salt-master.service
```

To start the Master:

```bash
systemctl start salt-master.service
```
Minion

To have the Minion start automatically at boot time:

```bash
systemctl enable salt-minion.service
```

To start the Minion:

```bash
systemctl start salt-minion.service
```

Post-installation tasks SLES

Master

To have the Master start automatically at boot time:

```bash
chkconfig salt-master on
```

To start the Master:

```bash
rcsalt-master start
```

Minion

To have the Minion start automatically at boot time:

```bash
chkconfig salt-minion on
```

To start the Minion:

```bash
rcsalt-minion start
```

Unstable Release

openSUSE

For openSUSE Factory run the following as root:

```bash
zypper refresh
zypper install salt salt-minion salt-master
```

For openSUSE 13.2 run the following as root:

```bash
zypper refresh
zypper install salt salt-minion salt-master
```

For openSUSE 13.1 run the following as root:

```bash
zypper refresh
zypper install salt salt-minion salt-master
```

For bleeding edge python Factory run the following as root:

```bash
zypper refresh
zypper install salt salt-minion salt-master
```
Suse Linux Enterprise

For SLE 12 run the following as root:

```
zypper refresh
zypper install salt salt-minion salt-master
```

For SLE 11 SP3 run the following as root:

```
zypper refresh
zypper install salt salt-minion salt-master
```

For SLE 11 SP2 run the following as root:

```
zypper refresh
zypper install salt salt-minion salt-master
```

Now go to the Configuring Salt page.

### 2.3 Dependencies

Salt should run on any Unix-like platform so long as the dependencies are met.

- **Python 2.6 >= 2.6 <3.0**
- **msgpack-python** - High-performance message interchange format
- **YAML** - Python YAML bindings
- **Jinja2** - parsing Salt States (configurable in the master settings)
- **MarkupSafe** - Implements a XML/HTML/XHTML Markup safe string for Python
- **apache-libcloud** - Python lib for interacting with many of the popular cloud service providers using a unified API
- **Requests** - HTTP library

Depending on the chosen Salt transport, **ZeroMQ** or **RAET**, dependencies vary:

- **ZeroMQ**:
  - **ZeroMQ >= 3.2.0**
  - **pyzmq >= 2.2.0** - ZeroMQ Python bindings
  - **PyCrypto** - The Python cryptography toolkit
  - **M2Crypto** - "Me Too Crypto" - Python OpenSSL wrapper

- **RAET**:
  - **libnacl** - Python bindings to **libsodium**
  - **ioflo** - The flo programming interface raet and salt-raet is built on
  - **RAET** - The worlds most awesome UDP protocol

Salt defaults to the **ZeroMQ** transport, and the choice can be made at install time, for example:
python setup.py --salt-transport=raet install

This way, only the required dependencies are pulled by the setup script if need be.

If installing using pip, the --salt-transport install option can be provided like:

deploy

```
pip install --install-option="--salt-transport=raet" salt
```

2.4 Optional Dependencies

- **mako** - an optional parser for Salt States (configurable in the master settings)
- **gcc** - dynamic **Cython** module compiling

2.5 Upgrading Salt

When upgrading Salt, the master(s) should always be upgraded first. Backward compatibility for minions running newer versions of salt than their masters is not guaranteed.

Whenever possible, backward compatibility between new masters and old minions will be preserved. Generally, the only exception to this policy is in case of a security vulnerability.
3.1 Introduction

3.1.1 Salt Masterless Quickstart

Running a masterless salt-minion lets you use Salt’s configuration management for a single machine without calling out to a Salt master on another machine.

Since the Salt minion contains such extensive functionality it can be useful to run it standalone. A standalone minion can be used to do a number of things:

- Stand up a master server via States (Salting a Salt Master)
- Use salt-call commands on a system without connectivity to a master
- Masterless States, run states entirely from files local to the minion

It is also useful for testing out state trees before deploying to a production setup.

Bootstrap Salt Minion

The salt-bootstrap script makes bootstrapping a server with Salt simple for any OS with a Bourne shell:

```
curl -L https://bootstrap.saltstack.com -o install_salt.sh
sudo sh install_salt.sh
```

See the salt-bootstrap documentation for other one liners. When using Vagrant to test out salt, the Vagrant salt provisioner will provision the VM for you.

Telling Salt to Run Masterless

To instruct the minion to not look for a master, the file_client configuration option needs to be set in the minion configuration file. By default the file_client is set to remote so that the minion gathers file server and pillar data from the salt master. When setting the file_client option to local the minion is configured to not gather this data from the master.

```
file_client: local
```

Now the salt minion will not look for a master and will assume that the local system has all of the file and pillar resources.
Note: When running Salt in masterless mode, do not run the salt-minion daemon. Otherwise, it will attempt to connect to a master and fail. The salt-call command stands on its own and does not need the salt-minion daemon.

Create State Tree

Following the successful installation of a salt-minion, the next step is to create a state tree, which is where the SLS files that comprise the possible states of the minion are stored.

The following example walks through the steps necessary to create a state tree that ensures that the server has the Apache webserver installed.

Note: For a complete explanation on Salt States, see the tutorial.

1. Create the top.sls file:

```
/srv/salt/top.sls:
base:    
  '*':  
    - webserver
```

2. Create the webserver state tree:

```
/srv/salt/webserver.sls:
apache: # ID declaration
  pkg:   # state declaration
    - installed # function declaration
```

Note: The apache package has different names on different platforms, for instance on Debian/Ubuntu it is apache2, on Fedora/RHEL it is httpd and on Arch it is apache

The only thing left is to provision our minion using salt-call and the highstate command.

Salt-call

The salt-call command is used to run module functions locally on a minion instead of executing them from the master. Normally the salt-call command checks into the master to retrieve file server and pillar data, but when running standalone salt-call needs to be instructed to not check the master for this data:

```
salt-call --local state.highstate
```

The --local flag tells the salt-minion to look for the state tree in the local file system and not to contact a Salt Master for instructions.

To provide verbose output, use -l debug:

```
salt-call --local state.highstate -l debug
```

The minion first examines the top.sls file and determines that it is a part of the group matched by * glob and that the webserver SLS should be applied.

It then examines the webserver.sls file and finds the apache state, which installs the Apache package.

The minion should now have Apache installed, and the next step is to begin learning how to write more complex states.
3.2 Basics

3.2.1 Standalone Minion

Since the Salt minion contains such extensive functionality it can be useful to run it standalone. A standalone minion can be used to do a number of things:

- Use salt-call commands on a system without connectivity to a master
- Masterless States, run states entirely from files local to the minion

Note: When running Salt in masterless mode, do not run the salt-minion daemon. Otherwise, it will attempt to connect to a master and fail. The salt-call command stands on its own and does not need the salt-minion daemon.

Telling Salt Call to Run Masterless

The salt-call command is used to run module functions locally on a minion instead of executing them from the master. Normally the salt-call command checks into the master to retrieve file server and pillar data, but when running standalone salt-call needs to be instructed to not check the master for this data. To instruct the minion to not look for a master when running salt-call the `file_client` configuration option needs to be set. By default the `file_client` is set to `remote` so that the minion knows that file server and pillar data are to be gathered from the master. When setting the `file_client` option to `local` the minion is configured to not gather this data from the master.

```
file_client: local
```

Now the salt-call command will not look for a master and will assume that the local system has all of the file and pillar resources.

Running States Masterless

The state system can be easily run without a Salt master, with all needed files local to the minion. To do this the minion configuration file needs to be set up to know how to return file_roots information like the master. The `file_roots` setting defaults to `/srv/salt` for the base environment just like on the master:

```
file_roots:
  base:
    - /srv/salt
```

Now set up the Salt State Tree, top file, and SLS modules in the same way that they would be set up on a master. Now, with the `file_client` option set to `local` and an available state tree then calls to functions in the state module will use the information in the file_roots on the minion instead of checking in with the master.

Remember that when creating a state tree on a minion there are no syntax or path changes needed, SLS modules written to be used from a master do not need to be modified in any way to work with a minion.

This makes it easy to "script" deployments with Salt states without having to set up a master, and allows for these SLS modules to be easily moved into a Salt master as the deployment grows.

The declared state can now be executed with:

```
salt-call state.highstate
```

Or the salt-call command can be executed with the `--local` flag, this makes it unnecessary to change the configuration file:
salt-call state.highstate --local

External Pillars

*External pillars* are supported when running in masterless mode.

### 3.2.2 Opening the Firewall up for Salt

The Salt master communicates with the minions using an AES-encrypted ZeroMQ connection. These communications are done over TCP ports `4505` and `4506`, which need to be accessible on the master only. This document outlines suggested firewall rules for allowing these incoming connections to the master.

**Note:** No firewall configuration needs to be done on Salt minions. These changes refer to the master only.

#### Fedora 18 and beyond / RHEL 7 / CentOS 7

Starting with Fedora 18 **FirewallD** is the tool that is used to dynamically manage the firewall rules on a host. It has support for IPv4/6 settings and the separation of runtime and permanent configurations. To interact with FirewallD use the command line client `firewall-cmd`.

**firewall-cmd example:**

```
firewall-cmd --permanent --zone=<zone> --add-port=4505-4506/tcp
```

Please choose the desired zone according to your setup. Don't forget to reload after you made your changes.

```
firewall-cmd --reload
```

#### RHEL 6 / CentOS 6

The **lokkit** command packaged with some Linux distributions makes opening iptables firewall ports very simple via the command line. Just be careful to not lock out access to the server by neglecting to open the ssh port.

**lokkit example:**

```
```

The **system-config-firewall-tui** command provides a text-based interface to modifying the firewall.

**system-config-firewall-tui:**

```
system-config-firewall-tui
```

#### openSUSE

Salt installs firewall rules in `/etc/sysconfig/SuSEfirewall2.d/services/salt`. Enable with:

```
SuSEfirewall2 open
SuSEfirewall2 start
```
If you have an older package of Salt where the above configuration file is not included, the `SuSEfirewall2` command makes opening iptables firewall ports very simple via the command line.

**SuSEfirewall example:**

```bash
SuSEfirewall2 open EXT TCP 4505
SuSEfirewall2 open EXT TCP 4506
```

The firewall module in YaST2 provides a text-based interface to modifying the firewall.

**YaST2:**

```
yast2 firewall
```

**iptables**

Different Linux distributions store their `iptables` (also known as `netfilter`) rules in different places, which makes it difficult to standardize firewall documentation. Included are some of the more common locations, but your mileage may vary.

**Fedora / RHEL / CentOS:**

```
/etc/sysconfig/iptables
```

**Arch Linux:**

```
/etc/iptables/iptables.rules
```

**Debian**

Follow these instructions: [https://wiki.debian.org/iptables](https://wiki.debian.org/iptables)

Once you’ve found your firewall rules, you’ll need to add the two lines below to allow traffic on `tcp/4505` and `tcp/4506`:

```bash
-A INPUT -m state --state new -m tcp -p tcp --dport 4505 -j ACCEPT
-A INPUT -m state --state new -m tcp -p tcp --dport 4506 -j ACCEPT
```

**Ubuntu**

Salt installs firewall rules in `/etc/ufw/applications.d/salt.ufw`. Enable with:

```
ufw allow salt
```

**pf.conf**

The BSD-family of operating systems uses `packet filter (pf)`. The following example describes the additions to `pf.conf` needed to access the Salt master.

```bash
pass in on $int_if proto tcp from any to $int_if port 4505
pass in on $int_if proto tcp from any to $int_if port 4506
```

Once these additions have been made to the `pf.conf` the rules will need to be reloaded. This can be done using the `pfctl` command.

```
pfctl -vf /etc/pf.conf
```
3.2.3 Whitelist communication to Master

There are situations where you want to selectively allow Minion traffic from specific hosts or networks into your Salt Master. The first scenario which comes to mind is to prevent unwanted traffic to your Master out of security concerns, but another scenario is to handle Minion upgrades when there are backwards incompatible changes between the installed Salt versions in your environment.

Here is an example *Linux iptables* ruleset to be set on the Master:

```bash
# Allow Minions from these networks
-I INPUT -s 10.1.2.0/24 -p tcp -m multiport --dports 4505,4506 -j ACCEPT
-I INPUT -s 10.1.3.0/24 -p tcp -m multiport --dports 4505,4506 -j ACCEPT
# Allow Salt to communicate with Master on the loopback interface
-A INPUT -i lo -p tcp -m multiport --dports 4505,4506 -j ACCEPT
# Reject everything else
-A INPUT -p tcp -m multiport --dports 4505,4506 -j REJECT
```

Note: The important thing to note here is that the salt command needs to communicate with the listening network socket of salt-master on the loopback interface. Without this you will see no outgoing Salt traffic from the master, even for a simple `salt '*' test.ping`, because the salt client never reached the salt-master to tell it to carry out the execution.

3.2.4 Using cron with Salt

The Salt Minion can initiate its own highstate using the `salt-call` command.

```bash
$ salt-call state.highstate
```

This will cause the minion to check in with the master and ensure it is in the correct 'state'.

Use cron to initiate a highstate

If you would like the Salt Minion to regularly check in with the master you can use the venerable cron to run the `salt-call` command.

```bash
# PATH=/bin:/sbin:/usr/bin:/usr/sbin
00 00 * * * salt-call state.highstate
```

The above cron entry will run a highstate every day at midnight.

Note: Be aware that you may need to ensure the PATH for cron includes any scripts or commands that need to be executed.

3.2.5 Remote execution tutorial

Before continuing make sure you have a working Salt installation by following the installation and the configuration instructions.

Stuck?

There are many ways to get help from the Salt community including our mailing list and our IRC channel #salt.
Order your minions around

Now that you have a master and at least one minion communicating with each other you can perform commands on the minion via the salt command. Salt calls are comprised of three main components:

```
salt '<target>' <function> [arguments]
```

See also:

salt manpage

target

The target component allows you to filter which minions should run the following function. The default filter is a glob on the minion id. For example:

```
salt '*' test.ping
salt '*.example.org' test.ping
```

Targets can be based on minion system information using the Grains system:

```
salt -G 'os:Ubuntu' test.ping
```

See also:

Grains system

Targets can be filtered by regular expression:

```
salt -E 'virtmach[0-9]' test.ping
```

Targets can be explicitly specified in a list:

```
salt -L 'foo,bar,baz,quo' test.ping
```

Or Multiple target types can be combined in one command:

```
salt -C 'G@os:Ubuntu and webser* or E@database.*' test.ping
```

function

A function is some functionality provided by a module. Salt ships with a large collection of available functions. List all available functions on your minions:

```
salt '*' sys.doc
```

Here are some examples:

Show all currently available minions:

```
salt '*' test.ping
```

Run an arbitrary shell command:

```
salt '*' cmd.run 'uname -a'
```

See also:

the full list of modules
arguments

Space-delimited arguments to the function:

```cmd.exec_code python 'import sys; print sys.version'
```

Optional, keyword arguments are also supported:

```pip.install salt timeout=5 upgrade=True```

They are always in the form of `kwarg=argument`.

### 3.2.6 Pillar Walkthrough

**Note:** This walkthrough assumes that the reader has already completed the initial Salt walkthrough.

Pillars are tree-like structures of data defined on the Salt Master and passed through to minions. They allow confidential, targeted data to be securely sent only to the relevant minion.

**Note:** Grains and Pillar are sometimes confused, just remember that Grains are data about a minion which is stored or generated from the minion. This is why information like the OS and CPU type are found in Grains. Pillar is information about a minion or many minions stored or generated on the Salt Master.

Pillar data is useful for:

- **Highly Sensitive Data:** Information transferred via pillar is guaranteed to only be presented to the minions that are targeted, making Pillar suitable for managing security information, such as cryptographic keys and passwords.

- **Minion Configuration:** Minion modules such as the execution modules, states, and returners can often be configured via data stored in pillar.

- **Variables:** Variables which need to be assigned to specific minions or groups of minions can be defined in pillar and then accessed inside sls formulas and template files.

- **Arbitrary Data:** Pillar can contain any basic data structure in dictionary format, so a key/value store can be defined making it easy to iterate over a group of values in sls formulas.

Pillar is therefore one of the most important systems when using Salt. This walkthrough is designed to get a simple Pillar up and running in a few minutes and then to dive into the capabilities of Pillar and where the data is available.

### Setting Up Pillar

The pillar is already running in Salt by default. To see the minion’s pillar data:

```pillar.items```

**Note:** Prior to version 0.16.2, this function is named `pillar.data`. This function name is still supported for backwards compatibility.

By default the contents of the master configuration file are loaded into pillar for all minions. This enables the master configuration file to be used for global configuration of minions.

Similar to the state tree, the pillar is comprised of sls files and has a top file. The default location for the pillar is in `/srv/pillar`. 

Note: The pillar location can be configured via the pillar_roots option inside the master configuration file. It must not be in a subdirectory of the state tree.

To start setting up the pillar, the /srv/pillar directory needs to be present:

```bash
mkdir /srv/pillar
```

Now create a simple top file, following the same format as the top file used for states:

```
/srv/pillar/top.sls:
base:
  '*':
    - data
```

This top file associates the data.sls file to all minions. Now the /srv/pillar/data.sls file needs to be populated:

```
/srv/pillar/data.sls:
info: some data
```

To ensure that the minions have the new pillar data, issue a command to them asking that they fetch their pillars from the master:

```
salt '*' saltutil.refresh_pillar
```

Now that the minions have the new pillar, it can be retrieved:

```
salt '*' pillar.items
```

The key info should now appear in the returned pillar data.

**More Complex Data**

Unlike states, pillar files do not need to define formulas. This example sets up user data with a UID:

```
/srv/pillar/users/init.sls:
users:
  thatch: 1000
  shouse: 1001
  utahdave: 1002
  redbeard: 1003
```

Note: The same directory lookups that exist in states exist in pillar, so the file users/init.sls can be referenced with users in the top file.

The top file will need to be updated to include this sls file:

```
/srv/pillar/top.sls:
base:
  '*':
    - data
    - users
```

Now the data will be available to the minions. To use the pillar data in a state, you can use Jinja:

```
/srv/salt/users/init.sls
```

---

3.2. Basics 37
{% for user, uid in pillar.get('users', {}).items() %}
  {user}:
    - uid: {{uid}}
{% endfor %}

This approach allows for users to be safely defined in a pillar and then the user data is applied in an sls file.

**Parameterizing States With Pillar**

Pillar data can be accessed in state files to customise behavior for each minion. All pillar (and grain) data applicable to each minion is substituted into the state files through templating before being run. Typical uses include setting directories appropriate for the minion and skipping states that don’t apply.

A simple example is to set up a mapping of package names in pillar for separate Linux distributions:

/srv/pillar/pkg/init.sls:

```
pkgs:
  {% if grains['os_family'] == 'RedHat' %}
    apache: httpd
    vim: vim-enhanced
  {% elif grains['os_family'] == 'Debian' %}
    apache: apache2
    vim: vim
  {% elif grains['os'] == 'Arch' %}
    apache: apache
    vim: vim
  {% endif %}
```

The new pkg sls needs to be added to the top file:

/srv/pillar/top.sls:

```
base:
  '*':
    - data
    - users
    - pkg
```

Now the minions will auto map values based on respective operating systems inside of the pillar, so sls files can be safely parameterized:

/srv/salt/apache/init.sls:

```
apache:
  pkg.installed:
    - name: {{ pillar['pkgs']['apache'] }}
```

Or, if no pillar is available a default can be set as well:

**Note:** The function pillar.get used in this example was added to Salt in version 0.14.0

/srv/salt/apache/init.sls:

```
apache:
  pkg.installed:
    - name: {{ salt['pillar.get']['pkgs:apache', 'httpd'] }}
```
In the above example, if the pillar value `pillar['pkgs']['apache']` is not set in the minion's pillar, then the default of `httpd` will be used.

**Note:** Under the hood, pillar is just a Python dict, so Python dict methods such as `get` and `items` can be used.

---

**Pillar Makes Simple States Grow Easily**

One of the design goals of pillar is to make simple sls formulas easily grow into more flexible formulas without refactoring or complicating the states.

A simple formula:

```
/srv/salt/edit/vim.sls:
```

```yaml
vim:
  pkg.installed: []

/etc/vimrc:
  file.managed:
    - source: salt://edit/vimrc
    - mode: 644
    - user: root
    - group: root
    - require:
      - pkg: vim
```

Can be easily transformed into a powerful, parameterized formula:

```
/srv/salt/edit/vim.sls:
```

```yaml
vim:
  pkg.installed:
    - name: {{ pillar['pkgs']['vim'] }}

/etc/vimrc:
  file.managed:
    - source: {{ pillar['vimrc'] }}
    - mode: 644
    - user: root
    - group: root
    - require:
      - pkg: vim
```

Where the vimrc source location can now be changed via pillar:

```
/srv/pillar/edit/vim.sls:
```

```yaml
{% if grains['id'].startswith('dev') %}
vimrc: salt://edit/dev_vimrc
{% elseif grains['id'].startswith('qa') %}
vimrc: salt://edit/qa_vimrc
{% else %}
vimrc: salt://edit/vimrc
{% endif %}
```

Ensuring that the right vimrc is sent out to the correct minions.
Setting Pillar Data on the Command Line

Pillar data can be set on the command line like so:

```shell
call ' '*' state.highstate pillar='"foo": "bar"'}
```

The `state.sls` command can also be used to set pillar values via the command line:

```shell
call ' '*' state.sls my_sls_file pillar='"hello": "world"'}
```

**Note:** If a key is passed on the command line that already exists on the minion, the key that is passed in will overwrite the entire value of that key, rather than merging only the specified value set via the command line.

More On Pillar

Pillar data is generated on the Salt master and securely distributed to minions. Salt is not restricted to the pillar sls files when defining the pillar but can retrieve data from external sources. This can be useful when information about an infrastructure is stored in a separate location.

Reference information on pillar and the external pillar interface can be found in the Salt documentation:

*Pillar*

Minion Config in Pillar

Minion configuration options can be set on pillars. Any option that you want to modify, should be in the first level of the pillars, in the same way you set the options in the config file. For example, to configure the MySQL root password to be used by MySQL Salt execution module:

```shell
mysql.pass: hardtoguesspassword
```

This is very convenient when you need some dynamic configuration change that you want to be applied on the fly. For example, there is a chicken and the egg problem if you do this:

```shell
mysql-admin-passwd:
  mysql_user.present:
    - name: root
    - password: somepasswd
mydb:
  mysql_db.present
```

The second state will fail, because you changed the root password and the minion didn't notice it. Setting `mysql.pass` in the pillar, will help to sort out the issue. But always change the root admin password in the first place.

This is very helpful for any module that needs credentials to apply state changes: mysql, keystone, etc.

### 3.3 States

#### 3.3.1 How Do I Use Salt States?

Simplicity, Simplicity, Simplicity
Many of the most powerful and useful engineering solutions are founded on simple principles. Salt States strive to do just that: K.I.S.S. (Keep It Stupidly Simple)

The core of the Salt State system is the SLS, or Salt State file. The SLS is a representation of the state in which a system should be in, and is set up to contain this data in a simple format. This is often called configuration management.

Note: This is just the beginning of using states, make sure to read up on pillar Pillar next.

It is All Just Data

Before delving into the particulars, it will help to understand that the SLS file is just a data structure under the hood. While understanding that the SLS is just a data structure isn’t critical for understanding and making use of Salt States, it should help bolster knowledge of where the real power is.

SLS files are therefore, in reality, just dictionaries, lists, strings, and numbers. By using this approach Salt can be much more flexible. As one writes more state files, it becomes clearer exactly what is being written. The result is a system that is easy to understand, yet grows with the needs of the admin or developer.

The Top File

The example SLS files in the below sections can be assigned to hosts using a file called top.sls. This file is described in-depth here.

Default Data - YAML

By default Salt represents the SLS data in what is one of the simplest serialization formats available - YAML.

A typical SLS file will often look like this in YAML:

```
apache:
  pkg.installed: []
  service.running:
    - require:
      - pkg: apache
```

This SLS data will ensure that the package named apache is installed, and that the apache service is running. The components can be explained in a simple way.

The first line is the ID for a set of data, and it is called the ID Declaration. This ID sets the name of the thing that needs to be manipulated.

The second and third lines contain the state module function to be run, in the format `<state_module>..<function>`. The pkg.installed state module function ensures that a software package is installed via the system’s native package manager. The service.running state module function ensures that a given system daemon is running.

Finally, on line five, is the word require. This is called a Requisite Statement, and it makes sure that the Apache service is only started after a successful installation of the apache package.
Adding Configs and Users

When setting up a service like an Apache web server, many more components may need to be added. The Apache configuration file will most likely be managed, and a user and group may need to be set up.

```yaml
apache:
  pkg.installed: []
  service.running:
    - watch:
      - pkg: apache
      - file: /etc/httpd/conf/httpd.conf
      - user: apache
  user.present:
    - uid: 87
    - gid: 87
    - home: /var/www/html
    - shell: /bin/nologin
    - require:
      - group: apache
  group.present:
    - gid: 87
    - require:
      - pkg: apache

/etc/httpd/conf/httpd.conf:
  file.managed:
    - source: salt://apache/httpd.conf
    - user: root
    - group: root
    - mode: 644
```

This SLS data greatly extends the first example, and includes a config file, a user, a group and new requisite statement: `watch`.

Adding more states is easy, since the new user and group states are under the Apache ID, the user and group will be the Apache user and group. The `require` statements will make sure that the user will only be made after the group, and that the group will be made only after the Apache package is installed.

Next, the `require` statement under service was changed to watch, and is now watching 3 states instead of just one. The watch statement does the same thing as require, making sure that the other states run before running the state with a watch, but it adds an extra component. The `watch` statement will run the state's watcher function for any changes to the watched states. So if the package was updated, the config file changed, or the user uid modified, then the service state's watcher will be run. The service state's watcher just restarts the service, so in this case, a change in the config file will also trigger a restart of the respective service.

Moving Beyond a Single SLS

When setting up Salt States in a scalable manner, more than one SLS will need to be used. The above examples were in a single SLS file, but two or more SLS files can be combined to build out a State Tree. The above example also references a file with a strange source - `salt://apache/httpd.conf`. That file will need to be available as well.

The SLS files are laid out in a directory structure on the Salt master; an SLS is just a file and files to download are just files.

The Apache example would be laid out in the root of the Salt file server like this:
apache/init.sls
apache/httpd.conf

So the httpd.conf is just a file in the apache directory, and is referenced directly.

**Do not use dots in SLS file names or their directories**

The initial implementation of `top.sls` and *Include declaration* followed the python import model where a slash is represented as a period. This means that a SLS file with a period in the name (besides the suffix period) cannot be referenced. For example, webserver_1.0.sls is not referenceable because webserver_1.0 would refer to the directory/file webserver_1/0.sls

The same applies for any subdirectories, this is especially 'tricky' when git repos are created. Another command that typically can’t render it’s output is `state.show_sls` of a file in a path that contains a dot.

But when using more than one single SLS file, more components can be added to the toolkit. Consider this SSH example:

```
ssh/init.sls:

.openssh-client:
  pkg.installed

/etc/ssh/ssh_config:
  file.managed:
    - user: root
    - group: root
    - mode: 644
    - source: salt://ssh/ssh_config
    - require:
      - pkg: openssh-client

ssh/server.sls:

include:
  - ssh

.openssh-server:
  pkg.installed

/sshd:
  service.running:
    - require:
      - pkg: openssh-client
      - pkg: openssh-server
      - file: /etc/ssh/banner
      - file: /etc/ssh/sshd_config

/etc/ssh/sshd_config:
  file.managed:
    - user: root
    - group: root
    - mode: 644
    - source: salt://ssh/sshd_config
    - require:
      - pkg: openssh-server

/etc/ssh/banner:
  file:
```

3.3. States
- managed
- user: root
- group: root
- mode: 644
- source: salt://ssh/banner
- require:
  - pkg: openssh-server

Note: Notice that we use two similar ways of denoting that a file is managed by Salt. In the /etc/ssh/sshd_config state section above, we use the file.managed state declaration whereas with the /etc/ssh/banner state section, we use the file state declaration and add a managed attribute to that state declaration. Both ways produce an identical result; the first way -- using file.managed -- is merely a shortcut.

Now our State Tree looks like this:

apache/init.sls
apache/httpd.conf
ssh/init.sls
ssh/server.sls
ssh/banner
ssh/ssh_config
ssh/sshd_config

This example now introduces the include statement. The include statement includes another SLS file so that components found in it can be required, watched or as will soon be demonstrated - extended.

The include statement allows for states to be cross linked. When an SLS has an include statement it is literally extended to include the contents of the included SLS files.

Note that some of the SLS files are called init.sls, while others are not. More info on what this means can be found in the States Tutorial.

Extending Included SLS Data

Sometimes SLS data needs to be extended. Perhaps the apache service needs to watch additional resources, or under certain circumstances a different file needs to be placed.

In these examples, the first will add a custom banner to ssh and the second will add more watchers to apache to include mod_python.

ssh/custom-server.sls:

include:
  - ssh.server

extend:
  /etc/ssh/banner:
    file:
      - source: salt://ssh/custom-banner

python/mod_python.sls:

include:
  - apache

extend:
  apache:
The `custom-server.sls` file uses the `extend` statement to overwrite where the banner is being downloaded from, and therefore changing what file is being used to configure the banner.

In the new `mod_python` SLS the `mod_python` package is added, but more importantly the `apache` service was extended to also watch the `mod_python` package.

### Using `extend` with `require` or `watch`

The `extend` statement works differently for `require` or `watch`. It appends to, rather than replacing the requisite component.

### Understanding the Render System

Since SLS data is simply that (data), it does not need to be represented with YAML. Salt defaults to YAML because it is very straightforward and easy to learn and use. But the SLS files can be rendered from almost any imaginable medium, so long as a renderer module is provided.

The default rendering system is the `yaml_jinja` renderer. The `yaml_jinja` renderer will first pass the template through the Jinja2 templating system, and then through the YAML parser. The benefit here is that full programming constructs are available when creating SLS files.

Other renderers available are `yaml_mako` and `yaml_wempy` which each use the Mako or Wempy templating system respectively rather than the Jinja templating system, and more notably, the pure Python or `pydsl` & `pyobjects` renderers. The `py` renderer allows for SLS files to be written in pure Python, allowing for the utmost level of flexibility and power when preparing SLS data; while the `pydsl` renderer provides a flexible, domain-specific language for authoring SLS data in Python; and the `pyobjects` renderer gives you a “Pythonic” interface to building state data.

### Note

The templating engines described above aren’t just available in SLS files. They can also be used in `file.managed` states, making file management much more dynamic and flexible. Some examples for using templates in managed files can be found in the documentation for the `file states`, as well as the `MooseFS example` below.

### Getting to Know the Default - `yaml_jinja`

The default renderer - `yaml_jinja`, allows for use of the Jinja templating system. A guide to the Jinja templating system can be found here: [http://jinja.pocoo.org/docs](http://jinja.pocoo.org/docs)

When working with renderers a few very useful bits of data are passed in. In the case of templating engine based renderers, three critical components are available, `salt`, `grains`, and `pillar`. The `salt` object allows for any Salt function to be called from within the template, and `grains` allows for the Grains to be accessed from within the template. A few examples:

```python
apache/init.sls:

apache:
    pkg.installed:
        {% if grains['os'] == 'RedHat' %}
            - name: httpd
        {% endif %}
```

3.3. **States**
{% endif %}

service.running:
  {% if grains['os'] == 'RedHat' %}
    - name: httpd
  {% endif %}
  - watch:
    - pkg: apache
    - file: /etc/httpd/conf/httpd.conf
    - user: apache

user.present:
  - uid: 87
  - gid: 87
  - home: /var/www/html
  - shell: /bin/nologin
  - require:
    - group: apache

group.present:
  - gid: 87
  - require:
    - pkg: apache

/etc/httpd/conf/httpd.conf:
  file.managed:
    - source: salt://apache/httpd.conf
    - user: root
    - group: root
    - mode: 644

This example is simple. If the os grain states that the operating system is Red Hat, then the name of the Apache package and service needs to be httpd. A more aggressive way to use Jinja can be found here, in a module to set up a MooseFS distributed filesystem chunkserver:

moosefs/chunk.sls:

include:
  - moosefs

{% for mnt in salt['cmd.run']('ls /dev/data/moose*').split() %}
/mnt/moose{{ mnt[-1] }}:
  mount.mounted:
    - device: {{ mnt }}
    - fstype: xfs
    - mkmnt: True

file.directory:
  - user: mfs
  - group: mfs
  - require:
    - user: mfs
    - group: mfs
{% endfor %}

/etc/mfshdd.cfg:
  file.managed:
    - source: salt://moosefs/mfshdd.cfg
    - user: root
    - group: root
    - mode: 644
    - template: jinja
    - require:
- pkg: mfs-chunkserver

/etc/mfschunckserver.cfg:
  file.managed:
    - source: salt://moosefs/mfschunckserver.cfg
    - user: root
    - group: root
    - mode: 644
    - template: jinja
    - require:
      - pkg: mfs-chunkserver

mfs-chunkserver:
  pkg.installed: []
mfschunkserver:
  service.running:
    - require:
      {% for mnt in salt['cmd.run']('ls /dev/data/moose*') %}
        - mount: /mnt/moose{{ mnt[-1] }}
        - file: /mnt/moose{{ mnt[-1] }}
      {% endfor %}
    - file: /etc/mfschunkserver.cfg
    - file: /etc/mfshdd.cfg
    - file: /var/lib/mfs

This example shows much more of the available power of Jinja. Multiple for loops are used to dynamically detect available hard drives and set them up to be mounted, and the salt object is used multiple times to call shell commands to gather data.

**Introducing the Python, PyDSL, and the Pyobjects Renderers**

Sometimes the chosen default renderer might not have enough logical power to accomplish the needed task. When this happens, the Python renderer can be used. Normally a YAML renderer should be used for the majority of SLS files, but an SLS file set to use another renderer can be easily added to the tree.

This example shows a very basic Python SLS file:

```python
# !py
def run():
    '''
    Install the django package
    '''
    return {'include': ['python'],
            'django': {'pkg': ['installed']}}
```

This is a very simple example; the first line has an SLS shebang that tells Salt to not use the default renderer, but to use the py renderer. Then the run function is defined, the return value from the run function must be a Salt friendly data structure, or better known as a Salt HighState data structure.

Alternatively, using the pydsl renderer, the above example can be written more succinctly as:

```python
#!/pydsl
include('python', delayed=True)
state('django').pkg.installed()
```

3.3. States
The `pyobjects` renderer provides an "Pythonic" object based approach for building the state data. The above example could be written as:

```python
#!pyobjects
include('python')
Pkg.installed("django")
```

These Python examples would look like this if they were written in YAML:

```yaml
include:
  - python

django:
  pkg.installed
```

This example clearly illustrates that; one, using the YAML renderer by default is a wise decision and two, unbridled power can be obtained where needed by using a pure Python SLS.

Running and debugging salt states.

Once the rules in an SLS are ready, they should be tested to ensure they work properly. To invoke these rules, simply execute `salt '*' state.highstate` on the command line. If you get back only hostnames with a `:` after, but no return, chances are there is a problem with one or more of the sls files. On the minion, use the `salt-call` command: `salt-call state.highstate -l debug` to examine the output for errors. This should help troubleshoot the issue. The minions can also be started in the foreground in debug mode: `salt-minion -l debug`.

Next Reading

With an understanding of states, the next recommendation is to become familiar with Salt's pillar interface:

*Pillar Walkthrough*

3.3.2 States tutorial, part 1 - Basic Usage

The purpose of this tutorial is to demonstrate how quickly you can configure a system to be managed by Salt States. For detailed information about the state system please refer to the full states reference.

This tutorial will walk you through using Salt to configure a minion to run the Apache HTTP server and to ensure the server is running.

**Before continuing** make sure you have a working Salt installation by following the installation and the configuration instructions.

Stuck?

There are many ways to get help from the Salt community including our mailing list and our IRC channel #salt.

Setting up the Salt State Tree

States are stored in text files on the master and transferred to the minions on demand via the master's File Server. The collection of state files make up the State Tree.
To start using a central state system in Salt, the Salt File Server must first be set up. Edit the master config file (file_roots) and uncomment the following lines:

```yaml
file_roots:
    base:
        - /srv/salt
```

**Note:** If you are deploying on FreeBSD via ports, the file_roots path defaults to /usr/local/etc/salt/states.

Restart the Salt master in order to pick up this change:

```bash
pkill salt-master
salt-master -d
```

### Preparing the Top File

On the master, in the directory uncommented in the previous step, (/srv/salt by default), create a new file called top.sls and add the following:

```yaml
base:
    '*':
        - webserver
```

The top file is separated into environments (discussed later). The default environment is base. Under the base environment a collection of minion matches is defined; for now simply specify all hosts (*).

#### Targeting minions

The expressions can use any of the targeting mechanisms used by Salt — minions can be matched by glob, PCRE regular expression, or by grains. For example:

```yaml
base:
    'os:Fedora':
        - match: grain
        - webserver
```

### Create an sls file

In the same directory as the top file, create a file named webserver.sls, containing the following:

```yaml
apache: # ID declaration
    pkg: # state declaration
        - installed # function declaration
```

The first line, called the **ID declaration**, is an arbitrary identifier. In this case it defines the name of the package to be installed.

**Note:** The package name for the Apache httpd web server may differ depending on OS or distro — for example, on Fedora it is httpd but on Debian/Ubuntu it is apache2.

The second line, called the **State declaration**, defines which of the Salt States we are using. In this example, we are using the pkg state to ensure that a given package is installed.

The third line, called the **Function declaration**, defines which function in the pkg state module to call.

### 3.3. States

49
Renderers
States SLS files can be written in many formats. Salt requires only a simple data structure and is not concerned with how that data structure is built. Templating languages and DSLs are a dime-a-dozen and everyone has a favorite. Building the expected data structure is the job of Salt renderers and they are dead-simple to write.

In this tutorial we will be using YAML in Jinja2 templates, which is the default format. The default can be changed by editing renderer in the master configuration file.

Install the package

Next, let's run the state we created. Open a terminal on the master and run:

```
% salt '*' state.highstate
```

Our master is instructing all targeted minions to run state.highstate. When a minion executes a highstate call it will download the top file and attempt to match the expressions. When it does match an expression the modules listed for it will be downloaded, compiled, and executed.

Once completed, the minion will report back with a summary of all actions taken and all changes made.

**Warning:** If you have created custom grain modules, they will not be available in the top file until after the first highstate. To make custom grains available on a minion's first highstate, it is recommended to use this example to ensure that the custom grains are synced when the minion starts.

SLS File Namespace

Note that in the example above, the SLS file webserver.sls was referred to simply as webserver. The namespace for SLS files when referenced in top.sls or an Include declaration follows a few simple rules:

1. The .sls is discarded (i.e. webserver.sls becomes webserver).
2. Subdirectories can be used for better organization.
   a. Each subdirectory can be represented with a dot (following the python import model) or a slash.
      webserver/dev.sls can also be referred to as webserver.dev
   b. Because slashes can be represented as dots, SLS files can not contain dots in the name besides the dot for the SLS suffix. The SLS file webserver_1.0.sls can not be matched, and webserver_1.0 would match the directory/file webserver/1/0.sls
3. A file called init.sls in a subdirectory is referred to by the path of the directory. So, webserver/init.sls is referred to as webserver.
4. If both webserver.sls and webserver/init.sls happen to exist, webserver/init.sls will be ignored and webserver.sls will be the file referred to as webserver.

Troubleshooting Salt

If the expected output isn't seen, the following tips can help to narrow down the problem.

**Turn up logging** Salt can be quite chatty when you change the logging setting to debug:

```
salt-minion -l debug
```

**Run the minion in the foreground** By not starting the minion in daemon mode (-d) one can view any output from the minion as it works:
Increase the default timeout value when running salt. For example, to change the default timeout to 60 seconds:

```
salt -t 60
```

For best results, combine all three:

```
salt-minion -l debug &    # On the minion
salt '*' state.highstate -t 60 # On the master
```

Next steps

This tutorial focused on getting a simple Salt States configuration working. Part 2 will build on this example to cover more advanced sls syntax and will explore more of the states that ship with Salt.

### 3.3.3 States tutorial, part 2 - More Complex States, Requisites

Note: This tutorial builds on topics covered in part 1. It is recommended that you begin there.

In the last part of the Salt States tutorial we covered the basics of installing a package. We will now modify our `webserver.sls` file to have requirements, and use even more Salt States.

#### Call multiple States

You can specify multiple State declaration under an ID declaration. For example, a quick modification to our `webserver.sls` to also start Apache if it is not running:

```
apache:
  pkg.installed: []
  service.running:
    - require:
      - pkg: apache
```

Try stopping Apache before running state.highstate once again and observe the output.

#### Require other states

We now have a working installation of Apache so let’s add an HTML file to customize our website. It isn’t exactly useful to have a website without a webserver so we don’t want Salt to install our HTML file until Apache is installed and running. Include the following at the bottom of your `webserver/init.sls` file:

```
apache:
  pkg.installed: []
  service.running:
    - require:
      - pkg: apache

/var/www/index.html:
  file:
    - managed
    - source: salt://webserver/index.html
```

3.3. States
line 7 is the **ID declaration**. In this example it is the location we want to install our custom HTML file. *(Note: the default location that Apache serves may differ from the above on your OS or distro. `/srv/www` could also be a likely place to look.)*

**Line 8** the **State declaration**. This example uses the Salt **file state**.

**Line 9** is the **Function declaration**. The managed function will download a file from the master and install it in the location specified.

**Line 10** is a **Function arg declaration** which, in this example, passes the `source` argument to the managed function.

**Line 11** is a **Requisite declaration**.

**Line 12** is a **Requisite reference** which refers to a state and an ID. In this example, it is referring to the ID declaration from our example in part 1. This declaration tells Salt not to install the HTML file until Apache is installed.

Next, create the `index.html` file and save it in the `webserver` directory:

```html
<!DOCTYPE html>
<html>
  <head>
    <title>Salt rocks</title>
  </head>
  <body>
    <h1>This file brought to you by Salt</h1>
  </body>
</html>
```

Last, call `state.highstate` again and the minion will fetch and execute the highstate as well as our HTML file from the master using Salt’s File Server:

```bash
salt '*' state.highstate
```

Verify that Apache is now serving your custom HTML.

**require vs. watch**

There are two **Requisite declaration**, “require”, and “watch”. Not every state supports “watch”. The **service state** does support “watch” and will restart a service based on the watch condition.

For example, if you use Salt to install an Apache virtual host configuration file and want to restart Apache whenever that file is changed you could modify our Apache example from earlier as follows:

```bash
/etc/httpd/extra/httpd-vhosts.conf:
  file.managed:
    - source: salt://webserver/httpd-vhosts.conf

apache:
  pkg.installed: []
  service.running:
    - watch:
      - file: /etc/httpd/extra/httpd-vhosts.conf
    - require:
      - pkg: apache
```

If the `pkg` and service names differ on your OS or distro of choice you can specify each one separately using a **Name declaration** which explained in **Part 3**.
Next steps

In part 3 we will discuss how to use includes, extends, and templating to make a more complete State Tree configuration.

3.3.4 States tutorial, part 3 - Templating, Includes, Extends

Note: This tutorial builds on topics covered in part 1 and part 2. It is recommended that you begin there.

This part of the tutorial will cover more advanced templating and configuration techniques for SLS files.

Templating SLS modules

SLS modules may require programming logic or inline execution. This is accomplished with module templating. The default module templating system used is Jinja2 and may be configured by changing the renderer value in the master config.

All states are passed through a templating system when they are initially read. To make use of the templating system, simply add some templating markup. An example of an SLS module with templating markup may look like this:

```jinja
{% for usr in ['moe', 'larry', 'curly'] %}
  {{ usr }}:
    user.present
{% endfor %}
```

This templated SLS file once generated will look like this:

```
moe: user.present
larry: user.present
curly: user.present
```

Here’s a more complex example:

```jinja
# Comments in yaml start with a hash symbol.
# Since jinja rendering occurs before yaml parsing, if you want to include jinja # in the comments you may need to escape them using 'jinja' comments to prevent # jinja from trying to render something which is not well-defined jinja. # e.g.
# {% for usrs in ['moe', 'larry', 'curly'] %}
{% for usrs in ['moe', 'larry', 'curly'] %}
  {% if usrs == 'moe' %}
    group:
      - present
  {% endif %}
  user:
    - present
    - gid_from_name: True
    - require:
      - group: {{ usrs }}
  {% endfor %}
{% endfor %}
```

3.3. States
Using Grains in SLS modules

Often times a state will need to behave differently on different systems. *Salt grains* objects are made available in the template context. The *grains* can be used from within sls modules:

```yaml
apache:
  pkg.installed:
    {% if grains['os'] == 'RedHat' %}
      - name: httpd
    {% elif grains['os'] == 'Ubuntu' %}
      - name: apache2
    {% endif %}
```

Calling Salt modules from templates

All of the Salt modules loaded by the minion are available within the templating system. This allows data to be gathered in real time on the target system. It also allows for shell commands to be run easily from within the sls modules.

The Salt module functions are also made available in the template context as *salt*:

```yaml
moe:
  user.present:
    - gid: {{ salt['file.group_to_gid']('some_group_that_exists') }}
```

Note that for the above example to work, *some_group_that_exists* must exist before the state file is processed by the templating engine.

Below is an example that uses the *network.hw_addr* function to retrieve the MAC address for eth0:

```yaml
salt['network.hw_addr']('eth0')
```

Advanced SLS module syntax

Lastly, we will cover some incredibly useful techniques for more complex State trees.

Include declaration

A previous example showed how to spread a Salt tree across several files. Similarly, *requisites* span multiple files by using an *Include declaration*. For example:

```yaml
python/python-libs.sls:
  python-dateutil:
    pkg.installed

python/django.sls:
  include:
    - python.python-libs

django:
  pkg.installed:
    - require:
      - pkg: python-dateutil
```
Extend declaration

You can modify previous declarations by using an *Extend declaration*. For example the following modifies the Apache tree to also restart Apache when the vhosts file is changed:

```bash
apache/apache.sls:
apache:
    pkg.installed

apache/mywebsite.sls:
include:
    - apache.apache
extend:
    apache:
        service:
            - running
            - watch:
                - file: /etc/httpd/extra/httpd-vhosts.conf

/etc/httpd/extra/httpd-vhosts.conf:
    file.managed:
        - name: /etc/httpd/extra/httpd-vhosts.conf
          source: salt://apache/httpd-vhosts.conf

Using extend with require or watch

The *extend* statement works differently for *require* or *watch*. It appends to, rather than replacing the requisite component.

Name declaration

You can override the *ID declaration* by using a *Name declaration*. For example, the previous example is a bit more maintainable if rewritten as follows:

```bash
apache/mywebsite.sls:
include:
    - apache.apache
extend:
    apache:
        service:
            - running
            - watch:
                - file: mywebsite

mywebsite:
    file.managed:
        - name: /etc/httpd/extra/httpd-vhosts.conf
          source: salt://apache/httpd-vhosts.conf
```
Names declaration

Even more powerful is using a *Names declaration* to override the *ID declaration* for multiple states at once. This often can remove the need for looping in a template. For example, the first example in this tutorial can be rewritten without the loop:

```bash
stooges:
    user.present:
        - names:
            - moe
            - larry
            - curly
```

Next steps

In *part 4* we will discuss how to use salt’s *file_roots* to set up a workflow in which states can be "promoted" from dev, to QA, to production.

### 3.3.5 States tutorial, part 4

*Note:* This tutorial builds on topics covered in *part 1*, *part 2* and *part 3*. It is recommended that you begin there.

This part of the tutorial will show how to use salt’s *file_roots* to set up a workflow in which states can be "promoted" from dev, to QA, to production.

Salt fileserver path inheritance

Salt’s fileserver allows for more than one root directory per environment, like in the below example, which uses both a local directory and a secondary location shared to the salt master via NFS:

```bash
# In the master config file (/etc/salt/master)
file_roots:
    base:
        - /srv/salt
        - /mnt/salt-nfs/base
```

Salt’s fileserver collapses the list of root directories into a single virtual environment containing all files from each root. If the same file exists at the same relative path in more than one root, then the top-most match "wins". For example, if `/srv/salt/foo.txt` and `/mnt/salt-nfs/base/foo.txt` both exist, then `salt://foo.txt` will point to `/srv/salt/foo.txt`.

*Note:* When using multiple fileserver backends, the order in which they are listed in the *fileserver_backend* parameter also matters. If both *roots* and *git* backends contain a file with the same relative path, and *roots* appears before *git* in the *fileserver_backend* list, then the file in *roots* will "win", and the file in *git*s will be ignored.

A more thorough explanation of how Salt’s modular fileserver works can be found *here*. We recommend reading this.
Environment configuration

Configure a multiple-environment setup like so:

```yaml
file_roots:
  base:
    - /srv/salt/prod
  qa:
    - /srv/salt/qa
    - /srv/salt/prod
  dev:
    - /srv/salt/dev
    - /srv/salt/qa
    - /srv/salt/prod
```

Given the path inheritance described above, files within `/srv/salt/prod` would be available in all environments. Files within `/srv/salt/qa` would be available in both qa, and dev. Finally, the files within `/srv/salt/dev` would only be available within the dev environment.

Based on the order in which the roots are defined, new files/states can be placed within `/srv/salt/dev`, and pushed out to the dev hosts for testing.

Those files/states can then be moved to the same relative path within `/srv/salt/qa`, and they are now available only in the dev and qa environments, allowing them to be pushed to QA hosts and tested.

Finally, if moved to the same relative path within `/srv/salt/prod`, the files are now available in all three environments.

Practical Example

As an example, consider a simple website, installed to `/var/www/foobarcom`. Below is a top.sls that can be used to deploy the website:

```
/srv/salt/prod/top.sls:

base:
  'web*prod*':
    - webserver.foobarcom
qa:
  'web*qa*':
    - webserver.foobarcom
dev:
  'web*dev*':
    - webserver.foobarcom
```

Using pillar, roles can be assigned to the hosts:

```
/srv/pillar/top.sls:

base:
  'web*prod*':
    - webserver.prod
  'web*qa*':
    - webserver.qa
  'web*dev*':
    - webserver.dev
```

```
/srv/pillar/webserver/prod.sls:
```
webserver_role: prod

/srv/pillar/webserver/qa.sls:
webserver_role: qa

/srv/pillar/webserver/dev.sls:
webserver_role: dev

And finally, the SLS to deploy the website:

/srv/salt/prod/webserver/foobarcom.sls:

{% if pillar.get('webserver_role', '') %}
/var/www/foobarcom:
  file.recurse:
    - source: salt://webserver/src/foobarcom
    - env: {{ pillar['webserver_role'] }}
    - user: www
    - group: www
    - dir_mode: 755
    - file_mode: 644
{% endif %}

Given the above SLS, the source for the website should initially be placed in /srv/salt/dev/webserver/src/foobarcom.

First, let's deploy to dev. Given the configuration in the top file, this can be done using state.highstate:

```bash
salt --pillar 'webserver_role:dev' state.highstate
```

However, in the event that it is not desirable to apply all states configured in the top file (which could be likely in more complex setups), it is possible to apply just the states for the foobarcom website, using state.sls:

```bash
salt --pillar 'webserver_role:dev' state.sls webserver.foobarcom
```

Once the site has been tested in dev, then the files can be moved from /srv/salt/dev/webserver/src/foobarcom to /srv/salt/qa/webserver/src/foobarcom, and deployed using the following:

```bash
salt --pillar 'webserver_role:qa' state.sls webserver.foobarcom
```

Finally, once the site has been tested in qa, then the files can be moved from /srv/salt/qa/webserver/src/foobarcom to /srv/salt/prod/webserver/src/foobarcom, and deployed using the following:

```bash
salt --pillar 'webserver_role:prod' state.sls webserver.foobarcom
```

Thanks to Salt's fileserver inheritance, even though the files have been moved to within /srv/salt/prod, they are still available from the same salt:// URI in both the qa and dev environments.

**Continue Learning**

The best way to continue learning about Salt States is to read through the reference documentation and to look through examples of existing state trees. Many pre-configured state trees can be found on GitHub in the saltstack-formulas collection of repositories.
If you have any questions, suggestions, or just want to chat with other people who are using Salt, we have a very active community and we’d love to hear from you.

In addition, by continuing to part 5, you can learn about the powerful orchestration of which Salt is capable.

### 3.3.6 States Tutorial, Part 5 - Orchestration with Salt

**Note:** This tutorial builds on some of the topics covered in the earlier States Walkthrough pages. It is recommended to start with Part 1 if you are not familiar with how to use states.

Orchestration is accomplished in salt primarily through the Orchestrate Runner. Added in version 0.17.0, this Salt Runner can use the full suite of requisites available in states, and can also execute states/functions using salt-ssh.

**The Orchestrate Runner**

New in version 0.17.0.

**Note:** Orchestrate Deprecates OverState

The Orchestrate Runner (originally called the state.sls runner) offers all the functionality of the OverState, but with some advantages:

- All requisites available in states can be used.
- The states/functions will also work on salt-ssh minions.

The Orchestrate Runner was added with the intent to eventually deprecate the OverState system, however the Over-State will still be maintained until Salt Boron.

The orchestrate runner generalizes the Salt state system to a Salt master context. Whereas the state.sls, state.highstate, et al functions are concurrently and independently executed on each Salt minion, the state.orchestrate runner is executed on the master, giving it a master-level view and control over requisites, such as state ordering and conditionals. This allows for inter minion requisites, like ordering the application of states on different minions that must not happen simultaneously, or for halting the state run on all minions if a minion fails one of its states.

If you want to setup a load balancer in front of a cluster of web servers, for example, you can ensure the load balancer is setup before the web servers or stop the state run altogether if one of the minions does not set up correctly.

The state.sls, state.highstate, et al functions allow you to statefully manage each minion and the state.orchestrate runner allows you to statefully manage your entire infrastructure.

**Executing the Orchestrate Runner**

The Orchestrate Runner command format is the same as for the state.sls function, except that since it is a runner, it is executed with salt-run rather than salt. Assuming you have a state.sls file called /srv/salt/orch/webserver.sls the following command run on the master will apply the states defined in that file.

```
salt-run state.orchestrate orch.webserver
```

**Note:** state.orch is a synonym for state.orchestrate
Changed in version 2014.1.1: The runner function was renamed to `state.orchestrate` to avoid confusion with the `state.sls` execution function. In versions 0.17.0 through 2014.1.0, `state.sls` must be used.

**Examples**

**Function** To execute a function, use `salt.function`:

```bash
# /srv/salt/orch/cleanfoo.sls
cmd.run:
    salt.function:
      - tgt: '*'
      - arg:
        - rm -rf /tmp/foo

salt-run state.orchestrate orch.cleanfoo
```

**State** To execute a state, use `salt.state`.

```bash
# /srv/salt/orch/webserver.sls
install_nginx:
  salt.state:
    - tgt: 'web*'
    - sls:
      - nginx

salt-run state.orchestrate orch.webserver
```

**Highstate** To run a highstate, set `highstate: True` in your state config:

```bash
# /srv/salt/orch/web_setup.sls
webserver_setup:
  salt.state:
    - tgt: 'web*'
    - highstate: True

salt-run state.orchestrate orch.web_setup
```

**More Complex Orchestration**

Many states/functions can be configured in a single file, which when combined with the full suite of `requisites`, can be used to easily configure complex orchestration tasks. Additionally, the states/functions will be executed in the order in which they are defined, unless prevented from doing so by any `requisites`, as is the default in SLS files since 0.17.0.

```bash
cmd.run:
    salt.function:
      - tgt: 10.0.0.0/24
      - tgt_type: ipcidr
      - arg:
        - bootstrap

storage_setup:
    salt.state:
```

60 Chapter 3. Tutorials
- tgt: 'role:storage'
- tgt_type: grain
- sls: ceph
- require:
  - salt: webserver_setup

webserver_setup:
  salt.state:
    - tgt: 'web*'
    - highstate: True

Given the above setup, the orchestration will be carried out as follows:

1. The shell command `bootstrap` will be executed on all minions in the 10.0.0.0/24 subnet.
2. A Highstate will be run on all minions whose ID starts with "web", since the `storage_setup` state requires it.
3. Finally, the `ceph` SLS target will be executed on all minions which have a grain called `role` with a value of `storage`.

Note: Remember, salt-run is always executed on the master.

### 3.3.7 Syslog-ng usage

**Overview**

Syslog_ng state module is for generating syslog-ng configurations. You can do the following things:

- generate syslog-ng configuration from YAML,
- use non-YAML configuration,
- start, stop or reload syslog-ng.

There is also an execution module, which can check the syntax of the configuration, get the version and other information about syslog-ng.

**Configuration**

Users can create syslog-ng configuration statements with the `syslog_ng.config` function. It requires a `name` and a `config` parameter. The `name` parameter determines the name of the generated statement and the `config` parameter holds a parsed YAML structure.

A statement can be declared in the following forms (both are equivalent):

```
source.s_localhost:
  syslog_ng.config:
    - config:
      - tcp:
        - ip: "127.0.0.1"
        - port: 1233

s_localhost:
  syslog_ng.config:
    - config:
      source:
```
The first one is called short form, because it needs less typing. Users can use lists and dictionaries to specify their configuration. The format is quite self describing and there are more examples [at the end](#examples) of this document.

Quotation

The quotation can be tricky sometimes but here are some rules to follow:

- when a string meant to be "string" in the generated configuration, it should be like "'string'" in the YAML document
- similarly, users should write "'string'" to get 'string' in the generated configuration

Full example

The following configuration is an example, how a complete syslog-ng configuration looks like:

```yaml
# Set the location of the configuration file
set_location:
  module.run:
    - name: syslog_ng.set_config_file
      m_name: "'/home/tibi/install/syslog-ng/etc/syslog-ng.conf"

# The syslog-ng and syslog-ng-ctl binaries are here. You needn't use
# this method if these binaries can be found in a directory in your PATH.
set_bin_path:
  module.run:
    - name: syslog_ng.set_binary_path
      m_name: "'/home/tibi/install/syslog-ng/sbin"

# Writes the first lines into the config file, also erases its previous
# content
write_version:
  module.run:
    - name: syslog_ng.write_version
      m_name: "'3.6"

# There is a shorter form to set the above variables
set_variables:
  module.run:
    - name: syslog_ng.set_parameters
      version: "3.6"
      binary_path: "'/home/tibi/install/syslog-ng/sbin"
      config_file: "'/home/tibi/install/syslog-ng/etc/syslog-ng.conf"

# Some global options
options.global_options:
  syslog_ng.config:
    config:
      - time_reap: 30
      - mark_freq: 10
      - keep_hostname: "yes"
```
source.s_localhost:
  syslog_ng.config:
    - config:
      - tcp:
        - ip: "127.0.0.1"
        - port: 1233

destination.d_log_server:
  syslog_ng.config:
    - config:
      - tcp:
        - "127.0.0.1"
        - port: 1234

log.l_log_to_central_server:
  syslog_ng.config:
    - config:
      - source: s_localhost
      - destination: d_log_server

some_comment:
module.run:
  - name: syslog_ng.write_config
  - config: |
    # Multi line
    # comment

# An other mode to use comments or existing configuration snippets
config.other_comment_form:
  syslog_ng.config:
    - config: |
      # Multi line
      # comment

The `syslog_ng.reloaded` function can generate syslog-ng configuration from YAML. If the statement (source, destination, parser, etc.) has a name, this function uses the id as the name, otherwise (log statement) it's purpose is like a mandatory comment.

After execution this example the syslog_ng state will generate this file:

```yaml
# Generated by Salt on 2014-08-18 00:11:11
@version: 3.6

options {
  time_reap(30);
  mark_freq(10);
  keep_hostname(yes);
};

source_s_localhost {
  tcp(
```
Users can include arbitrary texts in the generated configuration with using the `config` statement (see the example above).

**Syslog_ng module functions**

You can use `syslog_ng.set_binary_path` to set the directory which contains the syslog-ng and syslog-ng-ctl binaries. If this directory is in your PATH, you don’t need to use this function. There is also a `syslog_ng.set_config_file` function to set the location of the configuration file.

**Examples**

**Simple source**

```bash
source s_tail {
    file("/var/log/apache/access.log",
         follow_freq(1),
         flags(no-parse, validate-utf8)
```

```bash
};

destination d_log_server {
    tcp(127.0.0.1,
        port(1234)
    );
};;

log {
    source(s_localhost);
    destination(d_log_server);
};;
```

# Multi line
# comment

# Multi line
# comment

```
```
Salt will call the source function of syslog_ng module

```python
s_tail:
    # Salt will call the source function of syslog_ng module
    syslog_ng.config:
        - config:
            source:
                - file:
                    - file: './var/log/apache/access.log'
                    - follow_freq : 1
                    - flags:
                        - no-parse
                        - validate-utf8
```

OR

```python
s_tail:
    syslog_ng.config:
        - config:
            source:
                - file:
                    - file: './var/log/apache/access.log'
                    - follow_freq : 1
                    - flags:
                        - no-parse
                        - validate-utf8
```

OR

```python
source.s_tail:
    syslog_ng.config:
        - config:
            - file:
                - file: './var/log/apache/access.log'
                - follow_freq : 1
                - flags:
                    - no-parse
                    - validate-utf8
```

Complex source

```python
source s_gsoc2014 {
    tcp(
        ip("0.0.0.0"),
        port(1234),
        flags(no-parse)
    );
}
```

```python
s_gsoc2014:
    syslog_ng.config:
        - config:
            source:
                - tcp:
                    - ip: 0.0.0.0
```

3.3. States
- port: 1234
  - flags: no-parse

Filter

filter f_json {
  match( 
    "@json:"
  );
};

f_json:
  syslog_ng.config:
    - config:
      - filter:
        - match:
          - ""@json:""

Template

template t_demo_filetemplate {
  template( 
    "$ISODATE $HOST $MSG 
  );
  template_escape( 
    no
  );
};

t_demo_filetemplate:
  syslog_ng.config:
    - config:
      - template:
        - template:
          - "$ISODATE $HOST $MSG\n"
        - template_escape:
          - "no"

Rewrite

rewrite r_set_message_to_MESSAGE {
  set( 
    "${.json.message}"
    value("$MESSAGE"
  );
};

r_set_message_to_MESSAGE:
  syslog_ng.config:
    - config:
      - rewrite:
        - set:
- '${.json.message}'
- value : '"$MESSAGE"'

Global options

options {
    time_reap(30);
    mark_freq(10);
    keep_hostname(yes);
};

global_options:
    syslog_ng.config:
        - config:
            options:
                - time_reap: 30
                - mark_freq: 10
                - keep_hostname: "yes"

Log

log {
    source(s_gsoc2014);
    junction {
        channel {
            filter(f_json);
            parser(p_json);
            rewrite(r_set_json_tag);
            rewrite(r_set_message_to_MESSAGE);
            destination {
                file("/tmp/json-input.log",
                template(t_gsoc2014)
            )
            }
            flags(final);
        }
        channel {
            filter(f_not_json);
            parser {
                syslog-parser(
                )
            }
            rewrite(r_set_syslog_tag);
            flags(final);
        }
        destination {
            file("/tmp/all.log",
            template(t_gsoc2014)
        );
    }
}
3.4 Advanced Topics

3.4.1 SaltStack Walk-through

Note: Welcome to SaltStack! I am excited that you are interested in Salt and starting down the path to better infrastructure management. I developed (and am continuing to develop) Salt with the goal of making the best software available to manage computers of almost any kind. I hope you enjoy working with Salt and that the software can solve your real world needs!

- Thomas S Hatch
  - Salt creator and Chief Developer
  - CTO of SaltStack, Inc.

Getting Started

What is Salt?

Salt is a different approach to infrastructure management, founded on the idea that high-speed communication with large numbers of systems can open up new capabilities. This approach makes Salt a powerful multitasking system that can solve many specific problems in an infrastructure.
The backbone of Salt is the remote execution engine, which creates a high-speed, secure and bi-directional communication net for groups of systems. On top of this communication system, Salt provides an extremely fast, flexible, and easy-to-use configuration management system called Salt States.

**Installing Salt**

SaltStack has been made to be very easy to install and get started. The *installation documents* contain instructions for all supported platforms.

**Starting Salt**

Salt functions on a master/minion topology. A master server acts as a central control bus for the clients, which are called minions. The minions connect back to the master.

**Setting Up the Salt Master**  Turning on the Salt Master is easy -- just turn it on! The default configuration is suitable for the vast majority of installations. The Salt Master can be controlled by the local Linux/Unix service manager:

- **On Systemd based platforms (OpenSuse, Fedora):**
  ```
  systemctl start salt-master
  ```

- **On Upstart based systems (Ubuntu, older Fedora/RHEL):**
  ```
  service salt-master start
  ```

- **On SysV Init systems (Debian, Gentoo etc.):**
  ```
  /etc/init.d/salt-master start
  ```

Alternatively, the Master can be started directly on the command-line:

```
salt-master -d
```

The Salt Master can also be started in the foreground in debug mode, thus greatly increasing the command output:

```
salt-master -l debug
```

The Salt Master needs to bind to two TCP network ports on the system. These ports are 4505 and 4506. For more in depth information on firewalling these ports, the firewall tutorial is available [here](#).

**Setting up a Salt Minion**  **Note:** The Salt Minion can operate with or without a Salt Master. This walk-through assumes that the minion will be connected to the master, for information on how to run a master-less minion please see the master-less quick-start guide:

**Masterless Minion Quickstart**

The Salt Minion only needs to be aware of one piece of information to run, the network location of the master.

By default the minion will look for the DNS name `salt` for the master, making the easiest approach to set internal DNS to resolve the name `salt` back to the Salt Master IP.

Otherwise, the minion configuration file will need to be edited so that the configuration option `master` points to the DNS name or the IP of the Salt Master:

**Note:** The default location of the configuration files is `/etc/salt`. Most platforms adhere to this convention, but
platforms such as FreeBSD and Microsoft Windows place this file in different locations.

/etc/salt/minion:

| master: saltmaster.example.com |

Now that the master can be found, start the minion in the same way as the master; with the platform init system or via the command line directly:

As a daemon:

| salt-minion -d |

In the foreground in debug mode:

| salt-minion -l debug |

When the minion is started, it will generate an id value, unless it has been generated on a previous run and cached in the configuration directory, which is /etc/salt by default. This is the name by which the minion will attempt to authenticate to the master. The following steps are attempted, in order to try to find a value that is not localhost:

1. The Python function socket.getfqdn() is run
2. /etc/hostname is checked (non-Windows only)
3. /etc/hosts (%WINDIR%\system32\drivers\etc\hosts on Windows hosts) is checked for hostnames that map to anything within 127.0.0.0/8.

If none of the above are able to produce an id which is not localhost, then a sorted list of IP addresses on the minion (excluding any within 127.0.0.0/8) is inspected. The first publicly-routable IP address is used, if there is one. Otherwise, the first privately-routable IP address is used.

If all else fails, then localhost is used as a fallback.

**Note:** Overriding the id

The minion id can be manually specified using the id parameter in the minion config file. If this configuration value is specified, it will override all other sources for the id.

Now that the minion is started, it will generate cryptographic keys and attempt to connect to the master. The next step is to venture back to the master server and accept the new minion’s public key.

**Using salt-key** Salt authenticates minions using public-key encryption and authentication. For a minion to start accepting commands from the master, the minion keys need to be accepted by the master.

The salt-key command is used to manage all of the keys on the master. To list the keys that are on the master:

| salt-key -L |

The keys that have been rejected, accepted, and pending acceptance are listed. The easiest way to accept the minion key is to accept all pending keys:

| salt-key -A |

**Note:** Keys should be verified! Print the master key fingerprint by running salt-key -F master on the Salt master. Copy the master.pub fingerprint from the Local Keys section, and then set this value as the master_finger in the minion configuration file. Restart the Salt minion.
On the master, run `salt-key -f minion-id` to print the fingerprint of the minion's public key that was received by the master. On the minion, run `salt-call key.finger --local` to print the fingerprint of the minion key.

On the master:

```bash
# salt-key -f foo.domain.com
Unaccepted Keys:
```

On the minion:

```bash
# salt-call key.finger --local
local:
```

If they match, approve the key with `salt-key -a foo.domain.com`.

---

**Sending the First Commands**  
Now that the minion is connected to the master and authenticated, the master can start to command the minion.

Salt commands allow for a vast set of functions to be executed and for specific minions and groups of minions to be targeted for execution.

The `salt` command is comprised of command options, target specification, the function to execute, and arguments to the function.

A simple command to start with looks like this:

```bash
salt '*' test.ping
```

The `*` is the target, which specifies all minions.

`test.ping` tells the minion to run the `test.ping` function.

In the case of `test.ping`, `test` refers to a **execution module**, `ping` refers to the `ping` function contained in the aforementioned `test` module.

**Note:** Execution modules are the workhorses of Salt. They do the work on the system to perform various tasks, such as manipulating files and restarting services.

The result of running this command will be the master instructing all of the minions to execute `test.ping` in parallel and return the result.

This is not an actual ICMP ping, but rather a simple function which returns `True`. Using `test.ping` is a good way of confirming that a minion is connected.

**Note:** Each minion registers itself with a unique minion ID. This ID defaults to the minion's hostname, but can be explicitly defined in the minion config as well by using the `id` parameter.

Of course, there are hundreds of other modules that can be called just as `test.ping` can. For example, the following would return disk usage on all targeted minions:

```bash
salt '*' disk.usage
```

**Getting to Know the Functions**  
Salt comes with a vast library of functions available for execution, and Salt functions are self-documenting. To see what functions are available on the minions execute the `sys.doc` function:

---

3.4. Advanced Topics
This will display a very large list of available functions and documentation on them.

**Note:** Module documentation is also available on the web.

These functions cover everything from shelling out to package management to manipulating database servers. They comprise a powerful system management API which is the backbone to Salt configuration management and many other aspects of Salt.

**Note:** Salt comes with many plugin systems. The functions that are available via the `salt` command are called *Execution Modules*.

### Helpful Functions to Know

The `cmd` module contains functions to shell out on minions, such as `cmd.run` and `cmd.run_all`:

```
salt '*' cmd.run 'ls -l /etc'
```

The `pkg` functions automatically map local system package managers to the same salt functions. This means that `pkg.install` will install packages via `yum` on Red Hat based systems, `apt` on Debian systems, etc.:

```
salt '*' pkg.install vim
```

**Note:** Some custom Linux spins and derivatives of other distributions are not properly detected by Salt. If the above command returns an error message saying that `pkg.install` is not available, then you may need to override the `pkg` provider. This process is explained [here](#).

The `network.interfaces` function will list all interfaces on a minion, along with their IP addresses, netmasks, MAC addresses, etc:

```
salt '*' network.interfaces
```

### Changing the Output Format

The default output format used for most Salt commands is called the *nested* outputter, but there are several other outputters that can be used to change the way the output is displayed. For instance, the `pprint` outputter can be used to display the return data using Python's `pprint` module:

```
root@saltmaster:~# salt myminion grains.item pythonpath --out=pprint
{
    'myminion': {
        'pythonpath': [
            '/usr/lib64/python2.7',
            '/usr/lib/python2.7/plat-linux2',
            '/usr/lib64/python2.7/lib-tk',
            '/usr/lib/python2.7/lib-tk',
            '/usr/lib/python2.7/site-packages',
            '/usr/lib/python2.7/site-packages/gst-0.10',
            '/usr/lib/python2.7/site-packages/gtk-2.0']}
}
```

The full list of Salt outputters, as well as example output, can be found [here](#).

### `salt-call`

The examples so far have described running commands from the Master using the `salt` command, but when troubleshooting it can be more beneficial to login to the minion directly and use `salt-call`.

Doing so allows you to see the minion log messages specific to the command you are running (which are *not* part of the return data you see when running the command from the Master using `salt`), making it unnecessary to tail the minion log. More information on `salt-call` and how to use it can be found [here](#).
Grains  Salt uses a system called Grains to build up static data about minions. This data includes information about the operating system that is running, CPU architecture and much more. The grains system is used throughout Salt to deliver platform data to many components and to users.

Grains can also be statically set, this makes it easy to assign values to minions for grouping and managing.

A common practice is to assign grains to minions to specify what the role or roles a minion might be. These static grains can be set in the minion configuration file or via the grains.setval function.

Targeting  Salt allows for minions to be targeted based on a wide range of criteria. The default targeting system uses globular expressions to match minions, hence if there are minions named larry1, larry2, curly1, and curly2, a glob of larry* will match larry1 and larry2, and a glob of *1 will match larry1 and curly1.

Many other targeting systems can be used other than globs, these systems include:

Regular Expressions  Target using PCRE-compliant regular expressions

Grains  Target based on grains data: Targeting with Grains

Pillar  Target based on pillar data: Targeting with Pillar

IP  Target based on IP address/subnet/range

Compound  Create logic to target based on multiple targets: Targeting with Compound

Nodegroup  Target with nodegroups: Targeting with Nodegroup

The concepts of targets are used on the command line with Salt, but also function in many other areas as well, including the state system and the systems used for ACLs and user permissions.

Passing in Arguments  Many of the functions available accept arguments which can be passed in on the command line:

```bash
salt '*' pkg.install vim
```

This example passes the argument vim to the pkg.install function. Since many functions can accept more complex input than just a string, the arguments are parsed through YAML, allowing for more complex data to be sent on the command line:

```bash
salt '*' test.echo 'foo: bar'
```

In this case Salt translates the string 'foo: bar' into the dictionary `{foo: 'bar'}`

Note: Any line that contains a newline will not be parsed by YAML.

Salt States

Now that the basics are covered the time has come to evaluate States. Salt States, or the State System is the component of Salt made for configuration management.

The state system is already available with a basic Salt setup, no additional configuration is required. States can be set up immediately.

Note: Before diving into the state system, a brief overview of how states are constructed will make many of the concepts clearer. Salt states are based on data modeling and build on a low level data structure that is used to execute each state function. Then more logical layers are built on top of each other.

The high layers of the state system which this tutorial will cover consists of everything that needs to be known to use states, the two high layers covered here are the sls layer and the highest layer highstate.
Understanding the layers of data management in the State System will help with understanding states, but they never
need to be used. Just as understanding how a compiler functions assists when learning a programming language,
understanding what is going on under the hood of a configuration management system will also prove to be a
valuable asset.

The First SLS Formula

The state system is built on SLS formulas. These formulas are built out in files on Salt’s file server. To make a very
basic SLS formula open up a file under /srv/salt named vim.sls. The following state ensures that vim is installed on
a system to which that state has been applied.

```
/srv/salt/vim.sls:

vim:
  pkg.installed
```

Now install vim on the minions by calling the SLS directly:

```
salt '*' state.sls vim
```

This command will invoke the state system and run the vim SLS.

Now, to beef up the vim SLS formula, a vimrc can be added:

```
/srv/salt/vim.sls:

vim:
  pkg.installed: []

/etc/vimrc:
  file.managed:
    - source: salt://vimrc
    - mode: 644
    - user: root
    - group: root
```

Now the desired vimrc needs to be copied into the Salt file server to /srv/salt/vimrc. In Salt, everything is a
file, so no path redirection needs to be accounted for. The vimrc file is placed right next to the vim.sls file. The
same command as above can be executed to all the vim SLS formulas and now include managing the file.

**Note:** Salt does not need to be restarted/reloaded or have the master manipulated in any way when changing SLS
formulas. They are instantly available.

Adding Some Depth

Obviously maintaining SLS formulas right in a single directory at the root of the file server will not scale out to
reasonably sized deployments. This is why more depth is required. Start by making an nginx formula a better way,
make an nginx subdirectory and add an init.sls file:

```
/srv/salt/nginx/init.sls:

nginx:
  pkg.installed: []
  service.running:
    - require:
      - pkg: nginx
```

74 Chapter 3. Tutorials
A few concepts are introduced in this SLS formula. First is the service statement which ensures that the nginx service is running. Of course, the nginx service can’t be started unless the package is installed -- hence the require statement which sets up a dependency between the two. The require statement makes sure that the required component is executed before and that it results in success.

Note: The require option belongs to a family of options called requisites. Requisites are a powerful component of Salt States, for more information on how requisites work and what is available see: Requisites

Also evaluation ordering is available in Salt as well: Ordering States

This new sls formula has a special name -- init.sls. When an SLS formula is named init.sls it inherits the name of the directory path that contains it. This formula can be referenced via the following command:

```
salt '*' state.sls nginx
```

Note: Reminder! Just as one could call the test.ping or disk.usage execution modules, state.sls is simply another execution module. It simply takes the name of an SLS file as an argument.

Now that subdirectories can be used, the vim.sls formula can be cleaned up. To make things more flexible, move the vim.sls and vimrc into a new subdirectory called edit and change the vim.sls file to reflect the change:

```
/srv/salt/edit/vim.sls:

vim:
    pkg.installed

/etc/vimrc:
    file.managed:
        - source: salt://edit/vimrc
        - mode: 644
        - user: root
        - group: root
```

Only the source path to the vimrc file has changed. Now the formula is referenced as edit.vim because it resides in the edit subdirectory. Now the edit subdirectory can contain formulas for emacs, nano, joe or any other editor that may need to be deployed.

Next Reading

Two walk-throughs are specifically recommended at this point. First, a deeper run through States, followed by an explanation of Pillar.

1. Starting States
2. Pillar Walkthrough

An understanding of Pillar is extremely helpful in using States.

Getting Deeper Into States

Two more in-depth States tutorials exist, which delve much more deeply into States functionality.
1. *How Do I Use Salt States?*, covers much more to get off the ground with States.

2. The *States Tutorial* also provides a fantastic introduction.

These tutorials include much more in-depth information including templating SLS formulas etc.

**So Much More!**

This concludes the initial Salt walk-through, but there are many more things still to learn! These documents will cover important core aspects of Salt:

- Pillar
- Job Management

A few more tutorials are also available:

- Remote Execution Tutorial
- Standalone Minion

This still is only scratching the surface, many components such as the reactor and event systems, extending Salt, modular components and more are not covered here. For an overview of all Salt features and documentation, look at the *Table of Contents*.

### 3.4.2 running salt as normal user tutorial

**Before continuing** make sure you have a working Salt installation by following the *installation* and the *configuration* instructions.

**Stuck?**

There are many ways to *get help from the Salt community* including our *mailing list* and our *IRC channel #salt*.

**Running Salt functions as non root user**

If you don’t want to run salt cloud as root or even install it you can configure it to have a virtual root in your working directory.

The salt system uses the *salt.syspath* module to find the variables

If you run the salt-build, it will generated in:

```
./build/lib.linux-x86_64-2.7/salt/_syspaths.py
```

To generate it, run the command:

```
python setup.py build
```

Copy the generated module into your salt directory

```
cp ./build/lib.linux-x86_64-2.7/salt/_syspaths.py salt/_syspaths.py
```

Edit it to include needed variables and your new paths
# you need to edit this
ROOT_DIR = *your current dir* + '/salt/root'

# you need to edit this
INSTALL_DIR = *location of source code*

CONFIG_DIR = ROOT_DIR + '/etc/salt'
CACHE_DIR = ROOT_DIR + '/var/cache/salt'
SOCK_DIR = ROOT_DIR + '/var/run/salt'
SRV_ROOT_DIR = ROOT_DIR + '/srv'
BASE_FILE_ROOTS_DIR = ROOT_DIR + '/srv/salt'
BASE_PILLAR_ROOTS_DIR = ROOT_DIR + '/srv/pillar'
BASE_MASTER_ROOTS_DIR = ROOT_DIR + '/srv/salt-master'
LOGS_DIR = ROOT_DIR + '/var/log/salt'
PIDFILE_DIR = ROOT_DIR + '/var/run'
CLOUD_DIR = INSTALL_DIR + '/cloud'
BOOTSTRAP = CLOUD_DIR + '/deploy/bootstrap-salt.sh'

Create the directory structure

```bash
```

Populate the configuration files:

```bash
cp -r conf/* root/etc/salt/
```

Edit your `root/etc/salt/master` configuration that is used by salt-cloud:

```bash
user: *your user name*
```

Run like this:

```bash
PYTHONPATH=`pwd` scripts/salt-cloud
```

## 3.4.3 MinionFS Backend Walkthrough

New in version 2014.1.0.

Sometimes, you might need to propagate files that are generated on a minion. Salt already has a feature to send files from a minion to the master:

```bash
salt 'minion-id' cp.push /path/to/the/file
```

This command will store the file, including its full path, under `cachedir/master/minions/minion-id/files`. With the default `cachedir` the example file above would be stored as `/var/cache/salt/master/minions/minion-id/files/path/to/the/file`.

**Note:** This walkthrough assumes basic knowledge of Salt and `cp.push`. To get up to speed, check out the walkthrough.

Since it is not a good idea to expose the whole `cachedir`, MinionFS should be used to send these files to other minions.
Simple Configuration

To use the minionfs backend only two configuration changes are required on the master. The `file-server_backend` option needs to contain a value of `minion` and `file_recv` needs to be set to true:

```yaml
fileserver_backend:
  - roots
  - minion
file_recv: True
```

These changes require a restart of the master, then new requests for the `salt://minion-id/` protocol will send files that are pushed by `cp.push` from `minion-id` to the master.

**Note:** All of the files that are pushed to the master are going to be available to all of the minions. If this is not what you want, please remove `minion` from `fileserver_backend` in the master config file.

**Note:** Having directories with the same name as your minions in the root that can be accessed like `salt://minion-id/` might cause confusion.

Commandline Example

Let's assume that we are going to generate SSH keys on a minion called `minion-source` and put the public part in `~/.ssh/authorized_keys` of root user of a minion called `minion-destination`.

First, let's make sure that `/root/.ssh` exists and has the right permissions:

```bash
[root@salt-master file]# salt '*' file.mkdir dir_path=/root/.ssh user=root group=root mode=700
```

```
minion-source:
None
```

```
minion-destination:
None
```

We create an RSA key pair without a passphrase:

```bash
[root@salt-master file]# salt 'minion-source' cmd.run 'ssh-keygen -N "" -f /root/.ssh/id_rsa'
```

```
minion-source:
Generating public/private rsa key pair.
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
The key's randomart image is:

```
1 Yes, that was the actual key on my server, but the server is already destroyed.
```
and we send the public part to the master to be available to all minions:

```bash
[root@salt-master file]# salt 'minion-source' cp.push /root/.ssh/id_rsa.pub
minion-source:
    True
```

now it can be seen by everyone:

```bash
[root@salt-master file]# salt 'minion-destination' cp.list_master_dirs
minion-destination:
    - .
    - etc
    - minion-source/root
    - minion-source/root/.ssh
```

Lets copy that as the only authorized key to minion-destination:

```bash
[root@salt-master file]# salt 'minion-destination' cp.get_file salt://minion-source/root/.ssh/id_rsa.pub /root/.ssh/authorized_keys
minion-destination:
    /root/.ssh/authorized_keys
```

Or we can use a more elegant and salty way to add an SSH key:

```bash
[root@salt-master file]# salt 'minion-destination' ssh.set_auth_key_from_file user=root source=salt://minion-source/root/.ssh/id_rsa.pub
minion-destination:
    new
```

### 3.4.4 Automatic Updates / Frozen Deployments

New in version 0.10.3.

Salt has support for the Esky application freezing and update tool. This tool allows one to build a complete zipfile out of the salt scripts and all their dependencies - including shared objects / DLLs.

**Getting Started**

To build frozen applications, suitable build environment will be needed for each platform. You should probably set up a virtualenv in order to limit the scope of Q/A.

This process does work on Windows. Directions are available at [https://github.com/saltstack/salt-windows-install](https://github.com/saltstack/salt-windows-install) for details on installing Salt in Windows. Only the 32-bit Python and dependencies have been tested, but they have been tested on 64-bit Windows.

Install bbfreeze, and then esky from PyPI in order to enable the bdist_esky command in setup.py. Salt itself must also be installed, in addition to its dependencies.

**Building and Freezing**

Once you have your tools installed and the environment configured, use `setup.py` to prepare the distribution files.

```bash
python setup.py sdist
python setup.py bdist
```

Once the distribution files are in place, Esky can be used to traverse the module tree and pack all the scripts up into a redistributable.
python setup.py bdist_esky

There will be an appropriately versioned salt-VERSION.zip in dist/ if everything went smoothly.

**Windows**

C:\Python27\lib\site-packages\zmq will need to be added to the PATH variable. This helps bbfreeze find the zmq DLL so it can pack it up.

**Using the Frozen Build**

Unpack the zip file in the desired install location. Scripts like salt-minion and salt-call will be in the root of the zip file. The associated libraries and bootstrapping will be in the directories at the same level. (Check the Esky documentation for more information)

To support updating your minions in the wild, put the builds on a web server that the minions can reach. salt.modules.saltutil.update() will trigger an update and (optionally) a restart of the minion service under the new version.

**Troubleshooting**

**A Windows minion isn't responding**

The process dispatch on Windows is slower than it is on *nix. It may be necessary to add `-t 15` to salt commands to give minions plenty of time to return.

**Windows and the Visual Studio Redist**

The Visual C++ 2008 32-bit redistributable will need to be installed on all Windows minions. Esky has an option to pack the library into the zipfile, but OpenSSL does not seem to acknowledge the new location. If a no OPENSSL_Applink error appears on the console when trying to start a frozen minion, the redistributable is not installed.

**Mixed Linux environments and Yum**

The Yum Python module doesn't appear to be available on any of the standard Python package mirrors. If RHEL/CentOS systems need to be supported, the frozen build should created on that platform to support all the Linux nodes. Remember to build the virtualenv with `--system-site-packages` so that the yum module is included.

**Automatic (Python) module discovery**

Automatic (Python) module discovery does not work with the late-loaded scheme that Salt uses for (Salt) modules. Any misbehaving modules will need to be explicitly added to the freezer_includes in Salt's setup.py. Always check the zipped application to make sure that the necessary modules were included.
3.4.5 Multi Master Tutorial

As of Salt 0.16.0, the ability to connect minions to multiple masters has been made available. The multi-master system allows for redundancy of Salt masters and facilitates multiple points of communication out to minions. When using a multi-master setup, all masters are running hot, and any active master can be used to send commands out to the minions.

Note: If you need failover capabilities with multiple masters, there is also a MultiMaster-PKI setup available, that uses a different topology MultiMaster-PKI with Failover Tutorial

In 0.16.0, the masters do not share any information, keys need to be accepted on both masters, and shared files need to be shared manually or use tools like the git files server backend to ensure that the file_roots are kept consistent.

Summary of Steps

1. Create a redundant master server
2. Copy primary master key to redundant master
3. Start redundant master
4. Configure minions to connect to redundant master
5. Restart minions
6. Accept keys on redundant master

Prepping a Redundant Master

The first task is to prepare the redundant master. If the redundant master is already running, stop it. There is only one requirement when preparing a redundant master, which is that masters share the same private key. When the first master was created, the master's identifying key pair was generated and placed in the master's pki_dir. The default location of the master's key pair is /etc/salt/pki/master/. Take the private key, master.pem, and copy it to the same location on the redundant master. Do the same for the master's public key, master.pub. Assuming that no minions have yet been connected to the new redundant master, it is safe to delete any existing key in this location and replace it.

Note: There is no logical limit to the number of redundant masters that can be used.

Once the new key is in place, the redundant master can be safely started.

Configure Minions

Since minions need to be master-aware, the new master needs to be added to the minion configurations. Simply update the minion configurations to list all connected masters:

```
master:
  - saltmaster1.example.com
  - saltmaster2.example.com
```

Now the minion can be safely restarted.

Now the minions will check into the original master and also check into the new redundant master. Both masters are first-class and have rights to the minions.
Note: Minions can automatically detect failed masters and attempt to reconnect to reconnect to them quickly. To enable this functionality, set `master_alive_interval` in the minion config and specify a number of seconds to poll the masters for connection status.

If this option is not set, minions will still reconnect to failed masters but the first command sent after a master comes back up may be lost while the minion authenticates.

Sharing Files Between Masters

Salt does not automatically share files between multiple masters. A number of files should be shared or sharing of these files should be strongly considered.

Minion Keys

Minion keys can be accepted the normal way using `salt-key` on both masters. Keys accepted, deleted, or rejected on one master will NOT be automatically managed on redundant masters; this needs to be taken care of by running salt-key on both masters or sharing the `/etc/salt/pki/master/{minions,minions_pre,minions_rejected}` directories between masters.

Note: While sharing the `/etc/salt/pki/master` directory will work, it is strongly discouraged, since allowing access to the `master.pem` key outside of Salt creates a SERIOUS security risk.

File_Roots

The `file_roots` contents should be kept consistent between masters. Otherwise state runs will not always be consistent on minions since instructions managed by one master will not agree with other masters.

The recommended way to sync these is to use a fileserver backend like gitfs or to keep these files on shared storage.

Pillar_Roots

Pillar roots should be given the same considerations as `file_roots`.

Master Configurations

While reasons may exist to maintain separate master configurations, it is wise to remember that each master maintains independent control over minions. Therefore, access controls should be in sync between masters unless a valid reason otherwise exists to keep them inconsistent.

These access control options include but are not limited to:

- `external_auth`
- `client_acl`
- `peer`
- `peer_run`
3.4.6 Multi-Master-PKI Tutorial With Failover

This tutorial will explain, how to run a salt-environment where a single minion can have multiple masters and fail-over between them if its current master fails.

The individual steps are

- setup the master(s) to sign its auth-replies
- setup minion(s) to verify master-public-keys
- enable multiple masters on minion(s)
- enable master-check on minion(s)

Please note, that it is advised to have good knowledge of the salt-authentication and communication-process to understand this tutorial. All of the settings described here, go on top of the default authentication/communication process.

Motivation

The default behaviour of a salt-minion is to connect to a master and accept the masters public key. With each publication, the master sends his public-key for the minion to check and if this public-key ever changes, the minion complains and exits. Practically this means, that there can only be a single master at any given time.

Would it not be much nicer, if the minion could have any number of masters (1:n) and jump to the next master if its current master died because of a network or hardware failure?

Note: There is also a MultiMaster-Tutorial with a different approach and topology than this one, that might also suite your needs or might even be better suited Multi-Master Tutorial

It is also desirable, to add some sort of authenticity-check to the very first public key a minion receives from a master. Currently a minions takes the first masters public key for granted.

The Goal

Setup the master to sign the public key it sends to the minions and enable the minions to verify this signature for authenticity.

Prepping the master to sign its public key

For signing to work, both master and minion must have the signing and/or verification settings enabled. If the master signs the public key but the minion does not verify it, the minion will complain and exit. The same happens, when the master does not sign but the minion tries to verify.

The easiest way to have the master sign its public key is to set

```
master_sign_pubkey: True
```

After restarting the salt-master service, the master will automatically generate a new key-pair

```
master_sign.pem
master_sign.pub
```

A custom name can be set for the signing key-pair by setting
master_sign_key_name: <name_without_suffix>

The master will then generate that key-pair upon restart and use it for creating the public keys signature attached to the auth-reply.

The computation is done for every auth-request of a minion. If many minions auth very often, it is advised to use conf_master:master_pubkey_signature and conf_master:master_use_pubkey_signature settings described below.

If multiple masters are in use and should sign their auth-replies, the signing key-pair master_sign.* has to be copied to each master. Otherwise a minion will fail to verify the masters public when connecting to a different master than it did initially. That is because the public keys signature was created with a different signing key-pair.

Prepping the minion to verify received public keys

The minion must have the public key (and only that one!) available to be able to verify a signature it receives. That public key (default to master_sign.pub) must be copied from the master to the minions pki-directory.

/etc/salt/pki/minion/master_sign.pub

DO NOT COPY THE master_sign.pem FILE. IT MUST STAY ON THE MASTER AND ONLY THERE!

When that is done, enable the signature checking in the minions configuration

verify_master_pubkey_sign: True

and restart the minion. For the first try, the minion should be run in manual debug mode.

$ salt-minion -l debug

Upon connecting to the master, the following lines should appear on the output:

[DEBUG ] Attempting to authenticate with the Salt Master at 172.16.0.10
[DEBUG ] Loaded minion key: /etc/salt/pki/minion/minion.pem
[DEBUG ] salt.crypt.verify_signature: Loading public key
[DEBUG ] salt.crypt.verify_signature: Verifying signature
[DEBUG ] Successfully verified signature of master public key with verification public key master_sign.pub
[INFO ] Received signed and verified master pubkey from master 172.16.0.10
[DEBUG ] Decrypting the current master AES key

If the signature verification fails, something went wrong and it will look like this

[DEBUG ] Attempting to authenticate with the Salt Master at 172.16.0.10
[DEBUG ] Loaded minion key: /etc/salt/pki/minion/minion.pem
[DEBUG ] salt.crypt.verify_signature: Loading public key
[DEBUG ] salt.crypt.verify_signature: Verifying signature
[DEBUG ] Failed to verify signature of public key
[CRITICAL] The Salt Master server's public key did not authenticate!

In a case like this, it should be checked, that the verification pubkey (master_sign.pub) on the minion is the same as the one on the master.

Once the verification is successful, the minion can be started in daemon mode again.

For the paranoid among us, its also possible to verify the public whenever it is received from the master. That is, for every single auth-attempt which can be quite frequent. For example just the start of the minion will force the signature to be checked 6 times for various things like auth, mine, highstate, etc.

If that is desired, enable the setting
always_verify_signature: True

**Multiple Masters For A Minion**

Configuring multiple masters on a minion is done by specifying two settings:

- a list of masters addresses
- what type of master is defined

```yaml
master:
  - 172.16.0.10
  - 172.16.0.11
  - 172.16.0.12

master_type: failover
```

This tells the minion that all the master above are available for it to connect to. When started with this configuration, it will try the master in the order they are defined. To randomize that order, set

```yaml
master_shuffle: True
```

The master-list will then be shuffled before the first connection attempt.

The first master that accepts the minion, is used by the minion. If the master does not yet know the minion, that counts as accepted and the minion stays on that master.

For the minion to be able to detect if its still connected to its current master enable the check for it

```yaml
master_alive_interval: <seconds>
```

If the loss of the connection is detected, the minion will temporarily remove the failed master from the list and try one of the other masters defined (again shuffled if that is enabled).

**Testing the setup**

At least two running masters are needed to test the failover setup.

Both masters should be running and the minion should be running on the command line in debug mode

```bash
$ salt-minion -l debug
```

The minion will connect to the first master from its master list

```
[DEBU 2] Attempting to authenticate with the Salt Master at 172.16.0.10
[DEBU 2] Loaded minion key: /etc/salt/pki/minion/minion.pem
[DEBU 2] salt.crypt.verify_signature: Loading public key
[DEBU 2] salt.crypt.verify_signature: Verifying signature
[DEBU 2] Successfully verified signature of master public key with verification public key master_sign.pub
[INFO 3] Received signed and verified master pubkey from master 172.16.0.10
[DEBU 2] Decrypting the current master AES key
```

A test.ping on the master the minion is currently connected to should be run to test connectivity.

If successful, that master should be turned off. A firewall-rule denying the minions packets will also do the trick.

Depending on the configured `conf_minion:master_alive_interval`, the minion will notice the loss of the connection and log it to its logfile.

---

3.4. Advanced Topics
Connection to master 172.16.0.10 lost
Trying to tune in to next master from master-list

The minion will then remove the current master from the list and try connecting to the next master.

Removing possibly failed master 172.16.0.10 from list of masters
Master ip address changed from 172.16.0.10 to 172.16.0.11
Attempting to authenticate with the Salt Master at 172.16.0.11

If everything is configured correctly, the new master's public key will be verified successfully.

Received signed and verified master pub key from master 172.16.0.11
Authentication with master successful!

Performance Tuning

With the setup described above, the master computes a signature for every auth-request of a minion. With many minions and many auth-requests, that can chew up quite a bit of CPU-Power.

To avoid that, the master can use a pre-created signature of its public-key. The signature is saved as a base64 encoded string which the master reads once when starting and attaches only that string to auth-replies.

Enabling this also gives paranoid users the possibility, to have the signing key-pair on a different system than the actual salt-master and create the public keys signature there. Probably on a system with more restrictive firewall rules, without internet access, less users, etc.

That signature can be created with

$ salt-key --gen-signature

This will create a default signature file in the master pki-directory

/etc/salt/pki/master/master_pubkey_signature

It is a simple text-file with the binary-signature converted to base64.

If no signing-pair is present yet, this will auto-create the signing pair and the signature file in one call

$ salt-key --gen-signature --auto-create

Telling the master to use the pre-created signature is done with

master_use_pubkey_signature: True

That requires the file `master_pubkey_signature` to be present in the masters pki-directory with the correct signature.

If the signature file is named differently, its name can be set with
With many masters and many public-keys (default and signing), it is advised to use the salt-masters hostname for the signature-files name. Signatures can be easily confused because they do not provide any information about the key the signature was created from.

Verifying that everything works is done the same way as above.

**How the signing and verification works**

The default key-pair of the salt-master is

```
/etc/salt/pki/master/master.pem
/etc/salt/pki/master/master.pub
```

To be able to create a signature of a message (in this case a public-key), another key-pair has to be added to the setup. Its default name is:

```
master_sign.pem
master_sign.pub
```

The combination of the master* and master_sign* key-pairs give the possibility of generating signatures. The signature of a given message is unique and can be verified, if the public-key of the signing-key-pair is available to the recipient (the minion).

The signature of the masters public-key in master.pub is computed with

```
M2Crypto.EVP.sign_update()
```

This results in a binary signature which is converted to base64 and attached to the auth-reply send to the minion.

With the signing-pairs public-key available to the minion, the attached signature can be verified with

```
M2Crypto.EVP.verify_update().
```

When running multiple masters, either the signing key-pair has to be present on all of them, or the master_pubkey_signature has to be pre-computed for each master individually (because they all have different public-keys).

**DO NOT PUT THE SAME master.pub ON ALL MASTERS FOR EASE OF USE.**

### 3.4.7 Preseed Minion with Accepted Key

In some situations, it is not convenient to wait for a minion to start before accepting its key on the master. For instance, you may want the minion to bootstrap itself as soon as it comes online. You may also want to to let your developers provision new development machines on the fly.

**See also:**

Many ways to preseed minion keys

Salt has other ways to generate and pre-accept minion keys in addition to the manual steps outlined below. salt-cloud performs these same steps automatically when new cloud VMs are created (unless instructed not to).
Salt exposes an HTTP call to Salt's REST API to generate and download the new minion keys as a tarball.

There is a general four step process to do this:

1. Generate the keys on the master:
   ```
   root@saltmaster# salt-key --gen-keys=[key_name]
   ```
   Pick a name for the key, such as the minion's id.

2. Add the public key to the accepted minion folder:
   ```
   root@saltmaster# cp key_name.pub /etc/salt/pki/master/minions/[minion_id]
   ```
   It is necessary that the public key file has the same name as your minion id. This is how Salt matches minions with their keys. Also note that the pki folder could be in a different location, depending on your OS or if specified in the master config file.

3. Distribute the minion keys.
   There is no single method to get the keypair to your minion. The difficulty is finding a distribution method which is secure. For Amazon EC2 only, an AWS best practice is to use IAM Roles to pass credentials. (See blog post, http://blogs.aws.amazon.com/security/post/Tx610S2MLVZWEA/Using-IAM-roles-to-distribute-non-AWS-credentials-to-your-EC2-instances)

   **Security Warning**
   Since the minion key is already accepted on the master, distributing the private key poses a potential security risk. A malicious party will have access to your entire state tree and other sensitive data if they gain access to a preseeded minion key.

4. Preseed the Minion with the keys
   You will want to place the minion keys before starting the salt-minion daemon:
   ```
   /etc/salt/pki/minion/minion.pem
   /etc/salt/pki/minion/minion.pub
   ```
   Once in place, you should be able to start salt-minion and run `salt-call state.highstate` or any other salt commands that require master authentication.

### 3.4.8 Salt Bootstrap

The Salt Bootstrap script allows for a user to install the Salt Minion or Master on a variety of system distributions and versions. This shell script known as `bootstrap-salt.sh` runs through a series of checks to determine the operating system type and version. It then installs the Salt binaries using the appropriate methods. The Salt Bootstrap script installs the minimum number of packages required to run Salt. This means that in the event you run the bootstrap to install via package, Git will not be installed. Installing the minimum number of packages helps ensure the script stays as lightweight as possible, assuming the user will install any other required packages after the Salt binaries are present on the system. The script source is available on GitHub: https://github.com/saltstack/salt-bootstrap

**Supported Operating Systems**

- Amazon Linux 2012.09
- Arch
• CentOS 5/6
• Debian 6.x/7.x/8 (git installations only)
• Fedora 17/18
• FreeBSD 9.1/9.2/10
• Gentoo
• Linaro
• Linux Mint 13/14
• OpenSUSE 12.x
• Oracle Linux 5/5
• Red Hat 5/6
• Red Hat Enterprise 5/6
• Scientific Linux 5/6
• SmartOS
• SuSE 11 SP1/11 SP2
• Ubuntu 10.x/11.x/12.x/13.04/13.10
• Elementary OS 0.2

Note: In the event you do not see your distribution or version available please review the develop branch on GitHub as it main contain updates that are not present in the stable release: https://github.com/saltstack/salt-bootstrap/tree/develop

Example Usage

If you're looking for the one-liner to install salt, please scroll to the bottom and use the instructions for Installing via an Insecure One-Liner

Note: In every two-step example, you would be well-served to examine the downloaded file and examine it to ensure that it does what you expect.

Using curl to install latest git:

```
curl -L https://bootstrap.saltstack.com -o install_salt.sh
sudo sh install_salt.sh git develop
```

Using wget to install your distribution's stable packages:

```
wget -O install_salt.sh https://bootstrap.saltstack.com
sudo sh install_salt.sh
```

Install a specific version from git using wget:

```
wget -O install_salt.sh https://bootstrap.saltstack.com
sudo sh install_salt.sh -P git v0.16.4
```

If you already have python installed, python 2.6, then it's as easy as:
python -m urllib "https://bootstrap.saltstack.com" > install_salt.sh
sudo sh install_salt.sh git develop

All python versions should support the following one liner:

python -c "import urllib; print urllib.urlopen("https://bootstrap.saltstack.com").read()" > install_salt.sh
sudo sh install_salt.sh git develop

On a FreeBSD base system you usually don’t have either of the above binaries available. You do have fetch available though:

fetch -o install_salt.sh https://bootstrap.saltstack.com
sudo sh install_salt.sh

If all you want is to install a salt-master using latest git:

curl -o install_salt.sh -L https://bootstrap.saltstack.com
sudo sh install_salt.sh -M -N git develop

If you want to install a specific release version (based on the git tags):

curl -o install_salt.sh -L https://bootstrap.saltstack.com
sudo sh install_salt.sh git v0.16.4

To install a specific branch from a git fork:

curl -o install_salt.sh -L https://bootstrap.saltstack.com
sudo sh install_salt.sh -g https://github.com/myuser/salt.git git mybranch

**Installing via an Insecure One-Liner**

The following examples illustrate how to install Salt via a one-liner.

**Note:** Warning! These methods do not involve a verification step and assume that the delivered file is trustworthy.

**Examples**

Installing the latest develop branch of Salt:

curl -L https://bootstrap.saltstack.com | sudo sh -s -- git develop

Any of the example above which use two-lines can be made to run in a single-line configuration with minor modifications.

**Example Usage**

The Salt Bootstrap script has a wide variety of options that can be passed as well as several ways of obtaining the bootstrap script itself.

For example, using curl to install your distribution’s stable packages:

curl -L https://bootstrap.saltstack.com | sudo sh

Using wget to install your distribution's stable packages:
wget -O - https://bootstrap.saltstack.com | sudo sh

Installing the latest version available from git with curl:

curl -L https://bootstrap.saltstack.com | sudo sh -s -- git develop

Install a specific version from git using wget:

wget -O - https://bootstrap.saltstack.com | sh -s -- -P git v0.16.4

If you already have python installed, python 2.6, then it’s as easy as:

python -m urllib "https://bootstrap.saltstack.com" | sudo sh -s -- git develop

All python versions should support the following one liner:

python -c 'import urllib; print urllib.urlopen("https://bootstrap.saltstack.com").read()' | \  
sudo sh -s -- git develop

On a FreeBSD base system you usually don’t have either of the above binaries available. You do have fetch available though:

fetch -O - https://bootstrap.saltstack.com | sudo sh

If all you want is to install a salt-master using latest git:

curl -L https://bootstrap.saltstack.com | sudo sh -s -- -M -N git develop

If you want to install a specific release version (based on the git tags):

curl -L https://bootstrap.saltstack.com | sudo sh -s -- git v0.16.4

Downloading the develop branch (from here standard command line options may be passed):

wget https://bootstrap.saltstack.com/develop

**Command Line Options**

Here’s a summary of the command line options:

```
$ sh bootstrap-salt.sh -h

Usage : bootstrap-salt.sh [options] <install-type> <install-type-args>

Installation types:
- stable (default)
- stable [version] (ubuntu specific)
- daily (ubuntu specific)
- testing (redhat specific)
- git

Examples:
- bootstrap-salt.sh
- bootstrap-salt.sh stable
- bootstrap-salt.sh stable 2014.7
- bootstrap-salt.sh daily
- bootstrap-salt.sh testing
- bootstrap-salt.sh git
```
Salt Documentation, Release 2015.8.0

- bootstrap-salt.sh git develop
- bootstrap-salt.sh git v0.17.0
- bootstrap-salt.sh git 8c3fadf15ec183e5ce8c63739850d543617e4357

Options:
- h Display this message
- v Display script version
- n No colours.
- D Show debug output.
- c Temporary configuration directory
- g Salt repository URL. (default: git://github.com/saltstack/salt.git)
- G Instead of cloning from git://github.com/saltstack/salt.git, clone from https://github.com/saltstack/salt.git (Usually necessary on systems which have the regular git protocol port blocked, where https usually is not)
- k Temporary directory holding the minion keys which will pre-seed the master.
- s Sleep time used when waiting for daemons to start, restart and when checking for the services running. Default: 3
- M Also install salt-master
- S Also install salt-syndic
- N Do not install salt-minion
- X Do not start daemons after installation
- C Only run the configuration function. This option automatically bypasses any installation.
- P Allow pip based installations. On some distributions the required salt packages or its dependencies are not available as a package for that distribution. Using this flag allows the script to use pip as a last resort method. NOTE: This only works for functions which actually implement pip based installations.
- F Allow copied files to overwrite existing(config, init.d, etc)
- U If set, fully upgrade the system prior to bootstrapping salt
- K If set, keep the temporary files in the temporary directories specified with -c and -k.
- I If set, allow insecure connections while downloading any files. For example, pass '--no-check-certificate' to 'wget' or '--insecure' to 'curl'
- A Pass the salt-master DNS name or IP. This will be stored under ${_SALT_ETC_DIR}/minion.d/99-master-address.conf
- i Pass the salt-minion id. This will be stored under ${_SALT_ETC_DIR}/minion_id
- L Install the Apache Libcloud package if possible(required for salt-cloud)
- p Extra-package to install while installing salt dependencies. One package per -p flag. You're responsible for providing the proper package name.
- d Disable check_service functions. Setting this flag disables the 'install_<distro>_check_services' checks. You can also do this by touching /tmp/disable_salt_checks on the target host. Defaults ${BS_FALSE}
- H Use the specified http proxy for the installation
- Z Enable external software source for newer ZeroMQ(Only available for RHEL/CentOS/Fedora/Ubuntu based distros)

3.4.9 Git Fileserver Backend Walkthrough

Note: This walkthrough assumes basic knowledge of Salt. To get up to speed, check out the Salt Walkthrough.

The gitfs backend allows Salt to serve files from git repositories. It can be enabled by adding git to the file-server_backend list, and configuring one or more repositories in gitfs_remotes.

Branches and tags become Salt fileserver environments.
Installing Dependencies

Beginning with version 2014.7.0, both pygit2 and Dulwich are supported as alternatives to GitPython. The desired provider can be configured using the gitfs_provider parameter in the master config file.

If gitfs_provider is not configured, then Salt will prefer pygit2 if a suitable version is available, followed by GitPython and Dulwich.

pygit2

The minimum supported version of pygit2 is 0.20.3. Availability for this version of pygit2 is still limited, though the SaltStack team is working to get compatible versions available for as many platforms as possible.

For the Fedora/EPEL versions which have a new enough version packaged, the following command would be used to install pygit2:

```
# yum install python-pygit2
```

Provided a valid version is packaged for Debian/Ubuntu (which is not currently the case), the package name would be the same, and the following command would be used to install it:

```
# apt-get install python-pygit2
```

If pygit2 is not packaged for the platform on which the Master is running, the pygit2 website has installation instructions here. Keep in mind however that following these instructions will install libgit2 and pygit2 without system packages. Additionally, keep in mind that SSH authentication in pygit2 requires libssh2 (not libssh) development libraries to be present before libgit2 is built. On some distros (debian based) pkg-config is also required to link libgit2 with libssh2.

GitPython

GitPython 0.3.0 or newer is required to use GitPython for gitfs. For RHEL-based Linux distros, a compatible version is available in EPEL, and can be easily installed on the master using yum:

```
# yum install GitPython
```

Ubuntu 14.04 LTS and Debian Wheezy (7.x) also have a compatible version packaged:

```
# apt-get install python-git
```

If your master is running an older version (such as Ubuntu 12.04 LTS or Debian Squeeze), then you will need to install GitPython using either pip or easy_install (it is recommended to use pip). Version 0.3.2.RC1 is now marked as the stable release in PyPI, so it should be a simple matter of running pip install GitPython (or easy_install GitPython) as root.

**Warning:** Keep in mind that if GitPython has been previously installed on the master using pip (even if it was subsequently uninstalled), then it may still exist in the build cache (typically /tmp/pip-build-root/GitPython) if the cache is not cleared after installation. The package in the build cache will override any requirement specifiers, so if you try upgrading to version 0.3.2.RC1 by running pip install 'GitPython==0.3.2.RC1' then it will ignore this and simply install the version from the cache directory. Therefore, it may be necessary to delete the GitPython directory from the build cache in order to ensure that the specified version is installed.
Salt Documentation, Release 2015.8.0

Dulwich

Dulwich 0.9.4 or newer is required to use Dulwich as backend for gitfs.

Dulwich is available in EPEL, and can be easily installed on the master using yum:

```bash
# yum install python-dulwich
```

For APT-based distros such as Ubuntu and Debian:

```bash
# apt-get install python-dulwich
```

**Important:** If switching to Dulwich from GitPython/pygit2, or switching from GitPython/pygit2 to Dulwich, it is necessary to clear the gitfs cache to avoid unpredictable behavior. This is probably a good idea whenever switching to a new `gitfs_provider`, but it is less important when switching between GitPython and pygit2.

Beginning in version 2015.5.0, the gitfs cache can be easily cleared using the `fileservers.clear_cache` runner.

```bash
salt-run fileservers.clear_cache backend=git
```

If the Master is running an earlier version, then the cache can be cleared by removing the `gitfs` and `file_lists/gitfs` directories (both paths relative to the master cache directory, usually `/var/cache/salt/master`).

```bash
rm -rf /var/cache/salt/master{,,file_lists}/gitfs
```

**Simple Configuration**

To use the gitfs backend, only two configuration changes are required on the master:

1. Include `git` in the `fileservers.backend` list in the master config file:

   ```yaml
   fileservers_backend:
   - git
   ```

2. Specify one or more `git://`, `https://`, or `file://` URLs in `gitfs_remotes` to configure which repositories to cache and search for requested files:

   ```yaml
gitfs_remotes:
   - https://github.com/saltstack-formulas/salt-formula.git
   ```

   SSH remotes can also be configured using scp-like syntax:

   ```yaml
gitfs_remotes:
   - git@github.com:user/repo.git
   - ssh://user@domain.tld/path/to/repo.git
   ```

   Information on how to authenticate to SSH remotes can be found [here](#).

   **Note:** Dulwich does not recognize `ssh://` URLs, `git+ssh://` must be used instead. Salt version 2015.5.0 and later will automatically add the `git+` to the beginning of these URLs before fetching, but earlier Salt versions will fail to fetch unless the URL is specified using `git+ssh://`.

3. Restart the master to load the new configuration.

**Note:** In a master/minion setup, files from a gitfs remote are cached once by the master, so minions do not need direct access to the git repository.
Multiple Remotes

The `gitfs_remotes` option accepts an ordered list of git remotes to cache and search, in listed order, for requested files.

A simple scenario illustrates this cascading lookup behavior:

If the `gitfs_remotes` option specifies three remotes:

```yaml
gitfs_remotes:
  - git://github.com/example/first.git
  - https://github.com/example/second.git
  - file:///root/third
```

And each repository contains some files:

```plaintext
first.git:
  top.sls
  edit/vim.sls
  edit/vimrc
  nginx/init.sls

second.git:
  edit/dev_vimrc
  haproxy/init.sls

third:
  haproxy/haproxy.conf
  edit/dev_vimrc
```

Salt will attempt to lookup the requested file from each `gitfs` remote repository in the order in which they are defined in the configuration. The `git://github.com/example/first.git` remote will be searched first. If the requested file is found, then it is served and no further searching is executed. For example:

- A request for the file `salt://haproxy/init.sls` will be served from the `https://github.com/example/second.git` git repo.
- A request for the file `salt://haproxy/haproxy.conf` will be served from the `file:///root/third` repo.

**Note:** This example is purposefully contrived to illustrate the behavior of the `gitfs` backend. This example should not be read as a recommended way to lay out files and git repos.

The `file://` prefix denotes a git repository in a local directory. However, it will still use the given `file://` URL as a remote, rather than copying the git repo to the salt cache. This means that any refs you want accessible must exist as `local` refs in the specified repo.

**Warning:** Salt versions prior to 2014.1.0 are not tolerant of changing the order of remotes or modifying the URI of existing remotes. In those versions, when modifying remotes it is a good idea to remove the `gitfs` cache directory (`/var/cache/salt/master/gitfs`) before restarting the salt-master service.

Per-remote Configuration Parameters

New in version 2014.7.0.

The following master config parameters are global (that is, they apply to all configured `gitfs` remotes):
Salt Documentation, Release 2015.8.0

- `gitfs_base`
- `gitfs_root`
- `gitfs_mountpoint` (new in 2014.7.0)
- `gitfs_user` (pygit2 only, new in 2014.7.0)
- `gitfs_password` (pygit2 only, new in 2014.7.0)
- `gitfs_insecure_auth` (pygit2 only, new in 2014.7.0)
- `gitfs_pubkey` (pygit2 only, new in 2014.7.0)
- `gitfs_privkey` (pygit2 only, new in 2014.7.0)
- `gitfs_passphrase` (pygit2 only, new in 2014.7.0)

These parameters can now be overridden on a per-remote basis. This allows for a tremendous amount of customization. Here's some example usage:

```
gitfs_provider: pygit2
gitfs_base: develop

gitfs_remotes:  
- https://foo.com/foo.git  
- https://foo.com/bar.git:  
  - root: salt  
  - mountpoint: salt://foo/bar/baz  
  - base: salt-base  
- http://foo.com/baz.git:  
  - root: salt/states  
  - user: joe  
  - password: mysupersecretpassword  
  - insecure_auth: True
```

**Important:** There are two important distinctions which should be noted for per-remote configuration:

1. The URL of a remote which has per-remote configuration must be suffixed with a colon.
2. Per-remote configuration parameters are named like the global versions, with the `gitfs_` removed from the beginning.

In the example configuration above, the following is true:

1. The first and third `gitfs` remotes will use the `develop` branch/tag as the `base` environment, while the second one will use the `salt-base` branch/tag as the `base` environment.
2. The first remote will serve all files in the repository. The second remote will only serve files from the `salt` directory (and its subdirectories), while the third remote will only serve files from the `salt/states` directory (and its subdirectories).
3. The files from the second remote will be located under `salt://foo/bar/baz`, while the files from the first and third remotes will be located under the root of the Salt fileserver namespace (`salt://`).
4. The third remote overrides the default behavior of not authenticating to insecure (non-HTTPS) remotes.

**Serving from a Subdirectory**

The `gitfs_root` parameter allows files to be served from a subdirectory within the repository. This allows for only part of a repository to be exposed to the Salt fileserver.
Assume the below layout:

```
.gitignore
README.txt
foo/
  foo/bar/
  foo/bar/one.txt
  foo/bar/two.txt
  foo/bar/three.txt
  foo/baz/
  foo/baz/top.sls
  foo/baz/edit/vim.sls
  foo/baz/edit/vimrc
  foo/baz/nginx/init.sls
```

The below configuration would serve only the files under `foo/baz`, ignoring the other files in the repository:

```
gitfs_remotes:
  - git://mydomain.com/stuff.git

gitfs_root: foo/baz
```

The root can also be configured on a *per-remote basis*.

**Mountpoints**

New in version 2014.7.0.

The `gitfs_mountpoint` parameter will prepend the specified path to the files served from gitfs. This allows an existing repository to be used, rather than needing to reorganize a repository or design it around the layout of the Salt fileserver.

Before the addition of this feature, if a file being served up via gitfs was deeply nested within the root directory (for example, `salt://webapps/foo/files/foo.conf`), it would be necessary to ensure that the file was properly located in the remote repository, and that all of the parent directories were present (for example, the directories `webapps/foo/files/` would need to exist at the root of the repository).

The below example would allow for a file `foo.conf` at the root of the repository to be served up from the Salt fileserver path `salt://webapps/foo/files/foo.conf`.

```
gitfs_remotes:
  - https://mydomain.com/stuff.git

gitfs_mountpoint: salt://webapps/foo/files
```

Mountpoints can also be configured on a *per-remote basis*.

**Using gitfs Alongside Other Backends**

Sometimes it may make sense to use multiple backends; for instance, if SLS files are stored in git but larger files are stored directly on the master.

The cascading lookup logic used for multiple remotes is also used with multiple backends. If the `fileserver_backend` option contains multiple backends:

```
fileserver_backend:
  - roots
  - git
```

3.4. Advanced Topics
Then the roots backend (the default backend of files in /srv/salt) will be searched first for the requested file; then, if it is not found on the master, each configured git remote will be searched.

**Branches, Environments, and Top Files**

When using the gitfs backend, branches, and tags will be mapped to environments using the branch/tag name as an identifier.

There is one exception to this rule: the master branch is implicitly mapped to the base environment.

So, for a typical base, qa, dev setup, the following branches could be used:

```
master
qa
dev
```

top.sls files from different branches will be merged into one at runtime. Since this can lead to overly complex configurations, the recommended setup is to have a separate repository, containing only the top.sls file with just one single master branch.

To map a branch other than master as the base environment, use the gitfs_base parameter.

```
gitfs_base: salt-base
```

The base can also be configured on a *per-remote basis*.

**Environment Whitelist/Blacklist**

New in version 2014.7.0.

The gitfs_env_whitelist and gitfs_env_blacklist parameters allow for greater control over which branches/tags are exposed as fileserver environments. Exact matches, globs, and regular expressions are supported, and are evaluated in that order. If using a regular expression, ^ and $ must be omitted, and the expression must match the entire branch/tag.

```
gitfs_env_whitelist:
- base
- v1.*
- 'mybranch\d+'
```

**Note:** v1.*, in this example, will match as both a glob and a regular expression (though it will have been matched as a glob, since globs are evaluated before regular expressions).

The behavior of the blacklist/whitelist will differ depending on which combination of the two options is used:

- If only gitfs_env_whitelist is used, then only branches/tags which match the whitelist will be available as environments
- If only gitfs_env_blacklist is used, then the branches/tags which match the blacklist will not be available as environments
- If both are used, then the branches/tags which match the whitelist, but do not match the blacklist, will be available as environments.
Authentication

pygit2

New in version 2014.7.0.

Both HTTPS and SSH authentication are supported as of version 0.20.3, which is the earliest version of pygit2 supported by Salt for gitfs.

Note: The examples below make use of per-remote configuration parameters, a feature new to Salt 2014.7.0. More information on these can be found here.

HTTPS For HTTPS repositories which require authentication, the username and password can be provided like so:

```yaml
gitfs_remotes:
- https://domain.tld/myrepo.git:
  - user: git
  - password: mypassword
```

If the repository is served over HTTP instead of HTTPS, then Salt will by default refuse to authenticate to it. This behavior can be overridden by adding an insecure_auth parameter:

```yaml
 gitfs_remotes:
- http://domain.tld/insecure_repo.git:
  - user: git
  - password: mypassword
  - insecure_auth: True
```

SSH SSH repositories can be configured using the ssh:// protocol designation, or using scp-like syntax. So, the following two configurations are equivalent:

- ssh://git@github.com/user/repo.git
- git@github.com:user/repo.git

Both gitfs_pubkey and gitfs_privkey (or their per-remote counterparts) must be configured in order to authenticate to SSH-based repos. If the private key is protected with a passphrase, it can be configured using gitfs_passphrase (or simply passphrase if being configured per-remote). For example:

```yaml
 gitfs_remotes:
- git@github.com:user/repo.git:
  - pubkey: /root/.ssh/id_rsa.pub
  - privkey: /root/.ssh/id_rsa
  - passphrase: myawesomepassphrase
```

Finally, the SSH host key must be added to the known_hosts file.

GitPython

With GitPython, only passphrase-less SSH public key authentication is supported. The auth parameters (pubkey, privkey, etc.) shown in the pygit2 authentication examples above do not work with GitPython.

```yaml
 gitfs_remotes:
- ssh://git@github.com/example/salt-states.git
```

3.4. Advanced Topics
Since **GitPython** wraps the git CLI, the private key must be located in `~/.ssh/id_rsa` for the user under which the Master is running, and should have permissions of `0600`. Also, in the absence of a user in the repo URL, **GitPython** will (just as SSH does) attempt to login as the current user (in other words, the user under which the Master is running, usually `root`).

If a key needs to be used, then `~/.ssh/config` can be configured to use the desired key. Information on how to do this can be found by viewing the manpage for `ssh_config`. Here's an example entry which can be added to the `~/.ssh/config` to use an alternate key for gitfs:

```
Host github.com
  IdentityFile /root/.ssh/id_rsa_gitfs
```

The `Host` parameter should be a hostname (or hostname glob) that matches the domain name of the git repository.

It is also necessary to **add the SSH host key to the known_hosts file**. The exception to this would be if strict host key checking is disabled, which can be done by adding `StrictHostKeyChecking no` to the entry in `~/.ssh/config`:

```
Host github.com
  IdentityFile /root/.ssh/id_rsa_gitfs
  StrictHostKeyChecking no
```

However, this is generally regarded as insecure, and is not recommended.

### Adding the SSH Host Key to the known_hosts File

To use SSH authentication, it is necessary to have the remote repository's SSH host key in the `~/.ssh/known_hosts` file. If the master is also a minion, this can be done using the `ssh.set_known_host` function:

```
# salt mymaster ssh.set_known_host user=root hostname=github.com
mymaster:  
   ----------
   new:  
      ------
      enc:  
         ssh-rsa  
         fingerprint:  
         hostname:  
            1|0iefWwqOD4kw03BhoIGa8loRSAA=|BIXVtmcTbPER+68HvXmceodDcfI=  
         key:  
            AAAAB3NzaC1yc2EAAAABlwAAAQEAq2A7hRGmdnm9tUDb0IDSwBK6TbQa+PXYPbPy6rbTrTtw7PZhccKrpp0yVhp5
      old:  
      status:
         updated
```

If not, then the easiest way to add the key is to su to the user (usually `root`) under which the salt-master runs and attempt to login to the server via SSH:

```
$ su
Password:  
# ssh github.com
The authenticity of host 'github.com (192.30.252.128)' can't be established.  
Are you sure you want to continue connecting (yes/no)? yes
```
Warning: Permanently added 'github.com,192.30.252.128' (RSA) to the list of known hosts. Permission denied (publickey).

It doesn’t matter if the login was successful, as answering yes will write the fingerprint to the known_hosts file.

Verifying the Fingerprint  To verify that the correct fingerprint was added, it is a good idea to look it up. One way to do this is to use nmap:

```
$ nmap github.com --script ssh-hostkey
```

Nmap scan report for github.com (192.30.252.129)
Host is up (0.17s latency).
Not shown: 996 filtered ports

```
PORT     STATE SERVICE  
22/tcp   open     ssh
80/tcp   open     http
443/tcp  open     https
9418/tcp open     git
```

Nmap done: 1 IP address (1 host up) scanned in 28.78 seconds

Another way is to check one’s own known_hosts file, using this one-liner:

```
$ ssh-keygen -l -f /dev/stdin <<<`ssh-keyscan -t rsa github.com 2>/dev/null` | awk '{print $2}'
```

```
```

Refreshing gitfs Upon Push

By default, Salt updates the remote fileserver backends every 60 seconds. However, if it is desirable to refresh quicker than that, the Reactor System can be used to signal the master to update the fileserver on each push, provided that the git server is also a Salt minion. There are three steps to this process:

1. On the master, create a file /srv/reactor/update_fileserver.sls, with the following contents:

   ```
   update_fileserver:
   runner.fileserver.update
   ```

2. Add the following reactor configuration to the master config file:

   ```
   reactor:
   - 'salt/fileserver/gitfs/update':
     - /srv/reactor/update_fileserver.sls
   ```

3. On the git server, add a post-receive hook with the following contents:

   ```
   #!/usr/bin/env sh
   salt-call event.fire_master update salt/fileserver/gitfs/update
   ```

The update argument right after event.fire_master in this example can really be anything, as it represents the data being passed in the event, and the passed data is ignored by this reactor.

Similarly, the tag name salt/fileserver/gitfs/update can be replaced by anything, so long as the usage is consistent.
Using Git as an External Pillar Source

The git external pillar (a.k.a. git_pillar) has been rewritten for the 2015.8.0 release. This rewrite brings with it pygit2 support (allowing for access to authenticated repositories), as well as more granular support for per-remote configuration.

To make use of the new features, changes to the git ext_pillar configuration must be made. The new configuration schema is detailed here.

For Salt releases before 2015.8.0, click here for documentation.

Why aren't my custom modules/states/etc. syncing to my Minions?

In versions 0.16.3 and older, when using the git fileserver backend, certain versions of GitPython may generate errors when fetching, which Salt fails to catch. While not fatal to the fetch process, these interrupt the fileserver update that takes place before custom types are synced, and thus interrupt the sync itself. Try disabling the git fileserver backend in the master config, restarting the master, and attempting the sync again.

This issue is worked around in Salt 0.16.4 and newer.

3.4.10 The MacOS X (Maverick) Developer Step By Step Guide To Salt Installation

This document provides a step-by-step guide to installing a Salt cluster consisting of one master, and one minion running on a local VM hosted on Mac OS X.

Note: This guide is aimed at developers who wish to run Salt in a virtual machine. The official (Linux) walkthrough can be found here.

The 5 Cent Salt Intro

Since you’re here you’ve probably already heard about Salt, so you already know Salt lets you configure and run commands on hordes of servers easily. Here’s a brief overview of a Salt cluster:

- Salt works by having a `master` server sending commands to one or multiple `minion` servers. The master server is the `command center`. It is going to be the place where you store your configuration files, aka: `which server is the db, which is the web server, and what libraries and software they should have installed`.
  The minions receive orders from the master. Minions are the servers actually performing work for your business.

- Salt has two types of configuration files:

  1. the `salt communication channels` or `meta` or `config` configuration files (not official names): one for the master (usually is `/etc/salt/master`, on the master server), and one for minions (default is `/etc/salt/minion` or `/etc/salt/minion.conf, on the minion servers`). Those files are used to determine things like the Salt Master IP, port, Salt folder locations, etc.. If these are configured incorrectly, your minions will probably be unable to receive orders from the master, or the master will not know which software a given minion should install.

        2. the `business` or `service` configuration files (once again, not an official name): these are configuration files, ending with `.sls` extension, that describe which software should run on which server, along with particular configuration properties for the software that is being installed. These files should be created in the `/srv/salt` folder by default, but their location can be changed using ... /etc/salt/master configuration file!

2 Salt also works with `masterless` configuration where a minion is autonomous (in which case salt can be seen as a local configuration tool), or in `multiple master` configuration. See the documentation for more on that.
Note: This tutorial contains a third important configuration file, not to be confused with the previous two: the virtual machine provisioning configuration file. This in itself is not specifically tied to Salt, but it also contains some Salt configuration. More on that in step 3. Also note that all configuration files are YAML files. So indentation matters.

Before Digging In, The Architecture Of The Salt Cluster

Salt Master

The `Salt master` server is going to be the Mac OS machine, directly. Commands will be run from a terminal app, so Salt will need to be installed on the Mac. This is going to be more convenient for toying around with configuration files.

Salt Minion

We’ll only have one `Salt minion` server. It is going to be running on a Virtual Machine running on the Mac, using VirtualBox. It will run an Ubuntu distribution.

3.4.11 Step 1 - Configuring The Salt Master On Your Mac

Because Salt has a lot of dependencies that are not built in Mac OS X, we will use Homebrew to install Salt. Homebrew is a package manager for Mac, it’s great, use it (for this tutorial at least!). Some people spend a lot of time installing libs by hand to better understand dependencies, and then realize how useful a package manager is once they’re configuring a brand new machine and have to do it all over again. It also lets you `uninstall` things easily.

Note: Brew is a Ruby program (Ruby is installed by default with your Mac). Brew downloads, compiles, and links software. The linking phase is when compiled software is deployed on your machine. It may conflict with manually installed software, especially in the `/usr/local` directory. It’s ok, remove the manually installed version then refresh the link by typing `brew link 'packageName'`. Brew has a `brew doctor` command that can help you troubleshoot. It’s a great command, use it often. Brew requires xcode command line tools. When you run brew the first time it asks you to install them if they’re not already on your system. Brew installs software in `/usr/local/bin` (system bins are in `/usr/bin`). In order to use those bins you need your `$PATH` to search there first. Brew tells you if your `$PATH` needs to be fixed.

Tip: Use the keyboard shortcut `cmd + shift + period` in the `open` Mac OS X dialog box to display hidden files and folders, such as `.profile`.

Install Homebrew

Install Homebrew here [http://brew.sh/](http://brew.sh/) Or just type

```
ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/homebrew/go/install)"
```

Now type the following commands in your terminal (you may want to type `brew doctor` after each to make sure everything’s fine):
brew install python  
brew install swig  
brew install zmq

**Note:** zmq is ZeroMQ. It's a fantastic library used for server to server network communication and is at the core of Salt efficiency.

### Install Salt

You should now have everything ready to launch this command:

```
pip install salt
```

**Note:** There should be no need for `sudo pip install salt`. Brew installed Python for your user, so you should have all the access. In case you would like to check, type `which python` to ensure that it's `/usr/local/bin/python`, and `which pip` which should be `/usr/local/bin/pip`.

Now type `python` in a terminal then, `import salt`. There should be no errors. Now exit the Python terminal using `exit()`.

### Create The Master Configuration

If the default `/etc/salt/master` configuration file was not created, copy-paste it from here: `http://docs.saltstack.com/ref/configuration/examples.html#configuration-examples-master`

**Note:** `/etc/salt/master` is a file, not a folder.

Salt Master configuration changes. The Salt master needs a few customization to be able to run on Mac OS X:

```
sudo launchctl limit maxfiles 4096 8192
```

In the `/etc/salt/master` file, change `max_open_files` to 8192 (or just add the line: `max_open_files: 8192` (no quote) if it doesn't already exists).

You should now be able to launch the Salt master:

```
sudo salt-master --log-level=all
```

There should be no errors when running the above command.

**Note:** This command is supposed to be a daemon, but for toying around, we'll keep it running on a terminal to monitor the activity.

Now that the master is set, let's configure a minion on a VM.

### 3.4.12 Step 2 - Configuring The Minion VM

The Salt minion is going to run on a Virtual Machine. There are a lot of software options that let you run virtual machines on a mac, But for this tutorial we're going to use VirtualBox. In addition to virtualBox, we will use Vagrant, which allows you to create the base VM configuration.
Vagrant lets you build ready to use VM images, starting from an OS image and customizing it using "provisioners". In our case, we'll use it to:

- Download the base Ubuntu image
- Install salt on that Ubuntu image (Salt is going to be the "provisioner" for the VM).
- Launch the VM
- SSH into the VM to debug
- Stop the VM once you're done.

**Install VirtualBox**

Go get it here: [https://www.virtualBox.org/wiki/Downloads](https://www.virtualBox.org/wiki/Downloads) (click on VirtualBox for OS X hosts => x86/amd64)

**Install Vagrant**

Go get it here: [http://downloads.vagrantup.com/](http://downloads.vagrantup.com/) and choose the latest version (1.3.5 at time of writing), then the .dmg file. Double-click to install it. Make sure the `vagrant` command is found when run in the terminal. Type `vagrant`. It should display a list of commands.

**Create The Minion VM Folder**

Create a folder in which you will store your minion's VM. In this tutorial, it's going to be a minion folder in the `$home` directory.

```
cd $home
mkdir minion
```

**Initialize Vagrant**

From the minion folder, type

```
vagrant init
```

This command creates a default Vagrantfile configuration file. This configuration file will be used to pass configuration parameters to the Salt provisioner in Step 3.

**Import Precise64 Ubuntu Box**

```
vagrant box add precise64 http://files.vagrantup.com/precise64.box
```

**Note:** This box is added at the global Vagrant level. You only need to do it once as each VM will use this same file.

**Modify the Vagrantfile**

Modify `.minion/Vagrantfile` to use the `precise64` box. Change the `config.vm.box` line to:

```
config.vm.box = "precise64"
```
Uncomment the line creating a host-only IP. This is the ip of your minion (you can change it to something else if that IP is already in use):

```text
config.vm.network :private_network, ip: "192.168.33.10"
```

At this point you should have a VM that can run, although there won't be much in it. Let's check that.

**Checking The VM**

From the $home/minion folder type:

```
vagrant up
```

A log showing the VM booting should be present. Once it's done you'll be back to the terminal:

```
ping 192.168.33.10
```

The VM should respond to your ping request.

Now log into the VM in ssh using Vagrant again:

```
vagrant ssh
```

You should see the shell prompt change to something similar to `vagrant@precise64:` meaning you're inside the VM. From there, enter the following:

```
ping 10.0.2.2
```

**Note:** That ip is the ip of your VM host (the Mac OS X OS). The number is a VirtualBox default and is displayed in the log after the Vagrant ssh command. We'll use that IP to tell the minion where the Salt master is. Once you're done, end the ssh session by typing `exit`.

It's now time to connect the VM to the salt master

### 3.4.13 Step 3 - Connecting Master and Minion

**Creating The Minion Configuration File**

Create the `/etc/salt/minion` file. In that file, put the following lines, giving the ID for this minion, and the IP of the master:

```text
master: 10.0.2.2
id: 'minion1'
file_client: remote
```

Minions authenticate with the master using keys. Keys are generated automatically if you don't provide one and can accept them later on. However, this requires accepting the minion key every time the minion is destroyed or created (which could be quite often). A better way is to create those keys in advance, feed them to the minion, and authorize them once.

**Preseed minion keys**

From the minion folder on your Mac run:
 sudo salt-key --gen-keys=minion1

This should create two files: minion1.pem, and minion1.pub. Since those files have been created using sudo, but will be used by vagrant, you need to change ownership:

 sudo chown youruser:yourgroup minion1.pem
 sudo chown youruser:yourgroup minion1.pub

Then copy the .pub file into the list of accepted minions:

 sudo cp minion1.pub /etc/salt/pki/master/minions/minion1

Modify Vagrantfile to Use Salt Provisioner

Let's now modify the Vagrantfile used to provision the Salt VM. Add the following section in the Vagrantfile (note: it should be at the same indentation level as the other properties):

```
# salt-vagrant config
config.vm.provision :salt do |salt|
    salt.run_highstate = true
    salt.minion_config = "'/etc/salt/minion"
    salt.minion_key = "./minion1.pem"
    salt.minion_pub = "./minion1.pub"
end
```

Now destroy the vm and recreate it from the /minion folder:

 vagrant destroy
 vagrant up

If everything is fine you should see the following message:

"Bootstrapping Salt... (this may take a while)
Salt successfully configured and installed!"

Checking Master-Minion Communication

To make sure the master and minion are talking to each other, enter the following:

 sudo salt '*' test.ping

You should see your minion answering the ping. It's now time to do some configuration.

3.4.14 Step 4 - Configure Services to Install On the Minion

In this step we'll use the Salt master to instruct our minion to install Nginx.

Checking the system's original state

First, make sure that an HTTP server is not installed on our minion. When opening a browser directed at http://192.168.33.10/ You should get an error saying the site cannot be reached.
**Initialize the top.sls file**

System configuration is done in the /srv/salt/top.sls file (and subfiles/folders), and then applied by running the state.highstate command to have the Salt master give orders so minions will update their instructions and run the associated commands.

First Create an empty file on your Salt master (Mac OS X machine):

```bash
touch /srv/salt/top.sls
```

When the file is empty, or if no configuration is found for our minion an error is reported:

```bash
sudo salt 'minion1' state.highstate
```

Should return an error stating: ``No Top file or external nodes data matches found''.

**Create The Nginx Configuration**

Now is finally the time to enter the real meat of our server’s configuration. For this tutorial our minion will be treated as a web server that needs to have Nginx installed.

Insert the following lines into the /srv/salt/top.sls file (which should current be empty).

```yaml
base:
  'minion1':
    - bin.nginx
```

Now create a /srv/salt/bin/nginx.sls file containing the following:

```yaml
nginx:
  pkg.installed:
    - name: nginx
  service.running:
    - enable: True
    - reload: True
```

**Check Minion State**

Finally run the state.highstate command again:

```bash
sudo salt 'minion1' state.highstate
```

You should see a log showing that the Nginx package has been installed and the service configured. To prove it, open your browser and navigate to http://192.168.33.10/, you should see the standard Nginx welcome page.

Congratulations!

**Where To Go From Here**

A full description of configuration management within Salt (sls files among other things) is available here: http://docs.saltstack.com/en/latest/index.html#configuration-management
3.4.15 Writing Salt Tests

Note: THIS TUTORIAL IS A WORK IN PROGRESS

Salt comes with a powerful integration and unit test suite. The test suite allows for the fully automated run of integration and/or unit tests from a single interface. The integration tests are surprisingly easy to write and can be written to be either destructive or non-destructive.

Getting Set Up For Tests

To walk through adding an integration test, start by getting the latest development code and the test system from GitHub:

```plaintext
Note: The develop branch often has failing tests and should always be considered a staging area. For a checkout that tests should be running perfectly on, please check out a specific release tag (such as v2014.1.4).

git clone git@github.com:saltstack/salt.git
pip install git+https://github.com/saltstack/salt-testing.git#egg=SaltTesting
```

Now that a fresh checkout is available run the test suite

Destructive vs Non-destructive

Since Salt is used to change the settings and behavior of systems, often, the best approach to run tests is to make actual changes to an underlying system. This is where the concept of destructive integration tests comes into play. Tests can be written to alter the system they are running on. This capability is what fills in the gap needed to properly test aspects of system management like package installation.

To write a destructive test import and use the `destructiveTest` decorator for the test method:

```python
import integration
from salttesting.helpers import destructiveTest

class PkgTest(integration.ModuleCase):
    @destructiveTest
    def test_pkg_install(self):
        ret = self.run_function('pkg.install', name='finch')
        self.assertSaltTrueReturn(ret)
        ret = self.run_function('pkg.purge', name='finch')
        self.assertSaltTrueReturn(ret)
```

Automated Test Runs

SaltStack maintains a Jenkins server which can be viewed at http://jenkins.saltstack.com. The tests executed from this Jenkins server create fresh virtual machines for each test run, then execute the destructive tests on the new clean virtual machine. This allows for the execution of tests across supported platforms.

3.4.16 HTTP Modules

This tutorial demonstrates using the various HTTP modules available in Salt. These modules wrap the Python tornado, urllib2, and requests libraries, extending them in a manner that is more consistent with Salt workflows.
The `salt.utils.http` Library

This library forms the core of the HTTP modules. Since it is designed to be used from the minion as an execution module, in addition to the master as a runner, it was abstracted into this multi-use library. This library can also be imported by 3rd-party programs wishing to take advantage of its extended functionality.

Core functionality of the execution, state, and runner modules is derived from this library, so common usages between them are described here. Documentation specific to each module is described below.

This library can be imported with:

```python
import salt.utils.http
```

Configuring Libraries

This library can make use of either `tornado`, which is required by Salt, `urllib2`, which ships with Python, or `requests`, which can be installed separately. By default, `tornado` will be used. In order to switch to `urllib2`, set the following variable:

```python
backend: urllib2
```

In order to switch to `requests`, set the following variable:

```python
backend: requests
```

This can be set in the master or minion configuration file, or passed as an option directly to any `http.query()` functions.

`salt.utils.http.query()`

This function forms a basic query, but with some add-ons not present in the `tornado`, `urllib2`, and `requests` libraries. Not all functionality currently available in these libraries has been added, but can be in future iterations.

A basic query can be performed by calling this function with no more than a single URL:

```python
salt.utils.http.query('http://example.com')
```

By default the query will be performed with a `GET` method. The method can be overridden with the `method` argument:

```python
salt.utils.http.query('http://example.com/delete/url', 'DELETE')
```

When using the `POST` method (and others, such as `PUT`), extra data is usually sent as well. This data can be sent directly, in whatever format is required by the remote server (XML, JSON, plain text, etc).

```python
salt.utils.http.query(
    'http://example.com/delete/url',
    method='POST',
    data=json.loads(mydict)
)
```

Bear in mind that this data must be sent pre-formatted; this function will not format it for you. However, a templated file stored on the local system may be passed through, along with variables to populate it with. To pass through only the file (untemplated):
To pass through a file that contains jinja + yaml templating (the default):

```python
salt.utils.http.query(
    'http://example.com/post/url',
    method='POST',
    data_file='/srv/salt/somefile.jinja',
    data_render=True,
    template_data={'key1': 'value1', 'key2': 'value2'}
)
```

To pass through a file that contains mako templating:

```python
salt.utils.http.query(
    'http://example.com/post/url',
    method='POST',
    data_file='/srv/salt/somefile.mako',
    data_render=True,
    data_renderer='mako',
    template_data={'key1': 'value1', 'key2': 'value2'}
)
```

Because this function uses Salt's own rendering system, any Salt renderer can be used. Because Salt's renderer requires __opts__ to be set, an opts dictionary should be passed in. If it is not, then the default __opts__ values for the node type (master or minion) will be used. Because this library is intended primarily for use by minions, the default node type is minion. However, this can be changed to master if necessary.

```python
salt.utils.http.query(
    'http://example.com/post/url',
    method='POST',
    data_file='/srv/salt/somefile.jinja',
    data_render=True,
    template_data={'key1': 'value1', 'key2': 'value2'},
    opts=__opts__
)
```

```python
salt.utils.http.query(
    'http://example.com/delete/url',
    method='POST',
    header_file='/srv/salt/headers.jinja',
    header_render=True,
    node='master'
)
```

Headers may also be passed through, either as a header_list, a header_dict, or as a header_file. As with the data_file, the header_file may also be templated. Take note that because HTTP headers are normally syntactically-correct YAML, they will automatically be imported as an a Python dict.
header_renderer='jinja',
    template_data={"key1": 'value1', 'key2': 'value2'}
)

Because much of the data that would be templated between headers and data may be the same, the template_data is the same for both. Correcting possible variable name collisions is up to the user.

The query() function supports basic HTTP authentication. A username and password may be passed in as username and password, respectively.

salt.utils.http.query(
    'http://example.com',
    username='larry',
    password='5700g3543v4r',
)

Cookies are also supported, using Python's built-in cookielib. However, they are turned off by default. To turn cookies on, set cookies to True.

salt.utils.http.query(
    'http://example.com',
    cookies=True
)

By default cookies are stored in Salt's cache directory, normally /var/cache/salt, as a file called cookies.txt. However, this location may be changed with the cookie_jar argument:

salt.utils.http.query(
    'http://example.com',
    cookies=True,
    cookie_jar='/path/to/cookie_jar.txt'
)

By default, the format of the cookie jar is LWP (aka, lib-www-perl). This default was chosen because it is a human-readable text file. If desired, the format of the cookie jar can be set to Mozilla:

salt.utils.http.query(
    'http://example.com',
    cookies=True,
    cookie_jar='/path/to/cookie_jar.txt',
    cookie_format='mozilla'
)

Because Salt commands are normally one-off commands that are piped together, this library cannot normally behave as a normal browser, with session cookies that persist across multiple HTTP requests. However, the session can be persisted in a separate cookie jar. The default filename for this file, inside Salt's cache directory, is cookies.session.p. This can also be changed.

salt.utils.http.query(
    'http://example.com',
    persist_session=True,
    session_cookie_jar='/path/to/jar.p'
)

The format of this file is msgpack, which is consistent with much of the rest of Salt's internal structure. Historically, the extension for this file is .p. There are no current plans to make this configurable.
Return Data

By default, `query()` will attempt to decode the return data. Because it was designed to be used with REST interfaces, it will attempt to decode the data received from the remote server. First it will check the Content-type header to try and find references to XML. If it does not find any, it will look for references to JSON. If it does not find any, it will fall back to plain text, which will not be decoded.

JSON data is translated into a dict using Python's built-in `json` library. XML is translated using `salt.utils.xml_util`, which will use Python's built-in XML libraries to attempt to convert the XML into a dict. In order to force either JSON or XML decoding, the `decode_type` may be set:

```python
salt.utils.http.query(
    'http://example.com',
    decode_type='xml'
)
```

Once translated, the return dict from `query()` will include a dict called `dict`.

If the data is not to be translated using one of these methods, decoding may be turned off.

```python
salt.utils.http.query(
    'http://example.com',
    decode=False
)
```

If decoding is turned on, and references to JSON or XML cannot be found, then this module will default to plain text, and return the undecoded data as `text` (even if `text` is set to `False`; see below).

The `query()` function can return the HTTP status code, headers, and/or text as required. However, each must individually be turned on.

```python
salt.utils.http.query(
    'http://example.com',
    status=True,
    headers=True,
    text=True
)
```

The return from these will be found in the return dict as `status`, `headers` and `text`, respectively.

Writing Return Data to Files

It is possible to write either the return data or headers to files, as soon as the response is received from the server, but specifying file locations via the `text_out` or `headers_out` arguments. `text` and `headers` do not need to be returned to the user in order to do this.

```python
salt.utils.http.query(
    'http://example.com',
    text=False,
    headers=False,
    text_out='/path/to/url_download.txt',
    headers_out='/path/to/headers_download.txt',
)
```
SSL Verification

By default, this function will verify SSL certificates. However, for testing or debugging purposes, SSL verification can be turned off.

```python
salt.utils.http.query(  
    'https://example.com',  
    ssl_verify=False,  
)
```

CA Bundles

The requests library has its own method of detecting which CA (certificate authority) bundle file to use. Usually this is implemented by the packager for the specific operating system distribution that you are using. However, urllib2 requires a little more work under the hood. By default, Salt will try to auto-detect the location of this file. However, if it is not in an expected location, or a different path needs to be specified, it may be done so using the ca_bundle variable.

```python
salt.utils.http.query(  
    'https://example.com',  
    ca_bundle='/path/to/ca_bundle.pem',  
)
```

Updating CA Bundles  The update_ca_bundle() function can be used to update the bundle file at a specified location. If the target location is not specified, then it will attempt to auto-detect the location of the bundle file. If the URL to download the bundle from does not exist, a bundle will be downloaded from the cURL website.

CAUTION: The target and the source should always be specified! Failure to specify the target may result in the file being written to the wrong location on the local system. Failure to specify the source may cause the upstream URL to receive excess unnecessary traffic, and may cause a file to be download which is hazardous or does not meet the needs of the user.

```python
salt.utils.http.update_ca_bundle(  
    target='/path/to/ca-bundle.crt',  
    source='https://example.com/path/to/ca-bundle.crt',  
    opts=__opts__,  
)
```

The opts parameter should also always be specified. If it is, then the target and the source may be specified in the relevant configuration file (master or minion) as ca_bundle and ca_bundle_url, respectively.

```ini
ca_bundle: /path/to/ca-bundle.crt  
ca_bundle_url: https://example.com/path/to/ca-bundle.crt
```

If Salt is unable to auto-detect the location of the CA bundle, it will raise an error.

The update_ca_bundle() function can also be passed a string or a list of strings which represent files on the local system, which should be appended (in the specified order) to the end of the CA bundle file. This is useful in environments where private certs need to be made available, and are not otherwise reasonable to add to the bundle file.

```python
salt.utils.http.update_ca_bundle(  
    opts=__opts__,  
    merge_files=['/etc/ssl/private_cert_1.pem',
                  '/etc/ssl/private_cert_2.pem'],  
)
```
Test Mode

This function may be run in test mode. This mode will perform all work up until the actual HTTP request. By default, instead of performing the request, an empty dict will be returned. Using this function with TRACE logging turned on will reveal the contents of the headers and POST data to be sent.

Rather than returning an empty dict, an alternate test_url may be passed in. If this is detected, then test mode will replace the url with the test_url, set test to True in the return data, and perform the rest of the requested operations as usual. This allows a custom, non-destructive URL to be used for testing when necessary.

Execution Module

The http execution module is a very thin wrapper around the salt.utils.http library. The opts can be passed through as well, but if they are not specified, the minion defaults will be used as necessary.

Because passing complete data structures from the command line can be tricky at best and dangerous (in terms of execution injection attacks) at worse, the data_file, and header_file are likely to see more use here.

All methods for the library are available in the execution module, as kwargs.

```bash
salt myminion http.query http://example.com/restapi method=POST \
    username='larry' password='5700g3543v4r' headers=True text=True \
    status=True decode_type=xml data_render=True \ 
    header_file=/tmp/headers.txt data_file=/tmp/data.txt \ 
    header_render=True cookies=True persist_session=True
```

Runner Module

Like the execution module, the http runner module is a very thin wrapper around the salt.utils.http library. The only significant difference is that because runners execute on the master instead of a minion, a target is not required, and default opts will be derived from the master config, rather than the minion config.

All methods for the library are available in the runner module, as kwargs.

```bash
salt-run http.query http://example.com/restapi method=POST \
    username='larry' password='5700g3543v4r' headers=True text=True \
    status=True decode_type=xml data_render=True \ 
    header_file=/tmp/headers.txt data_file=/tmp/data.txt \ 
    header_render=True cookies=True persist_session=True
```

State Module

The state module is a wrapper around the runner module, which applies stateful logic to a query. All kwargs as listed above are specified as usual in state files, but two more kwargs are available to apply stateful logic. A required parameter is match, which specifies a pattern to look for in the return text. By default, this will perform a string comparison of looking for the value of match in the return text. In Python terms this looks like:
If more complex pattern matching is required, a regular expression can be used by specifying a \texttt{match\_type}. By default this is set to \texttt{string}, but it can be manually set to \texttt{pcre} instead. Please note that despite the name, this will use Python's \texttt{re.search()} rather than \texttt{re.match()}.

Therefore, the following states are valid:

\begin{verbatim}
http://example.com/restapi:
  http.query:
    - match: 'SUCCESS'
    - username: 'larry'
    - password: '5700g3543v4r'
    - data_render: True
    - header_file: /tmp/headers.txt
    - data_file: /tmp/data.txt
    - header_render: True
    - cookies: True
    - persist_session: True

http://example.com/restapi:
  http.query:
    - match\_type: pcre
    - match: '(?!succe[ss|ed]'
    - username: 'larry'
    - password: '5700g3543v4r'
    - data_render: True
    - header_file: /tmp/headers.txt
    - data_file: /tmp/data.txt
    - header_render: True
    - cookies: True
    - persist_session: True
\end{verbatim}

In addition to, or instead of a match pattern, the status code for a URL can be checked. This is done using the \texttt{status} argument:

\begin{verbatim}
http://example.com/:
  http.query:
    - status: '200'
\end{verbatim}

If both are specified, both will be checked, but if only one is \texttt{True} and the other is \texttt{False}, then \texttt{False} will be returned. In this case, the comments in the return data will contain information for troubleshooting.

Because this is a monitoring state, it will return extra data to code that expects it. This data will always include \texttt{text} and \texttt{status}. Optionally, \texttt{headers} and \texttt{dict} may also be requested by setting the \texttt{headers} and \texttt{decode} arguments to \texttt{True}, respectively.

### 3.4.17 LXC Management with Salt

\textbf{Note:} This walkthrough assumes basic knowledge of Salt. To get up to speed, check out the \textit{Salt Walkthrough}.

\section*{Dependencies}

Manipulation of LXC containers in Salt requires the minion to have an LXC version of at least 1.0 (an alpha or beta release of LXC 1.0 is acceptable). The following distributions are known to have new enough versions of LXC

packaged:

- RHEL/CentOS 6 and later (via EPEL)
- Fedora (All non-EOL releases)
- Debian 8.0 (Jessie)
- Ubuntu 14.04 LTS and later (LXC templates are packaged separately as lxc-templates, it is recommended to also install this package)
- openSUSE 13.2 and later

Profiles

Profiles allow for a sort of shorthand for commonly-used configurations to be defined in the minion config file, grains, pillar, or the master config file. The profile is retrieved by Salt using the config.get function, which looks in those locations, in that order. This allows for profiles to be defined centrally in the master config file, with several options for overriding them (if necessary) on groups of minions or individual minions.

There are two types of profiles:

- One for defining the parameters used in container creation/clone.
- One for defining the container's network interface(s) settings.

Container Profiles

LXC container profiles are defined defined underneath the lxc.container_profile config option:

```yaml
lxc.container_profile:
  centos:
    template: centos
    backing: lvm
    vname: vg1
    lvname: lxclv
    size: 10G
  centos_big:
    template: centos
    backing: lvm
    vname: vg1
    lvname: lxclv
    size: 20G
```

Profiles are retrieved using the config.get function, with the recurse merge strategy. This means that a profile can be defined at a lower level (for example, the master config file) and then parts of it can be overridden at a higher level (for example, in pillar data). Consider the following container profile data:

In the Master config file:

```yaml
lxc.container_profile:
  centos:
    template: centos
    backing: lvm
    vname: vg1
    lvname: lxclv
    size: 10G
```

In the Pillar data

```yaml

```
lxc.container_profile:
    centos:
        size: 20G

Any minion with the above Pillar data would have the size parameter in the centos profile overridden to 20G, while those minions without the above Pillar data would have the 10G size value. This is another way of achieving the same result as the centos_big profile above, without having to define another whole profile that differs in just one value.

Note: In the 2014.7.x release cycle and earlier, container profiles are defined under lxc.profile. This parameter will still work in version 2015.5.0, but is deprecated and will be removed in a future release. Please note however that the profile merging feature described above will only work with profiles defined under lxc.container_profile, and only in versions 2015.5.0 and later.

Additionally, in version 2015.5.0 container profiles have been expanded to support passing template-specific CLI options to lxc.create. Below is a table describing the parameters which can be configured in container profiles:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2015.5.0 and Newer</th>
<th>2014.7.x and Earlier</th>
</tr>
</thead>
<tbody>
<tr>
<td>template\a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>options\a</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>image\a</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>backing</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>snapshot\b</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>lvname\a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>fstype\a</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>size</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1. Parameter is only supported for container creation, and will be ignored if the profile is used when cloning a container.

2. Parameter is only supported for container cloning, and will be ignored if the profile is used when not cloning a container.

Network Profiles

LXC network profiles are defined defined underneath the lxc.network_profile config option. By default, the module uses a DHCP based configuration and try to guess a bridge to get connectivity.

Warning: on pre 2015.5.2, you need to specify explicitly the network bridge

lxc.network_profile:
    centos:
        eth0:
            link: br0
            type: veth
            flags: up
    ubuntu:
        eth0:
            link: lxcbr0
            type: veth
            flags: up

As with container profiles, network profiles are retrieved using the config.get function, with the recurse merge strategy. Consider the following network profile data:
In the Master config file:

```yaml
lxc.network_profile:
  centos:
    eth0:
      link: br0
      type: veth
      flags: up
```

In the Pillar data

```yaml
lxc.network_profile:
  centos:
    eth0:
      link: lxcbr0
```

Any minion with the above Pillar data would use the `lxcbr0` interface as the bridge interface for any container configured using the `centos` network profile, while those minions without the above Pillar data would use the `br0` interface for the same.

**Note:** In the 2014.7.x release cycle and earlier, network profiles are defined under `lxc.nic`. This parameter will still work in version 2015.5.0, but is deprecated and will be removed in a future release. Please note however that the profile merging feature described above will only work with profiles defined under `lxc.network_profile`, and only in versions 2015.5.0 and later.

The following are parameters which can be configured in network profiles. These will directly correspond to a parameter in an LXC configuration file (see `man 5 lxc.container.conf`).

- **type** - Corresponds to `lxc.network.type`
- **link** - Corresponds to `lxc.network.link`
- **flags** - Corresponds to `lxc.network.flags`

Interface-specific options (MAC address, IPv4/IPv6, etc.) must be passed on a container-by-container basis, for instance using the `nic_opts` argument to `lxc.create`:

```
salt myminion lxc.create container1 profile=centos network_profile=centos nic_opts='{eth0: {ipv4: 10.0.0.20/24, gateway: 10.0.0.1}}'
```

**Warning:** The `ipv4`, `ipv6`, `gateway`, and `link` (bridge) settings in network profiles / `nic_opts` will only work if the container does not redefine the network configuration (for example in `/etc/sysconfig/network-scripts/ifcfg-<interface_name>` on RHEL/CentOS, or `/etc/network/interfaces` on Debian/Ubuntu/etc.). Use these with caution. The container images installed using the download template, for instance, typically are configured for eth0 to use DHCP, which will conflict with static IP addresses set at the container level.

**Note:** For LXC < 1.0.7 and DHCP support, set `ipv4.gateway`: 'auto' is your network profile, ie:

```yaml
lxc.network_profile.nic:
  debian:
    eth0:
      link: lxcbr0
      ipv4.gateway: 'auto'
```

---

3.4. Advanced Topics 119
Old lxc support (<1.0.7)

With saltstack 2015.5.2 and above, normally the setting is autoselected, but before, you'll need to teach your network profile to set `lxc.network.ipv4.gateway` to `auto` when using a classic ipv4 configuration.

Thus you'll need

```yaml
lxc.network_profile.foo:
  eth0:
    link: lxcbr0
    ipv4.gateway: auto
```

Tricky network setups Examples

This example covers how to make a container with both an internal ip and a public routable ip, wired on two veth pairs.

The another interface which receives directly a public routable ip can't be on the first interface that we reserve for private inter LXC networking.

```yaml
lxc.network_profile.foo:
  eth0: {gateway: null, bridge: lxcbr0}
  eth1:
    # replace that by your main interface
    'link': 'br0'
    'mac': '00:16:5b:01:24:e1'
    'gateway': '2.20.9.14'
    'ipv4': '2.20.9.1'
```

Creating a Container on the CLI

From a Template

LXC is commonly distributed with several template scripts in `/usr/share/lxc/templates`. Some distros may package these separately in an `lxc-templates` package, so make sure to check if this is the case.

There are LXC template scripts for several different operating systems, but some of them are designed to use tools specific to a given distribution. For instance, the `ubuntu` template uses `deb_bootstrap`, the `centos` template uses `yum`, etc., making these templates impractical when a container from a different OS is desired.

The `lxc.create` function is used to create containers using a template script. To create a CentOS container named `container1` on a CentOS minion named `mycentosminion`, using the `centos` LXC template, one can simply run the following command:

```bash
salt mycentosminion lxc.create container1 template=centos
```

For these instances, there is a `download` template which retrieves minimal container images for several different operating systems. To use this template, it is necessary to provide an `options` parameter when creating the container, with three values:

1. `dist` - the Linux distribution (i.e. `ubuntu` or `centos`)
2. `release` - the release name/version (i.e. `trusty` or `6`)
3. `arch` - CPU architecture (i.e. `amd64` or `i386`)
The `lxc.images` function (new in version 2015.5.0) can be used to list the available images. Alternatively, the releases can be viewed on [http://images.linuxcontainers.org/images/](http://images.linuxcontainers.org/images/). The images are organized in such a way that the `dist`, `release`, and `arch` can be determined using the following URL format: [http://images.linuxcontainers.org/images/dist/release/arch](http://images.linuxcontainers.org/images/dist/release/arch). For example, [http://images.linuxcontainers.org/images/centos/6/amd64](http://images.linuxcontainers.org/images/centos/6/amd64) would correspond to a `dist` of `centos`, a `release` of `6`, and an `arch` of `amd64`.

Therefore, to use the `download` template to create a new 64-bit CentOS 6 container, the following command can be used:

```
salt myminion lxc.create container1 template=download options='{dist: centos, release: 6, arch: amd64}'
```

Note: These command-line options can be placed into a container profile, like so:

```
lxc.container_profile.cent6:
  template: download
  options:
    dist: centos
    release: 6
    arch: amd64
```

The `options` parameter is not supported in profiles for the 2014.7.x release cycle and earlier, so it would still need to be provided on the command-line.

### Cloning an Existing Container

To clone a container, use the `lxc.clone` function:

```
salt myminion lxc.clone container2 orig=container1
```

### Using a Container Image

While cloning is a good way to create new containers from a common base container, the source container that is being cloned needs to already exist on the minion. This makes deploying a common container across minions difficult. For this reason, Salt's `lxc.create` is capable of installing a container from a tar archive of another container's rootfs. To create an image of a container named `cent6`, run the following command as root:

```
tar czf cent6.tar.gz -C /var/lib/lxc/cent6 rootfs
```

Note: Before doing this, it is recommended that the container is stopped.

The resulting tarball can then be placed alongside the files in the salt fileserver and referenced using a `salt:// URL. To create a container using an image, use the `image` parameter with `lxc.create`:

```
salt myminion lxc.create new-cent6 image=salt://path/to/cent6.tar.gz
```

Note: Making images of containers with LVM backing

For containers with LVM backing, the rootfs is not mounted, so it is necessary to mount it first before creating the tar archive. When a container is created using LVM backing, an empty `rootfs` dir is handily created within `/var/lib/lxc/container_name`, so this can be used as the mountpoint. The location of the logical volume for the container will be `/dev/vgname/lvname`, where `vgname` is the name of the volume group, and `lvname` is the name of the logical volume. Therefore, assuming a volume group of `vg1`, a logical volume of `lxc-cent6`, and a container name of `cent6`, the following commands can be used to create a tar archive of the rootfs:
mount /dev/vg1/lxc-cent6 /var/lib/lxc/cent6/rootfs

tar czf cent6.tar.gz -C /var/lib/lxc/cent6 rootfs

umount /var/lib/lxc/cent6/rootfs

**Warning:** One caveat of using this method of container creation is that `/etc/hosts` is left unmodified. This could cause confusion for some distros if salt-minion is later installed on the container, as the functions that determine the hostname take `/etc/hosts` into account. Additionally, when creating an rootfs image, be sure to remove `/etc/salt/minion_id` and make sure that `id` is not defined in `/etc/salt/minion`, as this will cause similar issues.

### Initializing a New Container as a Salt Minion

The above examples illustrate a few ways to create containers on the CLI, but often it is desirable to also have the new container run as a Minion. To do this, the `lxc.init` function can be used. This function will do the following:

1. Create a new container
2. Optionally set password and/or DNS
3. Bootstrap the minion (using either `salt-bootstrap` or a custom command)

By default, the new container will be pointed at the same Salt Master as the host machine on which the container was created. It will then request to authenticate with the Master like any other bootstrapped Minion, at which point it can be accepted.

```bash
salt myminion lxc.init test1 profile=centos
salt-key -a test1
```

For even greater convenience, the `LXC runner` contains a runner function of the same name (`lxc.init`), which creates a keypair, seeds the new minion with it, and pre-accepts the key, allowing for the new Minion to be created and authorized in a single step:

```bash
salt-run lxc.init test1 host=myminion profile=centos
```

### Running Commands Within a Container

For containers which are not running their own Minion, commands can be run within the container in a manner similar to using `(cmd.run <salt.modules.cmdmod.run)`. The means of doing this have been changed significantly in version 2015.5.0 (though the deprecated behavior will still be supported for a few releases). Both the old and new usage are documented below.

#### 2015.5.0 and Newer

New functions have been added to mimic the behavior of the functions in the `cmd` module. Below is a table with the `cmd` functions and their `lxc` module equivalents:

<table>
<thead>
<tr>
<th>Description</th>
<th><code>cmd</code> Module</th>
<th><code>lxc</code> Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run a command and get all output</td>
<td><code>cmd.run</code></td>
<td><code>lxc.run</code></td>
</tr>
<tr>
<td>Run a command and get just stdout</td>
<td><code>cmd.run_stdout</code></td>
<td><code>lxc.run_stdout</code></td>
</tr>
<tr>
<td>Run a command and get just stderr</td>
<td><code>cmd.run_stderr</code></td>
<td><code>lxc.run_stderr</code></td>
</tr>
<tr>
<td>Run a command and get just the retcode</td>
<td><code>cmd.retcode</code></td>
<td><code>lxc.retcode</code></td>
</tr>
<tr>
<td>Run a command and get all information</td>
<td><code>cmd.run_all</code></td>
<td><code>lxc.run_all</code></td>
</tr>
</tbody>
</table>
2014.7.x and Earlier

Earlier Salt releases use a single function (`lxc.run_cmd`) to run commands within containers. Whether stdout, stderr, etc. are returned depends on how the function is invoked.

To run a command and return the stdout:

```bash
salt myminion lxc.run_cmd web1 'tail /var/log/messages'
```

To run a command and return the stderr:

```bash
salt myminion lxc.run_cmd web1 'tail /var/log/messages' stdout=False stderr=True
```

To run a command and return the retcode:

```bash
salt myminion lxc.run_cmd web1 'tail /var/log/messages' stdout=False stderr=False
```

To run a command and return all information:

```bash
salt myminion lxc.run_cmd web1 'tail /var/log/messages' stdout=True stderr=True
```

Container Management Using salt-cloud

Salt cloud uses under the hood the salt runner and module to manage containers, Please look at this chapter

Container Management Using States

Several states are being renamed or otherwise modified in version 2015.5.0. The information in this tutorial refers to the new states. For 2014.7.x and earlier, please refer to the documentation for the LXC states.

Ensuring a Container Is Present

To ensure the existence of a named container, use the `lxc.present` state. Here are some examples:

```yaml
# Using a template
web1:
  lxc.present:
    - template: download
    - options:
      dist: centos
      release: 6
      arch: amd64

# Cloning
web2:
  lxc.present:
    - clone_from: web-base

# Using a rootfs image
web3:
  lxc.present:
    - image: salt://path/to/cent6.tar.gz

# Using profiles
web4:
```

3.4. Advanced Topics
The `lxc.present` state also includes an optional `running` parameter which can be used to ensure that a container is running/stopped. Note that there are standalone `lxc.running` and `lxc.stopped` states which can be used for this purpose.

### Ensuring a Container Does Not Exist

To ensure that a named container is not present, use the `lxc.absent` state. For example:

```yaml
web1:
  lxc.absent
```

### Ensuring a Container is Running/Stopped/Frozen

Containers can be in one of three states:

- **running** - Container is running and active
- **frozen** - Container is running, but all process are blocked and the container is essentially non-active until the container is ```unfrozen```
- **stopped** - Container is not running

Salt has three states (`lxc.running`, `lxc.frozen`, and `lxc.stopped`) which can be used to ensure a container is in one of these states:

```yaml
web1:
  lxc.running

# Restart the container if it was already running
web2:
  lxc.running:
    - restart: True

web3:
  lxc.stopped

# Explicitly kill all tasks in container instead of gracefully stopping
web4:
  lxc.stopped:
    - kill: True

web5:
  lxc.frozen

# If container is stopped, do not start it (in which case the state will fail)
web6:
  lxc.frozen:
    - start: False
```
3.4.18 Using Salt with Stormpath

Stormpath is a user management and authentication service. This tutorial covers using SaltStack to manage and take advantage of Stormpath’s features.

External Authentication

Stormpath can be used for Salt’s external authentication system. In order to do this, the master should be configured with an apiid, apikey, and the ID of the application that is associated with the users to be authenticated:

```
stormpath:
  apiid: 367DFSF4FRJ8767FSF4G34FGH
  apikey: FEFREF43t3FEFRe/f323fwer4FWF3445gferWRWeer1
  application: 786786FREFrefreg435fr1
```

Note: These values can be found in the Stormpath dashboard <https://api.stormpath.com/ui2/index.html#/>.

Users that are to be authenticated should be set up under the stormpath dict under external_auth:

```
external_auth:
  stormpath:
    larry:
      - *
      - '@runner'
      - '@wheel'
```

Keep in mind that while Stormpath defaults the username associated with the account to the email address, it is better to use a username without an @ sign in it.

Configuring Stormpath Modules

Stormpath accounts can be managed via either an execution or state module. In order to use either, a minion must be configured with an API ID and key.

```
stormpath:
  apiid: 367DFSF4FRJ8767FSF4G34FGH
  apikey: FEFREF43t3FEFRe/f323fwer4FWF3445gferWRWeer1
  directory: efreg435fr1786786FREFr
  application: 786786FREFrefreg435fr1
```

Some functions in the stormpath modules can make use of other options. The following options are also available.

directory

The ID of the directory that is to be used with this minion. Many functions require an ID to be specified to do their work. However, if the ID of a directory is specified, then Salt can often look up the resource in question.

application

The ID of the application that is to be used with this minion. Many functions require an ID to be specified to do their work. However, if the ID of a application is specified, then Salt can often look up the resource in question.
Managing Stormpath Accounts

With the `stormpath` configuration in place, Salt can be used to configure accounts (which may be thought of as users) on the Stormpath service. The following functions are available.

`stormpath.create_account`

Create an account on the Stormpath service. This requires a `directory_id` as the first argument; it will not be retrieved from the minion configuration. An `email` address, `password`, first name (givenName) and last name (surname) are also required. For the full list of other parameters that may be specified, see:

http://docs.stormpath.com/rest/product-guide/#account-resource

When executed with no errors, this function will return the information about the account, from Stormpath.

```bash
salt myminion stormpath.create_account <directory_id> shemp@example.com letmein Shemp Howard
```

`stormpath.list_accounts`

Show all accounts on the Stormpath service. This will return all accounts, regardless of directory, application, or group.

```bash
salt myminion stormpath.list_accounts
```

`stormpath.show_account`

Show the details for a specific Stormpath account. An `account_id` is normally required. However, if an email is provided instead, along with either a `directory_id`, `application_id`, or `group_id`, then Salt will search the specified resource to try and locate the `account_id`.

```bash
salt myminion stormpath.show_account <account_id>
salt myminion stormpath.show_account email=<email> directory_id=<directory_id>
```

`stormpath.update_account`

Update one or more items for this account. Specifying an empty value will clear it for that account. This function may be used in one of two ways. In order to update only one key/value pair, specify them in order:

```bash
salt myminion stormpath.update_account <account_id> givenName shemp
salt myminion stormpath.update_account <account_id> middleName ""
```

In order to specify multiple items, they need to be passed in as a dict. From the command line, it is best to do this as a JSON string:

```bash
salt myminion stormpath.update_account <account_id> items='{"givenName": "Shemp"}"
salt myminion stormpath.update_account <account_id> items='{"middleName": ""}"
```

When executed with no errors, this function will return the information about the account, from Stormpath.
stormpath.delete_account

Delete an account from Stormpath.

```
salt myminion stormpath.delete_account <account_id>
```

stormpath.list_directories

Show all directories associated with this tenant.

```
salt myminion stormpath.list_directories
```

Using Stormpath States

Stormpath resources may be managed using the state system. The following states are available.

stormpath_account.present

Ensure that an account exists on the Stormpath service. All options that are available with the `stormpath.create_account` function are available here. If an account needs to be created, then this function will require the same fields that `stormpath.create_account` requires, including the password. However, if a password changes for an existing account, it will NOT be updated by this state.

```
curly@example.com:
    stormpath_account.present:
        - directory_id: efgreg435fr1786786FREFr
        - password: badpass
        - firstName: Curly
        - surname: Howard
        - nickname: curly
```

It is advisable to always set a nickname that is not also an email address, so that it can be used by Salt's external authentication module.

stormpath_account.absent

Ensure that an account does not exist on Stormpath. As with `stormpath_account.present`, the name supplied to this state is the email address associated with this account. Salt will use this, with or without the directory ID that is configured for the minion. However, lookups will be much faster with a directory ID specified.

3.5 Salt Virt

3.5.1 Salt as a Cloud Controller

In Salt 0.14.0, an advanced cloud control system were introduced, allow private cloud vms to be managed directly with Salt. This system is generally referred to as Salt Virt.

The Salt Virt system already exists and is installed within Salt itself, this means that beside setting up Salt, no additional salt code needs to be deployed.
The main goal of Salt Virt is to facilitate a very fast and simple cloud. The cloud that can scale and fully featured. Salt Virt comes with the ability to set up and manage complex virtual machine networking, powerful image, and disk management, as well as virtual machine migration with and without shared storage.

This means that Salt Virt can be used to create a cloud from a blade center and a SAN, but can also create a cloud out of a swarm of Linux Desktops without a single shared storage system. Salt Virt can make clouds from truly commodity hardware, but can also stand up the power of specialized hardware as well.

Setting up Hypervisors

The first step to set up the hypervisors involves getting the correct software installed and setting up the hypervisor network interfaces.

Installing Hypervisor Software

Salt Virt is made to be hypervisor agnostic but currently the only fully implemented hypervisor is KVM via libvirt. The required software for a hypervisor is libvirt and kvm. For advanced features install libguestfs or qemu-nbd.

Note: Libguestfs and qemu-nbd allow for virtual machine images to be mounted before startup and get pre-seeded with configurations and a salt minion

This sls will set up the needed software for a hypervisor, and run the routines to set up the libvirt pki keys.

Note: Package names and setup used is Red Hat specific, different package names will be required for different platforms

```python
libvirt:
    pkg.installed: []
    file.managed:
        - name: /etc/sysconfig/libvirtd
        - contents: \"LIBVIRTD_ARGS="--listen"\" 
        - require:
            - pkg: libvirt
    libvirt.keys:
        - require:
            - pkg: libvirt
    service.running:
        - name: libvirtd
        - require:
            - pkg: libvirt
            - network: br0
            - libvirt: libvirt
        - watch:
            - file: libvirt

libvirt-python:
    pkg.installed: []

libguestfs:
    pkg.installed:
        - pkgs:
            - libguestfs
            - libguestfs-tools
```
Hypervisor Network Setup

The hypervisors will need to be running a network bridge to serve up network devices for virtual machines, this formula will set up a standard bridge on a hypervisor connecting the bridge to eth0:

```
eth0:
    network.managed:
        - enabled: True
        - type: eth
        - bridge: br0

br0:
    network.managed:
        - enabled: True
        - type: bridge
        - proto: dhcp
        - require:
          - network: eth0
```

Virtual Machine Network Setup

Salt Virt comes with a system to model the network interfaces used by the deployed virtual machines; by default a single interface is created for the deployed virtual machine and is bridged to $br0$. To get going with the default networking setup, ensure that the bridge interface named $br0$ exists on the hypervisor and is bridged to an active network device.

**Note:** To use more advanced networking in Salt Virt, read the *Salt Virt Networking* document:

*Salt Virt Networking*

Libvirt State

One of the challenges of deploying a libvirt based cloud is the distribution of libvirt certificates. These certificates allow for virtual machine migration. Salt comes with a system used to auto deploy these certificates. Salt manages the signing authority key and generates keys for libvirt clients on the master, signs them with the certificate authority and uses pillar to distribute them. This is managed via the *libvirt* state. Simply execute this formula on the minion to ensure that the certificate is in place and up to date:

**Note:** The above formula includes the calls needed to set up libvirt keys.

```
libvirt_keys:
    libvirt.keys
```

Getting Virtual Machine Images Ready

Salt Virt, requires that virtual machine images be provided as these are not generated on the fly. Generating these virtual machine images differs greatly based on the underlying platform.

Virtual machine images can be manually created using KVM and running through the installer, but this process is not recommended since it is very manual and prone to errors.

Virtual Machine generation applications are available for many platforms:
Once virtual machine images are available, the easiest way to make them available to Salt Virt is to place them in the Salt file server. Just copy an image into /srv/salt and it can now be used by Salt Virt.

For purposes of this demo, the file name centos.img will be used.

Existing Virtual Machine Images

Many existing Linux distributions distribute virtual machine images which can be used with Salt Virt. Please be advised that NONE OF THESE IMAGES ARE SUPPORTED BY SALTSTACK.

CentOS  These images have been prepared for OpenNebula but should work without issue with Salt Virt, only the raw qcow image file is needed: http://wiki.centos.org/Cloud/OpenNebula

Fedora Linux  Images for Fedora Linux can be found here: http://fedoraproject.org/en/get-fedora#clouds

Ubuntu Linux  Images for Ubuntu Linux can be found here: http://cloud-images.ubuntu.com/

Using Salt Virt

With hypervisors set up and virtual machine images ready, Salt can start issuing cloud commands.

Start by running a Salt Virt hypervisor info command:

```
salt-run virt.hyper_info
```

This will query what the running hypervisor stats are and display information for all configured hypervisors. This command will also validate that the hypervisors are properly configured.

Now that hypervisors are available a virtual machine can be provisioned. The `virt.init` routine will create a new virtual machine:

```
salt-run virt.init centos1 2 512 salt://centos.img
```

This command assumes that the CentOS virtual machine image is sitting in the root of the Salt fileserver. Salt Virt will now select a hypervisor to deploy the new virtual machine on and copy the virtual machine image down to the hypervisor.

Once the VM image has been copied down the new virtual machine will be seeded. Seeding the VMs involves setting pre-authenticated Salt keys on the new VM and if needed, will install the Salt Minion on the new VM before it is started.

**Note:** The biggest bottleneck in starting VMs is when the Salt Minion needs to be installed. Making sure that the source VM images already have Salt installed will GREATLY speed up virtual machine deployment.

Now that the new VM has been prepared, it can be seen via the `virt.query` command:

```
salt-run virt.query
```
This command will return data about all of the hypervisors and respective virtual machines.

Now that the new VM is booted it should have contacted the Salt Master, a `test.ping` will reveal if the new VM is running.

**Migrating Virtual Machines**

Salt Virt comes with full support for virtual machine migration, and using the libvirt state in the above formula makes migration possible.

A few things need to be available to support migration. Many operating systems turn on firewalls when originally set up, the firewall needs to be opened up to allow for libvirt and kvm to cross communicate and execution migration routines. On Red Hat based hypervisors in particular port 16514 needs to be opened on hypervisors:

```
iptables -A INPUT -m state --state NEW -m tcp -p tcp --dport 16514 -j ACCEPT
```

**Note:** More in-depth information regarding distribution specific firewall settings can read in:

*Opening the Firewall up for Salt*

Salt also needs an additional flag to be turned on as well. The `virt.tunnel` option needs to be turned on. This flag tells Salt to run migrations securely via the libvirt TLS tunnel and to use port 16514. Without `virt.tunnel` libvirt tries to bind to random ports when running migrations. To turn on `virt.tunnel` simple apply it to the master config file:

```
virt.tunnel: True
```

Once the master config has been updated, restart the master and send out a call to the minions to refresh the pillar to pick up on the change:

```
salt * saltutil.refresh_modules
```

Now, migration routines can be run! To migrate a VM, simply run the Salt Virt migrate routine:

```
salt-run virt.migrate centos <new hypervisor>
```

**VNC Consoles**

Salt Virt also sets up VNC consoles by default, allowing for remote visual consoles to be oped up. The information from a `virt.query` routine will display the vnc console port for the specific vms:

```
centos
    CPU: 2
    Memory: 524288
    State: running
    Graphics: vnc - hyper6:5900
    Disk - vda:
        Size: 2.0G
        File: /srv/salt-images/ubuntu2/system.qcow2
        File Format: qcow2
    Nic - ac:de:48:98:08:77:
        Source: br0
        Type: bridge
```

The line `Graphics: vnc - hyper6:5900` holds the key. First the port named, in this case 5900, will need to be available in the hypervisor's firewall. Once the port is open, then the console can be easily opened via vncviewer:
vncviewer hyper6:5900

By default there is no VNC security set up on these ports, which suggests that keeping them firewalled and mandating that SSH tunnels be used to access these VNC interfaces. Keep in mind that activity on a VNC interface that is accessed can be viewed by any other user that accesses that same VNC interface, and any other user logging in can also operate with the logged in user on the virtual machine.

Conclusion

Now with Salt Virt running, new hypervisors can be seamlessly added just by running the above states on new bare metal machines, and these machines will be instantly available to Salt Virt.

3.6 LXC

3.6.1 LXC Management with Salt

Note: This walkthrough assumes basic knowledge of Salt. To get up to speed, check out the Salt Walkthrough.

Dependencies

Manipulation of LXC containers in Salt requires the minion to have an LXC version of at least 1.0 (an alpha or beta release of LXC 1.0 is acceptable). The following distributions are known to have new enough versions of LXC packaged:

- RHEL/CentOS 6 and later (via EPEL)
- Fedora (All non-EOL releases)
- Debian 8.0 (Jessie)
- Ubuntu 14.04 LTS and later (LXC templates are packaged separately as lxc-templates, it is recommended to also install this package)
- openSUSE 13.2 and later

Profiles

Profiles allow for a sort of shorthand for commonly-used configurations to be defined in the minion config file, grains, pillar, or the master config file. The profile is retrieved by Salt using the config.get function, which looks in those locations, in that order. This allows for profiles to be defined centrally in the master config file, with several options for overriding them (if necessary) on groups of minions or individual minions.

There are two types of profiles:

- One for defining the parameters used in container creation/clone.
- One for defining the container’s network interface(s) settings.
Container Profiles

LXC container profiles are defined underneath the `lxc.container_profile` config option:

```yaml
lxc.container_profile:
    centos:
        template: centos
        backing: lvm
        vgname: vg1
        lvname: lxclv
        size: 10G
    centos_big:
        template: centos
        backing: lvm
        vgname: vg1
        lvname: lxclv
        size: 20G
```

Profiles are retrieved using the `config.get` function, with the `recurse` merge strategy. This means that a profile can be defined at a lower level (for example, the master config file) and then parts of it can be overridden at a higher level (for example, in pillar data). Consider the following container profile data:

**In the Master config file:**

```yaml
lxc.container_profile:
    centos:
        template: centos
        backing: lvm
        vgname: vg1
        lvname: lxclv
        size: 10G
```

**In the Pillar data**

```yaml
lxc.container_profile:
    centos:
        size: 20G
```

Any minion with the above Pillar data would have the `size` parameter in the `centos` profile overridden to 20G, while those minions without the above Pillar data would have the 10G `size` value. This is another way of achieving the same result as the `centos_big` profile above, without having to define another whole profile that differs in just one value.

**Note:** In the 2014.7.x release cycle and earlier, container profiles are defined under `lxc.profile`. This parameter will still work in version 2015.5.0, but is deprecated and will be removed in a future release. Please note however that the profile merging feature described above will only work with profiles defined under `lxc.container_profile`, and only in versions 2015.5.0 and later.

Additionally, in version 2015.5.0 container profiles have been expanded to support passing template-specific CLI options to `lxc.create`. Below is a table describing the parameters which can be configured in container profiles:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>2015.5.0 and Newer</th>
<th>2014.7.x and Earlier</th>
</tr>
</thead>
<tbody>
<tr>
<td>template</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>options</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>image</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>backing</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>snapshot</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>lvname</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>fstype</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>size</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1. Parameter is only supported for container creation, and will be ignored if the profile is used when cloning a container.

2. Parameter is only supported for container cloning, and will be ignored if the profile is used when not cloning a container.

Network Profiles

LXC network profiles are defined under the `lxc.network_profile` config option. By default, the module uses a DHCP based configuration and try to guess a bridge to get connectivity.

**Warning:** on pre 2015.5.2, you need to specify explicitly the network bridge

```yaml
lxc.network_profile:
  centos:
    eth0:
      link: br0
      type: veth
      flags: up
  ubuntu:
    eth0:
      link: lxcbr0
      type: veth
      flags: up
```

As with container profiles, network profiles are retrieved using the `config.get` function, with the `recurse` merge strategy. Consider the following network profile data:

**In the Master config file:**

```yaml
lxc.network_profile:
  centos:
    eth0:
      link: br0
      type: veth
      flags: up
```

**In the Pillar data**

```yaml
lxc.network_profile:
  centos:
    eth0:
      link: lxcbr0
```

Any minion with the above Pillar data would use the `lxcbr0` interface as the bridge interface for any container configured using the `centos` network profile, while those minions without the above Pillar data would use the `br0` interface for the same.
Note: In the 2014.7.x release cycle and earlier, network profiles are defined under lxc.nic. This parameter will
still work in version 2015.5.0, but is deprecated and will be removed in a future release. Please note however that
the profile merging feature described above will only work with profiles defined under lxc.network_profile,
and only in versions 2015.5.0 and later.

The following are parameters which can be configured in network profiles. These will directly correspond to a
parameter in an LXC configuration file (see man 5 lxc.container.conf).

- **type** - Corresponds to lxc.network.type
- **link** - Corresponds to lxc.network.link
- **flags** - Corresponds to lxc.network.flags

Interface-specific options (MAC address, IPv4/IPv6, etc.) must be passed on a container-by-container basis, for in-
stance using the nic_opts argument to lxc.create:

```bash
salt myminion lxc.create container1 profile=centos network_profile=centos nic_opts='{eth0: {ipv4: 10.0.0.20/24, gateway: 10.0.0.1}}'
```

**Warning:** The ipv4, ipv6, gateway, and link (bridge) settings in network profiles/nic_opts will only work
if the container doesnt redefine the network configuration (for example in /etc/sysconfig/network-
scripts/ifcfg-<interface_name> on RHEL/CentOS, or /etc/network/interfaces on De-
bian/Ubuntu/etc.). Use these with caution. The container images installed using the download template, for in-
stance, typically are configured for eth0 to use DHCP, which will conflict with static IP addresses set at the
container level.

Note: For LXC < 1.0.7 and DHCP support, set ipv4.gateway: 'auto' is your network profile, ie:

```bash
lxc.network_profile.nic:
  debian:
    eth0:
      link: lxcbr0
      ipv4.gateway: 'auto'
```

**Old lxc support (<1.0.7)**

With saltstack 2015.5.2 and above, normally the setting is autoslected, but before, you'll need to teach your network
profile to set lxc.network.ipv4.gateway to auto when using a classic ipv4 configuration.

Thus you'll need

```bash
lxc.network_profile.foo:
  etho:
    link: lxcbr0
    ipv4.gateway: auto
```

**Tricky network setups Examples**

This example covers how to make a container with both an internal ip and a public routable ip, wired on two veth
pairs.

The another interface which receives directly a public routable ip can't be on the first interface that we reserve for
private inter LXC networking.
lxc.network_profile.foo:
  eth0: {gateway: null, bridge: lxcbr0}
  eth1:
    # replace that by your main interface
    'link': 'br0'
    'mac': '00:16:5b:01:24:e1'
    'gateway': '2.20.9.14'
    'ipv4': '2.20.9.1'

Creating a Container on the CLI

From a Template

LXC is commonly distributed with several template scripts in /usr/share/lxc/templates. Some distros may package these separately in an lxc-templates package, so make sure to check if this is the case.

There are LXC template scripts for several different operating systems, but some of them are designed to use tools specific to a given distribution. For instance, the ubuntu template uses deb_bootstrap, the centos template uses yum, etc., making these templates impractical when a container from a different OS is desired.

The lxc.create function is used to create containers using a template script. To create a CentOS container named container1 on a CentOS minion named mycentosminion, using the centos LXC template, one can simply run the following command:

```
salt mycentosminion lxc.create container1 template=centos
```

For these instances, there is a download template which retrieves minimal container images for several different operating systems. To use this template, it is necessary to provide an options parameter when creating the container, with three values:

1. dist - the Linux distribution (i.e. ubuntu or centos)
2. release - the release name/version (i.e. trusty or 6)
3. arch - CPU architecture (i.e. amd64 or i386)

The lxc.images function (new in version 2015.5.0) can be used to list the available images. Alternatively, the releases can be viewed on http://images.linuxcontainers.org/images/. The images are organized in such a way that the dist, release, and arch can be determined using the following URL format: http://images.linuxcontainers.org/images/dist/release/arch. For example, http://images.linuxcontainers.org/images/centos/6/amd64 would correspond to a dist of centos, a release of 6, and an arch of amd64.

Therefore, to use the download template to create a new 64-bit CentOS 6 container, the following command can be used:

```
salt myminion lxc.create container1 template=download options='{dist: centos, release: 6, arch: amd64}'
```

Note: These command-line options can be placed into a container profile, like so:

```
lxc.container_profile.cent6:
  template: download
  options:
    dist: centos
    release: 6
    arch: amd64
```
The `options` parameter is not supported in profiles for the 2014.7.x release cycle and earlier, so it would still need to be provided on the command-line.

## Cloning an Existing Container

To clone a container, use the `lxc.clone` function:

```
salt myminion lxc.clone container2 orig=container1
```

## Using a Container Image

While cloning is a good way to create new containers from a common base container, the source container that is being cloned needs to already exist on the minion. This makes deploying a common container across minions difficult. For this reason, Salt’s `lxc.create` is capable of installing a container from a tar archive of another container’s rootfs. To create an image of a container named `cent6`, run the following command as root:

```
tar czf cent6.tar.gz -C /var/lib/lxc/cent6 rootfs
```

**Note:** Before doing this, it is recommended that the container is stopped.

The resulting tarball can then be placed alongside the files in the salt fileserver and referenced using a `salt://` URL. To create a container using an image, use the `image` parameter with `lxc.create`:

```
salt myminion lxc.create new-cent6 image=salt://path/to/cent6.tar.gz
```

**Note:** Making images of containers with LVM backing

For containers with LVM backing, the rootfs is not mounted, so it is necessary to mount it first before creating the tar archive. When a container is created using LVM backing, an empty `rootfs` dir is handily created within `/var/lib/lxc/container_name`, so this can be used as the mountpoint. The location of the logical volume for the container will be `/dev/vgname/lvname`, where `vgname` is the name of the volume group, and `lvname` is the name of the logical volume. Therefore, assuming a volume group of `vg1`, a logical volume of `lxc-cent6`, and a container name of `cent6`, the following commands can be used to create a tar archive of the rootfs:

```
mount /dev/vg1/lxc-cent6 /var/lib/lxc/cent6/rootfs
tar czf cent6.tar.gz -C /var/lib/lxc/cent6/rootfs
umount /var/lib/lxc/cent6/rootfs
```

**Warning:** One caveat of using this method of container creation is that `/etc/hosts` is left unmodified. This could cause confusion for some distros if salt-minion is later installed on the container, as the functions that determine the hostname take `/etc/hosts` into account. Additionally, when creating a rootfs image, be sure to remove `/etc/salt/minion_id` and make sure that `id` is not defined in `/etc/salt/minion`, as this will cause similar issues.

## Initializing a New Container as a Salt Minion

The above examples illustrate a few ways to create containers on the CLI, but often it is desirable to also have the new container run as a Minion. To do this, the `lxc.init` function can be used. This function will do the following:

1. Create a new container
2. Optionally set password and/or DNS

3. Bootstrap the minion (using either salt-bootstrap or a custom command)

By default, the new container will be pointed at the same Salt Master as the host machine on which the container was created. It will then request to authenticate with the Master like any other bootstrapped Minion, at which point it can be accepted.

```
salt myminion lxc.init test1 profile=centos
salt-key -a test1
```

For even greater convenience, the LXC runner contains a runner function of the same name (`lxc.init`), which creates a keypair, seeds the new minion with it, and pre-accepts the key, allowing for the new Minion to be created and authorized in a single step:

```
salt-run lxc.init test1 host=myminion profile=centos
```

### Running Commands Within a Container

For containers which are not running their own Minion, commands can be run within the container in a manner similar to using (`cmd.run <salt.modules.cmdmod.run`). The means of doing this have been changed significantly in version 2015.5.0 (though the deprecated behavior will still be supported for a few releases). Both the old and new usage are documented below.

#### 2015.5.0 and Newer

New functions have been added to mimic the behavior of the functions in the `cmd` module. Below is a table with the `cmd` functions and their `lxc` module equivalents:

<table>
<thead>
<tr>
<th>Description</th>
<th><code>cmd</code> module</th>
<th><code>lxc</code> module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Run a command and get all output</td>
<td><code>cmd.run</code></td>
<td><code>lxc.run</code></td>
</tr>
<tr>
<td>Run a command and get just stdout</td>
<td><code>cmd.run_stdout</code></td>
<td><code>lxc.run_stdout</code></td>
</tr>
<tr>
<td>Run a command and get just stderr</td>
<td><code>cmd.run_stderr</code></td>
<td><code>lxc.run_stderr</code></td>
</tr>
<tr>
<td>Run a command and get just the retcode</td>
<td><code>cmd.retcode</code></td>
<td><code>lxc.retcode</code></td>
</tr>
<tr>
<td>Run a command and get all information</td>
<td><code>cmd.run_all</code></td>
<td><code>lxc.run_all</code></td>
</tr>
</tbody>
</table>

#### 2014.7.x and Earlier

Earlier Salt releases use a single function (`lxc.run_cmd`) to run commands within containers. Whether stdout, stderr, etc. are returned depends on how the function is invoked.

To run a command and return the stdout:

```
salt myminion lxc.run_cmd web1 'tail /var/log/messages'
```

To run a command and return the stderr:

```
salt myminion lxc.run_cmd web1 'tail /var/log/messages' stdout=False stderr=True
```

To run a command and return the retcode:

```
salt myminion lxc.run_cmd web1 'tail /var/log/messages' stdout=False stderr=False
```

To run a command and return all information:
Salt Documentation, Release 2015.8.0

```bash
salt myminion lxc.run_cmd web1 'tail /var/log/messages' stdout=True stderr=True
```

**Container Management Using salt-cloud**

Salt cloud uses under the hood the salt runner and module to manage containers. Please look at this chapter

**Container Management Using States**

Several states are being renamed or otherwise modified in version 2015.5.0. The information in this tutorial refers to the new states. For 2014.7.x and earlier, please refer to the documentation for the LXC states.

**Ensuring a Container Is Present**

To ensure the existence of a named container, use the `lxc.present` state. Here are some examples:

```yaml
web1:
  lxc.present:
    - template: download
      options:
        dist: centos
        release: 6
        arch: amd64

web2:
  lxc.present:
    - clone_from: web-base

web3:
  lxc.present:
    - image: salt://path/to/cent6.tar.gz

web4:
  lxc.present:
    - profile: centos_web
      network_profile: centos
```

**Warning:** The `lxc.present` state will not modify an existing container (in other words, it will not re-create the container). If an `lxc.present` state is run on an existing container, there will be no change and the state will return a `True` result.

The `lxc.present` state also includes an optional `running` parameter which can be used to ensure that a container is running/stopped. Note that there are standalone `lxc.running` and `lxc.stopped` states which can be used for this purpose.

**Ensuring a Container Does Not Exist**

To ensure that a named container is not present, use the `lxc.absent` state. For example:
Ensuring a Container is Running/Stopped/Frozen

Containers can be in one of three states:

- **running** - Container is running and active
- **frozen** - Container is running, but all process are blocked and the container is essentially non-active until the container is ``unfrozen``
- **stopped** - Container is not running

Salt has three states (lxc.running, lxc.frozen, and lxc.stopped) which can be used to ensure a container is in one of these states:

```python
web1:
  lxc.absent

# Restart the container if it was already running
web2:
  lxc.running:
    - restart: True

# Explicitly kill all tasks in container instead of gracefully stopping
web4:
  lxc.stopped:
    - kill: True

# If container is stopped, do not start it (in which case the state will fail)
web6:
  lxc.frozen:
    - start: False
```

3.7 Using Salt at scale

3.7.1 Using Salt at scale

The focus of this tutorial will be building a Salt infrastructure for handling large numbers of minions. This will include tuning, topology, and best practices.

For how to install the Salt Master please go here: Installing saltstack

**Note:** This tutorial is intended for large installations, although these same settings won't hurt, it may not be worth the complexity to smaller installations.

When used with minions, the term `many' refers to at least a thousand and `a few' always means 500.

For simplicity reasons, this tutorial will default to the standard ports used by Salt.
The Master

The most common problems on the Salt Master are:

1. too many minions authing at once
2. too many minions re-authing at once
3. too many minions re-connecting at once
4. too many minions returning at once
5. too few resources (CPU/HDD)

The first three are all "thundering herd" problems. To mitigate these issues we must configure the minions to back-off appropriately when the Master is under heavy load.

The fourth is caused by masters with little hardware resources in combination with a possible bug in ZeroMQ. At least that's what it looks like till today ([Issue 118651](https://github.com/saltstack/salt/issues/118651), [Issue 5948](https://github.com/saltstack/salt/issues/5948), [Mail thread](https://github.com/saltstack/salt/issues/5948)).

To fully understand each problem, it is important to understand, how Salt works.

Very briefly, the Salt Master offers two services to the minions.

- a job publisher on port 4505
- an open port 4506 to receive the minions returns

All minions are always connected to the publisher on port 4505 and only connect to the open return port 4506 if necessary. On an idle Master, there will only be connections on port 4505.

Too many minions authing

When the Minion service is first started up, it will connect to its Master’s publisher on port 4505. If too many minions are started at once, this can cause a "thundering herd". This can be avoided by not starting too many minions at once.

The connection itself usually isn’t the culprit, the more likely cause of master-side issues is the authentication that the Minion must do with the Master. If the Master is too heavily loaded to handle the auth request it will time it out. The Minion will then wait `acceptance_wait_time` to retry. If `acceptance_wait_time_max` is set then the Minion will increase its wait time by the `acceptance_wait_time` each subsequent retry until reaching `acceptance_wait_time_max`.

Too many minions re-authing

This is most likely to happen in the testing phase of a Salt deployment, when all Minion keys have already been accepted, but the framework is being tested and parameters are frequently changed in the Salt Master’s configuration file(s).

The Salt Master generates a new AES key to encrypt its publications at certain events such as a Master restart or the removal of a Minion key. If you are encountering this problem of too many minions re-authing against the Master, you will need to recalibrate your setup to reduce the rate of events like a Master restart or Minion key removal (`salt-key -d`).

When the Master generates a new AES key, the minions aren’t notified of this but will discover it on the next pub job they receive. When the Minion receives such a job it will then re-auth with the Master. Since Salt does minion-side filtering this means that all the minions will re-auth on the next command published on the master-- causing another "thundering herd". This can be avoided by setting the
random_reauth_delay: 60

in the minions configuration file to a higher value and stagger the amount of re-auth attempts. Increasing this value will of course increase the time it takes until all minions are reachable via Salt commands.

Too many minions re-connecting

By default the zmq socket will re-connect every 100ms which for some larger installations may be too quick. This will control how quickly the TCP session is re-established, but has no bearing on the auth load.

To tune the minions sockets reconnect attempts, there are a few values in the sample configuration file (default values)

```
recon_default: 100ms
recon_max: 5000
recon_randomize: True
```

- `recon_default`: the default value the socket should use, i.e. 100ms
- `recon_max`: the max value that the socket should use as a delay before trying to reconnect
- `recon_randomize`: enables randomization between `recon_default` and `recon_max`

To tune this values to an existing environment, a few decision have to be made.

1. How long can one wait, before the minions should be online and reachable via Salt?
2. How many reconnects can the Master handle without a syn flood?

These questions can not be answered generally. Their answers depend on the hardware and the administrators requirements.

Here is an example scenario with the goal, to have all minions reconnect within a 60 second time-frame on a Salt Master service restart.

```
recon_default: 1000
recon_max: 59000
recon_randomize: True
```

Each Minion will have a randomized reconnect value between `recon_default` and `recon_default + recon_max`, which in this example means between 1000ms and 60000ms (or between 1 and 60 seconds). The generated random value will be doubled after each attempt to reconnect (ZeroMQ default behavior).

Lets say the generated random value is 11 seconds (or 11000ms).

```
reconnect 1: wait 11 seconds
reconnect 2: wait 22 seconds
reconnect 3: wait 33 seconds
reconnect 4: wait 44 seconds
reconnect 5: wait 55 seconds
reconnect 6: wait time is bigger than 60 seconds (recon_default + recon_max)
reconnect 7: wait 11 seconds
reconnect 8: wait 22 seconds
reconnect 9: wait 33 seconds
reconnect x: etc.
```

With a thousand minions this will mean

```
1000/60 = ~16
```
round about 16 connection attempts a second. These values should be altered to values that match your environment. Keep in mind though, that it may grow over time and that more minions might raise the problem again.

**Too many minions returning at once**

This can also happen during the testing phase, if all minions are addressed at once with

```
$ salt * test.ping
```

it may cause thousands of minions trying to return their data to the Salt Master open port 4506. Also causing a flood of syn-flood if the Master can't handle that many returns at once.

This can be easily avoided with Salt's batch mode:

```
$ salt * test.ping -b 50
```

This will only address 50 minions at once while looping through all addressed minions.

**Too few resources**

The masters resources always have to match the environment. There is no way to give good advise without knowing the environment the Master is supposed to run in. But here are some general tuning tips for different situations:

**The Master is CPU bound**

Salt uses RSA-Key-Pairs on the masters and minions end. Both generate 4096 bit key-pairs on first start. While the key-size for the Master is currently not configurable, the minions keysize can be configured with different key-sizes. For example with a 2048 bit key:

```
keysize: 2048
```

With thousands of decryptions, the amount of time that can be saved on the masters end should not be neglected. See here for reference: Pull Request 9235 how much influence the key-size can have.

Downsizing the Salt Master's key is not that important, because the minions do not encrypt as many messages as the Master does.

**The Master is disk IO bound**

By default, the Master saves every Minion's return for every job in its job-cache. The cache can then be used later, to lookup results for previous jobs. The default directory for this is:

```
cachedir: /var/cache/salt
```

and then in the `/proc` directory.

Each job return for every Minion is saved in a single file. Over time this directory can grow quite large, depending on the number of published jobs. The amount of files and directories will scale with the number of jobs published and the retention time defined by

```
keep_jobs: 24
```

```
 250 jobs/day * 2000 minions returns = 500.000 files a day
```
If no job history is needed, the job cache can be disabled:

```yaml
job_cache: False
```

If the job cache is necessary there are (currently) 2 options:

- `ext_job_cache`: this will have the minions store their return data directly into a returner (not sent through the Master)

- `master_job_cache` (New in 2014.7.0): this will make the Master store the job data using a returner (instead of the local job cache on disk).
Targeting Minions

Targeting minions is specifying which minions should run a command or execute a state by matching against hostnames, or system information, or defined groups, or even combinations thereof.

For example the command `salt web1 apache.signal restart` to restart the Apache httpd server specifies the machine `web1` as the target and the command will only be run on that one minion.

Similarly when using States, the following `top file` specifies that only the `web1` minion should execute the contents of `webserver.sls`:

```yaml
base:
  'web1':
    - webserver
```

There are many ways to target individual minions or groups of minions in Salt:

### 4.1 Matching the minion id

Each minion needs a unique identifier. By default when a minion starts for the first time it chooses its FQDN (fully qualified domain name) as that identifier. The minion id can be overridden via the minion's `id` configuration setting.

**Tip:** minion id and minion keys

The `minion id` is used to generate the minion's public/private keys and if it ever changes the master must then accept the new key as though the minion was a new host.

#### 4.1.1 Globbing

The default matching that Salt utilizes is *shell-style globbing* around the `minion id`. This also works for states in the `top file`.

**Note:** You must wrap `salt` calls that use globbing in single-quotes to prevent the shell from expanding the globs before Salt is invoked.

- Match all minions:

  ```bash
  salt '1' test.ping
  ```

- Match all minions in the example.net domain or any of the example domains:
Match all the webN minions in the example.net domain (web1.example.net, web2.example.net ... webN.example.net):

```bash
salt 'web?.example.net' test.ping
```

Match the web1 through web5 minions:

```bash
salt 'web[1-5]' test.ping
```

Match the web1 and web3 minions:

```bash
salt 'web[1,3]' test.ping
```

Match the web-x, web-y, and web-z minions:

```bash
salt 'web-[x-z]' test.ping
```

Note: For additional targeting methods please review the compound matchers documentation.

### 4.1.2 Regular Expressions

Minions can be matched using Perl-compatible regular expressions (which is globbing on steroids and a ton of caffeine).

Match both web1-prod and web1-devel minions:

```bash
salt -E 'web1-(prod|devel)' test.ping
```

When using regular expressions in a State's top file, you must specify the matcher as the first option. The following example executes the contents of webserver.sls on the above-mentioned minions.

```bash
base:
  'web1-(prod|devel)'}:
  - match: pcre
  - webserver
```

### 4.1.3 Lists

At the most basic level, you can specify a flat list of minion IDs:

```bash
salt -L 'web1,web2,web3' test.ping
```

### 4.2 Grains

Salt comes with an interface to derive information about the underlying system. This is called the grains interface, because it presents salt with grains of information. Grains are collected for the operating system, domain name, IP address, kernel, OS type, memory, and many other system properties.

The grains interface is made available to Salt modules and components so that the right salt minion commands are automatically available on the right systems.
Grain data is relatively static, though if system information changes (for example, if network settings are changed), or if a new value is assigned to a custom grain, grain data is refreshed.

**Note:** Grain data resolves to lowercase letters. For example, `FOO` and `foo` target the same grain.

Match all CentOS minions:

```
salt -G 'os:CentOS' test.ping
```

Match all minions with 64-bit CPUs, and return number of CPU cores for each matching minion:

```
salt -G 'cpuarch:x86_64' grains.item num_cpus
```

Additionally, globs can be used in grain matches, and grains that are nested in a `dictionary` can be matched by adding a colon for each level that is traversed. For example, the following will match hosts that have a grain called `ec2_tags`, which itself is a `dict` with a key named `environment`, which has a value that contains the word `production`:

```
salt -G 'ec2_tags:environment:*production*'
```

### 4.2.1 Listing Grains

Available grains can be listed by using the `grains.ls` module:

```
salt '*' grains.ls
```

Grains data can be listed by using the `grains.items` module:

```
salt '*' grains.items
```

### 4.2.2 Grains in the Minion Config

Grains can also be statically assigned within the minion configuration file. Just add the option `grains` and pass options to it:

```
grains:
  roles:
    - webserver
    - memcache
  deployment: datacenter4
  cabinet: 13
  cab_u: 14-15
```

Then status data specific to your servers can be retrieved via Salt, or used inside of the State system for matching. It also makes targeting, in the case of the example above, simply based on specific data about your deployment.

### 4.2.3 Grains in /etc/salt/grains

If you do not want to place your custom static grains in the minion config file, you can also put them in `/etc/salt/grains` on the minion. They are configured in the same way as in the above example, only without a top-level `grains:` key:
4.2.4 Matching Grains in the Top File

With correctly configured grains on the Minion, the top file used in Pillar or during Highstate can be made very efficient. For example, consider the following configuration:

```yaml
'node_type:web':
    - match: grain
    - webserver

'node_type:postgres':
    - match: grain
    - database

'node_type:redis':
    - match: grain
    - redis

'node_type:lb':
    - match: grain
    - lb
```

For this example to work, you would need to have defined the grain node_type for the minions you wish to match. This simple example is nice, but too much of the code is similar. To go one step further, Jinja templating can be used to simplify the top file.

```yaml
{% set the_node_type = salt['grains.get']('node_type', '') %}

{% if the_node_type %}
    'node_type:{{ the_node_type }}':
        - match: grain
        - {{ the_node_type }}
{% endif %}
```

Using Jinja templating, only one match entry needs to be defined.

Note: The example above uses the grains.get function to account for minions which do not have the node_type grain set.

4.2.5 Writing Grains

The grains interface is derived by executing all of the `public` functions found in the modules located in the grains package or the custom grains directory. The functions in the modules of the grains must return a Python `dict`, where the keys in the `dict` are the names of the grains and the values are the values.

Custom grains should be placed in a _grains directory located under the file_roots specified by the master config file. The default path would be /srv/salt/_grains. Custom grains will be distributed to the minions when state.highstate is run, or by executing the saltutil.sync_grains or saltutil.sync_all functions.
Grains are easy to write, and only need to return a dictionary. A common approach would be code something similar to the following:

```python
#!/usr/bin/env python
def yourfunction():
    # initialize a grains dictionary
    grains = {}
    # Some code for logic that sets grains like
    grains['yourcustomgrain'] = True
    grains['anothergrain'] = 'somevalue'
    return grains
```

Before adding a grain to Salt, consider what the grain is and remember that grains need to be static data. If the data is something that is likely to change, consider using Pillar instead.

**Warning:** Custom grains will not be available in the top file until after the first highstate. To make custom grains available on a minion's first highstate, it is recommended to use this example to ensure that the custom grains are synced when the minion starts.

### 4.2.6 Precedence

Core grains can be overridden by custom grains. As there are several ways of defining custom grains, there is an order of precedence which should be kept in mind when defining them. The order of evaluation is as follows:

1. Core grains.
2. Custom grain modules in `_grains` directory, synced to minions.
3. Custom grains in `/etc/salt/grains`.
4. Custom grains in `/etc/salt/minion`.

Each successive evaluation overrides the previous ones, so any grains defined by custom grains modules synced to minions that have the same name as a core grain will override that core grain. Similarly, grains from `/etc/salt/grains` override both core grains and custom grain modules, and grains in `/etc/salt/minion` will override any grains of the same name.

### 4.2.7 Examples of Grains

The core module in the grains package is where the main grains are loaded by the Salt minion and provides the principal example of how to write grains:

https://github.com/saltstack/salt/blob/develop/salt/grains/core.py

### 4.2.8 Syncing Grains

Syncing grains can be done a number of ways, they are automatically synced when `state.highstate` is called, or (as noted above) the grains can be manually synced and reloaded by calling the `saltutil.sync_grains` or `saltutil.sync_all` functions.

### 4.3 Subnet/IP Address Matching

Minions can easily be matched based on IP address, or by subnet (using CIDR notation).
salt -S 192.168.40.20 test.ping
salt -S 10.0.0.0/24 test.ping

Ipcidr matching can also be used in compound matches

salt -C 'S@10.0.0.0/24 and G@os:Debian' test.ping

It is also possible to use in both pillar and state-matching

'172.16.0.0/12':
- match: ipcidr
- internal

Note: Only IPv4 matching is supported at this time.

4.4 Compound matchers

Compound matchers allow very granular minion targeting using any of Salt's matchers. The default matcher is a glob match, just as with CLI and top file matching. To match using anything other than a glob, prefix the match string with the appropriate letter from the table below, followed by an @ sign.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Delimiter</th>
<th>Match Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>x</td>
<td>Grains glob</td>
<td>G@os:Ubuntu</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>PCRE Minion ID</td>
<td>E@web\d+.(dev</td>
</tr>
<tr>
<td>P</td>
<td>x</td>
<td>Grains PCRE</td>
<td>P@os:(RedHat</td>
</tr>
<tr>
<td>L</td>
<td></td>
<td>List of minions</td>
<td><a href="mailto:L@minion1.example.com">L@minion1.example.com</a>,minion3.domain.com or bl*.domain.com</td>
</tr>
<tr>
<td>I</td>
<td>x</td>
<td>Pillar glob</td>
<td>I@pdata:foobar</td>
</tr>
<tr>
<td>J</td>
<td>x</td>
<td>Pillar PCRE</td>
<td>J@pdata:^(foo</td>
</tr>
<tr>
<td>S</td>
<td></td>
<td>Subnet/IP address</td>
<td>S@192.168.1.0/24 or S@192.168.1.100</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>Range cluster</td>
<td>R@%foo.bar</td>
</tr>
</tbody>
</table>

Matchers can be joined using boolean and, or, and not operators.

For example, the following string matches all Debian minions with a hostname that begins with webserv, as well as any minions that have a hostname which matches the regular expression web-dc1-srv.**:

salt -C 'webserv* and G@os:Debian or E@web-dc1-srv.*' test.ping

That same example expressed in a top file looks like the following:

base:
  'webserv* and G@os:Debian or E@web-dc1-srv.*':
    - match: compound
    - webserver

New in version 2015.8.0.

Excluding a minion based on its ID is also possible:

salt -C 'not web-dc1-srv' test.ping
Versions prior to 2015.8.0 a leading not was not supported in compound matches. Instead, something like the following was required:

```bash
salt -C '* and not G@kernel:Darwin' test.ping
```

Excluding a minion based on its ID was also possible:

```bash
salt -C '* and not web-dc1-srv' test.ping
```

### 4.4.1 Precedence Matching

Matches can be grouped together with parentheses to explicitly declare precedence amongst groups.

```bash
salt -C '( ms-1 or G@id:ms-3 ) and G@id:ms-3' test.ping
```

**Note:** Be certain to note that spaces are required between the parentheses and targets. Failing to obey this rule may result in incorrect targeting!

### 4.4.2 Alternate Delimiters

New in version 2015.8.0.

Some matchers allow an optional delimiter character specified between the leading matcher character and the @ pattern separator character. This can be essential when the globbing or PCRE pattern may use the default delimiter character :. This avoids incorrect interpretation of the pattern as part of the grain or pillar data structure traversal.

```bash
salt -C 'J[@foo|bar|^foo:bar$ or J[@gitrepo!https://github.com:example/project.git' test.ping
```

### 4.5 Node groups

Nodegroups are declared using a compound target specification. The compound target documentation can be found [here](#).

The `nodegroups` master config file parameter is used to define nodegroups. Here's an example nodegroup configuration within `/etc/salt/master`:

```yaml
nodegroups:
    group1: 'L@foo.domain.com,bar.domain.com,baz.domain.com or bl*.domain.com'
    group2: 'G@os:Debian and foo.domain.com'
    group3: 'G@os:Debian and N@group1'
    group4:
        - 'G@foo:bar'
        - 'or'
        - 'G@foo:baz'

**Note:** The L within group1 is matching a list of minions, while the G in group2 is matching specific grains. See the `compound matchers` documentation for more details.

New in version 2015.8.0.

**Note:** Nodegroups can reference other nodegroups as seen in `group3`. Ensure that you do not have circular references. Circular references will be detected and cause partial expansion with a logged error message.
New in version 2015.8.0.

Compound nodegroups can be either string values or lists of string values. When the nodegroup is a string value, it will be tokenized by splitting on whitespace. This may be a problem if whitespace is necessary as part of a pattern. When a nodegroup is a list of strings, tokenization will happen for each list element as a whole.

To match a nodegroup on the CLI, use the -N command-line option:

```
salt -N group1 test.ping
```

To match a nodegroup in your top file, make sure to put `- match: nodegroup` on the line directly following the nodegroup name.

```
base:
  group1:
    - match: nodegroup
    - webserver
```

**Note:** When adding or modifying nodegroups to a master configuration file, the master must be restarted for those changes to be fully recognized.

A limited amount of functionality, such as targeting with -N from the command-line may be available without a restart.

### 4.6 Batch Size

The -b (or --batch-size) option allows commands to be executed on only a specified number of minions at a time. Both percentages and finite numbers are supported.

```
salt '*' -b 10 test.ping
salt -G 'os:RedHat' --batch-size 25% apache.signal restart
```

This will only run test.ping on 10 of the targeted minions at a time and then restart apache on 25% of the minions matching os:RedHat at a time and work through them all until the task is complete. This makes jobs like rolling web server restarts behind a load balancer or doing maintenance on BSD firewalls using carp much easier with salt.

The batch system maintains a window of running minions, so, if there are a total of 150 minions targeted and the batch size is 10, then the command is sent to 10 minions, when one minion returns then the command is sent to one additional minion, so that the job is constantly running on 10 minions.

### 4.7 SECO Range

SECO range is a cluster-based metadata store developed and maintained by Yahoo!

The Range project is hosted here:

https://github.com/ytoolshed/range

Learn more about range here:

https://github.com/ytoolshed/range/wiki/
4.7.1 Prerequisites

To utilize range support in Salt, a range server is required. Setting up a range server is outside the scope of this document. Apache modules are included in the range distribution.

With a working range server, cluster files must be defined. These files are written in YAML and define hosts contained inside a cluster. Full documentation on writing YAML range files is here:

https://github.com/ytoolshed/range/wiki/%22yamlfile%22-module-file-spec

Additionally, the Python seco range libraries must be installed on the salt master. One can verify that they have been installed correctly via the following command:

```python
python -c 'import seco.range'
```

If no errors are returned, range is installed successfully on the salt master.

4.7.2 Preparing Salt

Range support must be enabled on the salt master by setting the hostname and port of the range server inside the master configuration file:

```
range_server: my.range.server.com:80
```

Following this, the master must be restarted for the change to have an effect.

4.7.3 Targeting with Range

Once a cluster has been defined, it can be targeted with a salt command by using the -R or --range flags.

For example, given the following range YAML file being served from a range server:

```
$ cat /etc/range/test.yaml
CLUSTER: host1..100.test.com
APPS:
  - frontend
  - backend
  - mysql
```

One might target host1 through host100 in the test.com domain with Salt as follows:

```
salt --range %test:CLUSTER test.ping
```

The following salt command would target three hosts: frontend, backend, and mysql:

```
salt --range %test:APPS test.ping
```
Pillar is an interface for Salt designed to offer global values that can be distributed to all minions. Pillar data is managed in a similar way as the Salt State Tree.

Pillar was added to Salt in version 0.9.8

**Note:** Storing sensitive data

Unlike state tree, pillar data is only available for the targeted minion specified by the matcher type. This makes it useful for storing sensitive data specific to a particular minion.

### 5.1 Declaring the Master Pillar

The Salt Master server maintains a pillar_roots setup that matches the structure of the file_roots used in the Salt file server. Like the Salt file server the pillar_roots option in the master config is based on environments mapping to directories. The pillar data is then mapped to minions based on matchers in a top file which is laid out in the same way as the state top file. Salt pillars can use the same matcher types as the standard top file.

The configuration for the pillar_roots in the master config file is identical in behavior and function as file_roots:

```yaml
pillar_roots:
  base:
    - /srv/pillar
```

This example configuration declares that the base environment will be located in the /srv/pillar directory. It must not be in a subdirectory of the state tree.

The top file used matches the name of the top file used for States, and has the same structure:

```yaml
/srv/pillar/top.sls
```

```yaml
base:
  '*':
    - packages
```

In the above top file, it is declared that in the base environment, the glob matching all minions will have the pillar data found in the packages pillar available to it. Assuming the pillar_roots value of /srv/pillar taken from above, the packages pillar would be located at /srv/pillar/packages.sls.

Another example shows how to use other standard top matching types to deliver specific salt pillar data to minions with different properties.
Here is an example using the grains matcher to target pillars to minions by their os grain:

```yaml
dev:
  'os:Debian':
    - match: grain
    - servers
```

/srv/pillar/packages.sls

```yaml
{% if grains['os'] == 'RedHat' %}
apache: httpd
```

```yaml
{% elif grains['os'] == 'Debian' %}
apache: apache2
```

```yaml
git: git
{% endif %}
```

compny: Foo Industries

The above pillar sets two key/value pairs. If a minion is running RedHat, then the apache key is set to httpd and the git key is set to the value of git. If the minion is running Debian, those values are changed to apache2 and git-core respectively. All minions that have this pillar targeting to them via a top file will have the key of company with a value of Foo Industries.

Consequently this data can be used from within modules, renderers, State SLS files, and more via the shared pillar dict:

```yaml
apache:
  pkg.installed:
    - name: {{ pillar['apache'] }}
```

```yaml
git:
  pkg.installed:
    - name: {{ pillar['git'] }}
```

Finally, the above states can utilize the values provided to them via Pillar. All pillar values targeted to a minion are available via the `pillar` dictionary. As seen in the above example, Jinja substitution can then be utilized to access the keys and values in the Pillar dictionary.

Note that you cannot just list key/value-information in top.sls. Instead, target a minion to a pillar file and then list the keys and values in the pillar. Here is an example top file that illustrates this point:

```yaml
base:
  '*':
    - common_pillar
```

And the actual pillar file at `/srv/pillar/common_pillar.sls`:

```yaml
foo: bar
boo: baz
```

### 5.2 Pillar namespace flattened

The separate pillar files all share the same namespace. Given a top.sls of:

```yaml
base:
  '*':
```

```yaml
{# Billing and usage are server-side and not exposed to httpd #}
```

```yaml
pillar defaults
```
packages

- packages
- services

a packages.sls file of:

```
bind: bind9
```

and a services.sls file of:

```
bind: named
```

Then a request for the bind pillar will only return named; the bind9 value is not available. It is better to structure your pillar files with more hierarchy. For example your package.sls file could look like:

```
packages:
    bind: bind9
```

### 5.3 Pillar Namespace Merges

With some care, the pillar namespace can merge content from multiple pillar files under a single key, so long as conflicts are avoided as described above.

For example, if the above example were modified as follows, the values are merged below a single key:

```
base:
    '*':
        - packages
        - services
```

And a packages.sls file like:

```
bind:
    package-name: bind9
    version: 9.9.5
```

And a services.sls file like:

```
bind:
    port: 53
    listen-on: any
```

The resulting pillar will be as follows:

```
$ salt-call pillar.get bind
local:
    listen-on: any
    package-name: bind9
    port: 53
    version: 9.9.5
```

Note: Remember: conflicting keys will be overwritten in a non-deterministic manner!
5.4 Including Other Pillars

New in version 0.16.0.

Pillar SLS files may include other pillar files, similar to State files. Two syntaxes are available for this purpose. The simple form simply includes the additional pillar as if it were part of the same file:

```yaml
include:
  - users
```

The full include form allows two additional options -- passing default values to the templating engine for the included pillar file as well as an optional key under which to nest the results of the included pillar:

```yaml
include:
  - users:
      defaults:
        sudo: ['bob', 'paul']
      key: users
```

With this form, the included file (users.sls) will be nested within the `users` key of the compiled pillar. Additionally, the `sudo` value will be available as a template variable to users.sls.

5.5 Viewing Minion Pillar

Once the pillar is set up the data can be viewed on the minion via the `pillar` module, the pillar module comes with functions, `pillar.items` and `pillar.raw`. `pillar.items` will return a freshly reloaded pillar and `pillar.raw` will return the current pillar without a refresh:

```
salt '*' pillar.items
```

Note: Prior to version 0.16.2, this function is named `pillar.data`. This function name is still supported for backwards compatibility.

5.6 Pillar `get" Function

New in version 0.14.0.

The `pillar.get` function works much in the same way as the `get` method in a python dict, but with an enhancement: nested dict components can be extracted using a `:` delimiter.

If a structure like this is in pillar:

```
foo:
  bar:
    baz: qux
```

Extracting it from the raw pillar in an sls formula or file template is done this way:

```
{{ pillar['foo']['bar']['baz'] }}
```

Now, with the new `pillar.get` function the data can be safely gathered and a default can be set, allowing the template to fall back if the value is not available:
{{ salt['pillar.get'](‘foo:bar:baz', ‘qux’) }}

This makes handling nested structures much easier.

---

**Note:** pillar.get() vs salt['pillar.get']()

It should be noted that within templating, the pillar variable is just a dictionary. This means that calling pillar.get() inside of a template will just use the default dictionary .get() function which does not include the extra : delimiter functionality. It must be called using the above syntax (salt['pillar.get']('foo:bar:baz', 'qux')) to get the salt function, instead of the default dictionary behavior.

---

### 5.7 Refreshing Pillar Data

When pillar data is changed on the master the minions need to refresh the data locally. This is done with the saltutil.refresh_pillar function.

```
salt '*' saltutil.refresh_pillar
```

This function triggers the minion to asynchronously refresh the pillar and will always return None.

### 5.8 Targeting with Pillar

Pillar data can be used when targeting minions. This allows for ultimate control and flexibility when targeting minions.

```
salt -I 'somekey:specialvalue' test.ping
```

Like with *Grains*, it is possible to use globbing as well as match nested values in Pillar, by adding colons for each level that is being traversed. The below example would match minions with a pillar named `foo`, which is a dict containing a key `bar`, with a value beginning with `baz`:

```
salt -I 'foo:bar:baz*' test.ping
```

### 5.9 Set Pillar Data at the Command Line

Pillar data can be set at the command line like the following example:

```
salt '*' state.highstate pillar='{"cheese": "spam"}'
```

This will create a dict with a key of `cheese` and a value of `spam`. A list can be created like this:

```
salt '*' state.highstate pillar='["cheese", "milk", "bread"]'
```

### 5.10 Master Config In Pillar

For convenience the data stored in the master configuration file can be made available in all minion’s pillars. This makes global configuration of services and systems very easy but may not be desired if sensitive data is stored in the master configuration. This option is disabled by default.
To enable the master config from being added to the pillar set `pillar_opts` to `True`:

```
pillar_opts: True
```

### 5.11 Minion Config in Pillar

Minion configuration options can be set on pillars. Any option that you want to modify, should be in the first level of the pillars, in the same way you set the options in the config file. For example, to configure the MySQL root password to be used by MySQL Salt execution module, set the following pillar variable:

```
mysql.pass: hardtoguesspassword
```

### 5.12 Master Provided Pillar Error

By default if there is an error rendering a pillar, the detailed error is hidden and replaced with:

```
Rendering SLS 'my.sls' failed. Please see master log for details.
```

The error is protected because it's possible to contain templating data which would give that minion information it shouldn't know, like a password!

To have the master provide the detailed error that could potentially carry protected data set `pillar_safe_render_error` to `False`:

```
pillar_safe_render_error: True
```
Salt version 0.11.0 introduced the reactor system. The premise behind the reactor system is that with Salt’s events and the ability to execute commands, a logic engine could be put in place to allow events to trigger actions, or more accurately, reactions.

This system binds sls files to event tags on the master. These sls files then define reactions. This means that the reactor system has two parts. First, the reactor option needs to be set in the master configuration file. The reactor option allows for event tags to be associated with sls reaction files. Second, these reaction files use highdata (like the state system) to define reactions to be executed.

6.1 Event System

A basic understanding of the event system is required to understand reactors. The event system is a local ZeroMQ PUB interface which fires salt events. This event bus is an open system used for sending information notifying Salt and other systems about operations.

The event system fires events with a very specific criteria. Every event has a tag. Event tags allow for fast top level filtering of events. In addition to the tag, each event has a data structure. This data structure is a dict, which contains information about the event.

6.2 Mapping Events to Reactor SLS Files

Reactor SLS files and event tags are associated in the master config file. By default this is /etc/salt/master, or /etc/salt/master.d/reactor.conf.

New in version 2014.7.0: Added Reactor support for salt:// file paths.

In the master config section `reactor:` is a list of event tags to be matched and each event tag has a list of reactor SLS files to be run.

```bash
reactor:
  # Master config section "reactor"
  - 'salt/minion/*/start':
    # Match tag "salt/minion/*/start"
    # Things to do when a minion starts
    - /srv/reactor/start.sls
    - /srv/reactor/monitor.sls
    # Other things to do

  - 'salt/cloud/*/destroyed':
    # Globs can be used to matching tags
    # Globs can be used to match file names
    - /srv/reactor/destroy/*.sls
```

---

**Reactor System**

Salt version 0.11.0 introduced the reactor system. The premise behind the reactor system is that with Salt’s events and the ability to execute commands, a logic engine could be put in place to allow events to trigger actions, or more accurately, reactions.

This system binds sls files to event tags on the master. These sls files then define reactions. This means that the reactor system has two parts. First, the reactor option needs to be set in the master configuration file. The reactor option allows for event tags to be associated with sls reaction files. Second, these reaction files use highdata (like the state system) to define reactions to be executed.

6.1 Event System

A basic understanding of the event system is required to understand reactors. The event system is a local ZeroMQ PUB interface which fires salt events. This event bus is an open system used for sending information notifying Salt and other systems about operations.

The event system fires events with a very specific criteria. Every event has a tag. Event tags allow for fast top level filtering of events. In addition to the tag, each event has a data structure. This data structure is a dict, which contains information about the event.

6.2 Mapping Events to Reactor SLS Files

Reactor SLS files and event tags are associated in the master config file. By default this is /etc/salt/master, or /etc/salt/master.d/reactor.conf.

New in version 2014.7.0: Added Reactor support for salt:// file paths.

In the master config section `reactor:` is a list of event tags to be matched and each event tag has a list of reactor SLS files to be run.

```bash
reactor:
  # Master config section "reactor"
  - 'salt/minion/*/start':
    # Match tag "salt/minion/*/start"
    # Things to do when a minion starts
    - /srv/reactor/start.sls
    - /srv/reactor/monitor.sls
    # Other things to do

  - 'salt/cloud/*/destroyed':
    # Globs can be used to matching tags
    # Globs can be used to match file names
    - /srv/reactor/destroy/*.sls
```
Reactor sls files are similar to state and pillar sls files. They are by default yaml + Jinja templates and are passed familiar context variables.

They differ because of the addition of the tag and data variables.

• The tag variable is just the tag in the fired event.

• The data variable is the event's data dict.

Here is a simple reactor sls:

```yaml
{% if data['id'] == 'mysql1' %}
highstate_run:
  local.state.highstate:
    - tgt: mysql1
{% endif %}
```

This simple reactor file uses Jinja to further refine the reaction to be made. If the id in the event data is mysql1 (in other words, if the name of the minion is mysql1) then the following reaction is defined. The same data structure and compiler used for the state system is used for the reactor system. The only difference is that the data is matched up to the salt command API and the runner system. In this example, a command is published to the mysql1 minion with a function of state.highstate. Similarly, a runner can be called:

```yaml
{% if data['data']['orchestrate'] == 'refresh' %}
orchestrate_run:
  runner.state.orchestrate
{% endif %}
```

This example will execute the state.orchestrate runner and initiate an orchestrate execution.

### 6.3 Fire an event

To fire an event from a minion call event.send

```
salt-call event.send 'foo' '{orchestrate: refresh}'
```

After this is called, any reactor sls files matching event tag foo will execute with `{{ data['data']['orchestrate'] }}` equal to 'refresh'.

See `salt.modules.event` for more information.

### 6.4 Knowing what event is being fired

The best way to see exactly what events are fired and what data is available in each event is to use the state.event runner.

See also:

- *Common Salt Events*

Example usage:

```
salt-run state.event pretty=True
```

---

162 Chapter 6. Reactor System
Example output:

```yaml
salt/job/20150213001905721678/new {
   "_stamp": "2015-02-13T00:19:05.724583",
   "arg": [],
   "fun": "test.ping",
   "jid": "20150213001905721678",
   "minions": ["jerry"],
   "tgt": "*",
   "tgt_type": "glob",
   "user": "root"
}
salt/job/20150213001910749506/ret/jerry {
   "_stamp": "2015-02-13T00:19:11.136730",
   "cmd": "_return",
   "fun": "saltutil.find_job",
   "fun_args": ["20150213001905721678"
   ],
   "id": "jerry",
   "jid": "20150213001910749506",
   "retcode": 0,
   "return": {},
   "success": true
}
```

6.5 Debugging the Reactor

The best window into the Reactor is to run the master in the foreground with debug logging enabled. The output will include when the master sees the event, what the master does in response to that event, and it will also include the rendered SLS file (or any errors generated while rendering the SLS file).

1. Stop the master.
2. Start the master manually:
   ```bash
   salt-master -l debug
   ```
3. Look for log entries in the form:
   ```
   [DEBUG ] Gathering reactors for tag foo/bar
   [DEBUG ] Compiling reactions for tag foo/bar
   [DEBUG ] Rendered data from file: /path/to/the/reactor_file.sls:
   <... Rendered output appears here. ...>
   ```

   The rendered output is the result of the Jinja parsing and is a good way to view the result of referencing Jinja variables. If the result is empty then Jinja produced an empty result and the Reactor will ignore it.

6.6 Understanding the Structure of Reactor Formulas

I.e., when to use `arg` and `kavg` and when to specify the function arguments directly.

While the reactor system uses the same basic data structure as the state system, the functions that will be called using that data structure are different functions than are called via Salt's state system. The Reactor can call Runner
modules using the `runner` prefix, Wheel modules using the `wheel` prefix, and can also cause minions to run Execution modules using the `local` prefix.

Changed in version 2014.7.0: The `cmd` prefix was renamed to `local` for consistency with other parts of Salt. A backward-compatible alias was added for `cmd`.

The Reactor runs on the master and calls functions that exist on the master. In the case of Runner and Wheel functions the Reactor can just call those functions directly since they exist on the master and are run on the master.

In the case of functions that exist on minions and are run on minions, the Reactor still needs to call a function on the master in order to send the necessary data to the minion so the minion can execute that function.

The Reactor calls functions exposed in Salt's Python API documentation, and thus the structure of Reactor files very transparently reflects the function signatures of those functions.

### 6.6.1 Calling Execution modules on Minions

The Reactor sends commands down to minions in the exact same way Salt's CLI interface does. It calls a function locally on the master that sends the name of the function as well as a list of any arguments and a dictionary of any keyword arguments that the minion should use to execute that function.

Specifically, the Reactor calls the async version of this function. You can see that function has `arg` and `kwarg` parameters which are both values that are sent down to the minion.

Executing remote commands maps to the `LocalClient` interface which is used by the `salt` command. This interface more specifically maps to the `cmd_async` method inside of the `LocalClient` class. This means that the arguments passed are being passed to the `cmd_async` method, not the remote method. A field starts with `local` to use the `LocalClient` subsystem. The result is, to execute a remote command, a reactor formula would look like this:

```python
clean_tmp:
  local.cmd.run:
    - tgt: '*'
    - arg:
      - rm -rf /tmp/*
```

The `arg` option takes a list of arguments as they would be presented on the command line, so the above declaration is the same as running this salt command:

```bash
salt 'x' cmd.run 'rm -rf /tmp/*'
```

Use the `expr_form` argument to specify a matcher:

```python
clean_tmp:
  local.cmd.run:
    - tgt: 'os:Ubuntu'
    - expr_form: grain
      - arg:
        - rm -rf /tmp/*
```

```python
clean_tmp:
  local.cmd.run:
    - tgt: 'G@roles:hbase_master'
    - expr_form: compound
      - arg:
        - rm -rf /tmp/*
```

Any other parameters in the `LocalClient.cmd()` method can be specified as well.
6.6.2 Calling Runner modules and Wheel modules

Calling Runner modules and Wheel modules from the Reactor uses a more direct syntax since the function is being executed locally instead of sending a command to a remote system to be executed there. There are no `arg` or `kwarg` parameters (unless the Runner function or Wheel function accepts a parameter with either of those names.)

For example:

```python
clear_the_grains_cache_for_all_minions:
    runner.cache.clear_grains
```

If the runner takes arguments then they can be specified as well:

```python
spin_up_more_web_machines:
    runner.cloud.profile:
        - prof: centos_6
        - instances:
            - web11  # These VM names would be generated via Jinja in a
            - web12  # real-world example.
```

6.6.3 Passing event data to Minions or Orchestrate as Pillar

An interesting trick to pass data from the Reactor script to `state.highstate` or `state.sls` is to pass it as inline Pillar data since both functions take a keyword argument named `pillar`.

The following example uses Salt’s Reactor to listen for the event that is fired when the key for a new minion is accepted on the master using `salt-key`.

/etc/salt/master.d/reactor.conf:

```yaml
reactor:
    - 'salt/key':
        - /srv/salt/haproxy/react_new_minion.sls
```

The Reactor then fires a `state.sls` command targeted to the HAProxy servers and passes the ID of the new minion from the event to the state file via inline Pillar.

/srv/salt/haproxy/react_new_minion.sls:

```python
{% if data['act'] == 'accept' and data['id'].startswith('web') %}
add_new_minion_to_pool:
    local.state.sls:
        - tgt: 'haproxy*'
        - arg:
            - haproxy.refresh_pool
        - kwarg:
            pillar:
                new_minion: {{ data['id'] }}
{% endif %}
```

The above command is equivalent to the following command at the CLI:

```
salt 'haproxy*' state.sls haproxy.refresh_pool 'pillar={new_minion: minionid}'
```

This works with Orchestrate files as well:

```python
call_some_orchestrate_file:
    runner.state.orchestrate:
        - mods: some_orchestrate_file
```
Which is equivalent to the following command at the CLI:

```
salt-run state.orchestrate some_orchestrate_file pillar='{stuff: things}'
```

Finally, that data is available in the state file using the normal Pillar lookup syntax. The following example is grabbing web server names and IP addresses from *Salt Mine*. If this state is invoked from the Reactor then the custom Pillar value from above will be available and the new minion will be added to the pool but with the `disabled` flag so that HAProxy won't yet direct traffic to it.

```
/srv/salt/haproxy/refresh_pool.sls:
{% set new_minion = salt['pillar.get']('new_minion') %}
listen web *:80
  balance source
  {% for server,ip in salt['mine.get']('web*', 'network.interfaces', ['eth0']).items() %}
    {% if server == new_minion %}
      server {{ server }} {{ ip }}:80 disabled
    {% else %}
      server {{ server }} {{ ip }}:80 check
    {% endif %}
  {% endfor %}
```

### 6.7 A Complete Example

In this example, we're going to assume that we have a group of servers that will come online at random and need to have keys automatically accepted. We'll also add that we don't want all servers being automatically accepted. For this example, we'll assume that all hosts that have an id that starts with `ink` will be automatically accepted and have state.highstate executed. On top of this, we're going to add that a host coming up that was replaced (meaning a new key) will also be accepted.

Our master configuration will be rather simple. All minions that attempt to authenticate will match the tag of `salt/auth`. When it comes to the minion key being accepted, we get a more refined tag that includes the minion id, which we can use for matching.

```
/etc/salt/master.d/reactor.conf:
reactor:
  - 'salt/auth':
    - /srv/reactor/auth-pending.sls
  - 'salt/minion/ink*/start':
    - /srv/reactor/auth-complete.sls
```

In this sls file, we say that if the key was rejected we will delete the key on the master and then also tell the master to ssh in to the minion and tell it to restart the minion, since a minion process will die if the key is rejected.

We also say that if the key is pending and the id starts with ink we will accept the key. A minion that is waiting on a pending key will retry authentication every ten seconds by default.

```
/srv/reactor/auth-pending.sls:
{# Ink server failed to authenticate -- remove accepted key #}
{% if not data['result'] and data['id'].startswith('ink') %}
  minion_remove:
```

Chapter 6. Reactor System
wheel.key.delete:
  - match: {{ data['id'] }}

minion_rejoin:
  local.cmd.run:
    - tgt: salt-master.domain.tld
    - arg:
      - ssh -o UserKnownHostsFile=/dev/null -o StrictHostKeyChecking=no "{{ data['id'] }}" 'sleep 10

{% endif %}

{% if 'act' in data and data['act'] == 'pend' and data['id'].startswith('ink') %}

minion_add:
  wheel.key.accept:
    - match: {{ data['id'] }}

{% endif %}

No if statements are needed here because we already limited this action to just Ink servers in the master configuration.

/srv/reactor/auth-complete.sls:

{{# When an Ink server connects, run state.highstate. #}}
highstate_run:
  local.state.highstate:
    - tgt: {{ data['id'] }}
    - ret: smtp

The above will also return the highstate result data using the smtp_return returner (use virtualname like when using from the command line with --return). The returner needs to be configured on the minion for this to work. See salt.returners.smtp_return documentation for that.

### 6.8 Syncing Custom Types on Minion Start

Salt will sync all custom types (by running a saltutil.sync_all) on every highstate. However, there is a chicken-and-egg issue where, on the initial highstate, a minion will not yet have these custom types synced when the top file is first compiled. This can be worked around with a simple reactor which watches for minion_start events, which each minion fires when it first starts up and connects to the master.

On the master, create /srv/reactor/sync_grains.sls with the following contents:

sync_grains:
  local.saltutil.sync_grains:
    - tgt: {{ data['id'] }}

And in the master config file, add the following reactor configuration:

reactor:
  - 'minion_start':
    - /srv/reactor/sync_grains.sls

This will cause the master to instruct each minion to sync its custom grains when it starts, making these grains available when the initial highstate is executed.

Other types can be synced by replacing local.saltutil.sync_grains with local.saltutil.sync_modules, local.saltutil.sync_all, or whatever else suits the intended use case.
The Salt Mine is used to collect arbitrary data from minions and store it on the master. This data is then made available to all minions via the \texttt{salt.modules.mine} module.

The data is gathered on the minion and sent back to the master where only the most recent data is maintained (if long term data is required use returners or the external job cache).

### 7.1 Mine Functions

To enable the Salt Mine the \texttt{mine_functions} option needs to be applied to a minion. This option can be applied via the minion's configuration file, or the minion's Pillar. The \texttt{mine_functions} option dictates what functions are being executed and allows for arguments to be passed in. If no arguments are passed, an empty list must be added:

```yaml
mine_functions:
  test.ping: []
  network.ip_addrs:
    interface: eth0
    cidr: '10.0.0.0/8'
```

#### 7.1.1 Mine Functions Aliases

Function aliases can be used to provide friendly names, usage intentions or to allow multiple calls of the same function with different arguments. There is a different syntax for passing positional and key-value arguments. Mixing positional and key-value arguments is not supported.

New in version 2014.7.

```yaml
mine_functions:
  network.ip_addrs: [eth0]
  networkplus.internal_ip_addrs: []
  internal_ip_addrs:
    mine_function: network.ip_addrs
    cidr: 192.168.0.0/16
  ip_list:
    - mine_function: grains.get
    - ip_interfaces
```
7.2 Mine Interval

The Salt Mine functions are executed when the minion starts and at a given interval by the scheduler. The default interval is every 60 minutes and can be adjusted for the minion via the `mine_interval` option:

```
mine_interval: 60
```

7.3 Mine in Salt-SSH

As of the 2015.5.0 release of salt, salt-ssh supports `mine.get`. Because the minions cannot provide their own `mine_functions` configuration, we retrieve the args for specified mine functions in one of three places, searched in the following order:

1. Roster data
2. Pillar
3. Master config

The `mine_functions` are formatted exactly the same as in normal salt, just stored in a different location. Here is an example of a flat roster containing `mine_functions`:

```
test:
  host: 104.237.131.248
  user: root
  mine_functions:
    cmd.run: ['echo "hello!"']
    network.ip_addrs:
      interface: eth0
```

Note: Because of the differences in the architecture of salt-ssh, `mine.get` calls are somewhat inefficient. Salt must make a new salt-ssh call to each of the minions in question to retrieve the requested data, much like a publish call. However, unlike publish, it must run the requested function as a wrapper function, so we can retrieve the function args from the pillar of the minion in question. This results in a non-trivial delay in retrieving the requested data.

7.4 Example

One way to use data from Salt Mine is in a State. The values can be retrieved via Jinja and used in the SLS file. The following example is a partial HAProxy configuration file and pulls IP addresses from all minions with the `web` grain to add them to the pool of load balanced servers.

```
/srv/pillar/top.sls:

base:
  'G@roles:web':
    - web

/srv/pillar/web.sls:

mine_functions:
  network.ip_addrs: [eth0]
```

```
/etc/salt/minion.d/mine.conf:
```
mine_interval: 5

/srv/salt/haproxy.sls:

haproxy_config:
  file.managed:
    - name: /etc/haproxy/config
    - source: salt://haproxy_config
    - template: jinja

/srv/salt/haproxy_config:

...file contents snipped...

{% for server, addrs in salt['mine.get']('roles:web', 'network.ip_addrs', expr_form='pillar').items() %}
server {{ server }} {{ addrs[0] }}:80 check
{% endfor %}

...file contents snipped...
Salt’s External Authentication System (eAuth) allows for Salt to pass through command authorization to any external authentication system, such as PAM or LDAP.

Note: eAuth using the PAM external auth system requires salt-master to be run as root as this system needs root access to check authentication.

### 8.1 Access Control System

The external authentication system allows for specific users to be granted access to execute specific functions on specific minions. Access is configured in the master configuration file and uses the access control system:

```yaml
external_auth:
  pam:
    thatch:
      - 'web*':
        - test.*
        - network.*
    steve:
      - .*
```

The above configuration allows the user `thatch` to execute functions in the test and network modules on the minions that match the `web*` target. User `steve` is given unrestricted access to minion commands.

Salt respects the current PAM configuration in place, and uses the `login` service to authenticate.

Note: The PAM module does not allow authenticating as `root`.

To allow access to `wheel modules` or `runner modules` the following `@` syntax must be used:

```yaml
external_auth:
  pam:
    thatch:
      - '@wheel'  # to allow access to all wheel modules
      - '@runner' # to allow access to all runner modules
      - '@jobs'   # to allow access to the jobs runner and/or wheel module
```

Note: The runner/wheel markup is different, since there are no minions to scope the acl to.
Note: Globs will not match wheel or runners! They must be explicitly allowed with @wheel or @runner.

The external authentication system can then be used from the command-line by any user on the same system as the master with the -a option:

```
$ salt -a pam web\* test.ping
```

The system will ask the user for the credentials required by the authentication system and then publish the command.

To apply permissions to a group of users in an external authentication system, append a % to the ID:

```
external_auth:
  pam:
    admins%:
      - '*'
      - 'pkg.*'
```

**Warning**: All users that have external authentication privileges are allowed to run `saltutil.findjob`. Be aware that this could inadvertently expose some data such as minion IDs.

### 8.2 Tokens

With external authentication alone, the authentication credentials will be required with every call to Salt. This can be alleviated with Salt tokens.

Tokens are short term authorizations and can be easily created by just adding a -T option when authenticating:

```
$ salt -T -a pam web\* test.ping
```

Now a token will be created that has an expiration of 12 hours (by default). This token is stored in a file named `salt_token` in the active user's home directory.

Once the token is created, it is sent with all subsequent communications. User authentication does not need to be entered again until the token expires.

Token expiration time can be set in the Salt master config file.

#### 8.2.1 LDAP and Active Directory

**Note**: LDAP usage requires that you have installed python-ldap.

Salt supports both user and group authentication for LDAP (and Active Directory accessed via its LDAP interface)

### 8.3 OpenLDAP and similar systems

LDAP configuration happens in the Salt master configuration file.

Server configuration values and their defaults:

```
# Server to auth against
auth.ldap.server: localhost
```
There are two phases to LDAP authentication. First, Salt authenticates to search for a user’s Distinguished Name and group membership. The user it authenticates as in this phase is often a special LDAP system user with read-only access to the LDAP directory. After Salt searches the directory to determine the actual user’s DN and groups, it re-authenticates as the user running the Salt commands.

If you are already aware of the structure of your DN and permissions in your LDAP store are set such that users can look up their own group memberships, then the first and second users can be the same. To tell Salt this is the case, omit the `auth.ldap.bindpw` parameter. You can template the binddn like this:

```
auth.ldap.binddn: uid={{ username }},cn=users,cn=accounts,dc=saltstack,dc=com
```

Salt will use the password entered on the salt command line in place of the bindpw.

To use two separate users, specify the LDAP lookup user in the binddn directive, and include a bindpw like so

```
auth.ldap.binddn: uid=ldaplookup, cn=sysaccounts, cn=etc, dc=saltstack, dc=com
auth.ldap.bindpw: mypassword
```
As mentioned before, Salt uses a filter to find the DN associated with a user. Salt substitutes the `{{ username }}` value for the username when querying LDAP.

```yaml
auth.ldap.filter: uid={{ username }}
```

For OpenLDAP, to determine group membership, one can specify an OU that contains group data. This is prepended to the base DN to create a search path. Then the results are filtered against `auth.ldap.groupclass`, default `posixGroup`, and the account's 'name' attribute, `memberUid` by default.

```yaml
auth.ldap.groupou: Groups
```

### 8.4 Active Directory

Active Directory handles group membership differently, and does not utilize the `groupou` configuration variable. AD needs the following options in the master config:

```yaml
auth.ldap.activedirectory: True
auth.ldap.filter: sAMAccountName={{username}}
auth.ldap.accountattributename: sAMAccountName
auth.ldap.groupclass: group
auth.ldap.persontype: person
```

To determine group membership in AD, the username and password that is entered when LDAP is requested as the eAuth mechanism on the command line is used to bind to AD’s LDAP interface. If this fails, then it doesn’t matter what groups the user belongs to, he or she is denied access. Next, the distinguishedName of the user is looked up with the following LDAP search:

```perl
(&(<value of auth.ldap.accountattributename>=={{username}}))
  (objectClass=<value of auth.ldap.persontype>)
)
```

This should return a distinguishedName that we can use to filter for group membership. Then the following LDAP query is executed:

```perl
(&(<member=<distinguishedName from search above>>) )
  (objectClass=<value of auth.ldap.groupclass>)
)
```

To configure an LDAP group, append a `%` to the ID:

```yaml
test_ldap_user:
  - '*':
    - test.ping
```

```yaml
test_ldap_group%:
  - '*':
    - test.echo
```

To configure an LDAP group, append a `%` to the ID:
Access Control System

New in version 0.10.4.

Salt maintains a standard system used to open granular control to non administrative users to execute Salt commands. The access control system has been applied to all systems used to configure access to non administrative control interfaces in Salt. These interfaces include, the peer system, the external auth system and the client acl system.

The access control system mandated a standard configuration syntax used in all of the three aforementioned systems. While this adds functionality to the configuration in 0.10.4, it does not negate the old configuration.

Now specific functions can be opened up to specific minions from specific users in the case of external auth and client ACLs, and for specific minions in the case of the peer system.

The access controls are manifested using matchers in these configurations:

```plaintext
client_acl:
    fred:
        - web\*:
        - pkg.list_pkgs
        - test.*
        - apache.*
```

In the above example, fred is able to send commands only to minions which match the specified glob target. This can be expanded to include other functions for other minions based on standard targets.

```plaintext
external_auth:
    pam:
        dave:
            - test.ping
            - mongo\*:
            - network.*
        - log\*:
            - network.*
            - pkg.*
            - 'G@os:RedHat':
                - kmod.*
        steve:
            - *
```

The above allows for all minions to be hit by test.ping by dave, and adds a few functions that dave can execute on other minions. It also allows steve unrestricted access to salt commands.
New in version 0.9.7.

Since Salt executes jobs running on many systems, Salt needs to be able to manage jobs running on many systems.

## 10.1 The Minion proc System

Salt Minions maintain a proc directory in the Salt cachedir. The proc directory maintains files named after the executed job ID. These files contain the information about the current running jobs on the minion and allow for jobs to be looked up. This is located in the proc directory under the cachedir, with a default configuration it is under /var/cache/salt/proc.

## 10.2 Functions in the saltutil Module

Salt 0.9.7 introduced a few new functions to the saltutil module for managing jobs. These functions are:

1. **running** Returns the data of all running jobs that are found in the proc directory.
2. **find_job** Returns specific data about a certain job based on job id.
3. **signal_job** Allows for a given jid to be sent a signal.
4. **term_job** Sends a termination signal (SIGTERM, 15) to the process controlling the specified job.
5. **kill_job** Sends a kill signal (SIGKILL, 9) to the process controlling the specified job.

These functions make up the core of the back end used to manage jobs at the minion level.

## 10.3 The jobs Runner

A convenience runner front end and reporting system has been added as well. The jobs runner contains functions to make viewing data easier and cleaner.

The jobs runner contains a number of functions...
10.3.1 active

The active function runs saltutil.running on all minions and formats the return data about all running jobs in a much more usable and compact format. The active function will also compare jobs that have returned and jobs that are still running, making it easier to see what systems have completed a job and what systems are still being waited on.

```
# salt-run jobs.active
```

10.3.2 lookup_jid

When jobs are executed the return data is sent back to the master and cached. By default it is cached for 24 hours, but this can be configured via the `keep_jobs` option in the master configuration. Using the lookup_jid runner will display the same return data that the initial job invocation with the salt command would display.

```
# salt-run jobs.lookup_jid <job id number>
```

10.3.3 list_jobs

Before finding a historic job, it may be required to find the job id. list_jobs will parse the cached execution data and display all of the job data for jobs that have already, or partially returned.

```
# salt-run jobs.list_jobs
```

10.4 Scheduling Jobs

In Salt versions greater than 0.12.0, the scheduling system allows incremental executions on minions or the master. The schedule system exposes the execution of any execution function on minions or any runner on the master.

Scheduling is enabled via the `schedule` option on either the master or minion config files, or via a minion's pillar data. Schedules that are implemented via pillar data, only need to refresh the minion's pillar data, for example by using `saltutil.refresh_pillar`. Schedules implemented in the master or minion config have to restart the application in order for the schedule to be implemented.

**Note:** The scheduler executes different functions on the master and minions. When running on the master the functions reference runner functions, when running on the minion the functions specify execution functions.

A scheduled run has no output on the minion unless the config is set to info level or higher. Refer to `minion logging settings`.

Specify `maxrunning` to ensure that there are no more than N copies of a particular routine running. Use this for jobs that may be long-running and could step on each other or otherwise double execute. The default for `maxrunning` is 1.

States are executed on the minion, as all states are. You can pass positional arguments and provide a yaml dict of named arguments.

```
schedule:
    job1:
      function: state.sls
      seconds: 3600
      args:
        - httpd
```
This will schedule the command: `state.sls httpd test=True` every 3600 seconds (every hour)

```python
{kwars:
    test: True
}
```

New in version 2014.7.0.

Frequency of jobs can also be specified using date strings supported by the python dateutil library. This requires python-dateutil to be installed on the minion.

```python
{kwars:
    when:
        - Monday 5:00pm
        - Tuesday 3:00pm
        - Wednesday 5:00pm
}
```
This will schedule the command: `state.sls httpd test=True` at 5pm on Monday, Wednesday, and Friday, and 3pm on Tuesday and Thursday.

```python
schedule:
    job1:
        function: state.sls
        seconds: 3600
        args:
            - httpd
        kwargs:
            test: True
        range:
            start: 8:00am
            end: 5:00pm
```

This will schedule the command: `state.sls httpd test=True` every 3600 seconds (every hour) between the hours of 8am and 5pm. The range parameter must be a dictionary with the date strings using the dateutil format. This requires python-dateutil to be installed on the minion.

New in version 2014.7.0.

The scheduler also supports ensuring that there are no more than N copies of a particular routine running. Use this for jobs that may be long-running and could step on each other or pile up in case of infrastructure outage.

The default for maxrunning is 1.

```python
schedule:
    long_running_job:
        function: big_file_transfer
        jid_include: True
```

### 10.5 States

```python
schedule:
    log-loadavg:
        function: cmd.run
        seconds: 3660
        args:
            - 'logger -t salt < /proc/loadavg'
        kwargs:
            stateful: False
            shell: /bin/sh
```

### 10.6 Highstates

To set up a highstate to run on a minion every 60 minutes set this in the minion config or pillar:

```python
schedule:
    highstate:
        function: state.highstate
        minutes: 60
```
Time intervals can be specified as seconds, minutes, hours, or days.

### 10.7 Runners

Runner executions can also be specified on the master within the master configuration file:

```yaml
schedule:
  run_my_orch:
    function: state.orchestrate
    hours: 6
    splay: 600
    args:
      - orchestration.my_orch
```

The above configuration is analogous to running `salt-run state.orch orchestration.my_orch` every 6 hours.

### 10.8 Scheduler With Returner

The scheduler is also useful for tasks like gathering monitoring data about a minion, this schedule option will gather status data and send it to a MySQL returner database:

```yaml
schedule:
  uptime:
    function: status.uptime
    seconds: 60
    returner: mysql
  meminfo:
    function: status.meminfo
    minutes: 5
    returner: mysql
```

Since specifying the returner repeatedly can be tiresome, the `schedule_returner` option is available to specify one or a list of global returners to be used by the minions when scheduling.

In Salt versions greater than 0.12.0, the scheduling system allows incremental executions on minions or the master. The schedule system exposes the execution of any execution function on minions or any runner on the master.

Scheduling is enabled via the `schedule` option on either the master or minion config files, or via a minion's pillar data. Schedules that are implemented via pillar data, only need to refresh the minion's pillar data, for example by using `saltutil.refresh_pillar`. Schedules implemented in the master or minion config have to restart the application in order for the schedule to be implemented.

---

**Note:** The scheduler executes different functions on the master and minions. When running on the master the functions reference runner functions, when running on the minion the functions specify execution functions.

A scheduled run has no output on the minion unless the config is set to info level or higher. Refer to `minion logging settings`.

Specify `maxrunning` to ensure that there are no more than N copies of a particular routine running. Use this for jobs that may be long-running and could step on each other or otherwise double execute. The default for `maxrunning` is 1.

States are executed on the minion, as all states are. You can pass positional arguments and provide a yaml dict of named arguments.
```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
```

This will schedule the command: `state.sls httpd=test=True` every 3600 seconds (every hour)

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    splay: 15
```

This will schedule the command: `state.sls httpd=test=True` every 3600 seconds (every hour) splaying the time between 0 and 15 seconds

```
schedule:
  job1:
    function: state.sls
    seconds: 3600
    args:
      - httpd
    kwargs:
      test: True
    splay:
      start: 10
      end: 15
```

This will schedule the command: `state.sls httpd=test=True` every 3600 seconds (every hour) splaying the time between 10 and 15 seconds

New in version 2014.7.0.

Frequency of jobs can also be specified using date strings supported by the python dateutil library. This requires python-dateutil to be installed on the minion.

```
schedule:
  job1:
    function: state.sls
    args:
      - httpd
    kwargs:
      test: True
    when: 5:00pm
```

This will schedule the command: `state.sls httpd=test=True` at 5:00pm minion localtime.

```
schedule:
  job1:
    function: state.sls
    args:
      - httpd
```

This will schedule the command: `state.sls httpd=test=True`
This will schedule the command: state.sls httpd test=True at 5pm on Monday, Wednesday, and Friday, and 3pm on Tuesday and Thursday.

```
    function: state.sls
    seconds: 3600
    args:
        - httpd
    kwargs:
        test: True
    range:
        start: 8:00am
        end: 5:00pm
```

This will schedule the command: state.sls httpd test=True every 3600 seconds (every hour) between the hours of 8am and 5pm. The range parameter must be a dictionary with the date strings using the dateutil format. This requires python-dateutil to be installed on the minion.

New in version 2014.7.0.

The scheduler also supports ensuring that there are no more than N copies of a particular routine running. Use this for jobs that may be long-running and could step on each other or pile up in case of infrastructure outage.

The default for maxrunning is 1.

```
    function: big_file_transfer
    jid_include: True
```

### 10.8.1 States

```
    function: cmd.run
    seconds: 3660
    args:
        - 'logger -t salt < /proc/loadavg'
    kwargs:
        stateful: False
        shell: /bin/sh
```

### 10.8.2 Highstates

To set up a highstate to run on a minion every 60 minutes set this in the minion config or pillar:
### 10.8.3 Runners

Runner executions can also be specified on the master within the master configuration file:

```yaml
schedule:
  run_my_orch:
    function: state.orchestrate
    hours: 6
    splay: 600
    args:
      - orchestration.my_orch
```

The above configuration is analogous to running `salt-run state.orch orchestration.my_orch` every 6 hours.

### 10.8.4 Scheduler With Returner

The scheduler is also useful for tasks like gathering monitoring data about a minion, this schedule option will gather status data and send it to a MySQL returner database:

```yaml
schedule:
  uptime:
    function: status.uptime
    seconds: 60
    returner: mysql
  meminfo:
    function: status.meminfo
    minutes: 5
    returner: mysql
```

Since specifying the returner repeatedly can be tiresome, the `schedule_returner` option is available to specify one or a list of global returners to be used by the minions when scheduling.
Managing the Job Cache

The Salt Master maintains a job cache of all job executions which can be queried via the jobs runner. This job cache is called the Default Job Cache.

11.1 Default Job Cache

A number of options are available when configuring the job cache. The default caching system uses local storage on the Salt Master and can be found in the job cache directory (on Linux systems this is typically /var/cache/salt/master/jobs). The default caching system is suitable for most deployments as it does not typically require any further configuration or management.

The default job cache is a temporary cache and jobs will be stored for 24 hours. If the default cache needs to store jobs for a different period the time can be easily adjusted by changing the `keep_jobs` parameter in the Salt Master configuration file. The value passed in is measured via hours:

```
keep_jobs: 24
```

11.2 Additional Job Cache Options

Many deployments may wish to use an external database to maintain a long term register of executed jobs. Salt comes with two main mechanisms to do this, the master job cache and the external job cache.

See *Storing Job Results in an External System*. 
Storing Job Results in an External System

After a job executes, job results are returned to the Salt Master by each Salt Minion. These results are stored in the Default Job Cache.

In addition to the Default Job Cache, Salt provides two additional mechanisms to send job results to other systems (databases, local syslog, and others):

- External Job Cache
- Master Job Cache

The major difference between these two mechanism is from where results are returned (from the Salt Master or Salt Minion).

12.1 External Job Cache - Minion-Side Returner

When an External Job Cache is configured, data is returned to the Default Job Cache on the Salt Master like usual, and then results are also sent to an External Job Cache using a Salt returner module running on the Salt Minion.

- Advantages: Data is stored without placing additional load on the Salt Master.
- Disadvantages: Each Salt Minion connects to the external job cache, which can result in a large number of connections. Also requires additional configuration to get returner module settings on all Salt Minions.
12.2 Master Job Cache - Master-Side Returner

New in version 2014.7.0.

Instead of configuring an External Job Cache on each Salt Minion, you can configure the Master Job Cache to send job results from the Salt Master instead. In this configuration, Salt Minions send data to the Default Job Cache as usual, and then the Salt Master sends the data to the external system using a Salt returner module running on the Salt Master.

- Advantages: A single connection is required to the external system. This is preferred for databases and similar systems.
- Disadvantages: Places additional load on your Salt Master.

12.3 Configure an External or Master Job Cache

12.3.1 Step 1: Understand Salt Returners

Before you configure a job cache, it is essential to understand Salt returner modules (``returners``). Returners are pluggable Salt Modules that take the data returned by jobs, and then perform any necessary steps to send the data to an external system. For example, a returner might establish a connection, authenticate, and then format and transfer data.

The Salt Returner system provides the core functionality used by the External and Master Job Cache systems, and the same returners are used by both systems.

Salt currently provides many different returners that let you connect to a wide variety of systems. A complete list is available at all Salt returners. Each returner is configured differently, so make sure you read and follow the instructions linked from that page.

For example, the MySQL returner requires:

- A database created using provided schema (structure is available at MySQL returner)
- A user created with with privileges to the database
- Optional SSL configuration

A simpler returner, such as Slack or HipChat, requires:
- An API key/version
- The target channel/room
- The username that should be used to send the message

12.3.2 Step 2: Configure the Returner

After you understand the configuration and have the external system ready, add the returner configuration settings to the Salt Minion configuration file for the External Job Cache, or to the Salt Master configuration file for the Master Job Cache.

For example, MySQL requires:

```yaml
mysql.host: 'salt'
mysql.user: 'salt'
mysql.pass: 'salt'
mysql.db: 'salt'
mysql.port: 3306
```

Slack requires:

```yaml
slack.channel: 'channel'
slack.api_key: 'key'
slack.from_name: 'name'
```

After you have configured the returner and added settings to the configuration file, you can enable the External or Master Job Cache.

12.3.3 Step 3: Enable the External or Master Job Cache

Configuration is a single line that specifies an already-configured returner to use to send all job data to an external system.

**External Job Cache**

To enable a returner as the External Job Cache (Minion-side), add the following line to the Salt Master configuration file:

```yaml
ext_job_cache: <returner>
```

For example:

```yaml
ext_job_cache: mysql
```

**Note:** When configuring an External Job Cache (Minion-side), the returner settings are added to the Minion configuration file, but the External Job Cache setting is configured in the Master configuration file.

**Master Job Cache**

To enable a returner as a Master Job Cache (Master-side), add the following line to the Salt Master configuration file:

```yaml
master_job_cache: <returner>
```
For example:

```
master_job_cache: mysql
```

Verify that the returner configuration settings are in the Master configuration file, and be sure to restart the salt-master service after you make configuration changes. (service salt-master restart).
The SDB interface is designed to store and retrieve data that, unlike pillars and grains, is not necessarily minion-specific. The initial design goal was to allow passwords to be stored in a secure database, such as one managed by the keyring package, rather than as plain-text files. However, as a generic database interface, it could conceptually be used for a number of other purposes.

SDB was added to Salt in version 2014.7.0. SDB is currently experimental, and should probably not be used in production.

### 13.1 SDB Configuration

In order to use the SDB interface, a configuration profile must be set up in either the master or minion configuration file. The configuration stanza includes the name/ID that the profile will be referred to as, a `driver` setting, and any other arguments that are necessary for the SDB module that will be used. For instance, a profile called `mykeyring`, which uses the `system` service in the `keyring` module would look like:

```
mykeyring:
    driver: keyring
    service: system
```

It is recommended to keep the name of the profile simple, as it is used in the SDB URI as well.

### 13.2 SDB URIs

SDB is designed to make small database queries (hence the name, SDB) using a compact URL. This allows users to reference a database value quickly inside a number of Salt configuration areas, without a lot of overhead. The basic format of an SDB URI is:

```
sdb://<profile>/<args>
```

The profile refers to the configuration profile defined in either the master or the minion configuration file. The args are specific to the module referred to in the profile, but will typically only need to refer to the key of a key/value pair inside the database. This is because the profile itself should define as many other parameters as possible.

For example, a profile might be set up to reference credentials for a specific OpenStack account. The profile might look like:

```
kevinopenstack:
    driver: keyring
    service: salt.cloud.openstack.kevin
```
And the URI used to reference the password might look like:

```
sdb://kevinopenstack/password
```

### 13.3 Writing SDB Modules

There is currently one function that MUST exist in any SDB module (get()) and one that MAY exist (set()). If using a (set()) function, a `__func_alias__` dictionary MUST be declared in the module as well:

```python
__func_alias__ = {
    'set': 'set',
}
```

This is because `set` is a Python built-in, and therefore functions should not be created which are called `set()`. The `__func_alias__` functionality is provided via Salt's loader interfaces, and allows legally-named functions to be referred to using names that would otherwise be unwise to use.

The `get()` function is required, as it will be called via functions in other areas of the code which make use of the `sdb://` URI. For example, the `config.get` function in the `config` execution module uses this function.

The `set()` function may be provided, but is not required, as some sources may be read-only, or may be otherwise unwise to access via a URI (for instance, because of SQL injection attacks).

A simple example of an SDB module is `salt/sdb/keyring_db.py`, as it provides basic examples of most, if not all, of the types of functionality that are available not only for SDB modules, but for Salt modules in general.
The Salt Event System is used to fire off events enabling third party applications or external processes to react to behavior within Salt.

The event system is comprised of a two primary components:

- The event sockets which publishes events.
- The event library which can listen to events and send events into the salt system.

### 14.1 Event types

#### 14.1.1 Salt Master Events

These events are fired on the Salt Master event bus. This list is not comprehensive.

**Authentication events**

**salt/auth**

Fired when a minion performs an authentication check with the master.

**Variables**

- **id** -- The minion ID.
- **act** -- The current status of the minion key: accept, pend, reject.
- **pub** -- The minion public key.

**Note:** Minions fire auth events on fairly regular basis for a number of reasons. Writing reactors to respond to events through the auth cycle can lead to infinite reactor event loops (minion tries to auth, reactor responds by doing something that generates another auth event, minion sends auth event, etc.). Consider reacting to salt/key or salt/minion/<MID>/start or firing a custom event tag instead.

**Start events**

**salt/minion/<MID>/start**

Fired every time a minion connects to the Salt master.

**Variables**

- **id** -- The minion ID.
Key events

**salt/key**
Fired when accepting and rejecting minions keys on the Salt master.

Variables
- **id** -- The minion ID.
- **act** -- The new status of the minion key: accept, pend, reject.

**Warning:** If a master is in **auto_accept** mode, **salt/key** events will not be fired when the keys are accepted. In addition, pre-seeding keys (like happens through **Salt-Cloud**) will not cause firing of these events.

Job events

**salt/job/<JID>/new**
Fired as a new job is sent out to minions.

Variables
- **jid** -- The job ID.
- **tgt** -- The target of the job: *, a minion ID, G@os_family:RedHat, etc.
- **tgt_type** -- The type of targeting used: glob, grain, compound, etc.
- **fun** -- The function to run on minions: test.ping, network.interfaces, etc.
- **arg** -- A list of arguments to pass to the function that will be called.
- **minions** -- A list of minion IDs that Salt expects will return data for this job.
- **user** -- The name of the user that ran the command as defined in Salt’s Client ACL or external auth.

**salt/job/<JID>/ret/<MID>**
Fired each time a minion returns data for a job.

Variables
- **id** -- The minion ID.
- **jid** -- The job ID.
- **retcode** -- The return code for the job.
- **fun** -- The function the minion ran. E.g., test.ping.
- **return** -- The data returned from the execution module.

**salt/job/<JID>/prog/<MID>/<RUN NUM>**
Fired each time a each function in a state run completes execution. Must be enabled using the **state_events** option.

Variables
- **data** -- The data returned from the state module function.
- **id** -- The minion ID.
- **jid** -- The job ID.
Presence events

**salt/presence/present**

Events fired on a regular interval about currently connected, newly connected, or recently disconnected minions. Requires the `presence_events` setting to be enabled.

Variables

- **present** -- A list of minions that are currently connected to the Salt master.

**salt/presence/change**

Fired when the Presence system detects new minions connect or disconnect.

Variables

- **new** -- A list of minions that have connected since the last presence event.
- **lost** -- A list of minions that have disconnected since the last presence event.

Cloud Events

Unlike other Master events, `salt-cloud` events are not fired on behalf of a Salt Minion. Instead, `salt-cloud` events are fired on behalf of a VM. This is because the minion-to-be may not yet exist to fire events to or also may have been destroyed.

This behavior is reflected by the `name` variable in the event data for `salt-cloud` events as compared to the `id` variable for Salt Minion-triggered events.

**salt/cloud/<VM NAME>/creating**

Fired when salt-cloud starts the VM creation process.

Variables

- **name** -- the name of the VM being created.
- **event** -- description of the event.
- **provider** -- the cloud provider of the VM being created.
- **profile** -- the cloud profile for the VM being created.

**salt/cloud/<VM NAME>/deploying**

Fired when the VM is available and salt-cloud begins deploying Salt to the new VM.

Variables

- **name** -- the name of the VM being created.
- **event** -- description of the event.
- **kwargs** -- options available as the deploy script is invoked: `conf_file`, `deploy_command`, `display_ssh_output`, `host`, `keep_tmp`, `key_filename`, `make_minion`, `minion_conf`, `name`, `parallel`, `preseed_minion_keys`, `script`, `script_args`, `script_env`, `sock_dir`, `start_action`, `sudo`, `tmp_dir`, `tty`, `username`

**salt/cloud/<VM NAME>/requesting**

Fired when salt-cloud sends the request to create a new VM.

Variables

- **event** -- description of the event.
- **location** -- the location of the VM being requested.
• **kwargs** -- options available as the VM is being requested: Action, ImageId, InstanceType, KeyName, MaxCount, MinCount, SecurityGroup

**salt/cloud/<VM NAME>/querying**
Fired when salt-cloud queries data for a new instance.

Variables
- **event** -- description of the event.
- **instance_id** -- the ID of the new VM.

**salt/cloud/<VM NAME>/tagging**
Fired when salt-cloud tags a new instance.

Variables
- **event** -- description of the event.
- **tags** -- tags being set on the new instance.

**salt/cloud/<VM NAME>/waiting_for_ssh**
Fired while the salt-cloud deploy process is waiting for ssh to become available on the new instance.

Variables
- **event** -- description of the event.
- **ip_address** -- IP address of the new instance.

**salt/cloud/<VM NAME>/deploy_script**
Fired once the deploy script is finished.

Variables
- **event** -- description of the event.

**salt/cloud/<VM NAME>/created**
Fired once the new instance has been fully created.

Variables
- **name** -- the name of the VM being created.
- **event** -- description of the event.
- **instance_id** -- the ID of the new instance.
- **provider** -- the cloud provider of the VM being created.
- **profile** -- the cloud profile for the VM being created.

**salt/cloud/<VM NAME>/destroying**
Fired when salt-cloud requests the destruction of an instance.

Variables
- **name** -- the name of the VM being created.
- **event** -- description of the event.
- **instance_id** -- the ID of the new instance.

**salt/cloud/<VM NAME>/destroyed**
Fired when an instance has been destroyed.

Variables
- **name** -- the name of the VM being created.
- **event** -- description of the event.
• **instance_id** -- the ID of the new instance.

## 14.2 Listening for Events

Salt’s Event Bus is used heavily within Salt and it is also written to integrate heavily with existing tooling and scripts. There is a variety of ways to consume it.

### 14.2.1 From the CLI

The quickest way to watch the event bus is by calling the `state.event` runner:

```bash
salt-run state.event pretty=True
```

That runner is designed to interact with the event bus from external tools and shell scripts. See the documentation for more examples.

### 14.2.2 Remotely via the REST API

Salt’s event bus can be consumed `salt.netapi.rest_cherrypy.app.Events` as an HTTP stream from external tools or services.

```bash
curl -SsNk https://salt-api.example.com:8000/events?token=05A3
```

### 14.2.3 From Python

Python scripts can access the event bus only as the same system user that Salt is running as.

The event system is accessed via the event library and can only be accessed by the same system user that Salt is running as. To listen to events a SaltEvent object needs to be created and then the get_event function needs to be run. The SaltEvent object needs to know the location that the Salt Unix sockets are kept. In the configuration this is the `sock_dir` option. The `sock_dir` option defaults to `/var/run/salt/master` on most systems.

The following code will check for a single event:

```python
import salt.config
import salt.utils.event

opts = salt.config.client_config('/etc/salt/master')

event = salt.utils.event.get_event('master',
    'master',
    sock_dir=opts['sock_dir'],
    transport=opts['transport'],
    opts=opts)

data = event.get_event()
```

Events will also use a "tag". Tags allow for events to be filtered by prefix. By default all events will be returned. If only authentication events are desired, then pass the tag "salt/auth".

The `get_event` method has a default poll time assigned of 5 seconds. To change this time set the "wait" option.

The following example will only listen for auth events and will wait for 10 seconds instead of the default 5.
data = event.get_event(wait=10, tag='salt/auth')

To retrieve the tag as well as the event data, pass full=True:

evdata = event.get_event(wait=10, tag='salt/job', full=True)

tag, data = evdata['tag'], evdata['data']

Instead of looking for a single event, the iter_events method can be used to make a generator which will continually yield salt events.

The iter_events method also accepts a tag but not a wait time:

```python
for data in event.iter_events(tag='salt/auth'):
    print(data)
```

And finally event tags can be globbed, such as they can be in the Reactor, using the fnmatch library.

```python
import fnmatch
import salt.config
import salt.utils.event

opts = salt.config.client_config('/etc/salt/master')

sevent = salt.utils.event.get_event(
    'master',
    sock_dir=opts['sock_dir'],
    transport=opts['transport'],
    opts=opts)

while True:
    ret = sevnet.get_event(full=True)
    if ret is None:
        continue

    if fnmatch.fnmatch(ret['tag'], 'salt/job/*/ret/*'):
        do_something_with_job_return(ret['data'])
```

### 14.3 Firing Events

It is possible to fire events on either the minion's local bus or to fire events intended for the master.

To fire a local event from the minion on the command line call the `event.fire` execution function:

```bash
salt-call event.fire {'"data": "message to be sent in the event"'} 'tag'
```

To fire an event to be sent up to the master from the minion call the `event.send` execution function. Remember YAML can be used at the CLI in function arguments:

```bash
salt-call event.send 'myco/mytag/success' '{success: True, message: "It works!"}'
```

If a process is listening on the minion, it may be useful for a user on the master to fire an event to it:

```bash
# Job on minion
import salt.utils.event
```
event = salt.utils.event.MinionEvent(**__opts__)  

for evdata in event.iter_events(tag='customtag/'):  
    return evdata  # do your processing here...

salt minionname event.fire '{"data": "message for the minion"}' 'customtag/african/unladen'

14.4 Firing Events from Python

14.4.1 From Salt execution modules

Events can be very useful when writing execution modules, in order to inform various processes on the master when a certain task has taken place. This is easily done using the normal cross-calling syntax:

# /srv/salt/_modules/my_custom_module.py

def do_something():
    '''
    Do something and fire an event to the master when finished
    
    CLI Example::

    salt '*' my_custom_module:do_something
    '''
    # do something!
    __salt__['event.send']('myco/my_custom_module/finished', {
        'finished': True,
        'message': 'The something is finished!',
    })

14.4.2 From Custom Python Scripts

Firing events from custom Python code is quite simple and mirrors how it is done at the CLI:

```python
import salt.client
caller = salt.client.Caller()
caller.sminion.functions['event.send']('myco/myevent/success', {
    'success': True,
    'message': 'It works!',
})
```
Beacons

The beacon system allows the minion to hook into a variety of system processes and continually monitor these processes. When monitored activity occurs in a system process, an event is sent on the Salt event bus that can be used to trigger a reactor.

Salt beacons can currently monitor and send Salt events for many system activities, including:

- file system changes
- system load
- service status
- shell activity, such as user login
- network and disk usage

See beacon modules for a current list.

Note: Salt beacons are an event generation mechanism. Beacons leverage the Salt reactor system to make changes when beacon events occur.

15.1 Configuring Beacons

Salt beacons do not require any changes to the system process that is being monitored, everything is configured using Salt.

Beacons are typically enabled by placing a beacons: top level block in the minion configuration file:

```yaml
beacons:
  inotify:
    /etc/httpd/conf.d: {}
    /opt: {}  
```

The beacon system, like many others in Salt, can also be configured via the minion pillar, grains, or local config file.

15.1.1 Beacon Monitoring Interval

Beacons monitor on a 1-second interval by default. To set a different interval, provide an interval argument to a beacon. The following beacons run on 5- and 10-second intervals:
beacons:
  inotify:
    /etc/httpd/conf.d: {}
    /opt: {}
    interval: 5
load:
  - 1m:
    - 0.0
    - 2.0
  - 5m:
    - 0.0
    - 1.5
  - 15m:
    - 0.1
    - 1.0
  - interval: 10

15.2 Beacon Example

This example demonstrates configuring the inotify beacon to monitor a file for changes, and then create a backup each time a change is detected.

Note: The inotify beacon requires Pyinotify on the minion, install it using salt myminion pkg.install python-inotify.

First, on the Salt minion, add the following beacon configuration to /etc/salt/minion:

beacons:
  inotify:
    home/user/importantfile:
      mask:
        - modify

Replace user in the previous example with the name of your user account, and then save the configuration file and restart the minion service.

Next, create a file in your home directory named importantfile and add some simple content. The beacon is now set up to monitor this file for modifications.

15.2.1 View Events on the Master

On your Salt master, start the event runner using the following command:

```
salt-run state.event pretty=true
```

This runner displays events as they are received on the Salt event bus. To test the beacon you set up in the previous section, make and save a modification to the importantfile you created. You’ll see an event similar to the following on the event bus:

```
salt/beacon/minion1/inotify/home/user/importantfile {
    "_stamp": "2015-09-09T15:59:37.972753",
    "data": {
        "change": "IN_IGNORED",
        "id": "minion1",
```


"path": "/home/user/importantfile"
},
"tag": "salt/beacon/minion1/inotify/home/user/importantfile"
}

This indicates that the event is being captured and sent correctly. Now you can create a reactor to take action when this event occurs.

### 15.2.2 Create a Reactor

On your Salt master, create a file named `srv/reactor/backup.sls`. If the `reactor` directory doesn't exist, create it. Add the following to `backup.sls`:

```bash
backup file:
  cmd.file.copy:
    - tgt: {{ data['data'][id] }}
    - arg:
      - {{ data['data']['path'] }}
      - {{ data['data']['path'] }}.bak
```

Next, add the code to trigger the reactor to `ect/salt/master`:

```bash
reactor:
  - salt/beacon/*/inotify/*/importantfile:
    - /srv/reactor/backup.sls
```

This reactor creates a backup each time a file named `importantfile` is modified on a minion that has the `inotify` beacon configured as previously shown.

**Note:** You can have only one top level `reactor` section, so if one already exists, add this code to the existing section. See [Understanding the Structure of Reactor Formulas](#) to learn more about reactor SLS syntax.

### 15.2.3 Start the Salt Master in Debug Mode

To help with troubleshooting, start the Salt master in debug mode:

```bash
service salt-master stop
salt-master -l debug
```

When debug logging is enabled, event and reactor data are displayed so you can discover syntax and other issues.

### 15.2.4 Trigger the Reactor

On your minion, make and save another change to `importantfile`. On the Salt master, you'll see debug messages that indicate the event was received and the `file.copy` job was sent. When you list the directory on the minion, you'll now see `importantfile.bak`.

All beacons are configured using a similar process of enabling the beacon, writing a reactor SLS, and mapping a beacon event to the reactor SLS.
15.3 Writing Beacon Plugins

Beacon plugins use the standard Salt loader system, meaning that many of the constructs from other plugin systems holds true, such as the __virtual__ function.

The important function in the Beacon Plugin is the beacon function. When the beacon is configured to run, this function will be executed repeatedly by the minion. The beacon function therefore cannot block and should be as lightweight as possible. The beacon also must return a list of dicts, each dict in the list will be translated into an event on the master.

Please see the inotify beacon as an example.

15.3.1 The beacon Function

The beacons system will look for a function named beacon in the module. If this function is not present then the beacon will not be fired. This function is called on a regular basis and defaults to being called on every iteration of the minion, which can be tens to hundreds of times a second. This means that the beacon function cannot block and should not be CPU or IO intensive.

The beacon function will be passed in the configuration for the executed beacon. This makes it easy to establish a flexible configuration for each called beacon. This is also the preferred way to ingest the beacon's configuration as it allows for the configuration to be dynamically updated while the minion is running by configuring the beacon in the minion's pillar.

15.3.2 The Beacon Return

The information returned from the beacon is expected to follow a predefined structure. The returned value needs to be a list of dictionaries (standard python dictionaries are preferred, no ordered dicts are needed).

The dictionaries represent individual events to be fired on the minion and master event buses. Each dict is a single event. The dict can contain any arbitrary keys but the ‘tag’ key will be extracted and added to the tag of the fired event.

The return data structure would look something like this:

```
[{
    'changes': ['/foo/bar'],
    'tag': 'foo'
  },
  {
    'changes': ['/foo/baz'],
    'tag': 'bar'
  }]
```

15.3.3 Calling Execution Modules

Execution modules are still the preferred location for all work and system interaction to happen in Salt. For this reason the __salt__ variable is available inside the beacon.

Please be careful when calling functions in __salt__, while this is the preferred means of executing complicated routines in Salt not all of the execution modules have been written with beacons in mind. Watch out for execution modules that may be CPU intense or IO bound. Please feel free to add new execution modules and functions to back specific beacons.
Running Custom Master Processes

In addition to the processes that the Salt Master automatically spawns, it is possible to configure it to start additional custom processes. This is useful if a dedicated process is needed that should run throughout the life of the Salt Master. For periodic independent tasks, a scheduled runner may be more appropriate. Processes started in this way will be restarted if they die and will be killed when the Salt Master is shut down.

16.1 Example Configuration

Processes are declared in the master config file with the `ext_processes` option. Processes will be started in the order they are declared.

```yaml
ext_processes:
  - mymodule.TestProcess
  - mymodule.AnotherProcess
```

16.2 Example Process Class

```python
# Import python libs
import time
import logging
from multiprocessing import Process

# Import Salt libs
from salt.utils.event import SaltEvent

log = logging.getLogger(__name__)

class TestProcess(Process):
    def __init__(self, opts):
        Process.__init__(self)
        self.opts = opts

    def run(self):
        self.event = SaltEvent('master', self.opts['sock_dir'])
        i = 0
```
```python
while True:
    self.event.fire_event({'iteration': i}, 'ext_processes/test[0]')
    time.sleep(60)
```
High Availability Features in Salt

Salt supports several features for high availability and fault tolerance. Brief documentation for these features is listed alongside their configuration parameters in *Configuration file examples*.

### 17.1 Multimaster

Salt minions can connect to multiple masters at one time by configuring the `master` configuration parameter as a YAML list of all the available masters. By default, all masters are ```hot```, meaning that any master can direct commands to the Salt infrastructure.

In a multimaster configuration, each master must have the same cryptographic keys, and minion keys must be accepted on all masters separately. The contents of `file_roots` and `pillar_roots` need to be kept in sync with processes external to Salt as well.

A tutorial on setting up multimaster with ```hot``` masters is here:

*Multimaster Tutorial*

### 17.2 Multimaster with Failover

Changing the `master_type` parameter from `str` to `failover` will cause minions to connect to the first responding master in the list of masters. Every `master_alive_check` seconds the minions will check to make sure the current master is still responding. If the master does not respond, the minion will attempt to connect to the next master in the list. If the minion runs out of masters, the list will be recycled in case dead masters have been restored. Note that `master_alive_check` must be present in the minion configuration, or else the recurring job to check master status will not get scheduled.

Failover can be combined with PKI-style encrypted keys, but PKI is NOT REQUIRED to use failover.

Multimaster with PKI and Failover is discussed in *this tutorial*

`master_type: failover` can be combined with `master_shuffle: True` to spread minion connections across all masters (one master per minion, not each minion connecting to all masters). Adding Salt Syndics into the mix makes it possible to create a load-balanced Salt infrastructure. If a master fails, minions will notice and select another master from the available list.
17.3 Syndic

Salt's Syndic feature is a way to create differing infrastructure topologies. It is not strictly an HA feature, but can be treated as such.

With the syndic, a Salt infrastructure can be partitioned in such a way that certain masters control certain segments of the infrastructure, and ``Master of Masters'' nodes can control multiple segments underneath them.

Syndics are covered in depth in Salt Syndic.

17.4 Syndic with Multimaster

New in version 2015.5.0.

Syndic with Multimaster lets you connect a syndic to multiple masters to provide an additional layer of redundancy in a syndic configuration.

Syndics are covered in depth in Salt Syndic.
Salt Syndic

The most basic or typical Salt topology consists of a single Master node controlling a group of Minion nodes. An intermediate node type, called Syndic, when used offers greater structural flexibility and scalability in the construction of Salt topologies than topologies constructed only out of Master and Minion node types.

A Syndic node can be thought of as a special passthrough Minion node. A Syndic node consists of a salt-syndic daemon and a salt-master daemon running on the same system. The salt-master daemon running on the Syndic node controls a group of lower level Minion nodes and the salt-syndic daemon connects higher level Master node, sometimes called a Master of Masters.

The salt-syndic daemon relays publications and events between the Master node and the local salt-master daemon. This gives the Master node control over the Minion nodes attached to the salt-master daemon running on the Syndic node.

18.1 Configuring the Syndic

To setup a Salt Syndic you need to tell the Syndic node and its Master node about each other. If your Master node is located at 10.10.0.1, then your configurations would be:

On the Syndic node:

```bash
# /etc/salt/master
syndic_master: 10.10.0.1  # may be either an IP address or a hostname

# /etc/salt/minion

# id is shared by the salt-syndic daemon and a possible salt-minion daemon
# on the Syndic node
id: my_syndic
```

On the Master node:

```bash
# /etc/salt/master
order_masters: True
```

The `syndic_master` option tells the Syndic node where to find the Master node in the same way that the `master` option tells a Minion node where to find a Master node.

The `id` option is used by the salt-syndic daemon to identify with the Master node and if unset will default to the hostname or IP address of the Syndic just as with a Minion.

The `order_masters` option configures the Master node to send extra information with its publications that is needed by Syndic nodes connected directly to it.
Note: Each Syndic must provide its own file_roots directory. Files will not be automatically transferred from the Master node.

18.2 Configuring the Syndic with Multimaster

New in version 2015.5.0.

Syndic with Multimaster lets you connect a syndic to multiple masters to provide an additional layer of redundancy in a syndic configuration.

Higher level masters should first be configured in a multimaster configuration. See Multimaster Tutorial.

On the syndic, the syndic_master option is populated with a list of the higher level masters.

Since each syndic is connected to each master, jobs sent from any master are forwarded to minions that are connected to each syndic. If the master_id value is set in the master config on the higher level masters, job results are returned to the master that originated the request in a best effort fashion. Events/jobs without a master_id are returned to any available master.

18.3 Running the Syndic

The salt-syndic daemon is a separate process that needs to be started in addition to the salt-master daemon running on the Syndic node. Starting the salt-syndic daemon is the same as starting the other Salt daemons.

The Master node in many ways sees the Syndic as an ordinary Minion node. In particular, the Master will need to accept the Syndic’s Minion key as it would for any other Minion.

On the Syndic node:

```
# salt-syndic
or
# service salt-syndic start
```

On the Master node:

```
# salt-key -a my_syndic
```

The Master node will now be able to control the Minion nodes connected to the Syndic. Only the Syndic key will be listed in the Master node’s key registry but this also means that key activity between the Syndic’s Minions and the Syndic does not encumber the Master node. In this way, the Syndic’s key on the Master node can be thought of as a placeholder for the keys of all the Minion and Syndic nodes beneath it, giving the Master node a clear, high level structural view on the Salt cluster.

On the Master node:

```
# salt-key -L
Accepted Keys:
my_syndic
Denied Keys:
Unaccepted Keys:
Rejected Keys:

# salt '*' test.ping
minion_1:
    True
```
18.4 Topology

A Master node (a node which is itself not a Syndic to another higher level Master node) must run a salt-master daemon and optionally a salt-minion daemon.

A Syndic node must run salt-syndic and salt-master daemons and optionally a salt-minion daemon.

A Minion node must run a salt-minion daemon.

When a salt-master daemon issues a command, it will be received by the Syndic and Minion nodes directly connected to it. A Minion node will process the command in the way it ordinarily would. On a Syndic node, the salt-syndic daemon will relay the command to the salt-master daemon running on the Syndic node, which then propagates the command to to the Minions and Syndics connected to it.

When events and job return data are generated by salt-minion daemons, they are aggregated by the salt-master daemon they are connected to, which salt-master daemon then relays the data back through its salt-syndic daemon until the data reaches the Master or Syndic node that issued the command.

18.5 Syndic wait

**Note:** To reduce the amount of time the CLI waits for Minions to respond, install a Minion on the Syndic or tune the value of the syndic_wait configuration.

While it is possible to run a Syndic without a Minion installed on the same system, it is recommended, for a faster CLI response time, to do so. Without a Minion installed on the Syndic node, the timeout value of syndic_wait increases significantly - about three-fold. With a Minion installed on the Syndic, the CLI timeout resides at the value defined in syndic_wait.

**Note:** If you have a very large infrastructure or many layers of Syndics, you may find that the CLI doesn't wait long enough for the Syndics to return their events. If you think this is the case, you can set the syndic_wait value in the Master configs on the Master or Syndic nodes from which commands are executed. The default value is 5, and should work for the majority of deployments.

In order for a Master or Syndic node to return information from Minions that are below their Syndics, the CLI requires a short wait time in order to allow the Syndics to gather responses from their Minions. This value is defined in the syndic_wait config option and has a default of five seconds.

18.6 Syndic config options

These are the options that can be used to configure a Syndic node. Note that other than id, Syndic config options are placed in the Master config on the Syndic node.

- **id**: Syndic id (shared by the salt-syndic daemon with a potential salt-minion daemon on the same system)
• **syndic_master**: Master node IP address or hostname
• **syndic_master_port**: Master node ret_port
• **syndic_log_file**: path to the logfile (absolute or not)
• **syndic_pidfile**: path to the pidfile (absolute or not)
• **syndic_wait**: time in seconds to wait on returns from this syndic
Proxy minions are a developing Salt feature that enables controlling devices that, for whatever reason, cannot run a standard salt-minion. Examples include network gear that has an API but runs a proprietary OS, devices with limited CPU or memory, or devices that could run a minion, but for security reasons, will not.

Proxy minions are not an `out of the box` feature. Because there are an infinite number of controllable devices, you will most likely have to write the interface yourself. Fortunately, this is only as difficult as the actual interface to the proxied device. Devices that have an existing Python module (PyUSB for example) would be relatively simple to interface. Code to control a device that has an HTML REST-based interface should be easy. Code to control your typical housecat would be excellent source material for a PhD thesis.

Salt proxy-minions provide the 'plumbing' that allows device enumeration and discovery, control, status, remote execution, and state management.

See the Proxy Minion Walkthrough for an end-to-end demonstration of a working proxy minion.

19.1 New in 2015.8

Starting with the 2015.8 release of Salt, proxy processes are no longer forked off from a controlling minion. Instead, they have their own script salt-proxy which takes mostly the same arguments that the standard Salt minion does with the addition of --proxyid. This is the id that the salt-proxy will use to identify itself to the master. Proxy configurations are still best kept in Pillar and their format has not changed.

This change allows for better process control and logging. Proxy processes can now be listed with standard process management utilities (ps from the command line). Also, a full Salt minion is no longer required (though it is still strongly recommended) on machines hosting proxies.

19.2 Getting Started

The following diagram may be helpful in understanding the structure of a Salt installation that includes proxy-minions:
The key thing to remember is the left-most section of the diagram. Salt’s nature is to have a minion connect to a master, then the master may control the minion. However, for proxy minions, the target device cannot run a minion. After the proxy minion is started and initiates its connection to the ‘dumb’ device, it connects back to the salt-master and for all intents and purposes looks like just another minion to the Salt master.

To create support for a proxied device one needs to create four things:

1. The `proxy_connection_module` (located in salt/proxy).
2. The `grains support code` (located in salt/grains).
3. `Salt modules` specific to the controlled device.
4. `Salt states` specific to the controlled device.
19.2.1 Configuration parameters

Proxy minions require no configuration parameters in /etc/salt/master.

Salt’s Pillar system is ideally suited for configuring proxy-minions. Proxies can either be designated via a pillar file in pillar_roots, or through an external pillar. External pillars afford the opportunity for interfacing with a configuration management system, database, or other knowledgeable system that that may already contain all the details of proxy targets. To use static files in pillar_roots, pattern your files after the following examples, which are based on the diagram above:

/srv/pillar/top.sls

```yaml
base:
    dumbdevice1:
    - dumbdevice1
    dumbdevice2:
    - dumbdevice2
    dumbdevice3:
    - dumbdevice3
    dumbdevice4:
    - dumbdevice4
    dumbdevice5:
    - dumbdevice5
    dumbdevice6:
    - dumbdevice6
    dumbdevice7:
    - dumbdevice7
```

/srv/pillar/dumbdevice1.sls

proxy:
    proxitype: networkswitch
    host: 172.23.23.5
    username: root
    passwd: letmein

/srv/pillar/dumbdevice2.sls

proxy:
    proxitype: networkswitch
    host: 172.23.23.6
    username: root
    passwd: letmein

/srv/pillar/dumbdevice3.sls

proxy:
    proxitype: networkswitch
    host: 172.23.23.7
    username: root
    passwd: letmein

/srv/pillar/dumbdevice4.sls

proxy:
    proxitype: i2c_lightshow
    i2c_address: 1

/srv/pillar/dumbdevice5.sls
proxy:
  proxytype: i2c_lightshow
  i2c_address: 2

/srv/pillar/dumbdevice6.sls
proxy:
  proxytype: 433mhz_wireless

/srv/pillar/dumbdevice7.sls
proxy:
  proxytype: sms_serial
  deventry: /dev/tty04

Note the contents of each minioncontroller key may differ widely based on the type of device that the proxy-minion is managing.

In the above example

- dumbdevices 1, 2, and 3 are network switches that have a management interface available at a particular IP address.
- dumbdevices 4 and 5 are very low-level devices controlled over an i2c bus. In this case the devices are physically connected to machine 'minioncontroller2', and are addressable on the i2c bus at their respective i2c addresses.
- dumbdevice6 is a 433 MHz wireless transmitter, also physically connected to minioncontroller2
- dumbdevice7 is an SMS gateway connected to machine minioncontroller3 via a serial port.

Because of the way pillar works, each of the salt-proxy processes that fork off the proxy minions will only see the keys specific to the proxies it will be handling.

Also, in general, proxy-minions are lightweight, so the machines that run them could conceivably control a large number of devices. To run more than one proxy from a single machine, simply start an additional proxy process with --proxyid set to the id to which you want the proxy to bind. It is possible for the proxy services to be spread across many machines if necessary, or intentionally run on machines that need to control devices because of some physical interface (e.g. i2c and serial above). Another reason to divide proxy services might be security. In more secure environments only certain machines may have a network path to certain devices.

19.2.2 Proxymodules

A proxy module encapsulates all the code necessary to interface with a device. Proxymodules are located inside the salt.proxymodule. At a minimum a proxymodule object must implement the following functions:

__virtual__(): This function performs the same duty that it does for other types of Salt modules. Logic goes here to determine if the module can be loaded, checking for the presence of Python modules on which the proxy depends. Returning False will prevent the module from loading.

init(opts): Perform any initialization that the device needs. This is a good place to bring up a persistent connection to a device, or authenticate to create a persistent authorization token.

shutdown(): Code to cleanly shut down or close a connection to a controlled device goes here. This function must exist, but can contain only the keyword pass if there is no shutdown logic required.

ping(): While not required, it is highly recommended that this function also be defined in the proxymodule. The code for ping should contact the controlled device and make sure it is really available.

Pre 2015.8 the proxymodule also must have an id() function. 2015.8 and following don't use this function because the proxy's id is required on the command line.
id(opts): Returns a unique, unchanging id for the controlled device. This is the "name" of the device, and is used by the salt-master for targeting and key authentication.

Here is an example proxymodule used to interface to a very simple REST server. Code for the server is in the salt-contrib GitHub repository

This proxymodule enables "service" enumeration, starting, stopping, restarting, and status; "package" installation, and a ping.

```python
# -*- coding: utf-8 -*-

'''This is a simple proxy-minion designed to connect to and communicate with
the bottle-based web service contained in
https://github.com/saltstack/salt-contrib/proxyminion_rest_example
'''

from __future__ import absolute_import

# Import python libs
import logging
import salt.utils.http

HAS_REST_EXAMPLE = True

# This must be present or the Salt loader won't load this module
__proxyenabled__ = ['rest_sample']

# Variables are scoped to this module so we can have persistent data
# across calls to fns in here.
GRAINS_CACHE = {}
DETAILS = {}

# Want logging!
log = logging.getLogger(__file__)

# This does nothing, it's here just as an example and to provide a log
# entry when the module is loaded.
def __virtual__():
    '''
    Only return if all the modules are available
    '''
    log.debug('rest_sample proxy __virtual__() called...')
    return True

# Every proxy module needs an 'init', though you can
# just put a 'pass' here if it doesn't need to do anything.
def init(opts):
    log.debug('rest_sample proxy init() called...')

    # Save the REST URL
    DETAILS['url'] = opts['proxy']['url']

    # Make sure the REST URL ends with a '/'
    if not DETAILS['url'].endswith('/'):
        DETAILS['url'] += '/

def id(opts):
```
Return a unique ID for this proxy minion. This ID MUST NOT CHANGE. If it changes while the proxy is running the salt-master will get really confused and may stop talking to this minion

```python
r = salt.utils.http.query(opts['proxy']['url']+'id', decode_type='json', decode=True)
return r['dict']['id'].encode('ascii', 'ignore')
```

def grains():
    # Get the grains from the proxied device
    if not GRAINS_CACHE:
        r = salt.utils.http.query(DETAILS['url']+'info', decode_type='json', decode=True)
        GRAINS_CACHE = r['dict']
    return GRAINS_CACHE

def grains_refresh():
    # Refresh the grains from the proxied device
    GRAINS_CACHE = {}
    return grains()

def service_start(name):
    # Start a "service" on the REST server
    r = salt.utils.http.query(DETAILS['url']+'service/start/'+name, decode_type='json', decode=True)
    return r['dict']

def service_stop(name):
    # Stop a "service" on the REST server
    r = salt.utils.http.query(DETAILS['url']+'service/stop/'+name, decode_type='json', decode=True)
    return r['dict']

def service_restart(name):
    # Restart a "service" on the REST server
    r = salt.utils.http.query(DETAILS['url']+'service/restart/'+name, decode_type='json', decode=True)
    return r['dict']

def service_list():
    # List "services" on the REST server
    r = salt.utils.http.query(DETAILS['url']+'service/list', decode_type='json', decode=True)
    return r['dict']
def service_status(name):
    '''
    Check if a service is running on the REST server
    '''
    r = salt.utils.http.query(DETAILS['url']+'service/status/'+name, decode_type='json', decode=True)
    return r['dict']

def package_list():
    '''
    List "packages" installed on the REST server
    '''
    r = salt.utils.http.query(DETAILS['url']+'package/list', decode_type='json', decode=True)
    return r['dict']

def package_install(name, **kwargs):
    '''
    Install a "package" on the REST server
    '''
    cmd = DETAILS['url']+'package/install/'+name
    if 'version' in kwargs:
        cmd += '/' + kwargs['version']
    else:
        cmd += '/1.0'
    r = salt.utils.http.query(cmd, decode_type='json', decode=True)

def package_remove(name):
    '''
    Remove a "package" on the REST server
    '''
    r = salt.utils.http.query(DETAILS['url']+'package/remove/'+name, decode_type='json', decode=True)
    return r['dict']

def package_status(name):
    '''
    Check the installation status of a package on the REST server
    '''
    r = salt.utils.http.query(DETAILS['url']+'package/status/'+name, decode_type='json', decode=True)
    return r['dict']

def ping():
    '''
    Is the REST server up?
    '''
    r = salt.utils.http.query(DETAILS['url']+'ping', decode_type='json', decode=True)
    try:
        return r['dict'].get('ret', False)
    except Exception:
        return False

def shutdown(opts):
    '''

19.2. Getting Started
Grains are data about minions. Most proxied devices will have a paltry amount of data as compared to a typical Linux server. By default, a proxy minion will have several grains taken from the host. Salt core code requires values for `kernel`, `os`, and `os_family`—all of these are forced to be `proxy` for proxy-minions. To add others to your proxy minion for a particular device, create a file in `salt/grains` named `[proxytype].py` and place inside it the different functions that need to be run to collect the data you are interested in. Here's an example:

### 19.3 The `__proxyenabled__` directive

Salt execution modules, by, and large, cannot "automatically" work with proxied devices. Execution modules like `pkg` or `sqlite3` have no meaning on a network switch or a housecat. For an execution module to be available to a proxy-minion, the `__proxyenabled__` variable must be defined in the module as an array containing the names of all the proxytypes that this module can support. The array can contain the special value `*` to indicate that the module supports all proxies.

If no `__proxyenabled__` variable is defined, then by default, the execution module is unavailable to any proxy.

Here is an excerpt from a module that was modified to support proxy-minions:

```python
__proxyenabled__ = ['*']

def ping():
    if 'proxymodule' in __opts__:
        ping_cmd = __opts__['proxymodule'].loaded_base_name + '.ping'
        return __opts__['proxymodule'][ping_cmd]()
    else:
        return True
```

And then in `salt.proxy.rest_sample.py` we find

```python
def ping():
    """Is the REST server up?"
    """
    r = salt.utils.http.query(DETAILS['url']+'ping', decode_type='json', decode=True)
    try:
        return r['dict'].get('ret', False)
    except Exception:
        return False
```

### 19.3.1 Salt Proxy Minion End-to-End Example

The following is walkthrough that documents how to run a sample REST service and configure one or more proxy minions to talk to and control it.

1. Ideally, create a Python virtualenv in which to run the REST service. This is not strictly required, but without a virtualenv you will need to install `bottle` via pip globally on your system.
2. Clone https://github.com/saltstack/salt-contrib and copy the contents of the directory `proxyminion_rest_example` somewhere on a machine that is reachable from the machine on which you want to run the salt-proxy. This machine needs Python 2.7 or later.

3. Install bottle version 0.12.8 via pip or easy_install

```
pip install bottle==0.12.8
```

4. Run `python rest.py --help` for usage

5. Start the REST API on an appropriate port and IP.

6. Load the REST service's status page in your browser by going to the IP/port combination (e.g. `http://127.0.0.1:8000`)

7. You should see a page entitled "Salt Proxy Minion" with two sections, one for "services" and one for "packages" and you should see a log entry in the terminal where you started the REST process indicating that the index page was retrieved.

Now, configure your salt-proxy.

1. Edit `/etc/salt/proxy` and add an entry for your master's location

```
master: localhost
```

2. On your salt-master, ensure that pillar is configured properly. Select an ID for your proxy (in this example we will name the proxy with the letter 'p' followed by the port the proxy is answering on). In your pillar topfile, place an entry for your proxy:

```
base:
  'p8000':
    - p8000
```

This says that Salt's pillar should load some values for the proxy `p8000` from the file `/srv/pillar/p8000.sls` (if you have not changed your default pillar_roots)

3. In the pillar root for your base environment, create this file:

```
p8000.sls
-------

proxy:
  proxymodule: rest_sample
  url: http://<IP your REST listens on>:port
```

19.3. The `__proxyenabled__` directive
In other words, if your REST service is listening on port 8000 on 127.0.0.1 the `url` key above should say `url:
http://127.0.0.1:8000`

4. Make sure your salt-master is running.
5. Start the salt-proxy in debug mode

```
salt-proxy --proxyid=p8000 -l debug
```

6. Accept your proxy's key on your salt-master

```
salt-key -y -a p8000
The following keys are going to be accepted:
Unaccepted Keys:
p8000
Key for minion p8000 accepted.
```

7. Now you should be able to ping your proxy. When you ping, you should see a log entry in the terminal where the REST service is running.

```
salt p8000 test.ping
```

8. The REST service implements a degenerately simple pkg and service provider as well as a small set of grains. To ```install``` a package, use a standard `pkg.install`. If you pass ``==``` and a verrsion number after the package name then the service will parse that and accept that as the package's version.

9. Try running `salt p8000 grains.items` to see what grains are available. You can target proxies via grains if you like.

10. You can also start and stop the available services (apache, redbull, and postgresql with `service.start`, etc.

11. States can be written to target the proxy. Feel free to experiment with them.
The Salt Package Manager, or SPM, allows Salt formulas to be packaged, for ease of deployment. The design of SPM was influenced by other existing packaging systems including RPM, Yum, and Pacman.

### 20.1 Building Packages

Before SPM can install packages, they must be built. The source for these packages is often a Git repository, such as those found at the saltstack-formulas organization on GitHub.

#### 20.1.1 FORMULA

In addition to the formula itself, a FORMULA file must exist which describes the package. An example of this file is:

```text
name: apache
os: RedHat, Debian, Ubuntu, Suse, FreeBSD
os_family: RedHat, Debian, Suse, FreeBSD
dependencies: None
version: 201506
release: 2
summary: Formula for installing Apache
description: Formula for installing Apache
```

**Required Fields**

This file must contain at least the following fields:

- **name**

  The name of the package, as it will appear in the package filename, in the repository metadata, and the package database. Even if the source formula has `-formula` in its name, this name should probably not include that. For instance, when packaging the `apache-formula`, the name should be set to `apache`.

- **os**

  The value of the `os` grain that this formula supports. This is used to help users know which operating systems can support this package.
os_family

The value of the `os_family` grain that this formula supports. This is used to help users know which operating system families can support this package.

version

The version of the package. While it is up to the organization that manages this package, it is suggested that this version is specified in a YYYYMM format. For instance, if this version was released in June 2015, the package version should be 201506. If multiple released are made in a month, the `releasee` field should be used.

release

This field refers primarily to a release of a version, but also to multiple versions within a month. In general, if a version has been made public, and immediate updates need to be made to it, this field should also be updated.

summary

A one-line description of the package.

description

A more detailed description of the package which can contain more than one line.

Optional Fields

The following fields may also be present.

top_level_dir

This field is optional, but highly recommended. If it is not specified, the package name will be used.

Formula repositories typically do not store .sls files in the root of the repository; instead they are stored in a subdirectory. For instance, an `apache-formula` repository would contain a directory called `apache`, which would contain an `init.sls`, plus a number of other related files. In this instance, the `top_level_dir` should be set to `apache`.

Files outside the `top_level_dir`, such as readme.rst, FORMULA, and LICENSE will not be installed. The exceptions to this rule are files that are already treated specially, such as pillar.example and _modules/.

dependencies

A list of packages which must be installed before this package can function.

20.1.2 Building a Package

Once a FORMULA file has been created, it is placed into the root of the formula that is to be turned into a package. The `spm build` command is used to turn that formula into a package:

```
spm build /path/to/saltstack-formulas/apache-formula
```

The resulting file will be placed in the build directory. By default this directory is located at `/srv/spm/`. 

226 Chapter 20. Salt Package Manager
20.2 Building Repositories

Once one or more packages have been built, they can be made available to SPM via a package repository. Place the packages into the directory to be served and issue an `spm create_repo` command:

```
spm create_repo /srv/spm
```

This command is used, even if repository metadata already exists in that directory. SPM will regenerate the repository metadata again, using all of the packages in that directory.

20.3 Configuring Remote Repositories

Before SPM can use a repository, two things need to happen. First, SPM needs to know where the repositories are. Then it needs to pull down the repository metadata.

20.3.1 Repository Configuration Files

Normally repository configuration files are placed in the `/etc/salt/spm.repos.d`. These files contain the name of the repository, and the link to that repository:

```
my_repo:
  url: https://spm.example.com/
```

The URL can use http, https, ftp, or file.

```
local_repo:
  url: file:///srv/spm
```

20.3.2 Updating Local Repository Metadata

Once the repository is configured, its metadata needs to be downloaded. At the moment, this is a manual process, using the `spm update_repo` command.

```
spm update_repo
```

20.4 Installing Packages

Packages may be installed either from a local file, or from an SPM repository. To install from a repository, use the `spm install` command:

```
spm install apache
```

To install from a local file, use the `spm local_install` command:

```
spm local_install /srv/spm/apache-201506-1.spm
```

Currently, SPM does not check to see if files are already in place before installing them. That means that existing files will be overwritten without warning.
20.5 Pillars

Formula packages include a pillar.example file. Rather than being placed in the formula directory, this file is renamed to `<formula name>.sls.orig` and placed in the `pillar_path`, where it can be easily updated to meet the user's needs.

20.6 Loader Modules

When an execution module is placed in `<file_roots>/_modules/` on the master, it will automatically be synced to minions, the next time a sync operation takes place. Other modules are also propagated this way: state modules can be placed in `_states/`, and so on.

When SPM detects a file in a package which resides in one of these directories, that directory will be placed in `<file_roots>` instead of in the formula directory with the rest of the files.

20.7 Removing Packages

Packages may be removed once they are installed using the `spm remove` command.

```
spm remove apache
```

If files have been modified, they will not be removed. Empty directories will also be removed.

20.8 Technical Information

Packages are built using BZ2-compressed tarballs. By default, the package database is stored using the `sqlite3` driver (see Loader Modules below).

Support for these are built into Python, and so no external dependencies are needed.

All other files belonging to SPM use YAML, for portability and ease of use and maintainability.

20.9 SPM-Specific Loader Modules

SPM was designed to behave like traditional package managers, which apply files to the filesystem and store package metadata in a local database. However, because modern infrastructures often extend beyond those use cases, certain parts of SPM have been broken out into their own set of modules.

20.9.1 Package Database

By default, the package database is stored using the `sqlite3` module. This module was chosen because support for SQLite3 is built into Python itself.

Please see the SPM Development Guide for information on creating new modules for package database management.
20.9.2 Package Files

By default, package files are installed using the local module. This module applies files to the local filesystem, on the machine that the package is installed on.

Please see the SPM Development Guide for information on creating new modules for package file management.

20.10 SPM Configuration

There are a number of options that are specific to SPM. They may be configured in the master configuration file, or in SPM’s own spm configuration file (normally located at /etc/salt/spm). If configured in both places, the spm file takes precedence. In general, these values will not need to be changed from the defaults.

20.10.1 spm_logfile

Default: /var/log/salt/spm

Where SPM logs messages.

20.10.2 spm_repos_config

Default: /etc/salt/spm.repos

SPM repositories are configured with this file. There is also a directory which corresponds to it, which ends in .d. For instance, if the filename is /etc/salt/spm.repos, the directory will be /etc/salt/spm.repos.d/.

20.10.3 spm_cache_dir

Default: /var/cache/salt/spm

When SPM updates package repository metadata and downloads packaged, they will be placed in this directory. The package database, normally called packages.db, also lives in this directory.

20.10.4 spm_db

Default: /var/cache/salt/spm/packages.db

The location and name of the package database. This database stores the names of all of the SPM packages installed on the system, the files that belong to them, and the metadata for those files.

20.10.5 spm_build_dir

Default: /srv/spm

When packages are built, they will be placed in this directory.
20.10.6 spm_build_exclude

Default: ['\.git\']

When SPM builds a package, it normally adds all files in the formula directory to the package. Files listed here will be excluded from that package. This option requires a list to be specified.

```python
spm_build_exclude:
  - .git
  - .svn
```

20.11 Types of Packages

SPM supports different types of formula packages. The function of each package is denoted by its name. For instance, packages which end in `-formula` are considered to be Salt States (the most common type of formula). Packages which end in `-conf` contain configuration which is to be placed in the `/etc/salt/` directory. Packages which do not contain one of these names are treated as if they have a `-formula` name.

20.11.1 formula

By default, most files from this type of package live in the `/srv/spm/salt/` directory. The exception is the `pillar.example` file, which will be renamed to `<package_name>.sls` and placed in the pillar directory (`/srv/spm/pillar/` by default).

20.11.2 reactor

By default, files from this type of package live in the `/srv/spm/reactor/` directory.

20.11.3 conf

The files in this type of package are configuration files for Salt, which normally live in the `/etc/salt/` directory. Configuration files for packages other than Salt can and should be handled with a Salt State (using a `formula` type of package).

SPM Development Guide

This document discusses developing additional code for SPM.

SPM-Specific Loader Modules

SPM was designed to behave like traditional package managers, which apply files to the filesystem and store package metadata in a local database. However, because modern infrastructures often extend beyond those use cases, certain parts of SPM have been broken out into their own set of modules.

Each function that accepts arguments has a set of required and optional arguments. Take note that SPM will pass all arguments in, and therefore each function must accept each of those arguments. However, arguments that are marked as required are crucial to SPM’s core functionality, while arguments that are marked as optional are provided as a benefit to the module, if it needs to use them.
**Package Database** By default, the package database is stored using the `sqlite3` module. This module was chosen because support for SQLite3 is built into Python itself.

Modules for managing the package database are stored in the `salt/spm/pkgdb/` directory. A number of functions must exist to support database management.

**init()** Get a database connection, and initialize the package database if necessary.

This function accepts no arguments. If a database is used which supports a connection object, then that connection object is returned. For instance, the `sqlite3` module returns a `connect()` object from the `sqlite3` library:

```python
conn = sqlite3.connect(__opts__['spm_db'], isolation_level=None)
...
return conn
```

SPM itself will not use this connection object; it will be passed in as-is to the other functions in the module. Therefore, when you set up this object, make sure to do so in a way that is easily usable throughout the module.

**info()** Return information for a package. This generally consists of the information that is stored in the `FORMULA` file in the package.

The arguments that are passed in, in order, are `package` (required) and `conn` (optional).

`package` is the name of the package, as specified in the `FORMULA`. `conn` is the connection object returned from `init()`.

**list_files()** Return a list of files for an installed package. Only the filename should be returned, and no other information.

The arguments that are passed in, in order, are `package` (required) and `conn` (optional).

`package` is the name of the package, as specified in the `FORMULA`. `conn` is the connection object returned from `init()`.

**register_pkg()** Register a package in the package database. Nothing is expected to be returned from this function.

The arguments that are passed in, in order, are `name` (required), `formula_def` (required), and `conn` (optional).

`name` is the name of the package, as specified in the `FORMULA`. `formula_def` is the contents of the `FORMULA` file, as a dict. `conn` is the connection object returned from `init()`.

**register_file()** Register a file in the package database. Nothing is expected to be returned from this function.

The arguments that are passed in are `name` (required), `member` (required), `path` (required), `digest` (optional), and `conn` (optional).

`name` is the name of the package.

`member` is a `tarfile` object for the package file. It is included, because it contains most of the information for the file.

`path` is the location of the file on the local filesystem.

`digest` is the SHA1 checksum of the file.

`conn` is the connection object returned from `init()`.
unregister_pkg()  Unregister a package from the package database. This usually only involves removing the package's record from the database. Nothing is expected to be returned from this function.

The arguments that are passed in, in order, are name (required) and conn (optional).

name is the name of the package, as specified in the FORMULA. conn is the connection object returned from init().

unregister_file()  Unregister a package from the package database. This usually only involves removing the package's record from the database. Nothing is expected to be returned from this function.

The arguments that are passed in, in order, are name (required), pkg (optional) and conn (optional).

name is the path of the file, as it was installed on the filesystem.

pkg is the name of the package that the file belongs to.

conn is the connection object returned from init().

db_exists()  Check to see whether the package database already exists. This is the path to the package database file. This function will return True or False.

The only argument that is expected is db_, which is the package database file.

Package Files  By default, package files are installed using the local module. This module applies files to the local filesystem, on the machine that the package is installed on.

Modules for managing the package database are stored in the salt/spm/pkgfiles/ directory. A number of functions must exist to support file management.

init()  Initialize the installation location for the package files. Normally these will be directory paths, but other external destinations such as databases can be used. For this reason, this function will return a connection object, which can be a database object. However, in the default local module, this object is a dict containing the paths. This object will be passed into all other functions.

Three directories are used for the destinations: formula_path, pillar_path, and reactor_path.

formula_path is the location of most of the files that will be installed. The default is specific to the operating system, but is normally /srv/salt/.

pillar_path is the location that the pillar.example file will be installed to. The default is specific to the operating system, but is normally /srv/pillar/.

reactor_path is the location that reactor files will be installed to. The default is specific to the operating system, but is normally /srv/reactor/.

check_existing()  Check the filesystem for existing files. All files for the package will be checked, and if any are existing, then this function will normally state that SPM will refuse to install the package.

This function returns a list of the files that exist on the system.

The arguments that are passed into this function are, in order: package (required), pkg_files (required), formula_def (formula_def), and conn (optional).

package is the name of the package that is to be installed.

pkg_files is a list of the files to be checked.

formula_def is a copy of the information that is stored in the FORMULA file.
conn is the file connection object.

**install_file()**  Install a single file to the destination (normally on the filesystem). Nothing is expected to be returned from this function.

This function returns the final location that the file was installed to.

The arguments that are passed into this function are, in order, `package` (required), `formula_tar` (required), `member` (required), `formula_def` (required), and `conn` (optional).

- `package` is the name of the package that is to be installed.
- `formula_tar` is the tarfile object for the package. This is passed in so that the function can call `formula_tar.extract()` for the file.
- `member` is the tarfile object which represents the individual file. This may be modified as necessary, before being passed into `formula_tar.extract()`.
- `formula_def` is a copy of the information from the FORMULA file.
- `conn` is the file connection object.

**remove_file()**  Remove a single file from file system. Normally this will be little more than an `os.remove()`.

Nothing is expected to be returned from this function.

The arguments that are passed into this function are, in order, `path` (required) and `conn` (optional).

- `path` is the absolute path to the file to be removed.
- `conn` is the file connection object.

**hash_file()**  Returns the hexdigest hash value of a file.

The arguments that are passed into this function are, in order, `path` (required), `hashobj` (required), and `conn` (optional).

- `path` is the absolute path to the file.
- `hashobj` is a reference to `hashlib.sha1()`, which is used to pull the `hexdigest()` for the file.
- `conn` is the file connection object.

This function will not generally be more complex than:

```python
def hash_file(path, hashobj, conn=None):
    with salt.utils.fopen(path, 'r') as f:
        hashobj.update(f.read())
    return hashobj.hexdigest()
```

**path_exists()**  Check to see whether the file already exists on the filesystem. Returns `True` or `False`.

This function expects a `path` argument, which is the absolute path to the file to be checked.

**path_isdir()**  Check to see whether the path specified is a directory. Returns `True` or `False`.

This function expects a `path` argument, which is the absolute path to be checked.
Salt Transport

One of fundamental features of Salt is remote execution. Salt has two basic `channels` for communicating with minions. Each channel requires a client (minion) and a server (master) implementation to work within Salt. These pairs of channels will work together to implement the specific message passing required by the channel interface.

### 21.1 Pub Channel

The pub channel, or publish channel, is how a master sends a job (payload) to a minion. This is a basic pub/sub paradigm, which has specific targeting semantics. All data which goes across the publish system should be encrypted such that only members of the Salt cluster can decrypt the publishes.

### 21.2 Req Channel

The req channel is how the minions send data to the master. This interface is primarily used for fetching files and returning job returns. The req channels have two basic interfaces when talking to the master. `send` is the basic method that guarantees the message is encrypted at least so that only minions attached to the same master can read it-- but no guarantee of minion-master confidentiality, whereas the `encrypted_transfer_decode_dictentry` method does guarantee minion-master confidentiality.

#### 21.2.1 Zeromq Transport

**Note:** Zeromq is the current default transport within Salt

Zeromq is a messaging library with bindings into many languages. Zeromq implements a socket interface for message passing, with specific semantics for the socket type.

**Pub Channel**

The pub channel is implemented using zeromq’s pub/sub sockets. By default we don’t use zeromq’s filtering, which means that all publish jobs are sent to all minions and filtered minion side. Zeromq does have publisher side filtering which can be enabled in salt using `zmq_filtering`.
Req Channel

The req channel is implemented using zmq's req/rep sockets. These sockets enforce a send/recv pattern, which forces salt to serialize messages through these socket pairs. This means that although the interface is asynchronous on the minion we cannot send a second message until we have received the reply of the first message.

21.2.2 TCP Transport

The `tcp` transport is an implementation of Salt's channels using raw tcp sockets. Since this isn't using a pre-defined messaging library we will describe the wire protocol, message semantics, etc. in this document.

Wire Protocol

This implementation over TCP focuses on flexibility over absolute efficiency. This means we are okay to spend a couple of bytes of wire space for flexibility in the future. That being said, the wire framing is quite efficient and looks like:

\[
\text{len}(\text{payload}) \text{ msgpack}({'head': SOMEHEADER, 'body': SOMEBODY})
\]

The wire protocol is basically two parts, the length of the payload and a payload (which is a msgpack'd dict). Within that payload we have two items `head` and `body`. Head contains header information (such as `message id`). The Body contains the actual message that we are sending. With this flexible wire protocol we can implement any message semantics that we'd like-- including multiplexed message passing on a single socket.

Crypto

The current implementation uses the same crypto as the zmq transport.

Pub Channel

For the pub channel we send messages without `message ids` which the remote end interprets as a one-way send.

Note: As of today we send all publishes to all minions and rely on minion-side filtering.

Req Channel

For the req channel we send messages with a `message id`. This `message id` allows us to multiplex messages across the socket.

21.2.3 The RAET Transport

Note: The RAET transport is in very early development, it is functional but no promises are yet made as to its reliability or security. As for reliability and security, the encryption used has been audited and our tests show that raet is reliable. With this said we are still conducting more security audits and pushing the reliability. This document outlines the encryption used in RAET

New in version 2014.7.0.
The Reliable Asynchronous Event Transport, or RAET, is an alternative transport medium developed specifically with Salt in mind. It has been developed to allow queuing to happen up on the application layer and comes with socket layer encryption. It also abstracts a great deal of control over the socket layer and makes it easy to bubble up errors and exceptions.

RAET also offers very powerful message routing capabilities, allowing for messages to be routed between processes on a single machine all the way up to processes on multiple machines. Messages can also be restricted, allowing processes to be sent messages of specific types from specific sources allowing for trust to be established.

**Using RAET in Salt**

Using RAET in Salt is easy, the main difference is that the core dependencies change, instead of needing pycrypto, M2Crypto, ZeroMQ, and PYZMQ, the packages libsodium, libnacl, ioflo, and raet are required. Encryption is handled very cleanly by libnacl, while the queueing and flow control is handled by ioflo. Distribution packages are forthcoming, but libsodium can be easily installed from source, or many distributions do ship packages for it. The libnacl and ioflo packages can be easily installed from pypi, distribution packages are in the works.

Once the new deps are installed the 2014.7 release or higher of Salt needs to be installed.

Once installed, modify the configuration files for the minion and master to set the transport to raet:

**/etc/salt/master:**

```
transport: raet
```

**/etc/salt/minion:**

```
transport: raet
```

Now start salt as it would normally be started, the minion will connect to the master and share long term keys, which can then in turn be managed via salt-key. Remote execution and salt states will function in the same way as with Salt over ZeroMQ.

**Limitations**

The 2014.7 release of RAET is not complete! The Syndic and Multi Master have not been completed yet and these are slated for completion in the 2015.5.0 release.

Also, Salt-Raet allows for more control over the client but these hooks have not been implemented yet, therefore the client still uses the same system as the ZeroMQ client. This means that the extra reliability that RAET exposes has not yet been implemented in the CLI client.

**Why?**

**Customer and User Request**

Why make an alternative transport for Salt? There are many reasons, but the primary motivation came from customer requests, many large companies came with requests to run Salt over an alternative transport, the reasoning was varied, from performance and scaling improvements to licensing concerns. These customers have partnered with SaltStack to make RAET a reality.
More Capabilities

RAET has been designed to allow salt to have greater communication capabilities. It has been designed to allow for development into features which out ZeroMQ topologies can’t match.

Many of the proposed features are still under development and will be announced as they enter proof of concept phases, but these features include salt-fuse - a filesystem over salt, salt-vt - a parallel api driven shell over the salt transport and many others.

RAET Reliability

RAET is reliable, hence the name (Reliable Asynchronous Event Transport).

The concern posed by some over RAET reliability is based on the fact that RAET uses UDP instead of TCP and UDP does not have built in reliability.

RAET itself implements the needed reliability layers that are not natively present in UDP, this allows RAET to dynamically optimize packet delivery in a way that keeps it both reliable and asynchronous.

RAET and ZeroMQ

When using RAET, ZeroMQ is not required. RAET is a complete networking replacement. It is noteworthy that RAET is not a ZeroMQ replacement in a general sense, the ZeroMQ constructs are not reproduced in RAET, but they are instead implemented in such a way that is specific to Salt’s needs.

RAET is primarily an async communication layer over truly async connections, defaulting to UDP. ZeroMQ is over TCP and abstracts async constructs within the socket layer.

Salt is not dropping ZeroMQ support and has no immediate plans to do so.

Encryption

RAET uses Dan Bernstein's NACL encryption libraries and CurveCP handshake. The libnacl python binding binds to both libsodium and tweetnacl to execute the underlying cryptography. This allows us to completely rely on an externally developed cryptography system.

For more information on libsodium and CurveCP please see: http://doc.libsodium.org/ http://curvecp.org/

Programming Intro
Windows Software Repository

Note: Git repository management for the Windows Software Repository has changed in version 2015.8.0, and several master/minion config parameters have been renamed to make their naming more consistent with each other. Please see below for important details if upgrading from an earlier Salt release.

The Salt Windows Software Repository provides a package manager and software repository similar to what is provided by yum and apt on Linux.

It permits the installation of software using the installers on remote windows machines. In many senses, the operation is similar to that of the other package managers salt is aware of:

- the pkg.installed and similar states work on Windows.
- the pkg.install and similar module functions work on Windows.
- each windows machine needs to have pkg.refresh_db executed against it to pick up the latest version of the package database.

High level differences to yum and apt are:

- The repository metadata (sls files) is hosted through either salt or git.
- Packages can be downloaded from within the salt repository, a git repository or from http(s) or ftp urls.
- No dependencies are managed. Dependencies between packages needs to be managed manually.

22.1 Operation

The install state/module function of the windows package manager works roughly as follows:

1. Execute pkg.list_pkgs and store the result
2. Check if any action needs to be taken. (i.e. compare required package and version against pkg.list_pkgs results)
3. If so, run the installer command.
4. Execute pkg.list_pkgs and compare to the result stored from before installation.
5. Success/Failure/Changes will be reported based on the differences between the original and final pkg.list_pkgs results.

If there are any problems in using the package manager it is likely to be due to the data in your sls files not matching the difference between the pre and post pkg.list_pkgs results.
22.2 Usage

By default, the Windows software repository is found at /srv/salt/win/repo (C:salt\srv\salt\win\repo on standalone minions). This can be changed in the master config file by setting the `winrepo_dir` option (NOTE: this option was called `win_repo` in Salt versions prior to 2015.8.0). However, this path must reside somewhere inside the master's `file_roots`. Each piece of software should have its own directory which contains the installers and a package definition file. This package definition file is a YAML file named `init.sls`.

The package definition file should look similar to this example for Firefox:

```
/srv/salt/win/repo/firefox/init.sls
```

```yaml
definition:
  firefox:
    17.0.1:
      installer: 'salt://win/repo/firefox/English/Firefox Setup 17.0.1.exe'
      full_name: Mozilla Firefox 17.0.1 (x86 en-US)
      locale: en_US
      reboot: False
      install_flags: '-ms'
      uninstaller: '%ProgramFiles(x86)%/Mozilla Firefox/uninstall/helper.exe'
      uninstall_flags: '/S'
    16.0.2:
      installer: 'salt://win/repo/firefox/English/Firefox Setup 16.0.2.exe'
      full_name: Mozilla Firefox 16.0.2 (x86 en-US)
      locale: en_US
      reboot: False
      install_flags: '-ms'
      uninstaller: '%ProgramFiles(x86)%/Mozilla Firefox/uninstall/helper.exe'
      uninstall_flags: '/S'
    15.0.1:
      installer: 'salt://win/repo/firefox/English/Firefox Setup 15.0.1.exe'
      full_name: Mozilla Firefox 15.0.1 (x86 en-US)
      locale: en_US
      reboot: False
      install_flags: '-ms'
      uninstaller: '%ProgramFiles(x86)%/Mozilla Firefox/uninstall/helper.exe'
      uninstall_flags: '/S'
```

More examples can be found here: https://github.com/saltstack/salt-winrepo

The version number and `full_name` need to match the output from `pkg.list_pkgs` so that the status can be verified when running `highstate`. Note: It is still possible to successfully install packages using `pkg.install` even if they don’t match which can make this hard to troubleshoot.

```
salt 'test-2008' pkg.list_pkgs
salt 'test-2008' pkg.list_pkgs
```

```
test-2008
----------
7-Zip 9.20 (x64 edition):
  9.20.00.0
Microsoft .NET Framework 4 Client Profile:
  4.0.30319, 4.0.30319
Microsoft .NET Framework 4 Extended:
  4.0.30319, 4.0.30319
Microsoft Visual C++ 2008 Redistributable - x64 9.0.21022:
  9.0.21022
Mozilla Firefox 17.0.1 (x86 en-US):
  17.0.1
Mozilla Maintenance Service:
```
If any of these preinstalled packages already exist in winrepo the full_name will be automatically renamed to their package name during the next update (running highstate or installing another package).

```
7zip:
9.20.00.0
Microsoft .NET Framework 4 Client Profile:
  4.0.30319,4.0.30319
Microsoft .NET Framework 4 Extended:
  4.0.30319,4.0.30319
Microsoft Visual C++ 2008 Redistributable - x64 9.0.21022:
  9.0.21022
Mozilla Maintenance Service:
  17.0.1
Notepad++:
  6.4.2
Salt Minion 0.16.0:
  0.16.0
```

Add `msiexec: True` if using an MSI installer requiring the use of `msiexec /i` to install and `msiexec /x` to uninstall.

The `install_flags` and `uninstall_flags` are flags passed to the software installer to cause it to perform a silent install. These can often be found by adding `/?` or `/h` when running the installer from the command line. A great resource for finding these silent install flags can be found on the WPKG project's wiki:

```
7zip:
9.20.00.0:
  installer: salt://win/repo/7zip/7z920-x64.msi
  full_name: 7-Zip 9.20 (x64 edition)
  reboot: False
  install_flags: '/qn /norestart'
  msiexec: True
  uninstaller: '{23170F69-40C1-2702-0920-000001000000}'
  uninstall_flags: '/qn /norestart'
```

Alternatively the `uninstaller` can also simply repeat the URL of the `.msi` file.

```
7zip:
9.20.00.0:
  installer: salt://win/repo/7zip/7z920-x64.msi
  full_name: 7-Zip 9.20 (x64 edition)
  reboot: False
  install_flags: '/qn /norestart'
  msiexec: True
  uninstaller: salt://win/repo/7zip/7z920-x64.msi
```

22.2. Usage
uninstall_flags: 'qn /norestart'

Add cache_dir: True when the installer requires multiple source files. The directory containing the installer file will be recursively cached on the minion. Only applies to salt: installer URLs.

```python
sqlexpress:
12.0.2000.8:
    installer: 'salt://win/repo/sqlexpress/setup.exe'
    full_name: Microsoft SQL Server 2014 Setup (English)
    reboot: False
    install_flags: '/ACTION=install /IACCEPTSQLSERVERLICENSETERMS /Q'
    cache_dir: True
```

### 22.3 Generate Repo Cache File

Once the sls file has been created, generate the repository cache file with the winrepo runner:

```
salt-run winrepo.genrepo
```

Beginning with the 2015.8.0 Salt release the repository cache is compiled on the Salt Minion. This allows for easy templating on the minion which allows for pillar, grains and other things to be available during compilation time. From 2015.8.0 forward the above `salt-run winrepo.genrepo` is only required for older minions. New minions should execute `salt * pkg.refresh_db` to update from the latest from the master's repo.

Then update the repository cache file on your minions, exactly how it's done for the Linux package managers:

```
salt winminion pkg.refresh_db
```

### 22.4 Install Windows Software

Now you can query the available version of Firefox using the Salt pkg module.

```
salt winminion pkg.available_version firefox
```

```json
{'firefox': {'15.0.1': 'Mozilla Firefox 15.0.1 (x86 en-US)',
             '16.0.2': 'Mozilla Firefox 16.0.2 (x86 en-US)',
             '17.0.1': 'Mozilla Firefox 17.0.1 (x86 en-US)'}
```

As you can see, there are three versions of Firefox available for installation. You can refer a software package by its name or its full_name surround by single quotes.

```
salt winminion pkg.install 'firefox'
```

The above line will install the latest version of Firefox.

```
salt winminion pkg.install 'firefox' version=16.0.2
```

The above line will install version 16.0.2 of Firefox.

If a different version of the package is already installed it will be replaced with the version in the winrepo (only if the package itself supports live updating).

You can also specify the full name:
22.5 Uninstall Windows Software

Uninstall software using the pkg module:

```
salt winminion pkg.remove firefox
salt winminion pkg.purge firefox
```

pkg.purge just executes pkg.remove on Windows. At some point in the future pkg.purge may direct the installer to remove all configs and settings for software packages that support that option.

22.6 Managing Windows Software on a Standalone Windows Minion

The examples above for managing the winrepo using the winrepo runner apply to the master, but some use cases call for running a standalone (a.k.a. masterless) minion on a Windows server. For these cases, the runner functions are not available, so an execution module exists to provide the same functionality to standalone minions. The functions are named the same as the ones in the runner, and are used in the same way; the only difference is that salt-call is used instead of salt-run:

```
salt-call winrepo.genrepo
salt-call pkg.refresh_db
```

Package definition SLS files need to be in the correct location for winrepo.genrepo to find them. This location is governed by minion config parameters. With much of Salt's Windows Repo code having been rewritten for version 2015.8.0, the parameter names will differ depending on which version the minion is running. The following two sections include information on additional configuration required when running a standalone minion.

22.7 Minion Config Options for Releases Older Than 2015.8.0

If connected to a master, the minion will by default look for the winrepo cachefile (the file generated by the :py:func`winrepo.genrepo runner <salt.runners.winrepo.genrepo>`) at salt://win/repo/winrepo.p. If the cachefile is in a different path on the salt fileserver, then win_repo_cachefile will need to be updated to reflect the proper location.

Note: Additional Info for Standalone Minions

Additional configuration needs to be added to the minion config:

```
win_repo: 'C:\path\to\win\repo'
```

This path still needs to be within the minion's file_roots, just as when managing the Windows Repo on the master.

22.8 Minion Config Options for Releases 2015.8.0 and Newer

The winrepo_source_dir config parameter (default: salt://win/repo) controls where pkg.refresh_db looks for the cachefile (default: winrepo.p). This means that the default location for
the winrepo cachefile would be `salt://win/repo/winrepo.p`. Both `winrepo_source_dir` and `winrepo_cachefile` can be adjusted to match the actual location of this file on the Salt fileserver.

**Note:** Additional Info for Standalone Minions

The above still holds true regarding `winrepo_source_dir`, the differences are that the minion's `file_roots` is where that `salt://` URL will resolve, and the `winrepo` execution module must be used to generate this cachefile.

If `file_roots` has not been modified in the minion configuration, then no additional configuration needs to be added to the minion configuration. The `winrepo.genrepo` function from the `winrepo` execution module will by default look for the filename specified by `winrepo_cachefile` within `C:\salt\srv\salt\win\repo`. If the `file_roots` parameter has been modified, then `winrepo_dir` must be modified to fall within that path, at the proper relative path. For example, if the base environment in `file_roots` points to `D:\foo`, and `winrepo_source_dir` is `salt://win/repo`, then `winrepo_dir` must be set to `D:\foo\win\repo` to ensure that `winrepo.genrepo` puts the cachefile into right location.

### 22.9 Maintaining Windows Repo Definitions in Git Repositories

Windows software package definitions can also be hosted in one or more git repositories. The default repository configured is hosted on GitHub.com by SaltStack, Inc. It includes package definitions for various open source software projects.

This repo points to the HTTP or ftp locations of the installer files. Anyone is welcome to send a pull request to this repo to add new package definitions. Browse the repo here: [https://github.com/saltstack/salt-winrepo.git](https://github.com/saltstack/salt-winrepo.git).

Configure which git repositories the master can search for package definitions by modifying or extending the `winrepo_remotes` option (NOTE: this option was called `win_gitrepos` in Salt versions prior to 2015.8.0).

Use the `winrepo.update_git_repos` runner to clone/update the configured repos, then use `winrepo.genrepo` runner to compile the repository cache. Finally, use `pkg.refresh_db` on each minion to have them update their copy of the repository cache. Command examples are as follows:

```bash
salt-run winrepo.update_git_repos
salt-run winrepo.genrepo
salt winminion pkg.refresh_db
```

For standalone minions, the usage would be slightly different:

```bash
salt-call winrepo.update_git_repos
salt-call winrepo.genrepo
salt-call pkg.refresh_db
```

### 22.10 Changes in Version 2015.8.0

#### 22.10.1 Config Parameters Renamed

Many of the winrepo configuration parameters have changed in version 2015.8.0 to make the naming more consistent. The old parameter names will still work, but a warning will be logged indicating that the old name is deprecated. Below are the parameters which have changed for version 2015.8.0:
Master Config

<table>
<thead>
<tr>
<th>Old Name</th>
<th>New Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>win_repo</td>
<td>winrepo_dir</td>
</tr>
<tr>
<td>win_repo_mastercachefile</td>
<td>winrepo_cachefile</td>
</tr>
<tr>
<td>win_gitrepos</td>
<td>winrepo_remotes</td>
</tr>
</tbody>
</table>

See [here](#) for detailed information on all master config options for the Windows Repo.

Minion Config

<table>
<thead>
<tr>
<th>Old Name</th>
<th>New Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>win_repo</td>
<td>winrepo_dir</td>
</tr>
<tr>
<td>win_repo_cachefile</td>
<td>winrepo_cachefile</td>
</tr>
<tr>
<td>win_gitrepos</td>
<td>winrepo_remotes</td>
</tr>
</tbody>
</table>

See [here](#) for detailed information on all minion config options for the Windows Repo.

### 22.10.2 pygit2/GitPython Support for Maintaining Git Repos

The `winrepo.update_git_repos` runner (and the corresponding remote execution function for standalone minions) now makes use of the same underlying code used by the `Git Fileserver Backend` and `Git External Pillar` to maintain and update its local clones of git repositories. If a compatible version of either `pygit2` (0.20.3 and later) or `GitPython` (0.3.0 or later) is installed, then Salt will use it instead of the old method (which invokes the `git.latest` state).

**Note:** If compatible versions of both `pygit2` and `GitPython` are installed, then Salt will prefer `pygit2`, to override this behavior use the `winrepo_provider` configuration parameter:

```
winrepo_provider: gitpython
```

The `winrepo` execution module (discussed above in the Managing Windows Software on a Standalone Windows Minion section) does not yet officially support the new pygit2/GitPython functionality, but if either `pygit2` or `GitPython` is installed into Salt’s bundled Python then it should work. However, it should be considered experimental at this time.

To minimize potential issues, it is a good idea to remove any winrepo git repositories that were checked out by the old (pre-2015.8.0) winrepo code when upgrading the master to 2015.8.0 or later, and run `winrepo.update_git_repos` to clone them anew after the master is started.

Additional added features include the ability to access authenticated git repositories (**NOTE:** `pygit2` only), and to set per-remote config settings. An example of this would be the following:

```
winrepo_remotes:
  - https://github.com/saltstack/salt-winrepo.git
  - git@github.com:myuser/myrepo.git:
    - pubkey: /path/to/key.pub
    - privkey: /path/to/key
    - passphrase: myaw3s0m3pa$$phr4$3
  - https://github.com/myuser/privaterepo.git:
    - user: mygithubuser
    - password: CorrectHorseBatteryStaple
```

**Note:** Per-remote configuration settings work in the same fashion as they do in gitfs, with global parameters being overridden by their per-remote counterparts (for instance, setting `winrepo_passphrase` would set a global
passphrase for winrepo that would apply to all SSH-based remotes, unless overridden by a passphrase per-remote parameter).

See here for more a more in-depth explanation of how per-remote configuration works in gitfs, the same principles apply to winrepo.

There are a couple other changes in how Salt manages git repos using pygit2/GitPython. First of all, a clean argument has been added to the winrepo.update_git_repos runner, which (if set to True) will tell the runner to dispose of directories under the winrepo_dir which are not explicitly configured. This prevents the need to manually remove these directories when a repo is removed from the config file. To clean these old directories, just pass clean=True, like so:

```
salt-run winrepo.update_git_repos clean=True
```

However, if a mix of git and non-git Windows Repo definition files are being used, then this should not be used, as it will remove the directories containing non-git definitions.

The other major change is that collisions between repo names are now detected, and the winrepo.update_git_repos runner will not proceed if any are detected. Consider the following configuration:

```
winrepo_remotes:
  - https://foo.com/bar/baz.git
  - https://mydomain.tld/baz.git
  - https://github.com/foobar/baz
```

The winrepo.update_git_repos runner will refuse to update repos here, as all three of these repos would be checked out to the same directory. To work around this, a per-remote parameter called name can be used to resolve these conflicts:

```
winrepo_remotes:
  - https://foo.com/bar/baz.git
  - https://mydomain.tld/baz.git:
    - name: baz_junior
  - https://github.com/foobar/baz:
    - name: baz_the_third
```

### 22.11 Troubleshooting

#### 22.11.1 Incorrect name/version

If the package seems to install properly, but salt reports a failure then it is likely you have a version or full_name mismatch.

Check the exact full_name and version used by the package. Use pkg.list_pkgs to check that the names and version exactly match what is installed.

#### 22.11.2 Changes to sls files not being picked up

Ensure you have (re)generated the repository cache file and then updated the repository cache on the relevant minions:

```
salt-run winrepo.genrepo
salt winminion pkg.refresh_db
```
22.11.3 Packages management under Windows 2003

On windows server 2003, you need to install optional windows component `wmi windows installer provider` to have full list of installed packages. If you don't have this, salt-minion can't report some installed software.
Windows-specific Behaviour

Salt is capable of managing Windows systems, however due to various differences between the operating systems, there are some things you need to keep in mind.

This document will contain any quirks that apply across Salt or generally across multiple module functions. Any Windows-specific behavior for particular module functions will be documented in the module function documentation. Therefore this document should be read in conjunction with the module function documentation.

### 23.1 Group parameter for files

Salt was originally written for managing Unix-based systems, and therefore the file module functions were designed around that security model. Rather than trying to shoehorn that model on to Windows, Salt ignores these parameters and makes non-applicable module functions unavailable instead.

One of the commonly ignored parameters is the group parameter for managing files. Under Windows, while files do have a 'primary group' property, this is rarely used. It generally has no bearing on permissions unless intentionally configured and is most commonly used to provide Unix compatibility (e.g. Services For Unix, NFS services).

Because of this, any file module functions that typically require a group, do not under Windows. Attempts to directly use file module functions that operate on the group (e.g. `file.chgrp`) will return a pseudo-value and cause a log message to appear. No group parameters will be acted on.

If you do want to access and change the 'primary group' property and understand the implications, use the `file.get_pgid` or `file.get_pgroup` functions or the `pgroup` parameter on the `file.chown` module function.

### 23.2 Dealing with case-insensitive but case-preserving names

Windows is case-insensitive, but however preserves the case of names and it is this preserved form that is returned from system functions. This causes some issues with Salt because it assumes case-sensitive names. These issues generally occur in the state functions and can cause bizarre looking errors.

To avoid such issues, always pretend Windows is case-sensitive and use the right case for names, e.g. specify `user=Administrator` instead of `user=administrator`.

Follow issue 11801 for any changes to this behavior.
23.3 Dealing with various username forms

Salt does not understand the various forms that Windows usernames can come in, e.g. username, mydomain\username, username@mydomain.tld can all refer to the same user. In fact, Salt generally only considers the raw username value, i.e. the username without the domain or host information.

Using these alternative forms will likely confuse Salt and cause odd errors to happen. Use only the raw username value in the correct case to avoid problems.

Follow issue 11801 for any changes to this behavior.

23.4 Specifying the None group

Each Windows system has built-in _None_ group. This is the default `primary group' for files for users not on a domain environment.

Unfortunately, the word _None_ has special meaning in Python - it is a special value indicating `nothing', similar to `null' or `nil' in other languages.

To specify the None group, it must be specified in quotes, e.g. ./salt '*' file.chgrp C:\path\to\file "'None'".

23.5 Symbolic link loops

Under Windows, if any symbolic link loops are detected or if there are too many levels of symlinks (defaults to 64), an error is always raised.

For some functions, this behavior is different to the behavior on Unix platforms. In general, avoid symlink loops on either platform.

23.6 Modifying security properties (ACLs) on files

There is no support in Salt for modifying ACLs, and therefore no support for changing file permissions, besides modifying the owner/user.
24.1 Getting Started

Salt Cloud is built-in to Salt and is configured on and executed from your Salt Master.

24.1.1 Define a Provider

The first step is to add the credentials for your cloud host. Credentials and other settings provided by the cloud host are stored in provider configuration files. Provider configurations contain the details needed to connect to a cloud host such as EC2, GCE, Rackspace, etc., and any global options that you want set on your cloud minions (such as the location of your Salt Master).

On your Salt Master, browse to `/etc/salt/cloud.providers.d/` and create a file called `<provider>.provider.conf`, replacing `<provider>` with `ec2`, `softlayer`, and so on. The name helps you identify the contents, and is not important as long as the file ends in `.conf`.

Next, browse to the `Provider specifics` and add any required settings for your cloud host to this file. Here is an example for Amazon EC2:

```
my-ec2:
  driver: ec2
  # Set the EC2 access credentials (see below)
  #
  id: 'HJGRVICLJLKJYJG'
  key: 'kdjgfgsm;woormgl/aserigjksjdhasdfgn'
  # Make sure this key is owned by root with permissions 0400.
  #
  private_key: /etc/salt/my_test_key.pem
  keyname: my_test_key
  securitygroup: default
  # Optional: Set up the location of the Salt Master
  #
  minion:
    master: saltmaster.example.com
```

The required configuration varies between cloud hosts so make sure you read the provider specifics.

24.1.2 List Cloud Provider Options

You can now query the cloud provider you configured for available locations, images, and sizes. This information is used when you set up VM profiles.
24.1.3 Create VM Profiles

On your Salt Master, browse to /etc/salt/cloud.profiles.d/ and create a file called <provider>.profiles.conf, replacing <provider> with ec2, softlayer, and so on. The file must end in .conf.

You can now add any custom profiles you’d like to define to this file. Here are a few examples:

```yaml
micro_ec2:
  provider: my-ec2
  image: ami-d514f291
  size: t1.micro

medium_ec2:
  provider: my-ec2
  image: ami-d514f291
  size: m3.medium

large_ec2:
  provider: my-ec2
  image: ami-d514f291
  size: m3.large
```

Notice that the provider in our profile matches the provider name that we defined? That is how Salt Cloud knows how to connect to create a VM with these attributes.

24.1.4 Create VMs

VMs are created by calling salt-cloud with the following options:

```
salt-cloud -p <profile> <name1> <name2> ...
```

For example:

```
salt-cloud -p micro_ec2 minion1 minion2
```

24.1.5 Destroy VMs

Add a -d and the minion name you provided to destroy:

```
salt-cloud -d minion1 minion2
```

24.1.6 Query VMs

You can view details about the VMs you’ve created using --query:
24.2 Using Salt Cloud

24.2.1 salt-cloud

Provision virtual machines in the cloud with Salt

Synopsis

salt-cloud -m /etc/salt/cloud.map
salt-cloud -m /etc/salt/cloud.map NAME
salt-cloud -m /etc/salt/cloud.map NAME1 NAME2
salt-cloud -p PROFILE NAME
salt-cloud -p PROFILE NAME1 NAME2 NAME3 NAME4 NAME5 NAME6

Description

Salt Cloud is the system used to provision virtual machines on various public clouds via a cleanly controlled profile and mapping system.

Options

--version
Print the version of Salt that is running.

--versions-report
Show program's dependencies and version number, and then exit

-h, --help
Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

Execution Options

-L LOCATION, --location=LOCATION
Specify which region to connect to.

-a ACTION, --action=ACTION
Perform an action that may be specific to this cloud provider. This argument requires one or more instance names to be specified.
-f <FUNC-NAME> <PROVIDER>, --function=<FUNC-NAME> <PROVIDER>
    Perform an function that may be specific to this cloud provider, that does not apply to an instance. This argument requires a provider to be specified (i.e.: nova).

-p PROFILE, --profile=PROFILE
    Select a single profile to build the named cloud VMs from. The profile must be defined in the specified profiles file.

-m MAP, --map=MAP
    Specify a map file to use. If used without any other options, this option will ensure that all of the mapped VMs are created. If the named VM already exists then it will be skipped.

-H, --hard
    When specifying a map file, the default behavior is to ensure that all of the VMs specified in the map file are created. If the --hard option is set, then any VMs that exist on configured cloud providers that are not specified in the map file will be destroyed. Be advised that this can be a destructive operation and should be used with care.

-d, --destroy
    Pass in the name(s) of VMs to destroy, salt-cloud will search the configured cloud providers for the specified names and destroy the VMs. Be advised that this is a destructive operation and should be used with care. Can be used in conjunction with the -m option to specify a map of VMs to be deleted.

-P, --parallel
    Normally when building many cloud VMs they are executed serially. The -P option will run each cloud vm build in a separate process allowing for large groups of VMs to be build at once.

Be advised that some cloud provider’s systems don’t seem to be well suited for this influx of vm creation. When creating large groups of VMs watch the cloud provider carefully.

-u, --update-bootstrap
    Update salt-bootstrap to the latest develop version on GitHub.

-y, --assume-yes
    Default yes in answer to all confirmation questions.

-k, --keep-tmp
    Do not remove files from /tmp/ after deploy.sh finishes.

--show-deploy-args
    Include the options used to deploy the minion in the data returned.

--script-args=SCRIPT_ARGS
    Script arguments to be fed to the bootstrap script when deploying the VM.

Query Options

-Q, --query
    Execute a query and return some information about the nodes running on configured cloud providers.

-F, --full-query
    Execute a query and print out all available information about all cloud VMs. Can be used in conjunction with -m to display only information about the specified map.

-S, --select-query
    Execute a query and print out selected information about all cloud VMs. Can be used in conjunction with -m to display only information about the specified map.

--list-providers
    Display a list of configured providers.
**--list-profiles**

New in version 2014.7.0.

Display a list of configured profiles. Pass in a cloud provider to view the provider's associated profiles, such as `digital_ocean`, or pass `all` to list all the configured profiles.

**Cloud Providers Listings**

**--list-locations=LIST_LOCATIONS**

Display a list of locations available in configured cloud providers. Pass the cloud provider that available locations are desired on, aka `linode`, or pass `all` to list locations for all configured cloud providers

**--list-images=LIST_IMAGES**

Display a list of images available in configured cloud providers. Pass the cloud provider that available images are desired on, aka `linode`, or pass `all` to list images for all configured cloud providers

**--list-sizes=LIST_SIZES**

Display a list of sizes available in configured cloud providers. Pass the cloud provider that available sizes are desired on, aka `AWS`, or pass `all` to list sizes for all configured cloud providers

**Cloud Credentials**

**--set-password=<USERNAME> <PROVIDER>**

Configure password for a cloud provider and save it to the keyring. PROVIDER can be specified with or without a driver, for example: `--set-password bob rackspace`` or more specific `--set-password bob rackspace:openstack`` DEPRECATED!

**Output Options**

**--out**

Pass in an alternative outputer to display the return of data. This outputer can be any of the available outputers:

```
grains, highstate, json, key, overstatestage, pprint, raw, txt, yaml```

Some outputers are formatted only for data returned from specific functions; for instance, the `grains` outputer will not work for non-grains data.

If an outputer is used that does not support the data passed into it, then Salt will fall back on the `pprint` outputer and display the return data using the Python `pprint` standard library module.

**Note:** If using `--out=json`, you will probably want `--static` as well. Without the static option, you will get a separate JSON string per minion which makes JSON output invalid as a whole. This is due to using an iterative outputer. So if you want to feed it to a JSON parser, use `--static` as well.

**--out-indent** OUTPUT_INDENT, **--output-indent** OUTPUT_INDENT

Print the output indented by the provided value in spaces. Negative values disable indentation. Only applicable in outputers that support indentation.

**--out-file=OUTPUT_FILE, --output-file=OUTPUT_FILE**

Write the output to the specified file.

**--no-color**

Disable all colored output
--force-color
Force colored output

Note: When using colored output the color codes are as follows:
green denotes success, red denotes failure, blue denotes changes and success and yellow denotes a
expected future change in configuration.

Examples

To create 4 VMs named web1, web2, db1, and db2 from specified profiles:

```
salt-cloud -p fedora_rackspace web1 web2 db1 db2
```

To read in a map file and create all VMs specified therein:

```
salt-cloud -m /path/to/cloud.map
```

To read in a map file and create all VMs specified therein in parallel:

```
salt-cloud -m /path/to/cloud.map -P
```

To delete any VMs specified in the map file:

```
salt-cloud -m /path/to/cloud.map -d
```

To delete any VMs NOT specified in the map file:

```
salt-cloud -m /path/to/cloud.map -H
```

To display the status of all VMs specified in the map file:

```
salt-cloud -m /path/to/cloud.map -Q
```

See also

salt-cloud(7) salt(7) salt-master(1) salt-minion(1)

24.2.2 Salt Cloud basic usage

Salt Cloud needs, at least, one configured Provider and Profile to be functional.

Creating a VM

To create a VM with salt cloud, use command:

```
salt-cloud -p <profile> name_of_vm
```

Assuming there is a profile configured as following:

```
fedora_rackspace:
    provider: my-rackspace-config
    image: Fedora 17
    size: 256 server
    script: bootstrap-salt
```
Then, the command to create new VM named `fedora_http_01` is:

```bash
salt-cloud -p fedora_rackspace fedora_http_01
```

Destroying a VM

To destroy a created-by-salt-cloud VM, use command:

```bash
salt-cloud -d name_of_vm
```

For example, to delete the VM created on above example, use:

```bash
salt-cloud -d fedora_http_01
```

### 24.2.3 VM Profiles

Salt cloud designates virtual machines inside the profile configuration file. The profile configuration file defaults to `/etc/salt/cloud.profiles` and is a yaml configuration. The syntax for declaring profiles is simple:

```yaml
fedora_rackspace:
    provider: my-rackspace-config
    image: Fedora 17
    size: 256 server
    script: bootstrap-salt
```

It should be noted that the `script` option defaults to `bootstrap-salt`, and does not normally need to be specified. Further examples in this document will not show the `script` option.

A few key pieces of information need to be declared and can change based on the cloud provider. A number of additional parameters can also be inserted:

```yaml
centos_rackspace:
    provider: my-rackspace-config
    image: CentOS 6.2
    size: 1024 server
    minion:
        master: salt.example.com
        append_domain: webs.example.com
        grains:
            role: webserver
```

The image must be selected from available images. Similarly, sizes must be selected from the list of sizes. To get a list of available images and sizes use the following command:

```bash
salt-cloud --list-images openstack
salt-cloud --list-sizes openstack
```

Some parameters can be specified in the main Salt cloud configuration file and then are applied to all cloud profiles. For instance if only a single cloud provider is being used then the provider option can be declared in the Salt cloud configuration file.

### Multiple Configuration Files

In addition to `/etc/salt/cloud.profiles`, profiles can also be specified in any file matching `cloud.profiles.d/*conf` which is a sub-directory relative to the profiles configuration file(with the above
configuration file as an example, /etc/salt/cloud.profiles.d/*.*conf). This allows for more extensible configuration, and plays nicely with various configuration management tools as well as version control systems.

**Larger Example**

```
rhel_ec2:
  provider: my-ec2-config
  image: ami-e565ba8c
  size: t1.micro
  minion:
    cheese: edam

ubuntu_ec2:
  provider: my-ec2-config
  image: ami-7e2da54e
  size: t1.micro
  minion:
    cheese: edam

ubuntu_rackspace:
  provider: my-rackspace-config
  image: Ubuntu 12.04 LTS
  size: 256 server
  minion:
    cheese: edam

fedora_rackspace:
  provider: my-rackspace-config
  image: Fedora 17
  size: 256 server
  minion:
    cheese: edam

cent_linode:
  provider: my-linode-config
  image: CentOS 6.2 64bit
  size: Linode 512

cent_gogrid:
  provider: my-gogrid-config
  image: 12834
  size: 512MB

cent_joyent:
  provider: my-joyent-config
  image: centos-6
  size: Small 1GB
```

### 24.2.4 Cloud Map File

A number of options exist when creating virtual machines. They can be managed directly from profiles and the command line execution, or a more complex map file can be created. The map file allows for a number of virtual machines to be created and associated with specific profiles.

Map files have a simple format, specify a profile and then a list of virtual machines to make from said profile:
This map file can then be called to roll out all of these virtual machines. Map files are called from the salt-cloud command with the -m option:

```bash
$ salt-cloud -m /path/to/mapfile
```

Remember, that as with direct profile provisioning the -P option can be passed to create the virtual machines in parallel:

```bash
$ salt-cloud -m /path/to/mapfile -P
```

**Note:** Due to limitations in the GoGrid API, instances cannot be provisioned in parallel with the GoGrid driver. Map files will work with GoGrid, but the -P argument should not be used on maps referencing GoGrid instances.

A map file can also be enforced to represent the total state of a cloud deployment by using the --hard option. When using the hard option any vms that exist but are not specified in the map file will be destroyed:

```bash
$ salt-cloud -m /path/to/mapfile -P -H
```

Be careful with this argument, it is very dangerous! In fact, it is so dangerous that in order to use it, you must explicitly enable it in the main configuration file.

```
enable_hard_maps: True
```

A map file can include grains and minion configuration options:

```
fedora_small:
- web1:
  minion:
    log_level: debug
  grains:
    cheese: tasty
    omelet: du fromage
- web2:
  minion:
    log_level: warn
  grains:
    cheese: more tasty
    omelet: with peppers
```

A map file may also be used with the various query options:

```bash
$ salt-cloud -m /path/to/mapfile -Q

{'ec2': {'web1': {'id': 'i-e6aqfegb',
  'image': None,
  'private_ips': []},
```
```python

'public_ips': [],
'size': None,
'state': 0},
'web2': {'Absent'}}

...or with the delete option:

```
$ salt-cloud -m /path/to/mapfile -d
```

The following virtual machines are set to be destroyed:

```
web1
web2
```

Proceed? [N/y]

**Warning**: Specifying Nodes with Maps on the Command Line

Specifying the name of a node or nodes with the maps options on the command line is not supported. This is especially important to remember when using `--destroy` with maps; `salt-cloud` will ignore any arguments passed in which are not directly relevant to the map file. *When using `--destroy` with a map, every node in the map file will be deleted!* Maps don’t provide any useful information for destroying individual nodes, and should not be used to destroy a subset of a map.

### Setting up New Salt Masters

Bootstrapping a new master in the map is as simple as:

```yaml
fedora_small:
  - web1:
    make_master: True
  - web2
  - web3
```

Notice that **ALL** bootstrapped minions from the map will answer to the newly created salt-master.

To make any of the bootstrapped minions answer to the bootstrapping salt-master as opposed to the newly created salt-master, as an example:

```yaml
fedora_small:
  - web1:
    make_master: True
    minion:
      master: <the local master ip address>
      local_master: True
  - web2
  - web3
```

The above says the minion running on the newly created salt-master responds to the local master, ie, the master used to bootstrap these VMs.

Another example:

```yaml
fedora_small:
  - web1:
    make_master: True
  - web2
  - web3:
    minion:
      master: <the local master ip address>
      local_master: True
```
The above example makes the web3 minion answer to the local master, not the newly created master.

### 24.2.5 Cloud Actions

Once a VM has been created, there are a number of actions that can be performed on it. The "reboot" action can be used across all providers, but all other actions are specific to the cloud provider. In order to perform an action, you may specify it from the command line, including the name(s) of the VM to perform the action on:

```
$ salt-cloud -a reboot vm_name
$ salt-cloud -a reboot vm1 vm2 vm2
```

Or you may specify a map which includes all VMs to perform the action on:

```
$ salt-cloud -a reboot -m /path/to/mapfile
```

The following is a list of actions currently supported by salt-cloud:

<table>
<thead>
<tr>
<th>Provider</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>reboot</td>
</tr>
<tr>
<td>EC2</td>
<td>start, stop</td>
</tr>
<tr>
<td>Joyent</td>
<td>stop</td>
</tr>
<tr>
<td>Linode</td>
<td>start, stop</td>
</tr>
</tbody>
</table>

Another useful reference for viewing more salt-cloud actions is the [Salt Cloud Feature Matrix](salt-cloud-feature-matrix).

### 24.2.6 Cloud Functions

Cloud functions work much the same way as cloud actions, except that they don't perform an operation on a specific instance, and so do not need a machine name to be specified. However, since they perform an operation on a specific cloud provider, that provider must be specified.

```
$ salt-cloud -f show_image ec2 image=ami-fd20ad94
```

There are three universal salt-cloud functions that are extremely useful for gathering information about instances on a provider basis:

- **list_nodes**: Returns some general information about the instances for the given provider.
- **list_nodes_full**: Returns all information about the instances for the given provider.
- **list_nodes_select**: Returns select information about the instances for the given provider.

```
$ salt-cloud -f list_nodes linode
$ salt-cloud -f list_nodes_full linode
$ salt-cloud -f list_nodes_select linode
```

Another useful reference for viewing salt-cloud functions is the [Salt Cloud Feature Matrix](salt-cloud-feature-matrix).
24.3 Core Configuration

24.3.1 Install Salt Cloud

Salt Cloud is now part of Salt proper. It was merged in as of Salt version 2014.1.0.

On Ubuntu, install Salt Cloud by using following command:

```bash
sudo add-apt-repository ppa:saltstack/salt
sudo apt-get update
sudo apt-get install salt-cloud
```

If using Salt Cloud on OS X, `curl-ca-bundle` must be installed. Presently, this package is not available via `brew`, but it is available using MacPorts:

```bash
sudo port install curl-ca-bundle
```

Salt Cloud depends on `apache-libcloud`. Libcloud can be installed via `pip` with `pip install apache-libcloud`.

Installing Salt Cloud for development

Installing Salt for development enables Salt Cloud development as well, just make sure `apache-libcloud` is installed as per above paragraph.

See these instructions: Installing Salt for development.

24.3.2 Core Configuration

A number of core configuration options and some options that are global to the VM profiles can be set in the cloud configuration file. By default this file is located at `/etc/salt/cloud`.

**Thread Pool Size**

When salt cloud is operating in parallel mode via the `-P` argument, you can control the thread pool size by specifying the `pool_size` parameter with a positive integer value.

By default, the thread pool size will be set to the number of VMs that salt cloud is operating on.

```yaml
pool_size: 10
```

**Minion Configuration**

The default minion configuration is set up in this file. Minions created by salt-cloud derive their configuration from this file. Almost all parameters found in Configuring the Salt Minion can be used here.

```yaml
minion:
  master: saltmaster.example.com
```

In particular, this is the location to specify the location of the salt master and its listening port, if the port is not set to the default.
Cloud Configuration Syntax

The data specific to interacting with public clouds is set up here.

Cloud provider configuration settings can live in several places. The first is in /etc/salt/cloud:

```bash
# /etc/salt/cloud
providers:
  my-aws-migrated-config:
    id: HJGRYCILJKJYG
    key: kdjgfsgm;woormgl/aserigjksjhasdfgn
    keyname: test
    securitygroup: quick-start
    private_key: /root/test.pem
    driver: ec2
```

Cloud provider configuration data can also be housed in /etc/salt/cloud.providers or any file matching /etc/salt/cloud.providers.d/*.conf. All files in any of these locations will be parsed for cloud provider data.

Using the example configuration above:

```bash
# /etc/salt/cloud.providers
# or could be /etc/salt/cloud.providers.d/*.conf
my-aws-config:
  id: HJGRYCILJKJYG
  key: kdjgfsgm;woormgl/aserigjksjhasdfgn
  keyname: test
  securitygroup: quick-start
  private_key: /root/test.pem
  driver: ec2
```

**Note:** Salt Cloud provider configurations within /etc/cloud.provider.d/ should not specify the `providers` starting key.

It is also possible to have multiple cloud configuration blocks within the same alias block. For example:

```bash
production-config:
  - id: HJGRYCILJKJYG
    key: kdjgfsgm;woormgl/aserigjksjhasdfgn
    keyname: test
    securitygroup: quick-start
    private_key: /root/test.pem
    driver: ec2

  - user: example_user
    apikey: 123984bjjas87034
    driver: rackspace
```

However, using this configuration method requires a change with profile configuration blocks. The provider alias needs to have the provider key value appended as in the following example:

```bash
rhel_aws_dev:
  provider: production-config:ec2
  image: ami-e565ba8c
  size: t1.micro

rhel_aws_prod:
  provider: production-config:ec2
```

24.3. Core Configuration 263
Notice that because of the multiple entries, one has to be explicit about the provider alias and name, from the above example, `production-config: ec2`.

This data interacts with the `salt-cloud` binary regarding its `--list-location`, `--list-images`, and `--list-sizes` which needs a cloud provider as an argument. The argument used should be the configured cloud provider alias. If the provider alias has multiple entries, `<provider-alias>`: `<provider-name>` should be used.

To allow for a more extensible configuration, `--providers-config`, which defaults to `/etc/salt/cloud.providers`, was added to the cli parser. It allows for the providers’ configuration to be added on a per-file basis.

**Pillar Configuration**

It is possible to configure cloud providers using pillars. This is only used when inside the cloud module. You can setup a variable called `cloud` that contains your profile and provider to pass that information to the cloud servers instead of having to copy the full configuration to every minion. In your pillar file, you would use something like this:

```yaml
cloud:
  ssh_key_name: saltstack
  ssh_key_file: /root/.ssh/id_rsa
  update_cachedir: True
  diff_cache_events: True
  change_password: True

providers:
  my-nova:
    identity_url: https://identity.api.rackspacecloud.com/v2.0/
    compute_region: IAD
    user: myuser
    api_key: apikey
    tenant: 123456
    driver: nova

  my-openstack:
    identity_url: https://identity.api.rackspacecloud.com/v2.0/tokens
    user: user2
    apikey: apikey2
    tenant: 654321
    compute_region: DFW
    driver: openstack
    compute_name: cloudServersOpenStack

profiles:
  ubuntu-nova:
    provider: my-nova
    size: performance1-8
    image: bb02b1a3-bc77-4d17-ab5b-421d89850fca
```
Cloud Configurations

Scaleway

To use Salt Cloud with Scaleway, you need to get an access key and an API token. API tokens are unique identifiers associated with your Scaleway account. To retrieve your access key and API token, log-in to the Scaleway control panel, open the pull-down menu on your account name and click on "My Credentials" link.

If you do not have API token you can create one by clicking the "Create New Token" button on the right corner.

my-scaleway-config:
  access_key: 15cf404d-4560-41b1-9a0c-21c3d5c4ff1f
  token: a7347ec8-5de1-4024-a5e3-24b77d1ba91d
  driver: scaleway

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be provider: my-scaleway-config.

Rackspace

Rackspace cloud requires two configuration options; a user and an apikey:

my-rackspace-config:
  user: example_user
  apikey: 123984bjjas87034
  driver: rackspace

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be provider: my-rackspace-config.

Amazon AWS

A number of configuration options are required for Amazon AWS including id, key, keyname, security-group, and private_key:

my-aws-quick-start:
  id: HJGRYCILLJLKJVG
  key: 'kdjgfsmg;woormgl/aserigjksjdhhasdfgn'
  keyname: test
  securitygroup: quick-start
  private_key: /root/test.pem
  driver: ec2
my-aws-default:
  id: HJGRYCILJLKJYG
  key: 'kdjgfsmg;woormgl/aserigjksjdhasdfgn'
  keyname: test
  securitygroup: default
  private_key: /root/test.pem
  driver: ec2

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be either provider: my-aws-quick-start or provider: my-aws-default.

Linode

Linode requires a single API key, but the default root password also needs to be set:

my-linode-config:
  apikey: asldkgfakl;sdfjsjaslfjaklsdjf;askldjfaaksjdflhsalsdfgfhdfk
  password: F00barbaz
  ssh_pubkey: ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAIAIKHEOLLbeXgaqRQT9NBAopVz366SdYc0KKX33WAnq+2R user@host
  ssh_key_file: ~/.ssh/id_ed25519
  driver: linode

The password needs to be 8 characters and contain lowercase, uppercase, and numbers.

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be provider: my-linode-config

Joyent Cloud

The Joyent cloud requires three configuration parameters: The username and password that are used to log into the Joyent system, as well as the location of the private SSH key associated with the Joyent account. The SSH key is needed to send the provisioning commands up to the freshly created virtual machine.

my-joyent-config:
  user: fred
  password: saltybacon
  private_key: /root/joyent.pem
  driver: joyent

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be provider: my-joyent-config

GoGrid

To use Salt Cloud with GoGrid, log into the GoGrid web interface and create an API key. Do this by clicking on "My Account" and then going to the API Keys tab.

The apikey and the sharedsecret configuration parameters need to be set in the configuration file to enable interfacing with GoGrid:
my-gogrid-config:
  apikey: asdff7896asdh789
  sharedsecret: saltybacon
  driver: gogrid

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be provider: my-gogrid-config.

OpenStack

OpenStack configuration differs between providers, and at the moment several options need to be specified. This module has been officially tested against the HP and the Rackspace implementations, and some examples are provided for both.

# For HP
my-openstack-hp-config:
  compute_name: Compute
  compute_region: 'az-1.region-a.geo-1'
  tenant: myuser-tenant1
  user: myuser
  ssh_key_name: mykey
  ssh_key_file: '/etc/salt/hpcloud/mykey.pem'
  password: mypass
  driver: openstack

# For Rackspace
my-openstack-rackspace-config:
  identity_url: 'https://identity.api.rackspacecloud.com/v2.0/tokens'
  compute_name: cloudServersOpenStack
  protocol: ipv4
  compute_region: DFW
  protocol: ipv4
  user: myuser
  tenant: 5555555
  password: mypass
  driver: openstack

If you have an API key for your provider, it may be specified instead of a password:

my-openstack-hp-config:
  apikey: 901d3f579h23c8v73q9

my-openstack-rackspace-config:
  apikey: 901d3f579h23c8v73q9

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be either provider: my-openstack-hp-config or provider: my-openstack-rackspace-config.

You will certainly need to configure the user, tenant, and either password or apikey.

If your OpenStack instances only have private IP addresses and a CIDR range of private addresses are not reachable from the salt-master, you may set your preference to have Salt ignore it.
my-openstack-config:
  ignore_cidr: 192.168.0.0/16

For in-house OpenStack Essex installation, libcloud needs the service_type:

my-openstack-config:
  identity_url: 'http://control.openstack.example.org:5000/v2.0/
  compute_name : Compute Service
  service_type : compute

DigitalOcean

Using Salt for DigitalOcean requires a client_key and an api_key. These can be found in the DigitalOcean web interface, in the ```My Settings``` section, under the API Access tab.

my-digitalocean-config:
  driver: digital_ocean
  personal_access_token: xxx
  location: New York 1

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be 
  ```provider: my-digital-ocean-config```.

Parallels

Using Salt with Parallels requires a user, password and URL. These can be obtained from your cloud provider.

my-parallels-config:
  user: myuser
  password: xyzzy
  url: https://api.cloud.xmission.com:4465/paci/v1.0/
  driver: parallels

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be 
  ```provider: my-parallels-config```.

Proxmox

Using Salt with Proxmox requires a user, password, and URL. These can be obtained from your cloud host. Both 
PAM and PVE users can be used.

my-proxmox-config:
  driver: proxmox
  user: saltcloud@pve
  password: xyzzy
  url: your.proxmox.host

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be 
  ```provider: my-proxmox-config```.
LXC

The lxc driver uses saltify to install salt and attach the lxc container as a new lxc minion. As soon as we can, we manage baremetal operation over SSH. You can also destroy those containers via this driver.

```
devhost10-lxc:
  target: devhost10
  driver: lxc
```

And in the map file:

```
devhost10-lxc:
  provider: devhost10-lxc
  from_container: ubuntu
  backing: lvm
  sudo: True
  size: 3g
  ip: 10.0.3.9
  minion:
    master: 10.5.0.1
    master_port: 4506
  lxc_conf:
    - lxc.utsname: superlxc
```

Note: In the cloud profile that uses this provider configuration, the syntax for the provider required field would be `provider: devhost10-lxc`.

Saltify

The Saltify driver is a new, experimental driver designed to install Salt on a remote machine, virtual or bare metal, using SSH. This driver is useful for provisioning machines which are already installed, but not Salted. For more information about using this driver and for configuration examples, please see the Getting Started with Saltify documentation.

Extending Profiles and Cloud Providers Configuration

As of 0.8.7, the option to extend both the profiles and cloud providers configuration and avoid duplication was added. The extends feature works on the current profiles configuration, but, regarding the cloud providers configuration, only works in the new syntax and respective configuration files, i.e. `/etc/salt/salt/cloud.providers` or `/etc/salt/cloud.providers.d/*.conf`.

Note: Extending cloud profiles and providers is not recursive. For example, a profile that is extended by a second profile is possible, but the second profile cannot be extended by a third profile.

Also, if a profile (or provider) is extending another profile and each contains a list of values, the lists from the extending profile will override the list from the original profile. The lists are not merged together.

Extending Profiles

Some example usage on how to use `extends` with profiles. Consider `/etc/salt/salt/cloud.profiles` containing:
development-instances:
  provider: my-ec2-config
  size: t1.micro
  ssh_username: ec2_user
  securitygroup:
    - default
  deploy: False

Amazon-Linux-AMI-2012.09-64bit:
  image: ami-54cf5c3d
  extends: development-instances

Fedora-17:
  image: ami-08d97e61
  extends: development-instances

CentOS-5:
  provider: my-aws-config
  image: ami-09b61d60
  extends: development-instances

The above configuration, once parsed would generate the following profiles data:

```json
[{
  'deploy': False,
  'image': 'ami-08d97e61',
  'profile': 'Fedora-17',
  'provider': 'my-ec2-config',
  'securitygroup': ['default'],
  'size': 't1.micro',
  'ssh_username': 'ec2_user'},
{
  'deploy': False,
  'image': 'ami-09b61d60',
  'profile': 'CentOS-5',
  'provider': 'my-aws-config',
  'securitygroup': ['default'],
  'size': 't1.micro',
  'ssh_username': 'ec2_user'},
{
  'deploy': False,
  'image': 'ami-54cf5c3d',
  'profile': 'Amazon-Linux-AMI-2012.09-64bit',
  'provider': 'my-ec2-config',
  'securitygroup': ['default'],
  'size': 't1.micro',
  'ssh_username': 'ec2_user'},
{
  'deploy': False,
  'profile': 'development-instances',
  'provider': 'my-ec2-config',
  'securitygroup': ['default'],
  'size': 't1.micro',
  'ssh_username': 'ec2_user']
```

Pretty cool right?

## Extending Providers

Some example usage on how to use `extends` within the cloud providers configuration. Consider `/etc/salt/salt/cloud.providers` containing:
my-develop-envs:
- id: HJGRYCIILJKJYG
  key: 'kdjgfsgm;woormgl/aserigksjdhasdfgn'
  keyname: test
  securitygroup: quick-start
  private_key: /root/test.pem
  location: ap-southeast-1
  availability_zone: ap-southeast-1b
  driver: ec2
- user: myuser@mycorp.com
  password: mypass
  ssh_key_name: mykey
  ssh_key_file: '/etc/salt/ibm/mykey.pem'
  location: Raleigh
  driver: ibmsce

my-productions-envs:
- extends: my-develop-envs:ibmsce
  user: my-production-user@mycorp.com
  location: us-east-1
  availability_zone: us-east-1

The above configuration, once parsed would generate the following providers data:

```python
'providers': {
    'my-develop-envs': [
        {'availability_zone': 'ap-southeast-1b',
         'id': 'HJGRYCIILJKJYG',
         'key': 'kdjgfsgm;woormgl/aserigksjdhasdfgn',
         'keyname': 'test',
         'location': 'ap-southeast-1',
         'private_key': '/root/test.pem',
         'driver': 'aws',
         'securitygroup': 'quick-start'},
        {'location': 'Raleigh',
         'password': 'mypass',
         'driver': 'ibmsce',
         'ssh_key_file': '/etc/salt/ibm/mykey.pem',
         'ssh_key_name': 'mykey',
         'user': 'myuser@mycorp.com'},
    ],
    'my-productions-envs': [
        {'availability_zone': 'us-east-1',
         'location': 'us-east-1',
         'password': 'mypass',
         'driver': 'ibmsce',
         'ssh_key_file': '/etc/salt/ibm/mykey.pem',
         'ssh_key_name': 'mykey',
         'user': 'my-production-user@mycorp.com'}
    ]
}
```
24.4 Windows Configuration

24.4.1 Spinning up Windows Minions

It is possible to use Salt Cloud to spin up Windows instances, and then install Salt on them. This functionality is available on all cloud providers that are supported by Salt Cloud. However, it may not necessarily be available on all Windows images.

Requirements

Salt Cloud makes use of `impacket` and `winexe` to set up the Windows Salt Minion installer.

`impacket` is usually available as either the `impacket` or the `python-impacket` package, depending on the distribution. More information on `impacket` can be found at the project home:

- `impacket` project home

`winexe` is less commonly available in distribution-specific repositories. However, it is currently being built for various distributions in 3rd party channels:

- RPMs at phone.net
- OpenSuse Build Service

Optionally WinRM can be used instead of `winexe` if the python module `pywinrm` is available and WinRM is supported on the target Windows version. Information on `pywinrm` can be found at the project home:

- `pywinrm` project home

Additionally, a copy of the Salt Minion Windows installer must be present on the system on which Salt Cloud is running. This installer may be downloaded from saltstack.com:

- SaltStack Download Area

Firewall Settings

Because Salt Cloud makes use of `smbclient` and `winexe`, port 445 must be open on the target image. This port is not generally open by default on a standard Windows distribution, and care must be taken to use an image in which this port is open, or the Windows firewall is disabled.

If supported by the cloud provider, a PowerShell script may be used to open up this port automatically, using the cloud provider’s `userdata`. The following script would open up port 445, and apply the changes:

```powershell
New-NetFirewallRule -Name "SMB445" -DisplayName "SMB445" -Protocol TCP -LocalPort 445
Set-Item (dir wsman:\localhost\Listener\*\Port -Recurse).pspath 445 -Force
Restart-Service winrm
</powershell>
```

For EC2, this script may be saved as a file, and specified in the provider or profile configuration as `userdata_file`. For instance:

```
userdata_file: /etc/salt/windows-firewall.ps1
```
Configuration

Configuration is set as usual, with some extra configuration settings. The location of the Windows installer on the machine that Salt Cloud is running on must be specified. This may be done in any of the regular configuration files (main, providers, profiles, maps). For example:

Setting the installer in `/etc/salt/cloud.providers`:

```
my-softlayer:
    driver: softlayer
    user: MYUSER1138
    apikey: 'e3b68aa711e6deadc62d5b76355674beef7cc3116062ddbaa6e5f7e4655bdfdc9'
    minion:
        master: saltmaster.example.com
    win_installer: /root/Salt-Minion-2014.7.0-AMD64-Setup.exe
    win_username: Administrator
    win_password: letmein
    smb_port: 445
```

The default Windows user is *Administrator*, and the default Windows password is blank.

If WinRM is to be used `use_winrm` needs to be set to *True*.

Auto-Generated Passwords on EC2

On EC2, when the `win_password` is set to *auto*, Salt Cloud will query EC2 for an auto-generated password. This password is expected to take at least 4 minutes to generate, adding additional time to the deploy process.

When the EC2 API is queried for the auto-generated password, it will be returned in a message encrypted with the specified `keyname`. This requires that the appropriate `private_key` file is also specified. Such a profile configuration might look like:

```
windows-server-2012:
    provider: my-ec2-config
    image: ami-c49c0dac
    size: m1.small
    securitygroup: windows
    keyname: mykey
    private_key: /root/mykey.pem
    userdata_file: /etc/salt/windows-firewall.ps1
    win_installer: /root/Salt-Minion-2014.7.0-AMD64-Setup.exe
    win_username: Administrator
    win_password: auto
```

24.5 Cloud Provider Specifics

24.5.1 Getting Started With Aliyun ECS

The Aliyun ECS (Elastic Computer Service) is one of the most popular public cloud hosts in China. This cloud host can be used to manage aliyun instance using salt-cloud.

http://www.aliyun.com/
Dependencies

This driver requires the Python requests library to be installed.

Configuration

Using Salt for Aliyun ECS requires aliyun access key id and key secret. These can be found in the aliyun web interface, in the `User Center` section, under `My Service` tab.

```
# Note: This example is for /etc/salt/cloud.providers or any file in the
# /etc/salt/cloud.providers.d/ directory.

my-aliyun-config:
  # aliyun Access Key ID
  id: wDGzWregedg3435gDgxd
  # aliyun Access Key Secret
  key: GDd45t43RDBTrkkkg43934t34qT43t4dgegerGEgg
  location: cn-qingdao
  driver: aliyun
```

**Note:** Changed in version 2015.8.0.

The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

Profiles

Cloud Profiles

Set up an initial profile at `/etc/salt/cloud.profiles` or in the `/etc/salt/cloud.profiles.d/` directory:

```
aliyun_centos:
  provider: my-aliyun-config
  size: ecs.t1.small
  location: cn-qingdao
  securitygroup: G1989096784427999
  image: centos6u3_64_20G_aliaegis_20130816.vhd
```

Sizes can be obtained using the `--list-sizes` option for the `salt-cloud` command:

```
# salt-cloud --list-sizes my-aliyun-config
my-aliyun-config:
  --------
  aliyun:
  --------
  ecs.c1.large:
  ---------
  CpuCoreCount:
  8
  InstanceTypeId:
  ecs.c1.large
  MemorySize:
```

Chapter 24. Salt Cloud
Images can be obtained using the `--list-images` option for the `salt-cloud` command:

```bash
# salt-cloud --list-images my-aliyun-config
my-aliyun-config:
    ---------
    aliyun:
    ---------
    centos5u8_64_20G_aliaegis_20131231.vhd:
    ---------
    Architecture: x86_64
    Description:
    ImageId: centos5u8_64_20G_aliaegis_20131231.vhd
    ImageName: CentOS 5.8 64
    ImageOwnerAlias: system
    ImageVersion: 1.0
    OSName: CentOS 5.8 64
    Platform: CENTOS5
    Size: 20
    Visibility: public
```

Locations can be obtained using the `--list-locations` option for the `salt-cloud` command:

```bash
my-aliyun-config:
    ---------
    aliyun:
    ---------
    cn-beijing:
    ---------
    LocalName: 
    RegionId: cn-beijing
    cn-hangzhou:
    ---------
    LocalName: 
    RegionId: cn-hangzhou
    cn-hongkong:
    ---------
    LocalName: 
    RegionId: cn-hongkong
```
cn-qingdao:
    --------
    LocalName: cn-qingdao
    RegionId: cn-qingdao

Security Group can be obtained using the `-f list_securitygroup` option for the `salt-cloud` command:

```bash
# salt-cloud --location=cn-qingdao -f list_securitygroup my-aliyun-config
my-aliyun-config:
    --------
    aliyun:
        --------
        G1989096784427999:
            --------
            Description: G1989096784427999
            SecurityGroupId: G1989096784427999
```

Note: Aliyun ECS REST API documentation is available from [Aliyun ECS API](http://www.aliyun.com/).

### 24.5.2 Getting Started With Azure

New in version 2014.1.0.

Azure is a cloud service by Microsoft providing virtual machines, SQL services, media services, and more. This document describes how to use Salt Cloud to create a virtual machine on Azure, with Salt installed.


**Dependencies**

- The [Azure Python SDK] >= 0.11.1.
- The `python-requests` library, for Python < 2.7.9.
- A Microsoft Azure account
- OpenSSL (to generate the certificates)
- Salt

**Configuration**

Set up the provider config at `/etc/salt/cloud.providers.d/azure.conf`:

```bash
# Note: This example is for /etc/salt/cloud.providers.d/azure.conf
my-azure-config:
    driver: azure
    subscription_id: 3287abc8-f98a-c678-3bde-326766fd3617
    certificate_path: /etc/salt/azure.pem

    # Set up the location of the salt master
```
```
#
minion:
    master: saltmaster.example.com

# Optional
management_host: management.core.windows.net
```

The certificate used must be generated by the user. OpenSSL can be used to create the management certificates. Two certificates are needed: a .cer file, which is uploaded to Azure, and a .pem file, which is stored locally.

To create the .pem file, execute the following command:

```bash
openssl req -x509 -nodes -days 365 -newkey rsa:1024 -keyout /etc/salt/azure.pem -out /etc/salt/azure.pem
```

To create the .cer file, execute the following command:

```bash
openssl x509 -inform pem -in /etc/salt/azure.pem -outform der -out /etc/salt/azure.cer
```

After creating these files, the .cer file will need to be uploaded to Azure via the ``Upload a Management Certificate`` action of the ``Management Certificates`` tab within the ``Settings`` section of the management portal.

Optionally, a `management_host` may be configured, if necessary for the region.

**Note:** Changed in version 2015.8.0.

The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

**Cloud Profiles**

Set up an initial profile at `/etc/salt/cloud.profiles`:

```
azure-ubuntu:
    provider: my-azure-config
    image: 'b39f27a8b8c64d52b05eac6a62ebad85__Ubuntu-12_04_3-LTS-amd64-server-20131003-en-us-30GB'
    size: Small
    location: 'East US'
    ssh_username: azureuser
    ssh_password: verybadpass
    slot: production
    media_link: 'http://portalvhdabcdefghijklmn.blob.core.windows.net/vhds'
```

These options are described in more detail below. Once configured, the profile can be realized with a salt command:

```bash
salt-cloud -p azure-ubuntu newinstance
```

This will create an salt minion instance named `newinstance` in Azure. If the command was executed on the salt-master, its Salt key will automatically be signed on the master.

Once the instance has been created with salt-minion installed, connectivity to it can be verified with Salt:

```bash
salt newinstance test.ping
```
Profile Options

The following options are currently available for Azure.

**provider**

The name of the provider as configured in `/etc/salt/cloud.providers.d/azure.conf`.

**image**

The name of the image to use to create a VM. Available images can be viewed using the following command:

```
salt-cloud --list-images my-azure-config
```

**size**

The name of the size to use to create a VM. Available sizes can be viewed using the following command:

```
salt-cloud --list-sizes my-azure-config
```

**location**

The name of the location to create a VM in. Available locations can be viewed using the following command:

```
salt-cloud --list-locations my-azure-config
```

**affinity_group**

The name of the affinity group to create a VM in. Either a location or an affinity_group may be specified, but not both. See Affinity Groups below.

**ssh_username**

The user to use to log into the newly-created VM to install Salt.

**ssh_password**

The password to use to log into the newly-created VM to install Salt.

**slot**

The environment to which the hosted service is deployed. Valid values are staging or production. When set to production, the resulting URL of the new VM will be `<vm_name>.cloudapp.net`. When set to staging, the resulting URL will contain a generated hash instead.
media_link

This is the URL of the container that will store the disk that this VM uses. Currently, this container must already exist. If a VM has previously been created in the associated account, a container should already exist. In the web interface, go into the Storage area and click one of the available storage selections. Click the Containers link, and then copy the URL from the container that will be used. It generally looks like:

```
http://portalvhdabcdefghijklmnop.blob.core.windows.net/vhds
```

service_name

The name of the service in which to create the VM. If this is not specified, then a service will be created with the same name as the VM.

Show Instance

This action is a thin wrapper around `--full-query`, which displays details on a single instance only. In an environment with several machines, this will save a user from having to sort through all instance data, just to examine a single instance.

```
salt-cloud -a show_instance myinstance
```

Destroying VMs

There are certain options which can be specified in the global cloud configuration file (usually `/etc/salt/cloud`) which affect Salt Cloud’s behavior when a VM is destroyed.

cleanup_disks

New in version 2015.8.0.
Default is `False`. When set to `True`, Salt Cloud will wait for the VM to be destroyed, then attempt to destroy the main disk that is associated with the VM.

cleanup_vhds

New in version 2015.8.0.
Default is `False`. Requires `cleanup_disks` to be set to `True`. When also set to `True`, Salt Cloud will ask Azure to delete the VHD associated with the disk that is also destroyed.

cleanup_services

New in version 2015.8.0.
Default is `False`. Requires `cleanup_disks` to be set to `True`. When also set to `True`, Salt Cloud will wait for the disk to be destroyed, then attempt to remove the service that is associated with the VM. Because the disk belongs to the service, the disk must be destroyed before the service can be.
Managing Hosted Services

New in version 2015.8.0.

An account can have one or more hosted services. A hosted service is required in order to create a VM. However, as mentioned above, if a hosted service is not specified when a VM is created, then one will automatically be created with the name of the name. The following functions are also available.

create_service

Create a hosted service. The following options are available.

name  Required. The name of the hosted service to create.

label  Required. A label to apply to the hosted service.

description  Optional. A longer description of the hosted service.

location  Required, if affinity_group is not set. The location in which to create the hosted service. Either the location or the affinity_group must be set, but not both.

affinity_group  Required, if location is not set. The affinity group in which to create the hosted service. Either the location or the affinity_group must be set, but not both.

extended_properties  Optional. Dictionary containing name/value pairs of hosted service properties. You can have a maximum of 50 extended property name/value pairs. The maximum length of the Name element is 64 characters, only alphanumeric characters and underscores are valid in the Name, and the name must start with a letter. The value has a maximum length of 255 characters.

CLI Example  The following example illustrates creating a hosted service.

```
salt-cloud -f create_service my-azure name=my-service label=my-service location='West US'
```

show_service

Return details about a specific hosted service. Can also be called with get_service.

```
salt-cloud -f show_storage my-azure name=my-service
```

list_services

List all hosted services associates with the subscription.

```
salt-cloud -f list_services my-azure-config
```
**delete_service**

Delete a specific hosted service.

```
salt-cloud -f delete_service my-azure name=my-service
```

**Managing Storage Accounts**

New in version 2015.8.0.

Salt Cloud can manage storage accounts associated with the account. The following functions are available. Deprecated marked as deprecated are marked as such as per the SDK documentation, but are still included for completeness with the SDK.

**create_storage**

Create a storage account. The following options are supported.

- **name**  Required. The name of the storage account to create.
- **label**  Required. A label to apply to the storage account.
- **description**  Optional. A longer description of the storage account.
- **location**  Required, if **affinity_group** is not set. The location in which to create the storage account. Either the **location** or the **affinity_group** must be set, but not both.
- **affinity_group**  Required, if **location** is not set. The affinity group in which to create the storage account. Either the **location** or the **affinity_group** must be set, but not both.
- **extended_properties**  Optional. Dictionary containing name/value pairs of storage account properties. You can have a maximum of 50 extended property name/value pairs. The maximum length of the Name element is 64 characters, only alphanumeric characters and underscores are valid in the Name, and the name must start with a letter. The value has a maximum length of 255 characters.
- **geo_replication_enabled**  Deprecated. Replaced by the **account_type** parameter.
- **account_type**  Specifies whether the account supports locally-redundant storage, geo-redundant storage, zone-redundant storage, or read access geo-redundant storage. Possible values are:
  - Standard_LRS
  - Standard_ZRS
  - Standard_GRS
  - Standard_RAGRS
CLI Example  The following example illustrates creating a storage account.

```
salt-cloud -f create_storage my-azure name=my-storage label=my-storage location='West US'
```

**list_storage**

List all storage accounts associates with the subscription.

```
salt-cloud -f list_storage my-azure-config
```

**show_storage**

Return details about a specific storage account. Can also be called with get_storage.

```
salt-cloud -f show_storage my-azure name=my-storage
```

**update_storage**

Update details concerning a storage account. Any of the options available in create_storage can be used, but the name cannot be changed.

```
salt-cloud -f update_storage my-azure name=my-storage label=my-storage
```

**delete_storage**

Delete a specific storage account.

```
salt-cloud -f delete_storage my-azure name=my-storage
```

**show_storage_keys**

Returns the primary and secondary access keys for the specified storage account.

```
salt-cloud -f show_storage_keys my-azure name=my-storage
```

**regenerate_storage_keys**

Regenerate storage account keys. Requires a key_type (``primary'' or ``secondary'') to be specified.

```
salt-cloud -f regenerate_storage_keys my-azure name=my-storage key_type=primary
```

**Managing Disks**

New in version 2015.8.0.

When a VM is created, a disk will also be created for it. The following functions are available for managing disks. Deprecated marked as deprecated are marked as such as per the SDK documentation, but are still included for completeness with the SDK.
show_disk

Return details about a specific disk. Can also be called with get_disk.

```
salt-cloud -f show_disk my-azure name=my-disk
```

list_disks

List all disks associates with the account.

```
salt-cloud -f list_disks my-azure
```

update_disk

Update details for a disk. The following options are available.

- name  Required. The name of the disk to update.
- has_operating_system  Deprecated.
- label  Required. The label for the disk.
- media_link  Deprecated. The location of the disk in the account, including the storage container that it is in. This should not need to be changed.
- new_name  Deprecated. If renaming the disk, the new name.
- os  Deprecated.

**CLI Example**  The following example illustrates updating a disk.

```
salt-cloud -f update_disk my-azure name=my-disk label=my-disk
```

delete_disk

Delete a specific disk.

```
salt-cloud -f delete_disk my-azure name=my-disk
```

Managing Service Certificates

New in version 2015.8.0.

Stored at the cloud service level, these certificates are used by your deployed services. For more information on service certificates, see the following link:

- Manage Certificates
The following functions are available.

**list_service_certificates**

List service certificates associated with the account.

```bash
salt-cloud -f list_service_certificates my-azure
```

**show_service_certificate**

Show the data for a specific service certificate associated with the account. The name, thumbprint, and thumbalgorithm can be obtained from `list_service_certificates`. Can also be called with `get_service_certificate`.

```bash
salt-cloud -f show_service_certificate my-azure name=my_service_certificate \   thumbalgorithm=sha1 thumbprint=0123456789ABCDEF
```

**add_service_certificate**

Add a service certificate to the account. This requires that a certificate already exists, which is then added to the account. For more information on creating the certificate itself, see:

- Create a Service Certificate for Azure

The following options are available.

- **name** Required. The name of the hosted service that the certificate will belong to.

- **data** Required. The base-64 encoded form of the pfx file.

- **certificate_format** Required. The service certificate format. The only supported value is pfx.

- **password** The certificate password.

```bash
salt-cloud -f add_service_certificate my-azure name=my-cert \   data='...CERT_DATA...' certificate_format=pfx password=verybadpass
```

**delete_service_certificate**

Delete a service certificate from the account. The name, thumbprint, and thumbalgorithm can be obtained from `list_service_certificates`.

```bash
salt-cloud -f delete_service_certificate my-azure \   name=my_service_certificate \   thumbalgorithm=sha1 thumbprint=0123456789ABCDEF
```
Managing Management Certificates

New in version 2015.8.0.

A Azure management certificate is an X.509 v3 certificate used to authenticate an agent, such as Visual Studio Tools for Windows Azure or a client application that uses the Service Management API, acting on behalf of the subscription owner to manage subscription resources. Azure management certificates are uploaded to Azure and stored at the subscription level. The management certificate store can hold up to 100 certificates per subscription. These certificates are used to authenticate your Windows Azure deployment.

For more information on management certificates, see the following link.

- Manage Certificates

The following functions are available.

list_management_certificates

List management certificates associated with the account.

```
salt-cloud -f list_management_certificates my-azure
```

show_management_certificate

Show the data for a specific management certificate associated with the account. The name, thumbprint, and thumbalgorithm can be obtained from list_management_certificates. Can also be called with get_management_certificate.

```
salt-cloud -f show_management_certificate my-azure name=my_management_certificate \ 
   thumbalgorithm=sha1 thumbprint=0123456789ABCDEF
```

add_management_certificate

Management certificates must have a key length of at least 2048 bits and should reside in the Personal certificate store. When the certificate is installed on the client, it should contain the private key of the certificate. To upload to the certificate to the Microsoft Azure Management Portal, you must export it as a .cer format file that does not contain the private key. For more information on creating management certificates, see the following link:

- Create and Upload a Management Certificate for Azure

The following options are available.

```
public_key  A base64 representation of the management certificate public key.

thumbprint  The thumbprint that uniquely identifies the management certificate.

data  The certificate's raw data in base-64 encoded .cer format.
```

```
salt-cloud -f add_management_certificate my-azure public_key='...PUBKEY...' \ 
   thumbprint=0123456789ABCDEF data='...CERT_DATA...'
```
delete_management_certificate

Delete a management certificate from the account. The thumbprint can be obtained from list_management_certificates.

```
salt-cloud -f delete_management_certificate my-azure thumbprint=0123456789ABCDEF
```

Virtual Network Management

New in version 2015.8.0.
The following are functions for managing virtual networks.

list_virtual_networks

List input endpoints associated with the deployment.

```
salt-cloud -f list_virtual_networks my-azure service=myservice deployment=mydeployment
```

Managing Input Endpoints

New in version 2015.8.0.
Input endpoints are used to manage port access for roles. Because endpoints cannot be managed by the Azure Python SDK, Salt Cloud uses the API directly. With versions of Python before 2.7.9, the requests-python package needs to be installed in order for this to work. Additionally, the following needs to be set in the master’s configuration file:

```
requests_lib: True
```

The following functions are available.

list_input_endpoints

List input endpoints associated with the deployment

```
salt-cloud -f list_input_endpoints my-azure service=myservice deployment=mydeployment
```

show_input_endpoint

Show an input endpoint associated with the deployment

```
salt-cloud -f show_input_endpoint my-azure service=myservice deployment=mydeployment name=SSH
```

add_input_endpoint

Add an input endpoint to the deployment. Please note that there may be a delay before the changes show up. The following options are available.

```
service  Required. The name of the hosted service which the VM belongs to.
```
deployment Required. The name of the deployment that the VM belongs to. If the VM was created with Salt Cloud, the deployment name probably matches the VM name.

role Required. The name of the role that the VM belongs to. If the VM was created with Salt Cloud, the role name probably matches the VM name.

name Required. The name of the input endpoint. This typically matches the port that the endpoint is set to. For instance, port 22 would be called SSH.

port Required. The public (Internet-facing) port that is used for the endpoint.

local_port Optional. The private port on the VM itself that will be matched with the port. This is typically the same as the port. If this value is not specified, it will be copied from port.

protocol Required. Either tcp or udp.

enable_direct_server_return Optional. If an internal load balancer exists in the account, it can be used with a direct server return. The default value is False. Please see the following article for an explanation of this option.

- Load Balancing for Azure Infrastructure Services

timeout_for_tcp_idle_connection Optional. The default value is 4. Please see the following article for an explanation of this option.

- Configurable Idle Timeout for Azure Load Balancer

CLI Example The following example illustrates adding an input endpoint.

```bash
salt-cloud -f add_input_endpoint my-azure service=myservice \
    deployment=mydeployment role=myrole name=HTTP local_port=80 \
    port=80 protocol=tcp enable_direct_server_return=False \
    timeout_for_tcp_idle_connection=4
```

update_input_endpoint

Updates the details for a specific input endpoint. All options from add_input_endpoint are supported.

```bash
salt-cloud -f update_input_endpoint my-azure service=myservice \
    deployment=mydeployment role=myrole name=HTTP local_port=80 \
    port=80 protocol=tcp enable_direct_server_return=False \
    timeout_for_tcp_idle_connection=4
```

delete_input_endpoint

Delete an input endpoint from the deployment. Please note that there may be a delay before the changes show up. The following items are required.

CLI Example The following example illustrates deleting an input endpoint.
service  The name of the hosted service which the VM belongs to.

deployment  The name of the deployment that the VM belongs to. If the VM was created with Salt Cloud, the deployment name probably matches the VM name.

role  The name of the role that the VM belongs to. If the VM was created with Salt Cloud, the role name probably matches the VM name.

name  The name of the input endpoint. This typically matches the port that the endpoint is set to. For instance, port 22 would be called SSH.

Managing Affinity Groups

New in version 2015.8.0.

Affinity groups allow you to group your Azure services to optimize performance. All services and VMs within an affinity group will be located in the same region. For more information on Affinity groups, see the following link:

- Create an Affinity Group in the Management Portal

The following functions are available.

list_affinity_groups

List input endpoints associated with the account

salt-cloud -f list_affinity_groups my-azure

show_affinity_group

Show an affinity group associated with the account

salt-cloud -f show_affinity_group my-azure service=myservice \\
    deployment=mydeployment role=myrole name=HTTP

create_affinity_group

Create a new affinity group. The following options are supported.

name  Required. The name of the new affinity group.

location  Required. The region in which the affinity group lives.

label  Required. A label describing the new affinity group.
description  Optional. A longer description of the affinity group.

```
salt-cloud -f create_affinity_group my-azure name=my_affinity_group 
   label=my-affinity-group location='West US'
```

update_affinity_group

Update an affinity group's properties

```
salt-cloud -f update_affinity_group my-azure name=my_group label=my_group
```

delete_affinity_group

Delete a specific affinity group associated with the account

```
salt-cloud -f delete_affinity_group my-azure name=my_affinity_group
```

Managing Blob Storage

New in version 2015.8.0.

Azure storage containers and their contents can be managed with Salt Cloud. This is not as elegant as using one of the other available clients in Windows, but it benefits Linux and Unix users, as there are fewer options available on those platforms.

Blob Storage Configuration

Blob storage must be configured differently than the standard Azure configuration. Both a `storage_account` and a `storage_key` must be specified either through the Azure provider configuration (in addition to the other Azure configuration) or via the command line.

```
storage_account: mystorage
storage_key: ffhj334fDSGFEGDFDewr34fwfsFSDFwe==
```

`storage_account`  This is one of the storage accounts that is available via the `list_storage` function.

`storage_key`  Both a primary and a secondary `storage_key` can be obtained by running the `show_storage_keys` function. Either key may be used.

Blob Functions

The following functions are made available through Salt Cloud for managing blob storage.

```
make_blob_url  Creates the URL to access a blob

salt-cloud -f make_blob_url my-azure container=mycontainer blob=myblob
```

`container`  Name of the container.
blob Name of the blob.

account Name of the storage account. If not specified, derives the host base from the provider configuration.

protocol Protocol to use: 'http' or 'https'. If not specified, derives the host base from the provider configuration.

host_base Live host base URL. If not specified, derives the host base from the provider configuration.

list_storage_containers List containers associated with the storage account

```
salt-cloud -f list_storage_containers my-azure
```

create_storage_container Create a storage container

```
salt-cloud -f create_storage_container my-azure name=mycontainer
```

name Name of container to create.

meta_name_values Optional. A dict with name_value pairs to associate with the container as metadata. Example:{'Category': 'test'}

blob_public_access Optional. Possible values include: container, blob

fail_on_exist Specify whether to throw an exception when the container exists.

show_storage_container Show a container associated with the storage account

```
salt-cloud -f show_storage_container my-azure name=myservice
```

name Name of container to show.

show_storage_container_metadata Show a storage container’s metadata

```
salt-cloud -f show_storage_container_metadata my-azure name=myservice
```

name Name of container to show.

lease_id If specified, show_storage_container_metadata only succeeds if the container’s lease is active and matches this ID.

set_storage_container_metadata Set a storage container’s metadata

```
salt-cloud -f set_storage_container my-azure name=mycontainer
   x_ms_meta_name_values='{"my_name": "my_value"}'
```
**name**  Name of existing container.  `meta_name_values`  A dict containing name, value for metadata.  Example:  `{"category":"test"}`  

**lease_id**  If specified, `set_storage_container_metadata` only succeeds if the container’s lease is active and matches this ID.

**show_storage_container_acl**  Show a storage container’s acl

```
salt-cloud -f show_storage_container_acl my-azure name=myservice
```


**name**  Name of existing container.

**lease_id**  If specified, `show_storage_container_acl` only succeeds if the container’s lease is active and matches this ID.

**set_storage_container_acl**  Set a storage container’s acl

```
salt-cloud -f set_storage_container my-azure name=mycontainer
```


**name**  Name of existing container.

**signed_identifiers**  SignedIdentifiers instance

**blob_public_access**  Optional. Possible values include: container, blob

**lease_id**  If specified, `set_storage_container_acl` only succeeds if the container’s lease is active and matches this ID.

**delete_storage_container**  Delete a container associated with the storage account

```
salt-cloud -f delete_storage_container my-azure name=mycontainer
```


**name**  Name of container to create.

**fail_not_exist**  Specify whether to throw an exception when the container exists.

**lease_id**  If specified, `delete_storage_container` only succeeds if the container’s lease is active and matches this ID.

**lease_storage_container**  Lease a container associated with the storage account

```
salt-cloud -f lease_storage_container my-azure name=mycontainer
```


**name**  Name of container to create.

**lease_action**  Required. Possible values: acquire|renew|release|break|change

**lease_id**  Required if the container has an active lease.
lease_duration  Specifies the duration of the lease, in seconds, or negative one (-1) for a lease that never expires. A non-infinite lease can be between 15 and 60 seconds. A lease duration cannot be changed using renew or change. For backwards compatibility, the default is 60, and the value is only used on an acquire operation.

lease_break_period  Optional. For a break operation, this is the proposed duration of seconds that the lease should continue before it is broken, between 0 and 60 seconds. This break period is only used if it is shorter than the time remaining on the lease. If longer, the time remaining on the lease is used. A new lease will not be available before the break period has expired, but the lease may be held for longer than the break period. If this header does not appear with a break operation, a fixed-duration lease breaks after the remaining lease period elapses, and an infinite lease breaks immediately.

proposed_lease_id  Optional for acquire, required for change. Proposed lease ID, in a GUID string format.

list_blobs  List blobs associated with the container

salt-cloud -f list_blobs my-azure container=mycontainer

container  The name of the storage container

prefix  Optional. Filters the results to return only blobs whose names begin with the specified prefix.

marker  Optional. A string value that identifies the portion of the list to be returned with the next list operation. The operation returns a marker value within the response body if the list returned was not complete. The marker value may then be used in a subsequent call to request the next set of list items. The marker value is opaque to the client.

maxresults  Optional. Specifies the maximum number of blobs to return, including all BlobPrefix elements. If the request does not specify maxresults or specifies a value greater than 5,000, the server will return up to 5,000 items. Setting maxresults to a value less than or equal to zero results in error response code 400 (Bad Request).

include  Optional. Specifies one or more datasets to include in the response. To specify more than one of these options on the URI, you must separate each option with a comma. Valid values are:

- snapshots:
  Specifies that snapshots should be included in the enumeration. Snapshots are listed from oldest to newest in the response.
- metadata:
  Specifies that blob metadata be returned in the response.
- uncommittedblobs:
  Specifies that blobs for which blocks have been uploaded, but which have not been committed using Put Block List (REST API), be included in the response.
- copy:
  Version 2012-02-12 and newer. Specifies that metadata related to any current or previous Copy Blob operation should be included in the response.
delimiter

Optional. When the request includes this parameter, the operation returns a BlobPrefix element in the response body that acts as a placeholder for all blobs whose names begin with the same substring up to the appearance of the delimiter character. The delimiter may be a single character or a string.

**show_blob_service_properties**  
Show a blob’s service properties

```
salt-cloud -f show_blob_service_properties my-azure
```

**set_blob_service_properties**  
Sets the properties of a storage account's Blob service, including Windows Azure Storage Analytics. You can also use this operation to set the default request version for all incoming requests that do not have a version specified.

```
salt-cloud -f set_blob_service_properties my-azure
```

**properties**  
a StorageServiceProperties object.

**timeout**  
Optional. The timeout parameter is expressed in seconds.

**show_blob_properties**  
Returns all user-defined metadata, standard HTTP properties, and system properties for the blob.

```
salt-cloud -f show_blob_properties my-azure container=mycontainer blob=myblob
```

**container**  
Name of existing container.

**blob**  
Name of existing blob.

**lease_id**  
Required if the blob has an active lease.

**set_blob_properties**  
Set a blob’s properties

```
salt-cloud -f set_blob_properties my-azure
```

**container**  
Name of existing container.

**blob**  
Name of existing blob.

**blob_cache_control**  
Optional. Modifies the cache control string for the blob.

**blob_content_type**  
Optional. Sets the blob’s content type.

**blob_content_md5**  
Optional. Sets the blob’s MD5 hash.

**blob_content_encoding**  
Optional. Sets the blob’s content encoding.
**blob_content_language**  Optional. Sets the blob's content language.

**lease_id**  Required if the blob has an active lease.

**blob_content_disposition**  Optional. Sets the blob's Content-Disposition header. The Content-Disposition response header field conveys additional information about how to process the response payload, and also can be used to attach additional metadata. For example, if set to attachment, it indicates that the user-agent should not display the response, but instead show a Save As dialog with a filename other than the blob name specified.

**put_blob**  Upload a blob

```
salt-cloud -f put_blob my-azure container=base name=top.sls blob_path=/srv/salt/top.sls
salt-cloud -f put_blob my-azure container=base name=content.txt blob_content='Some content'
```

**container**  Name of existing container.

**name**  Name of existing blob.

**blob_path**  The path on the local machine of the file to upload as a blob. Either this or blob_content must be specified.

**blob_content**  The actual content to be uploaded as a blob. Either this or blob_path must me specified.

**cache_control**  Optional. The Blob service stores this value but does not use or modify it.

**content_language**  optional. Specifies the natural languages used by this resource.

**content_md5**  Optional. An MD5 hash of the blob content. This hash is used to verify the integrity of the blob during transport. When this header is specified, the storage service checks the hash that has arrived with the one that was sent. If the two hashes do not match, the operation will fail with error code 400 (Bad Request).

**blob_content_type**  Optional. Set the blob's content type.

**blob_content_encoding**  Optional. Set the blob's content encoding.

**blob_content_language**  Optional. Set the blob's content language.

**blob_content_md5**  Optional. Set the blob's MD5 hash.

**blob_cache_control**  Optional. Sets the blob's cache control.

**meta_name_values**  A dict containing name, value for metadata.
lease_id  Required if the blob has an active lease.

get_blob  Download a blob

salt-cloud -f get_blob my-azure container=base name=top.sls local_path=/srv/salt/top.sls
salt-cloud -f get_blob my-azure container=base name=content.txt return_content=True

container  Name of existing container.

name  Name of existing blob.

local_path  The path on the local machine to download the blob to. Either this or return_content must be specified.

return_content  Whether or not to return the content directly from the blob. If specified, must be True or False. Either this or the local_path must be specified.

snapshot  Optional. The snapshot parameter is an opaque DateTime value that, when present, specifies the blob snapshot to retrieve.

lease_id  Required if the blob has an active lease.

progress_callback  callback for progress with signature function(current, total) where current is the number of bytes transferred so far, and total is the size of the blob.

max_connections  Maximum number of parallel connections to use when the blob size exceeds 64MB. Set to 1 to download the blob chunks sequentially. Set to 2 or more to download the blob chunks in parallel. This uses more system resources but will download faster.

max_retries  Number of times to retry download of blob chunk if an error occurs.

retry_wait  Sleep time in secs between retries.

24.5.3 Getting Started With DigitalOcean

DigitalOcean is a public cloud host that specializes in Linux instances.

Configuration

Using Salt for DigitalOcean requires a personal_access_token, an ssh_key_file, and at least one SSH key name in ssh_key_names. More ssh_key_names can be added by separating each key with a comma. The personal_access_token can be found in the DigitalOcean web interface in the "Apps & API" section. The SSH key name can be found under the "SSH Keys" section.
# Note: This example is for /etc/salt/cloud.providers or any file in the
# /etc/salt/cloud.providers.d/ directory.

my-digitalocean-config:
  driver: digital_ocean
  personal_access_token: xxx
  ssh_key_file: /path/to/ssh/key/file
  ssh_key_names: my-key-name,my-key-name-2
  location: New York 1

Note: Changed in version 2015.8.0.

The provider parameter in cloud provider definitions was renamed to driver. This change was made to avoid confusion with the provider parameter that is used in cloud profile definitions. Cloud provider definitions now use driver to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use provider to refer to provider configurations that you define.

Profiles

Cloud Profiles

Set up an initial profile at /etc/salt/cloud.profiles or in the /etc/salt/cloud.profiles.d/ directory:

digitalocean-ubuntu:
  provider: my-digitalocean-config
  image: Ubuntu 14.04 x32
  size: 512MB
  location: New York 1
  private_networking: True
  backups_enabled: True
  ipv6: True

Locations can be obtained using the --list-locations option for the salt-cloud command:

# salt-cloud --list-locations my-digitalocean-config
my-digitalocean-config:
  ---------
  digital_ocean:
  ---------
  Amsterdam 1:
  ---------
  available:
  False
  features:
    [u'backups']
  name:
    Amsterdam 1
  sizes:
    []
  slug:
    ams1

...SNIP...

Sizes can be obtained using the --list-sizes option for the salt-cloud command:
Images can be obtained using the `--list-images` option for the `salt-cloud` command:

```bash
# salt-cloud --list-images my-digitalocean-config
my-digitalocean-config:
  digital_ocean:
    Arch Linux 2013.05 x64:
      distribution: Arch Linux
      id: 350424
      name: Arch Linux 2013.05 x64
      public: True
      slug: None
```

**Note:** DigitalOcean's concept of Applications is nothing more than a pre-configured instance (same as a normal Droplet). You will find examples such as Docker 0.7 Ubuntu 13.04 x64 and Wordpress on Ubuntu 12.10 when using the `--list-images` option. These names can be used just like the rest of the standard instances when specifying an image in the cloud profile configuration.

**Note:** If your domain's DNS is managed with DigitalOcean, you can automatically create A-records for newly created droplets. Use `create_dns_record: True` in your config to enable this. Add `delete_dns_record: True` to also delete records when a droplet is destroyed.

**Note:** Additional documentation is available from DigitalOcean.
24.5.4 Getting Started With AWS EC2

Amazon EC2 is a very widely used public cloud platform and one of the core platforms Salt Cloud has been built to support.

Previously, the suggested driver for AWS EC2 was the `aws` driver. This has been deprecated in favor of the `ec2` driver. Configuration using the old `aws` driver will still function, but that driver is no longer in active development.

Dependencies

This driver requires the Python `requests` library to be installed.

Configuration

The following example illustrates some of the options that can be set. These parameters are discussed in more detail below.

```yaml
# Note: This example is for /etc/salt/cloud.providers or any file in the
# /etc/salt/cloud.providers.d/ directory.

my-ec2-southeast-public-ips:
    # Set up the location of the salt master
    #
    minion:
        master: saltmaster.example.com

    # Set up grains information, which will be common for all nodes
    # using this provider
    grains:
        node_type: broker
        release: 1.0.1

    # Specify whether to use public or private IP for deploy script.
    #
    # Valid options are:
    #   private_ips - The salt-cloud command is run inside the EC2
    #   public_ips - The salt-cloud command is run outside of EC2
    #
    ssh_interface: public_ips

    # Optionally configure the Windows credential validation number of
    # retries and delay between retries. This defaults to 10 retries
    # with a one second delay between retries
    win_deploy_auth_retries: 10
    win_deploy_auth_retry_delay: 1

    # Set the EC2 access credentials (see below)
    #
    id: 'use-instance-role-credentials'
    key: 'use-instance-role-credentials'

    # Make sure this key is owned by root with permissions 0400.
```

private_key: /etc/salt/my_test_key.pem
driver: ec2

my-ec2-southeast-private-ips:
  # Set up the location of the salt master
  #
  minion:
    master: saltmaster.example.com

  # Specify whether to use public or private IP for deploy script.
  #
  # Valid options are:
  #   private_ips - The salt-master is also hosted with EC2
  #   public_ips - The salt-master is hosted outside of EC2
  #
  ssh_interface: private_ips

  # Optionally configure the Windows credential validation number of
  # retries and delay between retries. This defaults to 10 retries
  # with a one second delay between retries
  win_deploy_auth_retries: 10
  win_deploy_auth_retry_delay: 1

  # Set the EC2 access credentials (see below)
  #
  id: 'use-instance-role-credentials'
  key: 'use-instance-role-credentials'

  # Make sure this key is owned by root with permissions 0400.
  #
  private_key: /etc/salt/my_test_key.pem
  keyname: my_test_key
This one should NOT be specified if VPC was not configured in AWS to be the default. It might cause an error message which says that network interfaces and an instance-level security groups may not be specified on the same request.

```
securitygroup: default
```

# Optionally configure default region

```
location: ap-southeast-1
availability_zone: ap-southeast-1b
```

Configure which user to use to run the deploy script. This setting is dependent upon the AMI that is used to deploy. It is usually safer to configure this individually in a profile, than globally. Typical users are:

```
# Amazon Linux -> ec2-user
# RHEL            -> ec2-user
# CentOS          -> ec2-user
# Ubuntu          -> ubuntu
```

```
ssh_username: ec2-user
```

# Optionally add an IAM profile

```
iam_profile: 'my other profile name'
```

```
driver: ec2
```

**Note:** Changed in version 2015.8.0.

The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

## Access Credentials

The `id` and `key` settings may be found in the Security Credentials area of the AWS Account page:

https://portal.aws.amazon.com/gp/aws/securityCredentials

Both are located in the Access Credentials area of the page, under the Access Keys tab. The `id` setting is labeled Access Key ID, and the `key` setting is labeled Secret Access Key.

Note: if either `id` or `key` is set to `use-instance-role-credentials` it is assumed that Salt is running on an AWS instance, and the instance role credentials will be retrieved and used. Since both the `id` and `key` are required parameters for the AWS ec2 provider, it is recommended to set both to `use-instance-role-credentials` for this functionality.

A `static` and `permanent` Access Key ID and Secret Key can be specified, but this is not recommended. Instance role keys are rotated on a regular basis, and are the recommended method of specifying AWS credentials.
Windows Deploy Timeouts

For Windows instances, it may take longer than normal for the instance to be ready. In these circumstances, the provider configuration can be configured with a `win_deploy_auth_retries` and/or a `win_deploy_auth_retry_delay` setting, which default to 10 retries and a one second delay between retries. These retries and timeouts relate to validating the Administrator password once AWS provides the credentials via the AWS API.

Key Pairs

In order to create an instance with Salt installed and configured, a key pair will need to be created. This can be done in the EC2 Management Console, in the Key Pairs area. These key pairs are unique to a specific region. Keys in the us-east-1 region can be configured at:

https://console.aws.amazon.com/ec2/home?region=us-east-1#s=KeyPairs

Keys in the us-west-1 region can be configured at

https://console.aws.amazon.com/ec2/home?region=us-west-1#s=KeyPairs

...and so on. When creating a key pair, the browser will prompt to download a pem file. This file must be placed in a directory accessible by Salt Cloud, with permissions set to either 0400 or 0600.

Security Groups

An instance on EC2 needs to belong to a security group. Like key pairs, these are unique to a specific region. These are also configured in the EC2 Management Console. Security groups for the us-east-1 region can be configured at:

https://console.aws.amazon.com/ec2/home?region=us-east-1#s=SecurityGroups

...and so on.

A security group defines firewall rules which an instance will adhere to. If the salt-master is configured outside of EC2, the security group must open the SSH port (usually port 22) in order for Salt Cloud to install Salt.

IAM Profile

Amazon EC2 instances support the concept of an instance profile, which is a logical container for the IAM role. At the time that you launch an EC2 instance, you can associate the instance with an instance profile, which in turn corresponds to the IAM role. Any software that runs on the EC2 instance is able to access AWS using the permissions associated with the IAM role.

Scaffolding the profile is a 2-step configuration process:

1. Configure an IAM Role from the IAM Management Console.
2. Attach this role to a new profile. It can be done with the AWS CLI:
Once the profile is created, you can use the **PROFILE_NAME** to configure your cloud profiles.

**Cloud Profiles**

Set up an initial profile at `/etc/salt/cloud.profiles`:

```
base_ec2_private:
  provider: my-ec2-southeast-private-ips
  image: ami-e565ba8c
  size: t2.micro
  ssh_username: ec2-user

base_ec2_public:
  provider: my-ec2-southeast-public-ips
  image: ami-e565ba8c
  size: t2.micro
  ssh_username: ec2-user

base_ec2_db:
  provider: my-ec2-southeast-public-ips
  image: ami-e565ba8c
  size: m1.xlarge
  ssh_username: ec2-user
  volumes:
    - { size: 10, device: /dev/sdf }
    - { size: 10, device: /dev/sdg, type: io1, iops: 1000 }
    - { size: 10, device: /dev/sdh, type: io1, iops: 1000 }
  # optionally add tags to profile:
  tag: { 'Environment': 'production', 'Role': 'database' }
  # force grains to sync after install
  sync_after_install: grains

base_ec2_vpc:
  provider: my-ec2-southeast-public-ips
  image: ami-a73264ce
  size: m1.xlarge
  ssh_username: ec2-user
  script: /etc/salt/cloud.deploy.d/user_data.sh
  network_interfaces:
    - DeviceIndex: 0
      PrivateIpAddresses:
        - Primary: True
          #auto assign public ip (not EIP)
          AssociatePublicIpAddress: True
          SubnetId: subnet-813d4bbf
          SecurityGroupId:
            - sg-750af413
  volumes:
    - { size: 10, device: /dev/sdf }
    - { size: 10, device: /dev/sdg, type: io1, iops: 1000 }
    - { size: 10, device: /dev/sdh, type: io1, iops: 1000 }
  del_root_vol_on_destroy: True
  del_all_vol_on_destroy: True
  tag: { 'Environment': 'production', 'Role': 'database' }
```
The profile can now be realized with a salt command:

```bash
# salt-cloud -p base_ec2 ami.example.com
# salt-cloud -p base_ec2_public ami.example.com
# salt-cloud -p base_ec2_private ami.example.com
```

This will create an instance named `ami.example.com` in EC2. The minion that is installed on this instance will have an id of `ami.example.com`. If the command was executed on the salt-master, its Salt key will automatically be signed on the master.

Once the instance has been created with salt-minion installed, connectivity to it can be verified with Salt:

```bash
# salt 'ami.example.com' test.ping
```

### Required Settings

The following settings are always required for EC2:

```yaml
# Set the EC2 login data
my-ec2-config:
  id: HJGRYCILJLKJYG
  key: 'kdjgfsmg;woormgl/asericjksjhsadfgn'
  keyname: test
  securitygroup: quick-start
  private_key: /root/test.pem
  driver: ec2
```

### Optional Settings

EC2 allows a location to be set for servers to be deployed in. Availability zones exist inside regions, and may be added to increase specificity.

```yaml
# Optionally configure default region
location: ap-southeast-1
availability_zone: ap-southeast-1b
```

EC2 instances can have a public or private IP, or both. When an instance is deployed, Salt Cloud needs to log into it via SSH to run the deploy script. By default, the public IP will be used for this. If the salt-cloud command is run from another EC2 instance, the private IP should be used.

```yaml
# Specify whether to use public or private IP for deploy script
# private_ips or public_ips
ssh_interface: public_ips
```

Many EC2 instances do not allow remote access to the root user by default. Instead, another user must be used to run the deploy script using sudo. Some common usernames include ec2-user (for Amazon Linux), ubuntu (for Ubuntu instances), admin (for official Debian) and bitnami (for images provided by Bitnami).

```yaml
# Configure which user to use to run the deploy script
ssh_username: ec2-user
```
Multiple usernames can be provided, in which case Salt Cloud will attempt to guess the correct username. This is mostly useful in the main configuration file:

```yaml
my-ec2-config:
  ssh_username:
    - ec2-user
    - ubuntu
    - admin
    - bitnami
```

Multiple security groups can also be specified in the same fashion:

```yaml
my-ec2-config:
  securitygroup:
    - default
    - extra
```

Your instances may optionally make use of EC2 Spot Instances. The following example will request that spot instances be used and your maximum bid will be $0.10. Keep in mind that different spot prices may be needed based on the current value of the various EC2 instance sizes. You can check current and past spot instance pricing via the EC2 API or AWS Console.

```yaml
my-ec2-config:
  spot_config:
    spot_price: 0.10
```

By default, the spot instance type is set to `one-time', meaning it will be launched and, if it's ever terminated for whatever reason, it will not be recreated. If you would like your spot instances to be relaunched after a termination (by your or AWS), set the `type` to `persistent'.

NOTE: Spot instances are a great way to save a bit of money, but you do run the risk of losing your spot instances if the current price for the instance size goes above your maximum bid.

The following parameters may be set in the cloud configuration file to control various aspects of the spot instance launching:

- `wait_for_spot_timeout`: seconds to wait before giving up on spot instance launch (default=600)
- `wait_for_spot_interval`: seconds to wait in between polling requests to determine if a spot instance is available (default=30)
- `wait_for_spot_interval_multiplier`: a multiplier to add to the interval in between requests, which is useful if AWS is throttling your requests (default=1)
- `wait_for_spot_max_failures`: maximum number of failures before giving up on launching your spot instance (default=10)

If you find that you're being throttled by AWS while polling for spot instances, you can set the following in your core cloud configuration file that will double the polling interval after each request to AWS.

```yaml
wait_for_spot_interval: 1
wait_for_spot_interval_multiplier: 2
```

See the [AWS Spot Instances](https://aws.amazon.com/media/doc/AWSSpotInstances.pdf) documentation for more information.

Block device mappings enable you to specify additional EBS volumes or instance store volumes when the instance is launched. This setting is also available on each cloud profile. Note that the number of instance stores varies by instance type. If more mappings are provided than are supported by the instance type, mappings will be created in the order provided and additional mappings will be ignored. Consult the [AWS documentation](https://aws.amazon.com/documentation/s3/) for a listing of the available instance stores, and device names.
You can also use block device mappings to change the size of the root device at the provisioning time. For example, assuming the root device is `/dev/sda', you can set its size to 100G by using the following configuration.

```
my-ec2-config:
  block_device_mappings:
  - DeviceName: /dev/sda
    Ebs.VolumeSize: 100
    Ebs.VolumeType: gp2
    Ebs.SnapshotId: dummy0
```

Existing EBS volumes may also be attached (not created) to your instances or you can create new EBS volumes based on EBS snapshots. To simply attach an existing volume use the `volume_id` parameter.

```
device: /dev/xvdj
volume_id: vol-12345abcd
```

Or, to create a volume from an EBS snapshot, use the `snapshot` parameter.

```
device: /dev/xvdj
snapshot: snap-abcd12345
```

Note that `volume_id` will take precedence over the `snapshot` parameter.

Tags can be set once an instance has been launched.

```
my-ec2-config:
  tag:
    tag0: value
    tag1: value
```

Modify EC2 Tags

One of the features of EC2 is the ability to tag resources. In fact, under the hood, the names given to EC2 instances by salt-cloud are actually just stored as a tag called Name. Salt Cloud has the ability to manage these tags:

```
salt-cloud -a get_tags mymachine
salt-cloud -a set_tags mymachine tag1=somestuff tag2='Other stuff'
salt-cloud -a del_tags mymachine tag1,tag2,tag3
```

It is possible to manage tags on any resource in EC2 with a Resource ID, not just instances:

```
salt-cloud -f get_tags my_ec2 resource_id=af5467ba
salt-cloud -f set_tags my_ec2 resource_id=af5467ba tag1=somestuff
salt-cloud -f del_tags my_ec2 resource_id=af5467ba tag1,tag2,tag3
```

Rename EC2 Instances

As mentioned above, EC2 instances are named via a tag. However, renaming an instance by renaming its tag will cause the salt keys to mismatch. A rename function exists which renames both the instance, and the salt keys.
salt-cloud -a rename mymachine newname=yourmachine

**EC2 Termination Protection**

EC2 allows the user to enable and disable termination protection on a specific instance. An instance with this protection enabled cannot be destroyed.

salt-cloud -a enable_term_protect mymachine
salt-cloud -a disable_term_protect mymachine

**Rename on Destroy**

When instances on EC2 are destroyed, there will be a lag between the time that the action is sent, and the time that Amazon cleans up the instance. During this time, the instance still retains a Name tag, which will cause a collision if the creation of an instance with the same name is attempted before the cleanup occurs. In order to avoid such collisions, Salt Cloud can be configured to rename instances when they are destroyed. The new name will look something like:

myinstance-DEL20f5b8ad4eb64ed88f2c428df80a1a0c

In order to enable this, add rename_on_destroy line to the main configuration file:

```
my-ec2-config:
  rename_on_destroy: True
```

**Listing Images**

Normally, images can be queried on a cloud provider by passing the --list-images argument to Salt Cloud. This still holds true for EC2:

salt-cloud --list-images my-ec2-config

However, the full list of images on EC2 is extremely large, and querying all of the available images may cause Salt Cloud to behave as if frozen. Therefore, the default behavior of this option may be modified, by adding an owner argument to the provider configuration:

```
owner: aws-marketplace
```

The possible values for this setting are amazon, aws-marketplace, self, <AWS account ID> or all. The default setting is amazon. Take note that all and aws-marketplace may cause Salt Cloud to appear as if it is freezing, as it tries to handle the large amount of data.

It is also possible to perform this query using different settings without modifying the configuration files. To do this, call the avail_images function directly:

salt-cloud -f avail_images my-ec2-config owner=aws-marketplace

**EC2 Images**

The following are lists of available AMI images, generally sorted by OS. These lists are on 3rd-party websites, are not managed by Salt Stack in any way. They are provided here as a reference for those who are interested, and contain no warranty (express or implied) from anyone affiliated with Salt Stack. Most of them have never been used, much less tested, by the Salt Stack team.
• Arch Linux
• FreeBSD
• Fedora
• CentOS
• Ubuntu
• Debian
• OmniOS
• All Images on Amazon

**show_image**

This is a function that describes an AMI on EC2. This will give insight as to the defaults that will be applied to an instance using a particular AMI.

```
salt-cloud -f show_image ec2 image=ami-fd20ad94
```

**show_instance**

This action is a thin wrapper around `--full-query`, which displays details on a single instance only. In an environment with several machines, this will save a user from having to sort through all instance data, just to examine a single instance.

```
salt-cloud -a show_instance myinstance
```

**ebs_optimized**

This argument enables switching of the EbsOptimized setting which default to `false`. Indicates whether the instance is optimized for EBS I/O. This optimization provides dedicated throughput to Amazon EBS and an optimized configuration stack to provide optimal Amazon EBS I/O performance. This optimization isn't available with all instance types. Additional usage charges apply when using an EBS-optimized instance.

This setting can be added to the profile or map file for an instance.

If set to True, this setting will enable an instance to be EbsOptimized

```
ebs_optimized: True
```

This can also be set as a cloud provider setting in the EC2 cloud configuration:

```
my-ec2-config:
  ebs_optimized: True
```

**del_root_vol_on_destroy**

This argument overrides the default DeleteOnTermination setting in the AMI for the EBS root volumes for an instance. Many AMIs contain `false` as a default, resulting in orphaned volumes in the EC2 account, which may unknowingly be charged to the account. This setting can be added to the profile or map file for an instance.

If set, this setting will apply to the root EBS volume
del_root_vol_on_destroy: True

This can also be set as a cloud provider setting in the EC2 cloud configuration:

```yaml
my-ec2-config:
  del_root_vol_on_destroy: True
```

**del_all_vols_on_destroy**

This argument overrides the default DeleteOnTermination setting in the AMI for the not-root EBS volumes for an instance. Many AMIs contain 'false' as a default, resulting in orphaned volumes in the EC2 account, which may unknowingly be charged to the account. This setting can be added to the profile or map file for an instance.

If set, this setting will apply to any (non-root) volumes that were created by salt-cloud using the `volumes` setting.

The volumes will not be deleted under the following conditions:
* If a volume is detached before terminating the instance
* If a volume is created without this setting and attached to the instance

**del_all_vols_on_destroy: True**

This can also be set as a cloud provider setting in the EC2 cloud configuration:

```yaml
my-ec2-config:
  del_all_vols_on_destroy: True
```

The setting for this may be changed on all volumes of an existing instance using one of the following commands:

```
salt-cloud -a delvol_on_destroy myinstance
salt-cloud -a keepvol_on_destroy myinstance
salt-cloud -a show_delvol_on_destroy myinstance
```

The setting for this may be changed on a volume on an existing instance using one of the following commands:

```
salt-cloud -a delvol_on_destroy myinstance device=/dev/sda1
salt-cloud -a delvol_on_destroy myinstance volume_id=vol-1a2b3c4d
salt-cloud -a keepvol_on_destroy myinstance device=/dev/sda1
salt-cloud -a keepvol_on_destroy myinstance volume_id=vol-1a2b3c4d
salt-cloud -a show_delvol_on_destroy myinstance device=/dev/sda1
salt-cloud -a show_delvol_on_destroy myinstance volume_id=vol-1a2b3c4d
```

**EC2 Termination Protection**

EC2 allows the user to enable and disable termination protection on a specific instance. An instance with this protection enabled cannot be destroyed. The EC2 driver adds a show_term_protect action to the regular EC2 functionality.

```
salt-cloud -a show_term_protect mymachine
salt-cloud -a enable_term_protect mymachine
salt-cloud -a disable_term_protect mymachine
```

**Alternate Endpoint**

Normally, EC2 endpoints are build using the region and the service_url. The resulting endpoint would follow this pattern:
This results in an endpoint that looks like:

```plaintext
ec2.us-east-1.amazonaws.com
```

There are other projects that support an EC2 compatibility layer, which this scheme does not account for. This can be overridden by specifying the endpoint directly in the main cloud configuration file:

```plaintext
my-ec2-config:
  endpoint: myendpoint.example.com:1138/services/Cloud
```

## Volume Management

The EC2 driver has several functions and actions for management of EBS volumes.

### Creating Volumes

A volume may be created, independent of an instance. A zone must be specified. A size or a snapshot may be specified (in GiB). If neither is given, a default size of 10 GiB will be used. If a snapshot is given, the size of the snapshot will be used.

```plaintext
salt-cloud -f create_volume ec2 zone=us-east-1b
salt-cloud -f create_volume ec2 zone=us-east-1b size=10
salt-cloud -f create_volume ec2 zone=us-east-1b snapshot=snap12345678
salt-cloud -f create_volume ec2 size=10 type=standard
salt-cloud -f create_volume ec2 size=10 type=io1 iops=1000
```

### Attaching Volumes

Unattached volumes may be attached to an instance. The following values are required; name or instance_id, volume_id, and device.

```plaintext
salt-cloud -a attach_volume myinstance volume_id=vol-12345 device=/dev/sdb1
```

### Show a Volume

The details about an existing volume may be retrieved.

```plaintext
salt-cloud -a show_volume myinstance volume_id=vol-12345
salt-cloud -f show_volume ec2 volume_id=vol-12345
```

### Detaching Volumes

An existing volume may be detached from an instance.

```plaintext
salt-cloud -a detach_volume myinstance volume_id=vol-12345
```
Deleting Volumes

A volume that is not attached to an instance may be deleted.

```
salt-cloud -f delete_volume ec2 volume_id=vol-12345
```

Managing Key Pairs

The EC2 driver has the ability to manage key pairs.

Creating a Key Pair

A key pair is required in order to create an instance. When creating a key pair with this function, the return data will contain a copy of the private key. This private key is not stored by Amazon, will not be obtainable past this point, and should be stored immediately.

```
salt-cloud -f create_keypair ec2 keyname=mykeypair
```

Show a Key Pair

This function will show the details related to a key pair, not including the private key itself (which is not stored by Amazon).

```
salt-cloud -f show_keypair ec2 keyname=mykeypair
```

Delete a Key Pair

This function removes the key pair from Amazon.

```
salt-cloud -f delete_keypair ec2 keyname=mykeypair
```

Launching instances into a VPC

Simple launching into a VPC

In the amazon web interface, identify the id of the subnet into which your image should be created. Then, edit your cloud.profiles file like so:-

```
profile-id:
    provider: provider-name
    subnetid: subnet-XXXXXXXX
    image: ami-XXXXXXXX
    size: m1.medium
    ssh_username: ubuntu
    securitygroupid:  
        - sg-XXXXXXXX
```
Specifying interface properties

New in version 2014.7.0.

Launching into a VPC allows you to specify more complex configurations for the network interfaces of your virtual machines, for example:-

```
profile-id:
  provider: provider-name
  image: ami-XXXXXXXX
  size: m1.medium
  ssh_username: ubuntu

# Do not include either 'subnetid' or 'securitygroupid' here if you are
# going to manually specify interface configuration
#
network_interfaces:
  - DeviceIndex: 0
    SubnetId: subnet-XXXXXXXX
    SecurityGroupId:
      - sg-XXXXXXXX

# Uncomment this line if you would like to set an explicit private
# IP address for the ec2 instance
#
# PrivateIpAddress: 192.168.1.66

# Uncomment this to associate an existing Elastic IP Address with
# this network interface:
#
# associate_eip: eni-XXXXXXXX

# You can allocate more than one IP address to an interface. Use the
# 'ip addr list' command to see them.
#
# SecondaryPrivateIpAddressCount: 2

# Uncomment this to allocate a new Elastic IP Address to this
# interface (will be associated with the primary private ip address
# of the interface
#
# allocate_new_eip: True

# Uncomment this instead to allocate a new Elastic IP Address to
# both the primary private ip address and each of the secondary ones
#
# allocate_new_eips: True

# Uncomment this if you're creating NAT instances. Allows an instance
# to accept IP packets with destinations other than itself.
# SourceDestCheck: False
```

Note that it is an error to assign a 'subnetid' or 'securitygroupid' to a profile where the interfaces are manually configured like this. These are both really properties of each network interface, not of the machine itself.

### 24.5.5 Getting Started With GoGrid

GoGrid is a public cloud host that supports Linux and Windows.
Configuration

To use Salt Cloud with GoGrid log into the GoGrid web interface and create an API key. Do this by clicking on `My Account` and then going to the API Keys tab.

The `apikey` and the `sharedsecret` configuration parameters need to be set in the configuration file to enable interfacing with GoGrid:

```bash
# Note: This example is for /etc/salt/cloud.providers or any file in the # /etc/salt/cloud.providers.d/ directory.

my-gogrid-config:
  driver: gogrid
  apikey: asdff7896asdh789
  sharedsecret: saltybacon
```

Note: A Note about using Map files with GoGrid:

Due to limitations in the GoGrid API, instances cannot be provisioned in parallel with the GoGrid driver. Map files will work with GoGrid, but the `-P` argument should not be used on maps referencing GoGrid instances.

Note: Changed in version 2015.8.0.

The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

Profiles

Cloud Profiles

Set up an initial profile at `/etc/salt/cloud.profiles` or in the `/etc/salt/cloud.profiles.d/` directory:

```bash
gogrid_512:
  provider: my-gogrid-config
  size: 512MB
  image: CentOS 6.2 (64-bit) w/ None
```

Sizes can be obtained using the `--list-sizes` option for the `salt-cloud` command:

```bash
# salt-cloud --list-sizes my-gogrid-config
my-gogrid-config:
  ----------
  gogrid:
  ----------
  512MB:
  ----------
  bandwidth:
    None
disk:
  30
driver:
get_uuid:
id:
```
Images can be obtained using the --list-images option for the salt-cloud command:

```
# salt-cloud --list-images my-gogrid-config
my-gogrid-config:
    --------
    gogrid:
    --------
    CentOS 6.4 (64-bit) w/ None:
    --------
    driver:
    extra:
    --------
    get_uuid:
    id: 18094
    name: CentOS 6.4 (64-bit) w/ None
    uuid: bfd405539919e01aa6261828a96cf54c8dce2c4
```

Assigning IPs

New in version 2015.8.0.

The GoGrid API allows IP addresses to be manually assigned. Salt Cloud supports this functionality by allowing an IP address to be specified using the assign_public_ip argument. This likely makes the most sense inside a map file, but it may also be used inside a profile.

```
gogrid_512:
    provider: my-gogrid-config
    size: 512MB
    image: CentOS 6.2 (64-bit) w/ None
    assign_public_ip: 11.38.257.42
```

24.5.6 Getting Started With Google Compute Engine

Google Compute Engine (GCE) is Google-infrastructure as a service that lets you run your large-scale computing workloads on virtual machines. This document covers how to use Salt Cloud to provision and manage your virtual machines hosted within Google's infrastructure.

You can find out more about GCE and other Google Cloud Platform services at https://cloud.google.com.
Dependencies

- Libcloud >= 0.14.0-beta3
- PyCrypto >= 2.1.
- A Google Cloud Platform account with Compute Engine enabled
- A registered Service Account for authorization
- Oh, and obviously you’ll need salt

Google Compute Engine Setup

1. Sign up for Google Cloud Platform
   Go to https://cloud.google.com and use your Google account to sign up for Google Cloud Platform and complete the guided instructions.

2. Create a Project
   Next, go to the console at https://cloud.google.com/console and create a new Project. Make sure to select your new Project if you are not automatically directed to the Project.

   Projects are a way of grouping together related users, services, and billing. You may opt to create multiple Projects and the remaining instructions will need to be completed for each Project if you wish to use GCE and Salt Cloud to manage your virtual machines.

3. Enable the Google Compute Engine service
   In your Project, either just click Compute Engine to the left, or go to the APIs & auth section and APIs link and enable the Google Compute Engine service.

4. Create a Service Account
   To set up authorization, navigate to APIs & auth section and then the Credentials link and click the CREATE NEW CLIENT ID button. Select Service Account and click the Create Client ID button. This will automatically download a .json file which can be ignored.

   Look for a new Service Account section in the page and record the generated email address for the matching key/fingerprint. The email address will be used in the service_account_email_address of the /etc/salt/cloud file.

5. Key Format
   If you are using `libcloud > 0.17.0` it is recommended that you use the `JSON format` file you downloaded above and skip to the `Configuration` section below, using the JSON file `"_in place of `NEW.pem`_` in the documentation. If you are using an older version of libcloud or are unsure of the version you have, please follow the instructions below to generate and format a new P12 key.

   In the new Service Account section, click Generate new P12 key, which will automatically download a .p12 private key file. The .p12 private key needs to be converted to a format compatible with libcloud. This new Google-generated private key was encrypted using notasecret as a passphrase. Use the following command and record the location of the converted private key and record the location for use in the service_account_private_key of the /etc/salt/cloud file:

   ```bash
   openssl pkcs12 -in ORIG.p12 -passin pass:notasecret \
   -nodes -nocerts | openssl rsa -out NEW.pem
   ```
Configuration

Set up the cloud config at /etc/salt/cloud:

```yaml
# Note: This example is for /etc/salt/cloud

providers:
gce-config:
    # Set up the Project name and Service Account authorization
    #
    project: "your-project-id"
    service_account_email_address: "123-a5gt@developer.gserviceaccount.com"
    service_account_private_key: "/path/to/your/NEW.pem"

    # Set up the location of the salt master
    #
    minion:
        master: saltmaster.example.com

    # Set up grains information, which will be common for all nodes
    # using this provider
    grains:
        node_type: broker
        release: 1.0.1

        driver: gce
```

**Note:** The value provided for `project` must not contain underscores or spaces and is labeled as ```Project ID''` on the Google Developers Console.

**Note:** Changed in version 2015.8.0.

The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

Cloud Profiles

Set up an initial profile at /etc/salt/cloud.profiles:

```yaml
all_settings:
    image: centos-6
    size: n1-standard-1
    location: europe-west1-b
    network: default
    tags: ['"one", "two", "three"]'
    metadata: {'"one": 1, "2": "two"'}
    use_persistent_disk: True
    delete_boot_pd: False
    deploy: True
    make_master: False
    provider: gce-config
```

The profile can be realized now with a salt command:
salt-cloud -p all_settings gce-instance

This will create an salt minion instance named gce-instance in GCE. If the command was executed on the salt-master, its Salt key will automatically be signed on the master.

Once the instance has been created with salt-minion installed, connectivity to it can be verified with Salt:

```
salt 'ami.example.com' test.ping
```

**GCE Specific Settings**

Consult the sample profile below for more information about GCE specific settings. Some of them are mandatory and are properly labeled below but typically also include a hard-coded default.

```
all_settings:
  # Image is used to define what Operating System image should be used to for the instance. Examples are Debian 7 (wheezy) and CentOS 6.
  #
  # MANDATORY
  #
  # image: centos-6

  # A 'size', in GCE terms, refers to the instance's 'machine type'. See the on-line documentation for a complete list of GCE machine types.
  #
  # MANDATORY
  #
  # size: n1-standard-1

  # A 'location', in GCE terms, refers to the instance's 'zone'. GCE has the notion of both Regions (e.g. us-central1, europe-west1, etc) and Zones (e.g. us-central1-a, us-central1-b, etc).
  #
  # MANDATORY
  #
  # location: europe-west1-b

  # Use this setting to define the network resource for the instance. All GCE projects contain a network named 'default' but it's possible to use this setting to create instances belonging to a different network resource.
  #
  # network: default

  # GCE supports instance/network tags and this setting allows you to set custom tags. It should be a list of strings and must be parse-able by the python ast.literal_eval() function to convert it to a python list.
  #
  # tags: ['one', 'two', 'three']

  # GCE supports instance metadata and this setting allows you to set custom metadata. It should be a hash of key/value strings and parse-able by the python ast.literal_eval() function to convert it to a python dictionary.
```

316 Chapter 24. Salt Cloud
metadata: '{"one": "1", "2": "two"}'

# Use this setting to ensure that when new instances are created,
# they will use a persistent disk to preserve data between instance
# terminations and re-creations.
# use_persistent_disk: True

# In the event that you wish the boot persistent disk to be permanently
# deleted when you destroy an instance, set delete_boot_pd to True.
# delete_boot_pd: False

# Specify whether to use public or private IP for deploy script.
# Valid options are:
#    private_ips - The salt-master is also hosted with GCE
#    public_ips - The salt-master is hosted outside of GCE
ssh_interface: public_ips

# Per instance setting: Used a named fixed IP address to this host.
# Valid options are:
#    ephemeral - The host will use a GCE ephemeral IP
#    None - No external IP will be configured on this host.
# Optionally, pass the name of a GCE address to use a fixed IP address.
# If the address does not already exist, it will be created.
external_ip: "ephemeral"

GCE instances do not allow remote access to the root user by default. Instead, another user must be used to run the deploy script using sudo. Append something like this to /etc/salt/cloud.profiles:

all_settings:
...

    # SSH to GCE instances as gceuser
    ssh_username: gceuser

    # Use the local private SSH key file located here
    ssh_keyfile: /etc/cloud/google_compute_engine

If you have not already used this SSH key to login to instances in this GCE project you will also need to add the public key to your projects metadata at https://cloud.google.com/console. You could also add it via the metadata setting too:

all_settings:
...

metadata: '{"one": "1", "2": "two",
    "sshKeys": "gceuser:ssh-rsa <Your SSH Public Key> gceuser@host"}"

Single instance details

This action is a thin wrapper around --full-query, which displays details on a single instance only. In an environment with several machines, this will save a user from having to sort through all instance data, just to examine a single instance.

salt-cloud -a show_instance myinstance
Destroy, persistent disks, and metadata

As noted in the provider configuration, it’s possible to force the boot persistent disk to be deleted when you destroy the instance. The way that this has been implemented is to use the instance metadata to record the cloud profile used when creating the instance. When destroy is called, if the instance contains a `salt-cloud-profile` key, its value is used to reference the matching profile to determine if `delete_boot_pd` is set to `True`.

Be aware that any GCE instances created with salt cloud will contain this custom `salt-cloud-profile` metadata entry.

List various resources

It’s also possible to list several GCE resources similar to what can be done with other providers. The following commands can be used to list GCE zones (locations), machine types (sizes), and images.

```
salt-cloud --list-locations gce
salt-cloud --list-sizes gce
salt-cloud --list-images gce
```

Persistent Disk

The Compute Engine provider provides functions via salt-cloud to manage your Persistent Disks. You can create and destroy disks as well as attach and detach them from running instances.

Create

When creating a disk, you can create an empty disk and specify its size (in GB), or specify either an `image` or `snapshot`.

```
salt-cloud -f create_disk gce disk_name=pd location=us-central1-b size=200
```

Delete

Deleting a disk only requires the name of the disk to delete

```
salt-cloud -f delete_disk gce disk_name=old-backup
```

Attach

Attaching a disk to an existing instance is really an `action` and requires both an instance name and disk name. It’s possible to use this action to create bootable persistent disks if necessary. Compute Engine also supports attaching a persistent disk in READ_ONLY mode to multiple instances at the same time (but then cannot be attached in READ_WRITE to any instance).

```
salt-cloud -a attach_disk myinstance disk_name=pd mode=READ_WRITE boot=yes
```
Detach

Detaching a disk is also an action against an instance and only requires the name of the disk. Note that this does not safely sync and umount the disk from the instance. To ensure no data loss, you must first make sure the disk is unmounted from the instance.

```
salt-cloud -a detach_disk myinstance disk_name=pd
```

Show disk

It’s also possible to look up the details for an existing disk with either a function or an action.

```
salt-cloud -a show_disk myinstance disk_name=pd
salt-cloud -f show_disk gce disk_name=pd
```

Create snapshot

You can take a snapshot of an existing disk’s content. The snapshot can then in turn be used to create other persistent disks. Note that to prevent data corruption, it is strongly suggested that you unmount the disk prior to taking a snapshot. You must name the snapshot and provide the name of the disk.

```
salt-cloud -f create_snapshot gce name=backup-20140226 disk_name=pd
```

Delete snapshot

You can delete a snapshot when it’s no longer needed by specifying the name of the snapshot.

```
salt-cloud -f delete_snapshot gce name=backup-20140226
```

Show snapshot

Use this function to look up information about the snapshot.

```
salt-cloud -f show_snapshot gce name=backup-20140226
```

Networking

Compute Engine supports multiple private networks per project. Instances within a private network can easily communicate with each other by an internal DNS service that resolves instance names. Instances within a private network can also communicate with either directly without needing special routing or firewall rules even if they span different regions/zones.

Networks also support custom firewall rules. By default, traffic between instances on the same private network is open to all ports and protocols. Inbound SSH traffic (port 22) is also allowed but all other inbound traffic is blocked.

Create network

New networks require a name and CIDR range. New instances can be created and added to this network by setting the network name during create. It is not possible to add/remove existing instances to a network.
salt-cloud -f create_network gce name=mynet cidr=10.10.10.0/24

**Destroy network**

Destroy a network by specifying the name. Make sure that there are no instances associated with the network prior to deleting it or you'll have a bad day.

salt-cloud -f delete_network gce name=mynet

**Show network**

Specify the network name to view information about the network.

salt-cloud -f show_network gce name=mynet

**Create address**

Create a new named static IP address in a region.

salt-cloud -f create_address gce name=my-fixed-ip region=us-central1

**Delete address**

Delete an existing named fixed IP address.

salt-cloud -f delete_address gce name=my-fixed-ip region=us-central1

**Show address**

View details on a named address.

salt-cloud -f show_address gce name=my-fixed-ip region=us-central1

**Create firewall**

You'll need to create custom firewall rules if you want to allow other traffic than what is described above. For instance, if you run a web service on your instances, you'll need to explicitly allow HTTP and/or SSL traffic. The firewall rule must have a name and it will use the `default` network unless otherwise specified with a `network` attribute. Firewalls also support instance tags for source/destination.

salt-cloud -f create_fwrule gce name=web allow=tcp:80,tcp:443,icmp

**Delete firewall**

Deleting a firewall rule will prevent any previously allowed traffic for the named firewall rule.
Show firewall

Use this function to review an existing firewall rule’s information.

```
salt-cloud -f show_fwrule gce name=web
```

Load Balancer

Compute Engine possess a load-balancer feature for splitting traffic across multiple instances. Please reference the documentation for a more complete discription.

The load-balancer functionality is slightly different than that described in Google’s documentation. The concept of TargetPool and ForwardingRule are consolidated in salt-cloud/libcloud. HTTP Health Checks are optional.

HTTP Health Check

HTTP Health Checks can be used as a means to toggle load-balancing across instance members, or to detect if an HTTP site is functioning. A common use-case is to set up a health check URL and if you want to toggle traffic on/off to an instance, you can temporarily have it return a non-200 response. A non-200 response to the load-balancer’s health check will keep the LB from sending any new traffic to the “down” instance. Once the instance’s health check URL beings returning 200-responses, the LB will again start to send traffic to it. Review Compute Engine’s documentation for allowable parameters. You can use the following salt-cloud functions to manage your HTTP health checks.

```
salt-cloud -f create_hc gce name=myhc path=/ port=80
salt-cloud -f delete_hc gce name=myhc
salt-cloud -f show_hc gce name=myhc
```

Load-balancer

When creating a new load-balancer, it requires a name, region, port range, and list of members. There are other optional parameters for protocol, and list of health checks. Deleting or showing details about the LB only requires the name.

```
salt-cloud -f create_lb gce name=lb region=... ports=80 members=w1,w2,w3
salt-cloud -f delete_lb gce name=lb
salt-cloud -f show_lb gce name=lb
```

You can also create a load balancer using a named fixed IP address by specifying the name of the address. If the address does not exist yet it will be created.

```
salt-cloud -f create_lb gce name=my-lb region=us-central1 ports=234 members=s1,s2,s3 address=my-lb-ip
```

Attach and Detach LB

It is possible to attach or detach an instance from an existing load-balancer. Both the instance and load-balancer must exist before using these functions.
24.5.7 Getting Started With HP Cloud

HP Cloud is a major public cloud platform and uses the libcloud openstack driver. The current version of OpenStack that HP Cloud uses is Havana. When an instance is booted, it must have a floating IP added to it in order to connect to it and further below you will see an example that adds context to this statement.

Set up a cloud provider configuration file

To use the openstack driver for HP Cloud, set up the cloud provider configuration file as in the example shown below:

```
/etc/salt/cloud.providers.d/hpcloud.conf:

hpcloud-config:
    # Set the location of the salt-master
    #
    minion:
        master: saltmaster.example.com

    # Configure HP Cloud using the OpenStack plugin
    #
    identity_url: https://region-b.geo-1.identity.hpcloudsvc.com:35357/v2.0/tokens
    compute_name: Compute
    protocol: ipv4

    # Set the compute region:
    #
    compute_region: region-b.geo-1

    # Configure HP Cloud authentication credentials
    #
    user: myname
    tenant: myname-project1
    password: xxxxxxxxxx

    # keys to allow connection to the instance launched
    #
    ssh_key_name: yourkey
    ssh_key_file: /path/to/key/yourkey.priv

    driver: openstack
```

The subsequent example that follows is using the openstack driver.

**Note:** Changed in version 2015.8.0.

The provider parameter in cloud provider definitions was renamed to driver. This change was made to avoid confusion with the provider parameter that is used in cloud profile definitions. Cloud provider definitions now use driver to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use provider to refer to provider configurations that you define.
**Compute Region**

Originally, HP Cloud, in its OpenStack Essex version (1.0), had 3 availability zones in one region, US West (region-a.geo-1), which each behaved each as a region.

This has since changed, and the current OpenStack Havana version of HP Cloud (1.1) now has simplified this and now has two regions to choose from:

<table>
<thead>
<tr>
<th>Region</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>region-a.geo-1</td>
<td>US West</td>
</tr>
<tr>
<td>region-b.geo-1</td>
<td>US East</td>
</tr>
</tbody>
</table>

**Authentication**

The **user** is the same user as is used to log into the HP Cloud management UI. The **tenant** can be found in the upper left under "Project/Region/Scope". It is often named the same as **user** albeit with a `-project1` appended. The **password** is of course what you created your account with. The management UI also has other information such as being able to select US East or US West.

**Set up a cloud profile config file**

The profile shown below is a know working profile for an Ubuntu instance. The profile configuration file is stored in the following location:

```
/etc/salt/cloud.profiles.d/hp_ae1_ubuntu.conf
```

```
hp_ae1_ubuntu:
    provider: hp_ae1
    image: 9302692b-b787-4b52-a3a6-daebb79cb498
    ignore_cidr: 10.0.0.1/24
    networks:
        - floating: Ext-Net
    size: standard.small
    ssh_key_file: /root/keys/test.key
    ssh_key_name: test
    ssh_username: ubuntu
```

Some important things about the example above:

- The **image** parameter can use either the image name or image ID which you can obtain by running in the example below (this case US East):

  ```
  # salt-cloud --list-images hp_ae1
  ```

- The parameter **ignore_cidr** specifies a range of addresses to ignore when trying to connect to the instance. In this case, it's the range of IP addresses used for an private IP of the instance.

- The parameter **networks** is very important to include. In previous versions of Salt Cloud, this is what made it possible for salt-cloud to be able to attach a floating IP to the instance in order to connect to the instance and set up the minion. The current version of salt-cloud doesn't require it, though having it is of no harm either. Newer versions of salt-cloud will use this, and without it, will attempt to find a list of floating IP addresses to use regardless.

- The **ssh_key_file** and **ssh_key_name** are the keys that will make it possible to connect to the instance to set up the minion

- The **ssh_username** parameter, in this case, being that the image used will be ubuntu, will make it possible to not only log in but install the minion
Launch an instance

To instantiate a machine based on this profile (example):

```
# salt-cloud -p hp_a1_ubuntu ubuntu_instance_1
```

After several minutes, this will create an instance named ubuntu_instance_1 running in HP Cloud in the US East region and will set up the minion and then return information about the instance once completed.

Manage the instance

Once the instance has been created with salt-minion installed, connectivity to it can be verified with Salt:

```
# salt ubuntu_instance_1 ping
```

SSH to the instance

Additionally, the instance can be accessed via SSH using the floating IP assigned to it

```
# ssh ubuntu@<floating ip>
```

Using a private IP

Alternatively, in the cloud profile, using the private IP to log into the instance to set up the minion is another option, particularly if salt-cloud is running within the cloud on an instance that is on the same network with all the other instances (minions)

The example below is a modified version of the previous example. Note the use of `ssh_interface`:

```
hp_a1_ubuntu:
    provider: hp_a1
    image: 9302692b-b787-4b52-a3a6-daebb79cb498
    size: standard.small
    ssh_key_file: /root/keys/test.key
    ssh_key_name: test
    ssh_username: ubuntu
    ssh_interface: private_ips
```

With this setup, salt-cloud will use the private IP address to ssh into the instance and set up the salt-minion

### 24.5.8 Getting Started With Joyent

Joyent is a public cloud host that supports SmartOS, Linux, FreeBSD, and Windows.

**Dependencies**

This driver requires the Python `requests` library to be installed.
**Configuration**

The Joyent cloud requires three configuration parameters. The user name and password that are used to log into the Joyent system, and the location of the private ssh key associated with the Joyent account. The ssh key is needed to send the provisioning commands up to the freshly created virtual machine.

```yaml
# Note: This example is for /etc/salt/cloud.providers or any file in the
# /etc/salt/cloud.providers.d/ directory.
my-joyent-config:
  driver: joyent
  user: fred
  password: saltybacon
  private_key: /root/mykey.pem
  keyname: mykey
```

**Note:** Changed in version 2015.8.0.

The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

**Profiles**

**Cloud Profiles**

Set up an initial profile at `/etc/salt/cloud.profiles` or in the `/etc/salt/cloud.profiles.d/` directory:

```yaml
joyent_512
  provider: my-joyent-config
  size: Extra Small 512 MB
  image: Arch Linux 2013.06
```

Sizes can be obtained using the `--list-sizes` option for the `salt-cloud` command:

```bash
# salt-cloud --list-sizes my-joyent-config
my-joyent-config:
  ________
  joyent:
  ________
  Extra Small 512 MB:
  ____________
  default:
  false
disk:
  15360
id:
  Extra Small 512 MB
memory:
  512
name:
  Extra Small 512 MB
swap:
  1024
```
Images can be obtained using the --list-images option for the salt-cloud command:

```
# salt-cloud --list-images my-joyent-config
my-joyent-config:
    --------
    joyent:
    --------
    base:
    --------
    description:
    A 32-bit SmartOS image with just essential packages installed. Ideal for users who are comfortable with setting up their own environment and tools.
    disabled:
    False
    files:
    --------
    - compression:
      bzip2
    - sha1:
      48dc6457c237cf6306103c74b5f45f5bf2d9bbe
    - size:
      82492182
    name:
    base
    os:
    smartos
    owner:
    352971aa-31ba-496c-9ade-a379feaed52
    public:
    True
```

**SmartDataCenter**

This driver can also be used with the Joyent SmartDataCenter project. More details can be found at:

Using SDC requires that an api_host_suffix is set. The default value for this is `.api.joyentcloud.com`. All characters, including the leading `.`, should be included:

```
api_host_suffix: .api.myhostname.com
```

**Miscellaneous Configuration**

The following configuration items can be set in either provider or profile configuration files.

**use_ssl**

When set to True (the default), attach https:// to any URL that does not already have http:// or https:// included at the beginning. The best practice is to leave the protocol out of the URL, and use this setting to manage it.
verify_ssl

When set to True (the default), the underlying web library will verify the SSL certificate. This should only be set to False for debugging.

24.5.9 Getting Started With LXC

The LXC module is designed to install Salt in an LXC container on a controlled and possibly remote minion. In other words, Salt will connect to a minion, then from that minion:

- Provision and configure a container for networking access
- Use those modules to deploy salt and re-attach to master.
  - lxc runner
  - lxc module
  - seed

Limitations

- You can only act on one minion and one provider at a time.
- Listing images must be targeted to a particular LXC provider (nothing will be outputted with all)

Operation

Salt’s LXC support does use lxc.init via the lxc.cloud_init_interface and seeds the minion via seed.mkconfig.

You can provide to those lxc VMs a profile and a network profile like if you were directly using the minion module.

Order of operation:

- Create the LXC container on the desired minion (clone or template)
- Change LXC config options (if any need to be changed)
- Start container
- Change base passwords if any
- Change base DNS configuration if necessary
- Wait for LXC container to be up and ready for ssh
- Test SSH connection and bailout in error
- Upload deploy script and seeds, then re-attach the minion.

Provider configuration

Here is a simple provider configuration:
Profile configuration

Please read LXC Management with Salt before anything else. And specially Profiles.

Here are the options to configure your containers:

- **target** Host minion id to install the lxc Container into
- **lxc_profile** Name of the profile or inline options for the LXC vm creation/cloning, please see Container Profiles.
- **network_profile** Name of the profile or inline options for the LXC vm network settings, please see Network Profiles.
- **nic_opts** Totally optionnal. Per interface new-style configuration options mappings which will override any profile default option:

  ```
  eth0: {'mac': '00:16:3e:01:29:40',
         'gateway': None, (default)
         'link': 'br0', (default)
         'gateway': None, (default)
         'netmask': '', (default)
         'ip': '22.1.4.25'}
  ```
- **password** password for root and sysadmin users
- **dnsservers** List of DNS servers to use. This is optional.
- **minion** minion configuration (see Minion Configuration in Salt Cloud)
- **bootstrap_shell** shell for bootstraping script (default: /bin/sh)
- **script** defaults to salt-bootstrap
- **script_args** arguments which are given to the bootstrap script. the {0} placeholder will be replaced by the path which contains the minion config and key files, eg:

  ```python
  script_args="-c {0}"
  ```

Using profiles:

```bash
# Note: This example would go in /etc/salt/cloud.profiles or any file in the
# /etc/salt/cloud.profiles.d/ directory.
devhost10-lxc:
    provider: devhost10-lxc
    lxc_profile: foo
    network_profile: bar
```
Using inline profiles (eg to override the network bridge):

```yaml
devhost11-lxc:
  provider: devhost10-lxc
  lxc_profile:
    clone_from: foo
  network_profile:
    eth0:
      link: lxcbr0
  minion:
    master: 10.5.0.1
    master_port: 4506
```

Template instead of a clone:

```yaml
devhost11-lxc:
  provider: devhost10-lxc
  lxc_profile:
    template: ubuntu
  network_profile:
    eth0:
      link: lxcbr0
  minion:
    master: 10.5.0.1
    master_port: 4506
```

Static ip:

```yaml
# Note: This example would go in /etc/salt/cloud.profiles or any file in the
# /etc/salt/cloud.profiles.d/ directory.
devhost10-lxc:
  provider: devhost10-lxc
  nic_opts:
    eth0:
      ipv4: 10.0.3.9
  minion:
    master: 10.5.0.1
    master_port: 4506
```

DHCP:

```yaml
# Note: This example would go in /etc/salt/cloud.profiles or any file in the
# /etc/salt/cloud.profiles.d/ directory.
devhost10-lxc:
  provider: devhost10-lxc
  minion:
    master: 10.5.0.1
    master_port: 4506
```

Driver Support

- Container creation
- Image listing (LXC templates)
• Running container information (IP addresses, etc.)

24.5.10 Getting Started With Linode

Linode is a public cloud host with a focus on Linux instances.
Starting with the 2015.8.0 release of Salt, the Linode driver uses Linode's native REST API. There are no external dependencies required to use the Linode driver.

Configuration

Linode requires a single API key, but the default root password for new instances also needs to be set:

```bash
# Note: This example is for /etc/salt/cloud.providers or any file in the
# /etc/salt/cloud.providers.d/ directory.

my-linode-config:
  apikey: asldkgfakl;sdfljasldflsdjfl;askldjfaaklsjdfsldasdfsdfghdks
  password: F00barbaz
  ssh_pubkey: ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIHEOLLbeXgaqRQT9NBAopVz366SdYc0KKX33VAnq+2R user@host
  ssh_key_file: ~/.ssh/id_ed25519
  driver: linode
```

The password needs to be 8 characters and contain lowercase, uppercase, and numbers.

**Note:** Changed in version 2015.8.0.
The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

Profiles

Cloud Profiles

Set up an initial profile at `/etc/salt/cloud.profiles` or in the `/etc/salt/cloud.profiles.d/` directory:

```yaml
linode_1024:
  provider: my-linode-config
  size: Linode 1024
  image: Arch Linux 2013.06
  location: london
```

Sizes can be obtained using the `--list-sizes` option for the `salt-cloud` command:

```bash
# salt-cloud --list-sizes my-linode-config
my-linode-config:
  ----------
  linode:
    Linode 1024:
      ----------
      bandwidth:
```

330 Chapter 24. Salt Cloud
Images can be obtained using the --list-images option for the salt-cloud command:

```
# salt-cloud --list-images my-linode-config
my-linode-config:
        linode:
             Arch Linux 2013.06:
            driver:
            extra:
                 64bit:
                         1
                 pvops:
                         1
            get_uuid:
            id:
                     112
            name:
                     Arch Linux 2013.06
            uuid:
                     8457f92eaffc92b7666b6734a96ad7abe1a8a6dd
```

Locations can be obtained using the --list-locations option for the salt-cloud command:

```
# salt-cloud --list-locations my-linode-config
my-linode-config:
        linode:
             Atlanta, GA, USA:
                abbreviation: atlanta
                id:
                         4
             Dallas, TX, USA:
                abbreviation: dallas
```
Cloning

When salt-cloud accesses Linode via linode-python it can clone machines.

It is safest to clone a stopped machine. To stop a machine run

```
salt-cloud -a stop machine_to_clone
```

To create a new machine based on another machine, add an entry to your linode cloud profile that looks like this:

```
li-clone:
    provider: my-linode-config
    clonefrom: machine_to_clone
    script_args: -C
```

Then run salt-cloud as normal, specifying `-p li-clone`. The profile name can be anything; It doesn't have to be `li-clone`.

`Clonefrom:` is the name of an existing machine in Linode from which to clone. `Script args: -C` is necessary to avoid re-deploying Salt via salt-bootstrap. `-C` will just re-deploy keys so the new minion will not have a duplicate key or minion_id on the master.

24.5.11 Getting Started With OpenStack

OpenStack is one of the most popular cloud projects. It's an open source project to build public and/or private clouds. You can use Salt Cloud to launch OpenStack instances.

Dependencies

- Libcloud >= 0.13.2

Configuration

- Using the new format, set up the cloud configuration at `/etc/salt/cloud.providers` or `/etc/salt/cloud.providers.d/openstack.conf`:

```
my-openstack-config:
  # Set the location of the salt-master
  #
  minion:
    master: saltmaster.example.com

  # Configure the OpenStack driver
  #
  identity_url: http://identity.youopenstack.com/v2.0/tokens
  compute_name: nova
  protocol: ipv4

  compute_region: RegionOne

  # Configure Openstack authentication credentials
```
#
user: myname
password: 123456
# tenant is the project name
tenant: myproject
driver: openstack

# skip SSL certificate validation (default false)
insecure: false

Note: Changed in version 2015.8.0.
The provider parameter in cloud provider definitions was renamed to driver. This change was made to avoid confusion with the provider parameter that is used in cloud profile definitions. Cloud provider definitions now use driver to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use provider to refer to provider configurations that you define.

Using nova client to get information from OpenStack

One of the best ways to get information about OpenStack is using the novaclient python package (available in pip as python-novaclient). The client configuration is a set of environment variables that you can get from the Dashboard. Log in and then go to Project -> Access & security -> API Access and download the "OpenStack RC file". Then:

source /path/to/your/rcfile
nova credentials
nova endpoints

In the nova endpoints output you can see the information about compute_region and compute_name.

Compute Region

It depends on the OpenStack cluster that you are using. Please, have a look at the previous sections.

Authentication

The user and password is the same user as is used to log into the OpenStack Dashboard.

Profiles

Here is an example of a profile:

openstack_512:
    provider: my-openstack-config
    size: m1.tiny
    image: cirros-0.3.1-x86_64-uec
    ssh_key_file: /tmp/test.pem
    ssh_key_name: test
    ssh_interface: private_ips

The following list explains some of the important properties.
size can be one of the options listed in the output of nova flavor-list.
image can be one of the options listed in the output of nova image-list.

ssh_key_file The SSH private key that the salt-cloud uses to SSH into the VM after its first booted in order to execute a command or script. This private key's public key must be the openstack public key inserted into the authorized_key's file of the VM's root user account.

ssh_key_name The name of the openstack SSH public key that is inserted into the authorized_keys file of the VM's root user account. Prior to using this public key, you must use openstack commands or the horizon web UI to load that key into the tenant's account. Note that this openstack tenant must be the one you defined in the cloud provider.

ssh_interface This option allows you to create a VM without a public IP. If this option is omitted and the VM does not have a public IP, then the salt-cloud waits for a certain period of time and then destroys the VM. With the nova drive, private cloud networks can be defined here.

For more information concerning cloud profiles, see here.

change_password

If no ssh_key_file is provided, and the server already exists, change_password will use the api to change the root password of the server so that it can be bootstrapped.

change_password: True

userdata_file

Use userdata_file to specify the userdata file to upload for use with cloud-init if available.

userdata_file: /etc/salt/cloud-init/packages.yml

24.5.12 Getting Started With Parallels

Parallels Cloud Server is a product by Parallels that delivers a cloud hosting solution. The PARALLELS module for Salt Cloud enables you to manage instances hosted using PCS. Further information can be found at:

http://www.parallels.com/products/pcs/

- Using the old format, set up the cloud configuration at /etc/salt/cloud:

```yaml
# Set up the location of the salt master
#
minion:
  master: saltmaster.example.com

# Set the PARALLELS access credentials (see below)
#
PARALLELS.user: myuser
PARALLELS.password: badpass

# Set the access URL for your PARALLELS host
#
PARALLELS.url: https://api.cloud.xmission.com:4465/paci/v1.0/
```

- Using the new format, set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/parallels.conf:
my-parallels-config:
  # Set up the location of the salt master
  #
  minion:
    master: saltmaster.example.com

  # Set the PARALLELS access credentials (see below)
  #
  user: myuser
  password: badpass

  # Set the access URL for your PARALLELS provider
  #
  url: https://api.cloud.xmission.com:4465/paci/v1.0/
  driver: parallels

Note: Changed in version 2015.8.0.
The provider parameter in cloud provider definitions was renamed to driver. This change was made to avoid confusion with the provider parameter that is used in cloud profile definitions. Cloud provider definitions now use driver to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use provider to refer to provider configurations that you define.

Access Credentials

The user, password, and url will be provided to you by your cloud host. These are all required in order for the PARALLELS driver to work.

Cloud Profiles

Set up an initial profile at /etc/salt/cloud.profiles or /etc/salt/cloud.profiles.d/parallels.conf:

parallels-ubuntu:
  provider: my-parallels-config
  image: ubuntu-12.04-x86_64

The profile can be realized now with a salt command:

# salt-cloud -p parallels-ubuntu myubuntu

This will create an instance named myubuntu on the cloud host. The minion that is installed on this instance will have an id of myubuntu. If the command was executed on the salt-master, its Salt key will automatically be signed on the master.

Once the instance has been created with salt-minion installed, connectivity to it can be verified with Salt:

# salt myubuntu test.ping

Required Settings

The following settings are always required for PARALLELS:

- Using the old cloud configuration format:
PARALLELS.user: myuser
PARALLELS.password: badpass
PARALLELS.url: https://api.cloud.xmission.com:4465/paci/v1.0/

- Using the new cloud configuration format:

```makefile
my-parallels-config:
    user: myuser
    password: badpass
    url: https://api.cloud.xmission.com:4465/paci/v1.0/
    driver: parallels
```

Optional Settings

Unlike other cloud providers in Salt Cloud, Parallels does not utilize a size setting. This is because Parallels allows the end-user to specify a more detailed configuration for their instances than is allowed by many other cloud hosts. The following options are available to be used in a profile, with their default settings listed.

```makefile
# Description of the instance. Defaults to the instance name.
desc: <instance_name>

# How many CPU cores, and how fast they are (in MHz)
cpu_number: 1
cpu_power: 1000

# How many megabytes of RAM
ram: 256

# Bandwidth available, in kbps
bandwidth: 100

# How many public IPs will be assigned to this instance
ip_num: 1

# Size of the instance disk (in GiB)
disk_size: 10

# Username and password
ssh_username: root
password: <value from PARALLELS.password>

# The name of the image, from `salt-cloud --list-images parallels`
image: ubuntu-12.04-x86_64
```

24.5.13 Getting Started With Proxmox

Proxmox Virtual Environment is a complete server virtualization management solution, based on KVM virtualization and OpenVZ containers. Further information can be found at:

http://www.proxmox.org/

Dependencies

- IPy >= 0.81
• requests >= 2.2.1

Please note: This module allows you to create both OpenVZ and KVM but installing Salt on it will only be done when the VM is an OpenVZ container rather than a KVM virtual machine.

• Set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/proxmox.conf:

my-proxmox-config:

# Set up the location of the salt master
#
minion:
  master: saltmaster.example.com

# Set the PROXMOX access credentials (see below)
#
user: myuser@pve
password: badpass

# Set the access URL for your PROXMOX host
#
url: your.proxmox.host

driver: proxmox

Note: Changed in version 2015.8.0.
The provider parameter in cloud provider definitions was renamed to driver. This change was made to avoid confusion with the provider parameter that is used in cloud profile definitions. Cloud provider definitions now use driver to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use provider to refer to provider configurations that you define.

Access Credentials

The user, password, and url will be provided to you by your cloud host. These are all required in order for the PROXMOX driver to work.

Cloud Profiles

Set up an initial profile at /etc/salt/cloud.profiles or /etc/salt/cloud.profiles.d/proxmox.conf:

• Configure a profile to be used:

proxmox-ubuntu:

  provider: my-proxmox-config
  image: local:vztmpl/ubuntu-12.04-standard_12.04-1_amd64.tar.gz
  technology: openvz
  host: myvmhost
  ip_address: 192.168.100.155
  password: topsecret

The profile can be realized now with a salt command:

# salt-cloud -p proxmox-ubuntu myubuntu

This will create an instance named myubuntu on the cloud host. The minion that is installed on this instance will have a hostname of myubuntu. If the command was executed on the salt-master, its Salt key will automatically be signed on the master.
Once the instance has been created with salt-minion installed, connectivity to it can be verified with Salt:

```
# salt myubuntu test.ping
```

### Required Settings

The following settings are always required for PROXMOX:

- Using the new cloud configuration format:

```yaml
my-proxmox-config:
  driver: proxmox
  user: saltcloud@pve
  password: xyzzy
  url: your.proxmox.host
```

### Optional Settings

Unlike other cloud providers in Salt Cloud, Proxmox does not utilize a `size` setting. This is because Proxmox allows the end-user to specify a more detailed configuration for their instances, than is allowed by many other cloud providers. The following options are available to be used in a profile, with their default settings listed.

```
# Description of the instance.
desc: <instance_name>

# How many CPU cores, and how fast they are (in MHz)
cpus: 1
cpuunits: 1000

# How many megabytes of RAM
memory: 256

# How much swap space in MB
swap: 256

# Whether to auto boot the vm after the host reboots
onboot: 1

# Size of the instance disk (in GiB)
disk: 10

# Host to create this vm on
host: myvmhost

# Nameservers. Defaults to host
nameserver: 8.8.8.8 8.8.4.4

# Username and password
ssh_username: root
password: <value from PROXMOX.password>

# The name of the image, from `salt-cloud --list-images proxmox`
image: local:vztmpl/ubuntu-12.04-standard_12.04-1_amd64.tar.gz
```
24.5.14 Getting Started With Rackspace

Rackspace is a major public cloud platform which may be configured using either the rackspace or the openstack driver, depending on your needs.

Please note that the rackspace driver is intended only for 1st gen instances, aka, "the old cloud" at Rackspace. It is required for 1st gen instances, but will not work with OpenStack-based instances. Unless you explicitly have a reason to use it, it is highly recommended that you use the openstack driver instead.

Dependencies

- Libcloud >= 0.13.2

Configuration

To use the openstack driver (recommended), set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/rackspace.conf:

```yaml
my-rackspace-config:
  # Set the location of the salt-master
  #
  minion:
    master: saltmaster.example.com

  # Configure Rackspace using the OpenStack plugin
  #
  identity_url: https://identity.api.rackspacecloud.com/v2.0/tokens
  compute_name: cloudServersOpenStack
  protocol: ipv4

  # Set the compute region:
  #
  compute_region: DFW

  # Configure Rackspace authentication credentials
  #
  user: myname
  tenant: 123456
  apikey: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

  driver: openstack
```

To use the rackspace driver, set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/rackspace.conf:

```yaml
my-rackspace-config:
  driver: rackspace
  # The Rackspace login user
  user: fred
  # The Rackspace user's apikey
  apikey: 901d3f579h23c8v73q9
```

The settings that follow are for using Rackspace with the openstack driver, and will not work with the rackspace driver.

Note: Changed in version 2015.8.0.
The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

**Compute Region**

Rackspace currently has six compute regions which may be used:

- DFW -> Dallas/Forth Worth
- ORD -> Chicago
- SYD -> Sydney
- LON -> London
- IAD -> Northern Virginia
- HKG -> Hong Kong

Note: Currently the LON region is only available with a UK account, and UK accounts cannot access other regions.

**Authentication**

The `user` is the same user as is used to log into the Rackspace Control Panel. The `tenant` and `apikey` can be found in the API Keys area of the Control Panel. The `apikey` will be labeled as API Key (and may need to be generated), and `tenant` will be labeled as Cloud Account Number.

An initial profile can be configured in `/etc/salt/cloud.profiles` or `/etc/salt/cloud.profiles.d/rackspace.conf`:

```
openstack_512:
    provider: my-rackspace-config
    size: 512 MB Standard
    image: Ubuntu 12.04 LTS (Precise Pangolin)
```

To instantiate a machine based on this profile:

```
# salt-cloud -p openstack_512 myinstance
```

This will create a virtual machine at Rackspace with the name `myinstance`. This operation may take several minutes to complete, depending on the current load at the Rackspace data center.

Once the instance has been created with salt-minion installed, connectivity to it can be verified with Salt:

```
# salt myinstance test.ping
```

**RackConnect Environments**

Rackspace offers a hybrid hosting configuration option called RackConnect that allows you to use a physical firewall appliance with your cloud servers. When this service is in use the public_ip assigned by nova will be replaced by a NAT ip on the firewall. For salt-cloud to work properly it must use the newly assigned `access ip` instead of the Nova assigned public ip. You can enable that capability by adding this to your profiles:

```
openstack_512:
    provider: my-openstack-config
    size: 512 MB Standard
    image: Ubuntu 12.04 LTS (Precise Pangolin)
    rackconnect: True
```
Managed Cloud Environments

Rackspace offers a managed service level of hosting. As part of the managed service level you have the ability to choose from base of lamp installations on cloud server images. The post build process for both the base and the lamp installations used Chef to install things such as the cloud monitoring agent and the cloud backup agent. It also takes care of installing the lamp stack if selected. In order to prevent the post installation process from stomping over the bootstrapping you can add the below to your profiles.

```
openstack_512:
  provider: my-rackspace-config
  size: 512 MB Standard
  image: Ubuntu 12.04 LTS (Precise Pangolin)
  managedcloud: True
```

First and Next Generation Images

Rackspace provides two sets of virtual machine images, first, and next generation. As of 0.8.9 salt-cloud will default to using the next generation images. To force the use of first generation images, on the profile configuration please add:

```
FreeBSD-9.0-512:
  provider: my-rackspace-config
  size: 512 MB Standard
  image: FreeBSD 9.0
  force_first_gen: True
```

Private Subnets

By default salt-cloud will not add Rackspace private networks to new servers. To enable a private network to a server instantiated by salt cloud, add the following section to the provider file (typically /etc/salt/cloud.providers.d/rackspace.conf)

```
networks:
  - fixed:
    # This is the private network
    - private-network-id
    # This is Rackspace's "PublicNet"
    - 00000000-0000-0000-0000-000000000000
    # This is Rackspace's "ServiceNet"
    - 11111111-1111-1111-1111-111111111111
```

To get the Rackspace private network ID, go to Networking, Networks and hover over the private network name.

The order of the networks in the above code block does not map to the order of the ethernet devices on newly created servers. Public IP will always be first (eth0 ) followed by servicenet (eth1 ) and then private networks.

Enabling the private network per above gives the option of using the private subnet for all master-minion communication, including the bootstrap install of salt-minion. To enable the minion to use the private subnet, update the master: line in the minion: section of the providers file. To configure the master to only listen on the private subnet IP, update the interface: line in the /etc/salt/master file to be the private subnet IP of the salt master.

24.5.15 Getting Started With Saltify

The Saltify driver is a new, experimental driver for installing Salt on existing machines (virtual or bare metal).
Dependencies

The Saltify driver has no external dependencies.

Configuration

Because the Saltify driver does not use an actual cloud provider host, it has a simple provider configuration. The only thing that is required to be set is the driver name, and any other potentially useful information, like the location of the salt-master:

```bash
# Note: This example is for /etc/salt/cloud.providers file or any file in
# the /etc/salt/cloud.providers.d/ directory.

my-saltify-config:
    minion:
        master: 111.222.333.444
    provider: saltify
```

Profiles

Saltify requires a profile to be configured for each machine that needs Salt installed. The initial profile can be set up at /etc/salt/cloud.profiles or in the /etc/salt/cloud.profiles.d/ directory. Each profile requires both an `ssh_host` and an `ssh_username` key parameter as well as either an `key_filename` or a `password`.

Profile configuration example:

```bash
# /etc/salt/cloud.profiles.d/saltify.conf

salt-this-machine:
    ssh_host: 12.34.56.78
    ssh_username: root
    key_filename: '/etc/salt/mysshkey.pem'
    provider: my-saltify-config
```

The machine can now be ``Salted'' with the following command:

```bash
salt-cloud -p salt-this-machine my-machine
```

This will install salt on the machine specified by the cloud profile, `salt-this-machine`, and will give the machine the minion id of `my-machine`. If the command was executed on the salt-master, its Salt key will automatically be signed on the master.

Once a salt-minion has been successfully installed on the instance, connectivity to it can be verified with Salt:

```bash
salt my-machine test.ping
```

Using Map Files

The settings explained in the section above may also be set in a map file. An example of how to use the Saltify driver with a map file follows:

```bash
# /etc/salt/saltify-map

make_salty:
```
- my-instance-0:
  ssh_host: 12.34.56.78
  ssh_username: root
  password: very-bad-password
- my-instance-1:
  ssh_host: 44.33.22.11
  ssh_username: root
  password: another-bad-pass

Note: When using a cloud map with the Saltify driver, the name of the profile to use, in this case make_salary, must be defined in a profile config. For example:

```
# /etc/salt/cloud.profiles.d/saltify.conf
make_salary:
  provider: my-saltify-config
```

The machines listed in the map file can now be ``Salted'' by applying the following salt map command:

```
salt-cloud -m /etc/salt/saltify-map
```

This command will install salt on the machines specified in the map and will give each machine their minion id of my-instance-0 and my-instance-1, respectively. If the command was executed on the salt-master, its Salt key will automatically be signed on the master.

Connectivity to the new ``Salted'' instances can now be verified with Salt:

```
salt 'my-instance-*' test.ping
```

24.5.16 Getting Started With Scaleway

Scaleway is the first IaaS host worldwide to offer an ARM based cloud. It's the ideal platform for horizontal scaling with BareMetal SSD servers. The solution provides on demand resources: it comes with on-demand SSD storage, movable IPs, images, security group and an Object Storage solution. https://scaleway.com

Configuration

Using Salt for Scaleway, requires an access key and an API token. API tokens are unique identifiers associated with your Scaleway account. To retrieve your access key and API token, log-in to the Scaleway control panel, open the pull-down menu on your account name and click on ``My Credentials'' link.

If you do not have API token you can create one by clicking the ``Create New Token'' button on the right corner.

```
# Note: This example is for /etc/salt/cloud.providers or any file in the
# /etc/salt/cloud.providers.d/ directory.

my-scaleway-config:
  access_key: 15cf404d-4560-41b1-9a0c-21c3d5c4ff1f
  token: a7347ec8-5de1-4024-a5e3-24b77d1ba91d
  driver: scaleway
```

Note: Changed in version 2015.8.0.

The provider parameter in cloud provider definitions was renamed to driver. This change was made to avoid confusion with the provider parameter that is used in cloud profile definitions. Cloud provider definitions now
use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

## Profiles

### Cloud Profiles

Set up an initial profile at `/etc/salt/cloud.profiles` or in the `/etc/salt/cloud.profiles.d/` directory:

```bash
scalewa-ubuntu:
    provider: my-scaleway-config
    image: Ubuntu Trusty (14.04 LTS)
```

Images can be obtained using the `--list-images` option for the `salt-cloud` command:

```bash
# salt-cloud --list-images my-scaleway-config
my-scaleway-config:
    --------------
    scaleway:
        ----------
        069fd876-eb04-44ab-a9cd-47e2fa3e5309:
            ---------
            arch: arm
            creation_date: 2015-03-12T09:35:45.764477+00:00
            default_bootscript: 
                {'kernel': {'dtb': '', 'title': 'Pimouss 3.2.34-30-std', 'id': 'cfda4308-cd6f-4e51-9744-905fc0da370f', 'path': 'kernel/pimouss-uImage-3.2.34-30-std'}, 'title': '3.2.34-std #30 (stable)', 'id': 'c5af0215-2516-4316-befc-5da1cfad609c', 'initrd': 
                    {'path': 'initrd/c1-uInitrd', 'id': '1be14b1b-e24c-48e5-b0b6-7ba452e42b92', 'title': 'C1 initrd'}, 
                    'bootcmdargs': 
                        {'id': 'd22c4dde-e5a4-47ad-abb9-d23b54d542ff', 'value': 'ip=dhcp boot=local root=/dev/nbd0 USE_XNBD=1 nbd.max_parts=8'}, 
                        'organization': '11111111-1111-4111-8111-111111111111', 
                        'public': True}
extra_volumes: 
    []
    id: 069fd876-eb04-44ab-a9cd-47e2fa3e5309
    modification_date: 2015-04-24T12:02:16.820256+00:00
    name: Ubuntu Vivid (15.04)
    organization: a283af0b-d13e-42e1-a43f-855ffbf281ab
    public: True
    root_volume: 
        {'name': 'distrib-ubuntu-vivid-2015-03-12_10:32-snapshot', 'id': 'a6d9e2e63-8dee-4b0d-9b47-fc24f5f5eab2', 'volume_type': 'l_ssd', 'size': 50000000000L}
```

... Execute a query and return all information about the nodes running on configured cloud providers using the `-Q` option for the `salt-cloud` command:

```bash
# salt-cloud -F
[INFO ] salt-cloud starting
[INFO ] Starting new HTTPS connection (1): api.scaleway.com
my-scaleway-config:
    --------------
    scaleway:
        ------------
        salt-manager:
            ----------
            creation_date:
```

Chapter 24. Salt Cloud
24.5.17 Getting Started With SoftLayer

SoftLayer is a public cloud host, and baremetal hardware hosting service.

Dependencies

The SoftLayer driver for Salt Cloud requires the softlayer package, which is available at PyPI:
https://pypi.python.org/pypi/SoftLayer

This package can be installed using pip or easy_install:

# pip install softlayer
# easy_install softlayer

Configuration

Set up the cloud config at /etc/salt/cloud.providers:

# Note: These examples are for /etc/salt/cloud.providers

my-softlayer:
    # Set up the location of the salt master
    minion:
        master: saltmaster.example.com

    # Set the SoftLayer access credentials (see below)
    user: MYUSER1138
    apikey: 'e3b68aa711e6deadc62d5b76355674beef7cc3116062dbacafe5f7e465bf0c9'

    driver: softlayer

my-softlayer-hw:
    # Set up the location of the salt master
    minion:
        master: saltmaster.example.com

    # Set the SoftLayer access credentials (see below)
    user: MYUSER1138
    apikey: 'e3b68aa711e6deadc62d5b76355674beef7cc3116062dbacafe5f7e465bf0c9'

    driver: softlayer_h喜悦

Note: Changed in version 2015.8.0.

The provider parameter in cloud provider definitions was renamed to driver. This change was made to avoid confusion with the provider parameter that is used in cloud profile definitions. Cloud provider definitions now
use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

**Access Credentials**

The `user` setting is the same user as is used to log into the SoftLayer Administration area. The `apikey` setting is found inside the Admin area after logging in:

- Hover over the `Account` menu item.
- Click the `Users` link.
- Find the API Key column and click View.

**Profiles**

**Cloud Profiles**

Set up an initial profile at `/etc/salt/cloud.profiles`:

```yaml
base_softlayer_ubuntu:
  provider: my-softlayer
  image: UBUNTU_LATEST
  cpu_number: 1
  ram: 1024
  disk_size: 100
  local_disk: True
  hourly_billing: True
  domain: example.com
  location: sjc01
  # Optional
  max_net_speed: 1000
  private_vlan: 396
  private_network: True
  private_ssh: True
  # May be used _instead_of_ image
  global_identifier: 320d8be5-46c0-dead-cafe-13e3c51
```

Most of the above items are required; optional items are specified below.

**image** Images to build an instance can be found using the `--list-images` option:

```
# salt-cloud --list-images my-softlayer
```

The setting used will be labeled as `template`.

**cpu_number** This is the number of CPU cores that will be used for this instance. This number may be dependent upon the image that is used. For instance:

```
Red Hat Enterprise Linux 6 - Minimal Install (64 bit) (1 - 4 Core):
    _________
    name:
    Red Hat Enterprise Linux 6 - Minimal Install (64 bit) (1 - 4 Core)
    template:
```
Note that the template (meaning, the image option) for both of these is the same, but the names suggest how many CPU cores are supported.

**ram**  This is the amount of memory, in megabytes, that will be allocated to this instance.

**disk_size**  The amount of disk space that will be allocated to this image, in megabytes.

**local_disk**  When true the disks for the computing instance will be provisioned on the host which it runs, otherwise SAN disks will be provisioned.

**hourly_billing**  When true the computing instance will be billed on hourly usage, otherwise it will be billed on a monthly basis.

**domain**  The domain name that will be used in the FQDN (Fully Qualified Domain Name) for this instance. The domain setting will be used in conjunction with the instance name to form the FQDN.

**location**  Images to build an instance can be found using the `--list-locations` option:

```
# salt-cloud --list-location my-softlayer
```

**max_net_speed**  Specifies the connection speed for the instance's network components. This setting is optional. By default, this is set to 10.

**public_vlan**  If it is necessary for an instance to be created within a specific frontend VLAN, the ID for that VLAN can be specified in either the provider or profile configuration.

This ID can be queried using the `list_vlans` function, as described below. This setting is optional.

**private_vlan**  If it is necessary for an instance to be created within a specific backend VLAN, the ID for that VLAN can be specified in either the provider or profile configuration.

This ID can be queried using the `list_vlans` function, as described below. This setting is optional.

**private_network**  If a server is to only be used internally, meaning it does not have a public VLAN associated with it, this value would be set to True. This setting is optional. The default is False.

**private_ssh**  Whether to run the deploy script on the server using the public IP address or the private IP address. If set to True, Salt Cloud will attempt to SSH into the new server using the private IP address. The default is False. This setting is optional.
global_identifier When creating an instance using a custom template, this option is set to the corresponding value obtained using the list_custom_images function. This option will not be used if an image is set, and if an image is not set, it is required.

The profile can be realized now with a salt command:

```
# salt-cloud -p base_softlayer_ubuntu myserver
```

Using the above configuration, this will create myserver.example.com.

Once the instance has been created with salt-minion installed, connectivity to it can be verified with Salt:

```
# salt 'myserver.example.com' test.ping
```

Cloud Profiles

Set up an initial profile at /etc/salt/cloud.profiles:

```
base_softlayer_hw_centos:
  provider: my-softlayer-hw
  # CentOS 6.0 - Minimal Install (64 bit)
  image: 13963
  # 2 x 2.0 GHz Core Bare Metal Instance - 2 GB Ram
  size: 1921
  # 250GB SATA II
  hdd: 19
  # San Jose 01
  location: 168642
  domain: example.com
  # Optional
  vlan: 396
  port_speed: 273
  bandwidth: 248
```

Most of the above items are required; optional items are specified below.

image Images to build an instance can be found using the --list-images option:

```
# salt-cloud --list-images my-softlayer-hw
```

A list of id’s and names will be provided. The `name` will describe the operating system and architecture. The id will be the setting to be used in the profile.

size Sizes to build an instance can be found using the --list-sizes option:

```
# salt-cloud --list-sizes my-softlayer-hw
```

A list of id’s and names will be provided. The `name` will describe the speed and quantity of CPU cores, and the amount of memory that the hardware will contain. The id will be the setting to be used in the profile.

hdd There are currently two sizes of hard disk drive (HDD) that are available for hardware instances on SoftLayer:

```
19: 250GB SATA II
1267: 500GB SATA II
```

The hdd setting in the profile will be either 19 or 1267. Other sizes may be added in the future.
**location**  Locations to build an instance can be found using the `--list-images` option:

```bash
# salt-cloud --list-locations my-softlayer-hw
```

A list of IDs and names will be provided. The `location` will describe the location in human terms. The `id` will be the setting to be used in the profile.

**domain**  The domain name that will be used in the FQDN (Fully Qualified Domain Name) for this instance. The `domain` setting will be used in conjunction with the instance name to form the FQDN.

**vlan**  If it is necessary for an instance to be created within a specific VLAN, the ID for that VLAN can be specified in either the provider or profile configuration.

This ID can be queried using the `list_vlans` function, as described below.

**port_speed**  Specifies the speed for the instance’s network port. This setting refers to an ID within the SoftLayer API, which sets the port speed. This setting is optional. The default is 273, or, 100 Mbps Public & Private Networks. The following settings are available:

- 273: 100 Mbps Public & Private Networks
- 274: 1 Gbps Public & Private Networks
- 21509: 10 Mbps Dual Public & Private Networks (up to 20 Mbps)
- 21513: 100 Mbps Dual Public & Private Networks (up to 200 Mbps)
- 2314: 1 Gbps Dual Public & Private Networks (up to 2 Gbps)
- 272: 10 Mbps Public & Private Networks

**bandwidth**  Specifies the network bandwidth available for the instance. This setting refers to an ID within the SoftLayer API, which sets the bandwidth. This setting is optional. The default is 248, or, 5000 GB Bandwidth. The following settings are available:

- 248: 5000 GB Bandwidth
- 129: 6000 GB Bandwidth
- 130: 8000 GB Bandwidth
- 131: 10000 GB Bandwidth
- 36: Unlimited Bandwidth (10 Mbps Uplink)
- 125: Unlimited Bandwidth (100 Mbps Uplink)

**Actions**

The following actions are currently supported by the SoftLayer Salt Cloud driver.

**show_instance**

This action is a thin wrapper around `--full-query`, which displays details on a single instance only. In an environment with several machines, this will save a user from having to sort through all instance data, just to examine a single instance.
$ salt-cloud -a show_instance myinstance

Functions

The following functions are currently supported by the SoftLayer Salt Cloud driver.

list_vlans

This function lists all VLANs associated with the account, and all known data from the SoftLayer API concerning those VLANs.

$ salt-cloud -f list_vlans my-softlayer
$ salt-cloud -f list_vlans my-softlayer-hw

The id returned in this list is necessary for the vlan option when creating an instance.

list_custom_images

This function lists any custom templates associated with the account, that can be used to create a new instance.

$ salt-cloud -f list_custom_images my-softlayer

The globalIdentifier returned in this list is necessary for the global_identifier option when creating an image using a custom template.

Optional Products for SoftLayer HW

The softlayer_hw driver supports the ability to add optional products, which are supported by SoftLayer's API. These products each have an ID associated with them, that can be passed into Salt Cloud with the optional_products option:

```yaml
softlayer_hw_test:
    provider: my-softlayer-hw
    # CentOS 6.0 - Minimal Install (64 bit)
    image: 13963
    # 2 x 2.0 GHz Core Bare Metal Instance - 2 GB Ram
    size: 1921
    # 250GB SATA II
    hdd: 19
    # San Jose 01
    location: 168642
    domain: example.com
    optional_products:
        # MySQL for Linux
        - id: 28
        # Business Continuance Insurance
        - id: 104
```

These values can be manually obtained by looking at the source of an order page on the SoftLayer web interface. For convenience, many of these values are listed here:
Public Secondary IP Addresses

- 22: 4 Public IP Addresses
- 23: 8 Public IP Addresses

Primary IPv6 Addresses

- 17129: 1 IPv6 Address

Public Static IPv6 Addresses

- 1481: /64 Block Static Public IPv6 Addresses

OS-Specific Addon

- 17139: XenServer Advanced for XenServer 6.x
- 17141: XenServer Enterprise for XenServer 6.x
- 2334: XenServer Advanced for XenServer 5.6
- 2335: XenServer Enterprise for XenServer 5.6
- 13915: Microsoft WebMatrix
- 21276: VMware vCenter 5.1 Standard

Control Panel Software

- 121: cPanel/WHM with Fantastico and RVskin
- 20778: Parallels Plesk Panel 11 (Linux) 100 Domain w/ Power Pack
- 20786: Parallels Plesk Panel 11 (Windows) 100 Domain w/ Power Pack
- 20787: Parallels Plesk Panel 11 (Linux) Unlimited Domain w/ Power Pack
- 20792: Parallels Plesk Panel 11 (Windows) Unlimited Domain w/ Power Pack
- 2340: Parallels Plesk Panel 10 (Linux) 100 Domain w/ Power Pack
- 2339: Parallels Plesk Panel 10 (Linux) Unlimited Domain w/ Power Pack
- 13704: Parallels Plesk Panel 10 (Windows) Unlimited Domain w/ Power Pack

Database Software

- 29: MySQL 5.0 for Windows
- 28: MySQL for Linux
- 21501: Riak 1.x
- 20893: MongoDB
- 30: Microsoft SQL Server 2005 Express
- 92: Microsoft SQL Server 2005 Workgroup
- 90: Microsoft SQL Server 2005 Standard
- 94: Microsoft SQL Server 2005 Enterprise
- 1330: Microsoft SQL Server 2008 Express
- 1340: Microsoft SQL Server 2008 Web
- 1337: Microsoft SQL Server 2008 Workgroup
- 1334: Microsoft SQL Server 2008 Standard
- 1331: Microsoft SQL Server 2008 Enterprise
- 2179: Microsoft SQL Server 2008 Express R2
- 2173: Microsoft SQL Server 2008 Web R2
- 2183: Microsoft SQL Server 2008 Workgroup R2
- 2180: Microsoft SQL Server 2008 Standard R2
- 2176: Microsoft SQL Server 2008 Enterprise R2

**Anti-Virus & Spyware Protection**

- 594: McAfee VirusScan Anti-Virus - Windows
- 414: McAfee Total Protection - Windows

**Insurance**

- 104: Business Continuance Insurance

**Monitoring**

- 55: Host Ping
- 56: Host Ping and TCP Service Monitoring

**Notification**

- 57: Email and Ticket

**Advanced Monitoring**

- 2302: Monitoring Package - Basic
- 2303: Monitoring Package - Advanced
- 2304: Monitoring Package - Premium Application
Response

- 58: Automated Notification
- 59: Automated Reboot from Monitoring
- 60: 24x7x365 NOC Monitoring, Notification, and Response

Intrusion Detection & Protection

- 413: McAfee Host Intrusion Protection w/Reporting

Hardware & Software Firewalls

- 411: APF Software Firewall for Linux
- 894: Microsoft Windows Firewall
- 410: 10Mbps Hardware Firewall
- 409: 100Mbps Hardware Firewall
- 408: 1000Mbps Hardware Firewall

24.5.18 Getting Started with VEXXHOST

VEXXHOST is a cloud computing host which provides Canadian cloud computing services which are based in Montreal and use the libcloud OpenStack driver. VEXXHOST currently runs the Havana release of OpenStack. When provisioning new instances, they automatically get a public IP and private IP address. Therefore, you do not need to assign a floating IP to access your instance after it’s booted.

Cloud Provider Configuration

To use the openstack driver for the VEXXHOST public cloud, you will need to set up the cloud provider configuration file as in the example below:

```
/my-vexxhost-config:
  # Set the location of the salt-master
  #
  minion:
    master: saltmaster.example.com

  # Configure VEXXHOST using the OpenStack plugin
  #
  identity_url: http://auth.api.thenebulacloud.com:5000/v2.0/tokens
  compute_name: nova

  # Set the compute region:
  #
  compute_region: na-yul-nhs1

  # Configure VEXXHOST authentication credentials
```

24.5. Cloud Provider Specifics
Authentication

All of the authentication fields that you need can be found by logging into your VEXXHOST customer center. Once you've logged in, you will need to click on `"CloudConsole"` and then click on `"API Credentials"`.

Cloud Profile Configuration

In order to get the correct image UUID and the instance type to use in the cloud profile, you can run the following command respectively:

```
# salt-cloud --list-images=vexxhost-config
# salt-cloud --list-sizes=vexxhost-config
```

Once you have that, you can go ahead and create a new cloud profile. This profile will build an Ubuntu 12.04 LTS nb.2G instance.

```
/etc/salt/cloud.profiles.d/vh_ubuntu1204_2G.conf:

vh_ubuntu1204_2G:
    provider: my-vexxhost-config
    image: 4051139f-750d-4d72-8ef0-074f2ccc7e5a
    size: nb.2G
```

Provision an instance

To create an instance based on the sample profile that we created above, you can run the following `salt-cloud` command.

```
# salt-cloud -p vh_ubuntu1204_2G vh_instance1
```

Typically, instances are provisioned in under 30 seconds on the VEXXHOST public cloud. After the instance provisions, it will be set up a minion and then return all the instance information once it's complete.

Once the instance has been setup, you can test connectivity to it by running the following command:
# salt vh_instance1 test.ping

You can now continue to provision new instances and they will all automatically be set up as minions of the master you’ve defined in the configuration file.

## 24.5.19 Getting Started With VMware

New in version 2015.5.4.

**Author:** Nitin Madhok &lt;nmadhok@clemson.edu&gt;

The VMware cloud module allows you to manage VMware ESX, ESXi, and vCenter.

### Dependencies

The vmware module for Salt Cloud requires the *pyVmomi* package, which is available at PyPI: https://pypi.python.org/pypi/pyvmomi

This package can be installed using *pip* or *easy_install*:

```bash
pip install pyvmomi
easy_install pyvmomi
```

### Configuration

The VMware cloud module needs the vCenter URL, username and password to be set up in the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/vmware.conf:

```yaml
my-vmware-config:
    driver: vmware
    user: 'DOMAIN\user'
    password: 'verybadpass'
    url: '10.20.30.40'

vcenter01:
    driver: vmware
    user: 'DOMAIN\user'
    password: 'verybadpass'
    url: 'vcenter01.domain.com'
    protocol: 'https'
    port: 443

vcenter02:
    driver: vmware
    user: 'DOMAIN\user'
    password: 'verybadpass'
    url: 'vcenter02.domain.com'
    protocol: 'http'
    port: 80
```

Note: Optionally, protocol and port can be specified if the vCenter server is not using the defaults. Default is protocol: https and port: 443.

Note: Changed in version 2015.8.0.
The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

Profiles

Set up an initial profile at `/etc/salt/cloud.profiles` or `/etc/salt/cloud.profiles.d/vmware.conf`:

```
vmware-centos6.5:
  provider: vcenter01
  clonefrom: test-vm

  ## Optional arguments
  num_cpus: 4
  memory: 8GB

  devices:
    cd:
      CD/DVD drive 1:
        device_type: datastore_iso_file
        iso_path: "[nap004-1] vmimages/tools-isoimages/linux.iso"
      CD/DVD drive 2:
        device_type: client_device
        mode: atapi
      CD/DVD drive 3:
        device_type: client_device
        mode: passthrough

  disk:
    Hard disk 1:
      size: 30
    Hard disk 2:
      size: 20
    Hard disk 3:
      size: 5

  network:
    Network adapter 1:
      name: 10.20.30-400-Test
      switch_type: standard
      ip: 10.20.30.123
      gateway: [10.20.30.110]
      subnet_mask: 255.255.255.128
      domain: mycompany.com
    Network adapter 2:
      name: 10.30.40-500-Dev-DHCP
      adapter_type: e1000
      switch_type: distributed
    Network adapter 3:
      name: 10.40.50-600-Prod
      adapter_type: vmxnet3
      switch_type: distributed
      ip: 10.40.50.123
      gateway: [10.40.50.110]
      subnet_mask: 255.255.255.128
      domain: mycompany.com

  scsi:
    SCSI controller 1:
      type: lsilogic
```
SCSI controller 2:
  type: lsilogic_sas
  bus_sharing: virtual
SCSI controller 3:
  type: paravirtual
  bus_sharing: physical

domain: mycompany.com
dns_servers:
  - 123.127.255.240
  - 123.127.255.241
  - 123.127.255.242

# If cloning from template, either resourcepool or cluster MUST be specified!
resourcepool: Resources
cluster: Prod
datastore: HUGE-DATASTORE-Cluster
type: Development
datacenter: DC1
host: c4212n-002.domain.com
template: False
power_on: True
extra_config:
  mem.hotadd: 'yes'
guestinfo.foo: bar
guestinfo.domain: foobar.com
guestinfo.customVariable: customValue
deploy: True
private_key: /root/.ssh/mykey.pem
ssh_username: cloud-user
password: veryVeryBadPassword
minion:
  master: 123.127.193.105

file_map:
  /path/to/local/custom/script: /path/to/remote/script
  /path/to/local/file: /path/to/remote/file
  /srv/salt/yum/epel.repo: /etc/yum.repos.d/epel.repo

hardware_version: 10

provider Enter the name that was specified when the cloud provider config was created.
clonefrom Enter the name of the VM/template to clone from.
num_cpus Enter the number of vCPUS that you want the VM/template to have. If not specified, the current
  VM/template's vCPU count is used.
memory Enter the memory size (in MB or GB) that you want the VM/template to have. If not specified, the current
  VM/template's memory size is used. Example memory: 8GB or memory: 8192MB.
devices Enter the device specifications here. Currently, the following devices can be created or reconfigured:
  cd Enter the CD/DVD drive specification here. If the CD/DVD drive doesn't exist, it will be created with the
    specified configuration. If the CD/DVD drive already exists, it will be reconfigured with the specifications.
    The following options can be specified per CD/DVD drive:
      device_type Specify how the CD/DVD drive should be used. Currently supported types

24.5. Cloud Provider Specifics 357
are client_device and datastore_iso_file. Default is device_type: client_device

iso_path Enter the path to the iso file present on the datastore only if device_type: datastore_iso_file. The syntax to specify this is iso_path: "[datastoreName] vmimages/tools-isoimages/linux.iso". This field is ignored if device_type: client_device

mode Enter the mode of connection only if device_type: client_device. Currently supported modes are passthrough and atapi. This field is ignored if device_type: datastore_iso_file. Default is mode: passthrough

disk Enter the disk specification here. If the hard disk doesn't exist, it will be created with the provided size. If the hard disk already exists, it will be expanded if the provided size is greater than the current size of the disk.

network Enter the network adapter specification here. If the network adapter doesn't exist, a new network adapter will be created with the specified network name, type and other configuration. If the network adapter already exists, it will be reconfigured with the specifications. The following additional options can be specified per network adapter (See example above):

name Enter the network name you want the network adapter to be mapped to.

adapter_type Enter the network adapter type you want to create. Currently supported types are vmxnet, vmxnet2, vmxnet3, e1000 and e1000e. If no type is specified, by default vmxnet3 will be used.

switch_type Enter the type of switch to use. This decides whether to use a standard switch network or a distributed virtual portgroup. Currently supported types are standard for standard portgroups and distributed for distributed virtual portgroups.

ip Enter the static IP you want the network adapter to be mapped to. If the network specified is DHCP enabled, you do not have to specify this.

gateway Enter the gateway for the network as a list. If the network specified is DHCP enabled, you do not have to specify this.

subnet_mask Enter the subnet mask for the network. If the network specified is DHCP enabled, you do not have to specify this.

domain Enter the domain to be used with the network adapter. If the network specified is DHCP enabled, you do not have to specify this.

scsi Enter the SCSI adapter specification here. If the SCSI adapter doesn't exist, a new SCSI adapter will be created of the specified type. If the SCSI adapter already exists, it will be reconfigured with the specifications. The following additional options can be specified per SCSI adapter:

type Enter the SCSI adapter type you want to create. Currently supported types are lsilogic, lsilogic_sas and paravirtual. Type must be specified when creating a new SCSI adapter.

bus_sharing Specify this if sharing of virtual disks between virtual machines is desired. The following can be specified:

  virtual Virtual disks can be shared between virtual machines on the same server.

  physical Virtual disks can be shared between virtual machines on any server.

  no Virtual disks cannot be shared between virtual machines.

domain Enter the global domain name to be used for DNS. If not specified and if the VM name is a FQDN, domain is set to the domain from the VM name. Default is local.

dns_servers Enter the list of DNS servers to use in order of priority.
**resourcepool** Enter the name of the resourcepool to which the new virtual machine should be attached. This determines what compute resources will be available to the clone.

Note:
- For a clone operation from a virtual machine, it will use the same resourcepool as the original virtual machine unless specified.
- For a clone operation from a template to a virtual machine, specifying either this or cluster is required. If both are specified, the resourcepool value will be used.
- For a clone operation to a template, this argument is ignored.

**cluster** Enter the name of the cluster whose resource pool the new virtual machine should be attached to.

Note:
- For a clone operation from a virtual machine, it will use the same cluster's resourcepool as the original virtual machine unless specified.
- For a clone operation from a template to a virtual machine, specifying either this or resourcepool is required. If both are specified, the resourcepool value will be used.
- For a clone operation to a template, this argument is ignored.

**datastore** Enter the name of the datastore or the datastore cluster where the virtual machine should be located on physical storage. If not specified, the current datastore is used.

Note:
- If you specify a datastore cluster name, DRS Storage recommendation is automatically applied.
- If you specify a datastore name, DRS Storage recommendation is disabled.

**folder** Enter the name of the folder that will contain the new virtual machine.

Note:
- For a clone operation from a VM/template, the new VM/template will be added to the same folder that the original VM/template belongs to unless specified.
- If both folder and datacenter are specified, the folder value will be used.

**datacenter** Enter the name of the datacenter that will contain the new virtual machine.

Note:
- For a clone operation from a VM/template, the new VM/template will be added to the same folder that the original VM/template belongs to unless specified.
- If both folder and datacenter are specified, the folder value will be used.

**host** Enter the name of the target host where the virtual machine should be registered.

If not specified:

Note:
- If resource pool is not specified, current host is used.
- If resource pool is specified, and the target pool represents a stand-alone host, the host is used.
• If resource pool is specified, and the target pool represents a DRS-enabled cluster, a host selected by DRS is used.
• If resource pool is specified and the target pool represents a cluster without DRS enabled, an InvalidArgument exception be thrown.

**template** Specifies whether the new virtual machine should be marked as a template or not. Default is `template: False`.

**power_on** Specifies whether the new virtual machine should be powered on or not. If `template: True` is set, this field is ignored. Default is `power_on: True`.

**extra_config** Specifies the additional configuration information for the virtual machine. This describes a set of modifications to the additional options. If the key is already present, it will be reset with the new value provided. Otherwise, a new option is added. Keys with empty values will be removed.

**deploy** Specifies if salt should be installed on the newly created VM. Default is `True` so salt will be installed using the bootstrap script. If `template: True` or `power_on: False` is set, this field is ignored and salt will not be installed.

**private_key** Specify the path to the private key to use to be able to ssh to the VM.

**ssh_username** Specify the username to use in order to ssh to the VM. Default is `root`.

**password** Specify a password to use in order to ssh to the VM. If `private_key` is specified, you do not need to specify this.

**minion** Specify custom minion configuration you want the salt minion to have. A good example would be to specify the `master` as the IP/DNS name of the master.

**file_map** Specify file/files you want to copy to the VM before the bootstrap script is run and salt is installed. A good example of using this would be if you need to put custom repo files on the server in case your server will be in a private network and cannot reach external networks.

**hardware_version** Specify the virtual hardware version for the vm/template that is supported by the host.

### 24.5.20 Getting Started With vSphere

**Note:** Deprecated since version Carbon: The `vsphere` cloud driver has been deprecated in favor of the `vmware` cloud driver and will be removed in Salt Carbon. Please refer to **Getting started with VMware** instead to get started with the configuration.

VMware vSphere is a management platform for virtual infrastructure and cloud computing.

**Dependencies**

The vSphere module for Salt Cloud requires the PySphere package, which is available at PyPI:

https://pypi.python.org/pypi/pysphere

This package can be installed using `pip` or `easy_install`:

```
# pip install pysphere
# easy_install pysphere
```
Configuration

Set up the cloud config at `/etc/salt/cloud.providers` or in the `/etc/salt/cloud.providers.d/` directory:

```yaml
my-vsphere-config:
  driver: vsphere
  # Set the vSphere access credentials
  user: marco
  password: polo
  # Set the URL of your vSphere server
  url: 'vsphere.example.com'
```

**Note:** Changed in version 2015.8.0.

The `provider` parameter in cloud provider definitions was renamed to `driver`. This change was made to avoid confusion with the `provider` parameter that is used in cloud profile definitions. Cloud provider definitions now use `driver` to refer to the Salt cloud module that provides the underlying functionality to connect to a cloud host, while cloud profiles continue to use `provider` to refer to provider configurations that you define.

Profiles

Cloud Profiles

vSphere uses a Managed Object Reference to identify objects located in vCenter. The MOR ID's are used when configuring a vSphere cloud profile. Use the following reference when locating the MOR's for the cloud profile.

http://kb.vmware.com/selfservice/microsites/search.do?cmd=displayKC&docType=kc&externalId=1017126&sliceId=1&docTypeID=DT_KB_1_1&dialogID=520386078&stateId=1%200%20520388386

Set up an initial profile at `/etc/salt/cloud.profiles` or in the `/etc/salt/cloud.profiles.d/` directory:

```yaml
vsphere-centos:
  provider: my-vsphere-config
  image: centos
  # Optional
  datastore: datastore-15
  resourcepool: resgroup-8
  folder: salt-cloud
  host: host-9
  template: False
```

**provider** Enter the name that was specified when the cloud provider profile was created.

**image** Images available to build an instance can be found using the `--list-images` option:

```
# salt-cloud --list-images my-vsphere-config
```

**datastore** The MOR of the datastore where the virtual machine should be located. If not specified, the current datastore is used.

**resourcepool** The MOR of the resourcepool to be used for the new vm. If not set, it will use the same resourcepool as the original vm.
folder  Name of the folder that will contain the new VM. If not set, the VM will be added to the folder the original VM belongs to.

host  The MOR of the host where the vm should be registered.

If not specified:

- if resourcepool is not specified, the current host is used.
- if resourcepool is specified, and the target pool represents a stand-alone host, the host is used.
- if resourcepool is specified, and the target pool represents a DRS-enabled cluster, a host selected by DRS is used.
- if resourcepool is specified, and the target pool represents a cluster without DRS enabled, an InvalidArgument exception will be thrown.

template  Specifies whether or not the new virtual machine should be marked as a template. Default is False.

### 24.6 Miscellaneous Options

#### 24.6.1 Miscellaneous Salt Cloud Options

This page describes various miscellaneous options available in Salt Cloud.

**Deploy Script Arguments**

Custom deploy scripts are unlikely to need custom arguments to be passed to them, but salt-bootstrap has been extended quite a bit, and this may be necessary. `script_args` can be specified in either the profile or the map file, to pass arguments to the deploy script:

```yaml
ec2-amazon:
  provider: my-ec2-config
  image: ami-1624987f
  size: t1.micro
  ssh_username: ec2-user
  script: bootstrap-salt
  script_args: -c /tmp/

This has also been tested to work with pipes, if needed:

```yaml
script_args: | head
```

**Selecting the File Transport**

By default, Salt Cloud uses SFTP to transfer files to Linux hosts. However, if SFTP is not available, or specific SCP functionality is needed, Salt Cloud can be configured to use SCP instead.

```yaml
file_transport: sftp
file_transport: scp
```
Sync After Install

Salt allows users to create custom modules, grains, and states which can be synchronised to minions to extend Salt with further functionality.

This option will inform Salt Cloud to synchronise your custom modules, grains, states or all these to the minion just after it has been created. For this to happen, the following line needs to be added to the main cloud configuration file:

```
sync_after_install: all
```

The available options for this setting are:

- modules
- grains
- states
- all

Setting up New Salt Masters

It has become increasingly common for users to set up multi-hierarchal infrastructures using Salt Cloud. This sometimes involves setting up an instance to be a master in addition to a minion. With that in mind, you can now lay down master configuration on a machine by specifying master options in the profile or map file.

```
make_master: True
```

This will cause Salt Cloud to generate master keys for the instance, and tell salt-bootstrap to install the salt-master package, in addition to the salt-minion package.

The default master configuration is usually appropriate for most users, and will not be changed unless specific master configuration has been added to the profile or map:

```
master:
  user: root
  interface: 0.0.0.0
```

Delete SSH Keys

When Salt Cloud deploys an instance, the SSH pub key for the instance is added to the known_hosts file for the user that ran the salt-cloud command. When an instance is deployed, a cloud host generally recycles the IP address for the instance. When Salt Cloud attempts to deploy an instance using a recycled IP address that has previously been accessed from the same machine, the old key in the known_hosts file will cause a conflict.

In order to mitigate this issue, Salt Cloud can be configured to remove old keys from the known_hosts file when destroying the node. In order to do this, the following line needs to be added to the main cloud configuration file:

```
delete_sshkeys: True
```

Keeping /tmp/ Files

When Salt Cloud deploys an instance, it uploads temporary files to /tmp/ for salt-bootstrap to put in place. After the script has run, they are deleted. To keep these files around (mostly for debugging purposes), the --keep-tmp option can be added:
salt-cloud -p myprofile mymachine --keep-tmp

For those wondering why /tmp/ was used instead of /root/, this had to be done for images which require the use of sudo, and therefore do not allow remote root logins, even for file transfers (which makes /root/ unavailable).

**Hide Output From Minion Install**

By default Salt Cloud will stream the output from the minion deploy script directly to STDOUT. Although this can been very useful, in certain cases you may wish to switch this off. The following config option is there to enable or disable this output:

```plaintext
display_ssh_output: False
```

**Connection Timeout**

There are several stages when deploying Salt where Salt Cloud needs to wait for something to happen. The VM getting it’s IP address, the VM’s SSH port is available, etc.

If you find that the Salt Cloud defaults are not enough and your deployment fails because Salt Cloud did not wait log enough, there are some settings you can tweak.

**Note**

All values should be provided in seconds

You can tweak these settings globally, per cloud provider, or event per profile definition.

**wait_for_ip_timeout**

The amount of time Salt Cloud should wait for a VM to start and get an IP back from the cloud host. Default: varies by cloud provider (between 5 and 25 minutes)

**wait_for_ip_interval**

The amount of time Salt Cloud should sleep while querying for the VM's IP. Default: varies by cloud provider (between .5 and 10 seconds)

**ssh_connect_timeout**

The amount of time Salt Cloud should wait for a successful SSH connection to the VM. Default: varies by cloud provider (between 5 and 15 minutes)

**wait_for_passwd_timeout**

The amount of time until an ssh connection can be established via password or ssh key. Default: varies by cloud provider (mostly 15 seconds)
wait_for_passwd_maxtries

The number of attempts to connect to the VM until we abandon. Default: 15 attempts

wait_for_fun_timeout

Some cloud drivers check for an available IP or a successful SSH connection using a function, namely, SoftLayer, and SoftLayer-HW. So, the amount of time Salt Cloud should retry such functions before failing. Default: 15 minutes.

wait_for_spot_timeout

The amount of time Salt Cloud should wait before an EC2 Spot instance is available. This setting is only available for the EC2 cloud driver. Default: 10 minutes

Salt Cloud Cache

Salt Cloud can maintain a cache of node data, for supported providers. The following options manage this functionality.

update_cachedir

On supported cloud providers, whether or not to maintain a cache of nodes returned from a --full-query. The data will be stored in msgpack format under <SALT_CACHEDIR>/cloud/active/<DRIVER>/<PROVIDER>/<NODE_NAME>.p. This setting can be True or False.

diff_cache_events

When the cloud cachedir is being managed, if differences are encountered between the data that is returned live from the cloud host and the data in the cache, fire events which describe the changes. This setting can be True or False.

Some of these events will contain data which describe a node. Because some of the fields returned may contain sensitive data, the cache_event_strip_fields configuration option exists to strip those fields from the event return.

```yaml
cache_event_strip_fields:
  - password
  - priv_key
```

The following are events that can be fired based on this data.

salt/cloud/minionid/cache_node_new  A new node was found on the cloud host which was not listed in the cloud cachedir. A dict describing the new node will be contained in the event.

salt/cloud/minionid/cache_node_missing  A node that was previously listed in the cloud cachedir is no longer available on the cloud host.

salt/cloud/minionid/cache_node_diff  One or more pieces of data in the cloud cachedir has changed on the cloud host. A dict containing both the old and the new data will be contained in the event.
SSH Known Hosts

Normally when bootstrapping a VM, salt-cloud will ignore the SSH host key. This is because it does not know what the host key is before starting (because it doesn't exist yet). If strict host key checking is turned on without the key in the known_hosts file, then the host will never be available, and cannot be bootstrapped.

If a provider is able to determine the host key before trying to bootstrap it, that provider's driver can add it to the known_hosts file, and then turn on strict host key checking. This can be set up in the main cloud configuration file (normally /etc/salt/cloud) or in the provider-specific configuration file:

| known_hosts_file: /path/to/.ssh/known_hosts |

If this is not set, it will default to /dev/null, and strict host key checking will be turned off.

It is highly recommended that this option is not set, unless the user has verified that the provider supports this functionality, and that the image being used is capable of providing the necessary information. At this time, only the EC2 driver supports this functionality.

SSH Agent

New in version 2015.5.0.

If the ssh key is not stored on the server salt-cloud is being run on, set ssh_agent, and salt-cloud will use the forwarded ssh-agent to authenticate.

| ssh_agent: True |

File Map Upload

New in version 2014.7.0.

The file_map option allows an arbitrary group of files to be uploaded to the target system before running the deploy script. This functionality requires a provider uses salt.utils.cloud.bootstrap(), which is currently limited to the ec2, gce, openstack and nova drivers.

The file_map can be configured globally in /etc/salt/cloud, or in any cloud provider or profile file. For example, to upload an extra package or a custom deploy script, a cloud profile using file_map might look like:

<table>
<thead>
<tr>
<th>ubuntu14:</th>
</tr>
</thead>
<tbody>
<tr>
<td>provider: ec2-config</td>
</tr>
<tr>
<td>image: ami-98aa1cf0</td>
</tr>
<tr>
<td>size: t1.micro</td>
</tr>
<tr>
<td>ssh_username: root</td>
</tr>
<tr>
<td>securitygroup: default</td>
</tr>
<tr>
<td>file_map:</td>
</tr>
<tr>
<td>/local/path/to/custom/script: /remote/path/to/use/custom/script</td>
</tr>
<tr>
<td>/local/path/to/package: /remote/path/to/store/package</td>
</tr>
</tbody>
</table>

24.7 Troubleshooting Steps

24.7.1 Troubleshooting Salt Cloud

This page describes various steps for troubleshooting problems that may arise while using Salt Cloud.
Virtual Machines Are Created, But Do Not Respond

Are TCP ports 4505 and 4506 open on the master? This is easy to overlook on new masters. Information on how to open firewall ports on various platforms can be found here.

Generic Troubleshooting Steps

This section describes a set of instructions that are useful to a large number of situations, and are likely to solve most issues that arise.

Version Compatibility

One of the most common issues that Salt Cloud users run into is import errors. These are often caused by version compatibility issues with Salt.

Salt 0.16.x works with Salt Cloud 0.8.9 or greater.
Salt 0.17.x requires Salt Cloud 0.8.11.
Releases after 0.17.x (0.18 or greater) should not encounter issues as Salt Cloud has been merged into Salt itself.

Debug Mode

Frequently, running Salt Cloud in debug mode will reveal information about a deployment which would otherwise not be obvious:

```
salt-cloud -p myprofile myinstance -l debug
```

Keep in mind that a number of messages will appear that look at first like errors, but are in fact intended to give developers factual information to assist in debugging. A number of messages that appear will be for cloud providers that you do not have configured; in these cases, the message usually is intended to confirm that they are not configured.

Salt Bootstrap

By default, Salt Cloud uses the Salt Bootstrap script to provision instances:

This script is packaged with Salt Cloud, but may be updated without updating the Salt package:

```
salt-cloud -u
```

The Bootstrap Log

If the default deploy script was used, there should be a file in the /tmp/ directory called bootstrap-salt.log. This file contains the full output from the deployment, including any errors that may have occurred.

Keeping Temp Files

Salt Cloud uploads minion-specific files to instances once they are available via SSH, and then executes a deploy script to put them into the correct place and install Salt. The --keep-tmp option will instruct Salt Cloud not to remove those files when finished with them, so that the user may inspect them for problems:
salt-cloud -p myprofile myinstance --keep-tmp

By default, Salt Cloud will create a directory on the target instance called /tmp/.saltcloud/. This directory should be owned by the user that is to execute the deploy script, and should have permissions of 0700.

Most cloud hosts are configured to use root as the default initial user for deployment, and as such, this directory and all files in it should be owned by the root user.

The /tmp/.saltcloud/ directory should have the following files:

- A deploy.sh script. This script should have permissions of 0755.
- A .pem and .pub key named after the minion. The .pem file should have permissions of 0600. Ensure that the .pem and .pub files have been properly copied to the /etc/salt/pki/minion/ directory.
- A file called minion. This file should have been copied to the /etc/salt/ directory.
- Optionally, a file called grains. This file, if present, should have been copied to the /etc/salt/ directory.

Unprivileged Primary Users

Some cloud hosts, most notably EC2, are configured with a different primary user. Some common examples are ec2-user, ubuntu, fedora, and bitnami. In these cases, the /tmp/.saltcloud/ directory and all files in it should be owned by this user.

Some cloud hosts, such as EC2, are configured to not require these users to provide a password when using the sudo command. Because it is more secure to require sudo users to provide a password, other hosts are configured that way.

If this instance is required to provide a password, it needs to be configured in Salt Cloud. A password for sudo to use may be added to either the provider configuration or the profile configuration:

```
sudo_password: mypassword
```

/tmp/ is Mounted as noexec

It is more secure to mount the /tmp/ directory with a noexec option. This is uncommon on most cloud hosts, but very common in private environments. To see if the /tmp/ directory is mounted this way, run the following command:

```
mount | grep tmp
```

If the output of this command includes a line that looks like this, then the /tmp/ directory is mounted as noexec:

```
tmpfs on /tmp type tmpfs (rw,noexec)
```

If this is the case, then the deploy_command will need to be changed in order to run the deploy script through the sh command, rather than trying to execute it directly. This may be specified in either the provider or the profile config:

```
deploy_command: sh /tmp/.saltcloud/deploy.sh
```

Please note that by default, Salt Cloud will place its files in a directory called /tmp/.saltcloud/. This may be also be changed in the provider or profile configuration:
tmp_dir: /tmp/.saltcloud/

If this directory is changed, then the deploy_command need to be changed in order to reflect the tmp_dir configuration.

Executing the Deploy Script Manually

If all of the files needed for deployment were successfully uploaded to the correct locations, and contain the correct permissions and ownerships, the deploy script may be executed manually in order to check for other issues:

```bash
cd /tmp/.saltcloud/
./deploy.sh
```

24.8 Extending Salt Cloud

24.8.1 Writing Cloud Driver Modules

Salt Cloud runs on a module system similar to the main Salt project. The modules inside saltcloud exist in the salt/cloud/clouds directory of the salt source.

There are two basic types of cloud modules. If a cloud host is supported by libcloud, then using it is the fastest route to getting a module written. The Apache Libcloud project is located at:

http://libcloud.apache.org/

Not every cloud host is supported by libcloud. Additionally, not every feature in a supported cloud host is necessarily supported by libcloud. In either of these cases, a module can be created which does not rely on libcloud.

All Driver Modules

The following functions are required by all driver modules, whether or not they are based on libcloud.

The __virtual__() Function

This function determines whether or not to make this cloud module available upon execution. Most often, it uses get_configured_provider() to determine if the necessary configuration has been set up. It may also check for necessary imports, to decide whether to load the module. In most cases, it will return a True or False value.

If the name of the driver used does not match the filename, then that name should be returned instead of True. An example of this may be seen in the Azure module:

https://github.com/saltstack/salt/tree/develop/salt/cloud/clouds/msazure.py

The get_configured_provider() Function

This function uses config.is_provider_configured() to determine whether all required information for this driver has been configured. The last value in the list of required settings should be followed by a comma.
Libcloud Based Modules

Writing a cloud module based on libcloud has two major advantages. First of all, much of the work has already been done by the libcloud project. Second, most of the functions necessary to Salt have already been added to the Salt Cloud project.

The create() Function

The most important function that does need to be manually written is the create() function. This is what is used to request a virtual machine to be created by the cloud host, wait for it to become available, and then (optionally) log in and install Salt on it.

A good example to follow for writing a cloud driver module based on libcloud is the module provided for Linode: https://github.com/saltstack/salt/tree/develop/salt/cloud/clouds/linode.py

The basic flow of a create() function is as follows:

- Send a request to the cloud host to create a virtual machine.
- Wait for the virtual machine to become available.
- Generate kwargstobe used to deploy Salt.
- Log into the virtual machine and deploy Salt.
- Return a data structure that describes the newly-created virtual machine.

At various points throughout this function, events may be fired on the Salt event bus. Four of these events, which are described below, are required. Other events may be added by the user, where appropriate.

When the create() function is called, it is passed a data structure called vm_. This dict contains a composite of information describing the virtual machine to be created. A dict called __opts__ is also provided by Salt, which contains the options used to run Salt Cloud, as well as a set of configuration and environment variables.

The first thing the create() function must do is fire an event stating that it has started the create process. This event is tagged salt/cloud/<vm name>/creating. The payload contains the names of the VM, profile, and provider.

A set of kwargs is then usually created, to describe the parameters required by the cloud host to request the virtual machine.

An event is then fired to state that a virtual machine is about to be requested. It is tagged as salt/cloud/<vm name>/requesting. The payload contains most or all of the parameters that will be sent to the cloud host. Any private information (such as passwords) should not be sent in the event.

After a request is made, a set of deploy kwargs will be generated. These will be used to install Salt on the target machine. Windows options are supported at this point, and should be generated, even if the cloud host does not currently support Windows. This will save time in the future if the host does eventually decide to support Windows.

An event is then fired to state that the deploy process is about to begin. This event is tagged salt/cloud/<vm name>/deploying. The payload for the event will contain a set of deploy kwargs, useful for debugging purposes. Any private data, including passwords and keys (including public keys) should be stripped from the deploy kwargs before the event is fired.

If any Windows options have been passed in, the salt.utils.cloud.deploy_windows() function will be called. Otherwise, it will be assumed that the target is a Linux or Unix machine, and the salt.utils.cloud.deploy_script() will be called.

Both of these functions will wait for the target machine to become available, then the necessary port to log in, then a successful login that can be used to install Salt. Minion configuration and keys will then be uploaded to a temporary
directory on the target by the appropriate function. On a Windows target, the Windows Minion Installer will be run in silent mode. On a Linux/Unix target, a deploy script (bootstrap-salt.sh, by default) will be run, which will auto-detect the operating system, and install Salt using its native package manager. These do not need to be handled by the developer in the cloud module.

The `salt.utils.cloud.validate_windows_cred()` function has been extended to take the number of retries and retry_delay parameters in case a specific cloud host has a delay between providing the Windows credentials and the credentials being available for use. In their `create()` function, or as a sub-function called during the creation process, developers should use the `win_deploy_auth_retries` and `win_deploy_auth_retry_delay` parameters from the provider configuration to allow the end-user the ability to customize the number of tries and delay between tries for their particular host.

After the appropriate deploy function completes, a final event is fired which describes the virtual machine that has just been created. This event is tagged `salt/cloud/<vm name>/created`. The payload contains the names of the VM, profile, and provider.

Finally, a dict (queried from the provider) which describes the new virtual machine is returned to the user. Because this data is not fired on the event bus it can, and should, return any passwords that were returned by the cloud host. In some cases (for example, Rackspace), this is the only time that the password can be queried by the user; post-creation queries may not contain password information (depending upon the host).

**The libcloudfuncs Functions**

A number of other functions are required for all cloud hosts. However, with libcloud-based modules, these are all provided for free by the libcloudfuncs library. The following two lines set up the imports:

```python
from salt.cloud.libcloudfuncs import *  # pylint: disable=W0614,W0401
from salt.utils import namespaced_function
```

And then a series of declarations will make the necessary functions available within the cloud module.

```python
get_size = namespaced_function(get_size, globals())
get_image = namespaced_function(get_image, globals())
avail_locations = namespaced_function(avail_locations, globals())
avail_images = namespaced_function(avail_images, globals())
avail_sizes = namespaced_function(avail_sizes, globals())
script = namespaced_function(script, globals())
destroy = namespaced_function(destroy, globals())
list_nodes = namespaced_function(list_nodes, globals())
list_nodes_full = namespaced_function(list_nodes_full, globals())
list_nodes_select = namespaced_function(list_nodes_select, globals())
show_instance = namespaced_function(show_instance, globals())
```

If necessary, these functions may be replaced by removing the appropriate declaration line, and then adding the function as normal.

These functions are required for all cloud modules, and are described in detail in the next section.

**Non-Libcloud Based Modules**

In some cases, using libcloud is not an option. This may be because libcloud has not yet included the necessary driver itself, or it may be that the driver that is included with libcloud does not contain all of the necessary features required by the developer. When this is the case, some or all of the functions in `libcloudfuncs` may be replaced. If they are all replaced, the libcloud imports should be absent from the Salt Cloud module.

A good example of a non-libcloud driver is the DigitalOcean driver:
The `create()` Function

The `create()` function must be created as described in the libcloud-based module documentation.

The `get_size()` Function

This function is only necessary for libcloud-based modules, and does not need to exist otherwise.

The `get_image()` Function

This function is only necessary for libcloud-based modules, and does not need to exist otherwise.

The `avail_locations()` Function

This function returns a list of locations available, if the cloud host uses multiple data centers. It is not necessary if the cloud host uses only one data center. It is normally called using the `--list-locations` option.

```
salt-cloud --list-locations my-cloud-provider
```

The `avail_images()` Function

This function returns a list of images available for this cloud provider. There are not currently any known cloud providers that do not provide this functionality, though they may refer to images by a different name (for example, `templates`). It is normally called using the `--list-images` option.

```
salt-cloud --list-images my-cloud-provider
```

The `avail_sizes()` Function

This function returns a list of sizes available for this cloud provider. Generally, this refers to a combination of RAM, CPU, and/or disk space. This functionality may not be present on some cloud providers. For example, the Parallels module breaks down RAM, CPU, and disk space into separate options, whereas in other providers, these options are baked into the image. It is normally called using the `--list-sizes` option.

```
salt-cloud --list-sizes my-cloud-provider
```

The `script()` Function

This function builds the deploy script to be used on the remote machine. It is likely to be moved into the `salt.utils.cloud` library in the near future, as it is very generic and can usually be copied wholesale from another module. An excellent example is in the Azure driver.
The destroy() Function

This function irreversibly destroys a virtual machine on the cloud provider. Before doing so, it should fire an event on the Salt event bus. The tag for this event is `salt/cloud/<vm name>/destroying`. Once the virtual machine has been destroyed, another event is fired. The tag for that event is `salt/cloud/<vm name>/destroyed`.

This function is normally called with the `-d` options:

```
salt-cloud -d myinstance
```

The list_nodes() Function

This function returns a list of nodes available on this cloud provider, using the following fields:

- id (str)
- image (str)
- size (str)
- state (str)
- private_ips (list)
- public_ips (list)

No other fields should be returned in this function, and all of these fields should be returned, even if empty. The private_ips and public_ips fields should always be of a list type, even if empty, and the other fields should always be of a str type. This function is normally called with the `-Q` option:

```
salt-cloud -Q
```

The list_nodes_full() Function

All information available about all nodes should be returned in this function. The fields in the list_nodes() function should also be returned, even if they would not normally be provided by the cloud provider. This is because some functions both within Salt and 3rd party will break if an expected field is not present. This function is normally called with the `-F` option:

```
salt-cloud -F
```

The list_nodes_select() Function

This function returns only the fields specified in the `query.selection` option in `/etc/salt/cloud`. Because this function is so generic, all of the heavy lifting has been moved into the `salt.utils.cloud` library.

A function to call `list_nodes_select()` still needs to be present. In general, the following code can be used as-is:

```python
def list_nodes_select(call=None):
    ""
    Return a list of the VMs that are on the provider, with select fields
    ""
    return salt.utils.cloud.list_nodes_select(
        list_nodes_full('function'), __opts__['query.selection'], call,
    )
```

24.8. Extending Salt Cloud 373
However, depending on the cloud provider, additional variables may be required. For instance, some modules use a `conn` object, or may need to pass other options into `list_nodes_full()`. In this case, be sure to update the function appropriately:

```python
def list_nodes_select(conn=None, call=None):
    '''
    Return a list of the VMs that are on the provider, with select fields
    '''
    if not conn:
        conn = get_conn()  # pylint: disable=E0602
    return salt.utils.cloud.list_nodes_select(
        list_nodes_full(conn, 'function'),
        __opts__['query.selection'],
        call,
    )
```

This function is normally called with the `-S` option:

```
salt-cloud -S
```

The `show_instance()` Function

This function is used to display all of the information about a single node that is available from the cloud provider. The simplest way to provide this is usually to call `list_nodes_full()`, and return just the data for the requested node. It is normally called as an action:

```
salt-cloud -a show_instance myinstance
```

Actions and Functions

Extra functionality may be added to a cloud provider in the form of an `--action` or a `--function`. Actions are performed against a cloud instance/virtual machine, and functions are performed against a cloud provider.

Actions

Actions are calls that are performed against a specific instance or virtual machine. The `show_instance` action should be available in all cloud modules. Actions are normally called with the `-a` option:

```
salt-cloud -a show_instance myinstance
```

Actions must accept a `name` as a first argument, may optionally support any number of `kwargs` as appropriate, and must accept an argument of `call`, with a default of `None`.

Before performing any other work, an action should normally verify that it has been called correctly. It may then perform the desired feature, and return useful information to the user. A basic action looks like:

```python
def show_instance(name, call=None):
    '''
    Show the details from EC2 concerning an AMI
    '''
    if call != 'action':
        raise SaltCloudSystemExit(  
            'The show_instance action must be called with -a or --action.'
        )
```
Please note that generic kwargs, if used, are passed through to actions as kwargs and not **kwargs. An example of this is seen in the Functions section.

### Functions

Functions are called that are performed against a specific cloud provider. An optional function that is often useful is `show_image`, which describes an image in detail. Functions are normally called with the `-f` option:

```bash
salt-cloud -f show_image my-cloud-provider image='Ubuntu 13.10 64-bit'
```

A function may accept any number of kwargs as appropriate, and must accept an argument of `call` with a default of `None`.

Before performing any other work, a function should normally verify that it has been called correctly. It may then perform the desired feature, and return useful information to the user. A basic function looks like:

```python
def show_image(kwargs, call=None):
    '''
    Show the details from EC2 concerning an AMI
    '''
    if call != 'function':
        raise SaltCloudSystemExit(  
            'The show_image action must be called with -f or --function.'
        )
    params = {
        'ImageId.1': kwargs['image'],  
        'Action': 'DescribeImages'
    }  
    result = query(params)
    log.info(result)

    return result
```

Take note that generic kwargs are passed through to functions as kwargs and not **kwargs.

#### 24.8.2 OS Support for Cloud VMs

Salt Cloud works primarily by executing a script on the virtual machines as soon as they become available. The script that is executed is referenced in the cloud profile as the `script`. In older versions, this was the `os` argument. This was changed in 0.8.2.

A number of legacy scripts exist in the deploy directory in the saltcloud source tree. The preferred method is currently to use the salt-bootstrap script. A stable version is included with each release tarball starting with 0.8.4. The most updated version can be found at:

https://github.com/saltstack/salt-bootstrap

If you do not specify a script argument, this script will be used at the default.

If the Salt Bootstrap script does not meet your needs, you may write your own. The script should be written in bash and is a Jinja template. Deploy scripts need to execute a number of functions to do a complete salt setup. These functions include:

1. Install the salt minion. If this can be done via system packages this method is HIGHLY preferred.
2. Add the salt minion keys before the minion is started for the first time. The minion keys are available as strings that can be copied into place in the Jinja template under the dict named "vm".

3. Start the salt-minion daemon and enable it at startup time.

4. Set up the minion configuration file from the "minion" data available in the Jinja template.

A good, well commented, example of this process is the Fedora deployment script:

https://github.com/saltstack/salt-cloud/blob/master/saltcloud/deploy/Fedora.sh

A number of legacy deploy scripts are included with the release tarball. None of them are as functional or complete as Salt Bootstrap, and are still included for academic purposes.

Other Generic Deploy Scripts

If you want to be assured of always using the latest Salt Bootstrap script, there are a few generic templates available in the deploy directory of your saltcloud source tree:

```
curl-bootstrap
curl-bootstrap-git
python-bootstrap
wget-bootstrap
wget-bootstrap-git
```

These are example scripts which were designed to be customized, adapted, and refit to meet your needs. One important use of them is to pass options to the salt-bootstrap script, such as updating to specific git tags.

Post-Deploy Commands

Once a minion has been deployed, it has the option to run a salt command. Normally, this would be the state.highstate command, which would finish provisioning the VM. Another common option is state.sls, or for just testing, test.ping. This is configured in the main cloud config file:

```
start_action: state.highstate
```

This is currently considered to be experimental functionality, and may not work well with all cloud hosts. If you experience problems with Salt Cloud hanging after Salt is deployed, consider using Startup States instead:

http://docs.saltstack.com/ref/states/startup.html

Skipping the Deploy Script

For whatever reason, you may want to skip the deploy script altogether. This results in a VM being spun up much faster, with absolutely no configuration. This can be set from the command line:

```
salt-cloud --no-deploy -p micro_aws my_instance
```

Or it can be set from the main cloud config file:

```
deploy: False
```

Or it can be set from the provider’s configuration:

```
RACKSPACE.user: example_user
RACKSPACE.apikey: 123984bjjas87034
RACKSPACE.deploy: False
```
Or even on the VM's profile settings:

```yaml
ubuntu_aws:
    provider: my-ec2-config
    image: ami-7e2da54e
    size: t1.micro
    deploy: False
```

The default for deploy is True.

In the profile, you may also set the script option to None:

```yaml
script: None
```

This is the slowest option, since it still uploads the None deploy script and executes it.

**Updating Salt Bootstrap**

Salt Bootstrap can be updated automatically with salt-cloud:

```bash
salt-cloud -u
salt-cloud --update-bootstrap
```

Bear in mind that this updates to the latest (unstable) version, so use with caution.

**Keeping /tmp/ Files**

When Salt Cloud deploys an instance, it uploads temporary files to /tmp/ for salt-bootstrap to put in place. After the script has run, they are deleted. To keep these files around (mostly for debugging purposes), the --keep-tmp option can be added:

```bash
salt-cloud -p myprofile mymachine --keep-tmp
```

For those wondering why /tmp/ was used instead of /root/, this had to be done for images which require the use of sudo, and therefore do not allow remote root logins, even for file transfers (which makes /root/ unavailable).

**Deploy Script Arguments**

Custom deploy scripts are unlikely to need custom arguments to be passed to them, but salt-bootstrap has been extended quite a bit, and this may be necessary. script_args can be specified in either the profile or the map file, to pass arguments to the deploy script:

```yaml
aws-amazon:
    provider: my-ec2-config
    image: ami-1624987f
    size: t1.micro
    ssh_username: ec2-user
    script: bootstrap-salt
    script_args: -c /tmp/
```

This has also been tested to work with pipes, if needed:

```yaml
script_args: | head
```
24.9 Using Salt Cloud from Salt

24.9.1 Using the Salt Modules for Cloud

In addition to the `salt-cloud` command, Salt Cloud can be called from Salt, in a variety of different ways. Most users will be interested in either the execution module or the state module, but it is also possible to call Salt Cloud as a runner.

Because the actual work will be performed on a remote minion, the normal Salt Cloud configuration must exist on any target minion that needs to execute a Salt Cloud command. Because Salt Cloud now supports breaking out configuration into individual files, the configuration is easily managed using Salt's own `file.managed` state function. For example, the following directories allow this configuration to be managed easily:

```
/etc/salt/cloud.providers.d/
/etc/salt/cloud.profiles.d/
```

Minion Keys

Keep in mind that when creating minions, Salt Cloud will create public and private minion keys, upload them to the minion, and place the public key on the machine that created the minion. It will *not* attempt to place any public minion keys on the master, unless the minion which was used to create the instance is also the Salt Master. This is because granting arbitrary minions access to modify keys on the master is a serious security risk, and must be avoided.

Execution Module

The `cloud` module is available to use from the command line. At the moment, almost every standard Salt Cloud feature is available to use. The following commands are available:

```
list_images
```

This command is designed to show images that are available to be used to create an instance using Salt Cloud. In general they are used in the creation of profiles, but may also be used to create an instance directly (see below). Listing images requires a provider to be configured, and specified:

```
salt myminion cloud.list_images my-cloud-provider
```

```
list_sizes
```

This command is designed to show sizes that are available to be used to create an instance using Salt Cloud. In general they are used in the creation of profiles, but may also be used to create an instance directly (see below). This command is not available for all cloud providers; see the provider-specific documentation for details. Listing sizes requires a provider to be configured, and specified:

```
salt myminion cloud.list_sizes my-cloud-provider
```

```
list_locations
```

This command is designed to show locations that are available to be used to create an instance using Salt Cloud. In general they are used in the creation of profiles, but may also be used to create an instance directly (see below).
This command is not available for all cloud providers; see the provider-specific documentation for details. Listing locations requires a provider to be configured, and specified:

```bash
salt myminion cloud.list_locations my-cloud-provider
```

**query**

This command is used to query all configured cloud providers, and display all instances associated with those accounts. By default, it will run a standard query, returning the following fields:

- **id** The name or ID of the instance, as used by the cloud provider.
- **image** The disk image that was used to create this instance.
- **private_ips** Any public IP addresses currently assigned to this instance.
- **public_ips** Any private IP addresses currently assigned to this instance.
- **size** The size of the instance; can refer to RAM, CPU(s), disk space, etc., depending on the cloud provider.
- **state** The running state of the instance; for example, `running`, `stopped`, `pending`, etc. This state is dependent upon the provider.

This command may also be used to perform a full query or a select query, as described below. The following usages are available:

```bash
salt myminion cloud.query
salt myminion cloud.query list_nodes
salt myminion cloud.query list_nodes_full
```

**full_query**

This command behaves like the `query` command, but lists all information concerning each instance as provided by the cloud provider, in addition to the fields returned by the `query` command.

```bash
salt myminion cloud.full_query
```

**select_query**

This command behaves like the `query` command, but only returned select fields as defined in the `/etc/salt/cloud` configuration file. A sample configuration for this section of the file might look like:

```yaml
query.selection:
  - id
  - key_name
```

This configuration would only return the `id` and `key_name` fields, for those cloud providers that support those two fields. This would be called using the following command:

```bash
salt myminion cloud.select_query
```

**profile**

This command is used to create an instance using a profile that is configured on the target minion. Please note that the profile must be configured before this command can be used with it.

---

24.9. Using Salt Cloud from Salt
Please note that the execution module does not run in parallel mode. Using multiple minions to create instances can effectively perform parallel instance creation.

**create**

This command is similar to the `profile` command, in that it is used to create a new instance. However, it does not require a profile to be pre-configured. Instead, all of the options that are normally configured in a profile are passed directly to Salt Cloud to create the instance:

```
salt myminion cloud.create my-ec2-config my-new-instance

  image=ami-1624987f size=t1.micro ssh_username=ec2-user
  securitygroup=default delvol_on_destroy=True
```

Please note that the execution module does not run in parallel mode. Using multiple minions to create instances can effectively perform parallel instance creation.

**destroy**

This command is used to destroy an instance or instances. This command will search all configured providers and remove any instance(s) which matches the name(s) passed in here. The results of this command are non-reversible and should be used with caution.

```
salt myminion cloud.destroy myinstance
salt myminion cloud.destroy myinstance1,myinstance2
```

**action**

This command implements both the `action` and the `function` commands used in the standard salt-cloud command. If one of the standard `action` commands is used, an instance name must be provided. If one of the standard function commands is used, a provider configuration must be named.

```
salt myminion cloud.action start instance=myinstance
salt myminion cloud.action show_image provider=my-ec2-config

  image=ami-1624987f
```

The actions available are largely dependent upon the module for the specific cloud provider. The following actions are available for all cloud providers:

**list_nodes** This is a direct call to the `query` function as described above, but is only performed against a single cloud provider. A provider configuration must be included.

**list_nodes_select** This is a direct call to the `full_query` function as described above, but is only performed against a single cloud provider. A provider configuration must be included.

**list_nodes_select** This is a direct call to the `select_query` function as described above, but is only performed against a single cloud provider. A provider configuration must be included.

**show_instance** This is a thin wrapper around `list_nodes`, which returns the full information about a single instance. An instance name must be provided.
State Module

A subset of the execution module is available through the cloud state module. Not all functions are currently included, because there is currently insufficient code for them to perform statefully. For example, a command to create an instance may be issued with a series of options, but those options cannot currently be statefully managed. Additional states to manage these options will be released at a later time.

cloud.present

This state will ensure that an instance is present inside a particular cloud provider. Any option that is normally specified in the cloud.create execution module and function may be declared here, but only the actual presence of the instance will be managed statefully.

```yaml
my-instance-name:
  cloud.present:
    - provider: my-ec2-config
    - image: ami-1624987f
    - size: 't1.micro'
    - ssh_username: ec2-user
    - securitygroup: default
    - delvol_on_destroy: True
```

cloud.profile

This state will ensure that an instance is present inside a particular cloud provider. This function calls the cloud.profile execution module and function, but as with cloud.present, only the actual presence of the instance will be managed statefully.

```yaml
my-instance-name:
  cloud.profile:
    - profile: ec2-centos64-x64
```

cloud.absent

This state will ensure that an instance (identified by name) does not exist in any of the cloud providers configured on the target minion. Please note that this state is non-reversible and may be considered especially destructive when issued as a cloud state.

```yaml
my-instance-name:
  cloud.absent
```

Runner Module

The cloud runner module is executed on the master, and performs actions using the configuration and Salt modules on the master itself. This means that any public minion keys will also be properly accepted by the master.

Using the functions in the runner module is no different than using those in the execution module, outside of the behavior described in the above paragraph. The following functions are available inside the runner:

- list_images
- list_sizes
- list_locations

24.9. Using Salt Cloud from Salt
Outside of the standard usage of `salt-run` itself, commands are executed as usual:

```bash
salt-run cloud.profile ec2-centos64-x86_64 my-instance-name
```

**CloudClient**

The execution, state, and runner modules ultimately all use the CloudClient library that ships with Salt. To use the CloudClient library locally (either on the master or a minion), create a client object and issue a command against it:

```python
import salt.cloud
import pprint
client = salt.cloud.CloudClient('/etc/salt/cloud')
nodes = client.query()
pprint.pprint(nodes)
```

## 24.10 Feature Comparison

### 24.10.1 Feature Matrix

A number of features are available in most cloud hosts, but not all are available everywhere. This may be because the feature isn’t supported by the cloud host itself, or it may only be that the feature has not yet been added to Salt Cloud. In a handful of cases, it is because the feature does not make sense for a particular cloud provider (Saltify, for instance).

This matrix shows which features are available in which cloud hosts, as far as Salt Cloud is concerned. This is not a comprehensive list of all features available in all cloud hosts, and should not be used to make business decisions concerning choosing a cloud host. In most cases, adding support for a feature to Salt Cloud requires only a little effort.

**Legacy Drivers**

Both AWS and Rackspace are listed as “Legacy”. This is because those drivers have been replaced by other drivers, which are generally the preferred method for working with those hosts.

The EC2 driver should be used instead of the AWS driver, when possible. The OpenStack driver should be used instead of the Rackspace driver, unless the user is dealing with instances in “the old cloud” in Rackspace.

**Note for Developers**

When adding new features to a particular cloud host, please make sure to add the feature to this table. Additionally, if you notice a feature that is not properly listed here, pull requests to fix them is appreciated.
### Standard Features

These are features that are available for almost every cloud host.

<table>
<thead>
<tr>
<th>Feature</th>
<th>AWS (Legacy)</th>
<th>CloudStack</th>
<th>Digital Ocean</th>
<th>EC2</th>
<th>GoGrid</th>
<th>Joyent</th>
<th>Linode</th>
<th>OpenStack</th>
<th>Parallels</th>
<th>Rackspace (Legacy)</th>
<th>Saltify</th>
<th>Softlayer</th>
<th>Softlayer Hardware</th>
<th>Aliyun</th>
</tr>
</thead>
<tbody>
<tr>
<td>Query</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full Query</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Selective Query</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>List Sizes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>List Images</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>List Locations</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>create</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>destroy</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### Actions

These are features that are performed on a specific instance, and require an instance name to be passed in. For example:

```
# salt-cloud -a attach_volume ami.example.com
```
## Actions

<table>
<thead>
<tr>
<th>Actions</th>
<th>AWS (Legacy)</th>
<th>CloudStack</th>
<th>Digital Ocean</th>
<th>EC2</th>
<th>JoyEnt</th>
<th>Linode</th>
<th>OpenStack</th>
<th>Parallels</th>
<th>Rackspace (Legacy)</th>
<th>Saltify</th>
<th>SoftLayer</th>
<th>SoftLayer Hardware</th>
<th>Aliyun</th>
</tr>
</thead>
<tbody>
<tr>
<td>attach_volume</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>create_volumes</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>del_tags</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>delvol_on_destroy</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>detach_volume</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>disable_term_protect</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>enable_term_protect</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>get_tags</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>keep_vol_on_destroy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>list_keypairs</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rename</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>set_tags</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>show_delvol_on_destroy</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>show_instance</td>
<td>Yes Yes Yes Yes Yes Yes Yes Yes Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>show_term_protect</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>start</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stop</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>take_action</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Functions

These are features that are performed against a specific cloud provider, and require the name of the provider to be passed in. For example:

```
# salt-cloud -f list_images my_digitalocean
```
<table>
<thead>
<tr>
<th>Functions</th>
<th>AWS (Legacy)</th>
<th>CloudStack</th>
<th>Digital Ocean</th>
<th>EC2</th>
<th>GoGrid</th>
<th>JoyEnt</th>
<th>Linode</th>
<th>OpenStack</th>
</tr>
</thead>
<tbody>
<tr>
<td>get_size</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>get_spot_config</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>get_subnetid</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iam_profile</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>import_key</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>key_list</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>keyname</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>list_availability_zones</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>list_custom_images</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>list_keys</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>list_nodes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>list_nodes_full</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>list_nodes_select</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>list_vlans</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rackconnect</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reboot</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reformat_node</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>securitygroup</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>securitygroupid</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>show_image</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>show_key</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>show_keypair</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>show_volume</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 24.11 Tutorials

#### 24.11.1 Using Salt Cloud with the Event Reactor

One of the most powerful features of the Salt framework is the Event Reactor. As the Reactor was in development, Salt Cloud was regularly updated to take advantage of the Reactor upon completion. As such, various aspects of both the creation and destruction of instances with Salt Cloud fire events to the Salt Master, which can be used by the Event Reactor.

**Event Structure**

As of this writing, all events in Salt Cloud have a tag, which includes the ID of the instance being managed, and a payload which describes the task that is currently being handled. A Salt Cloud tag looks like:

```
salt/cloud/<minion_id>/<task>
```

For instance, the first event fired when creating an instance named `web1` would look like:
```
salt/cloud/web1/creating
```

Assuming this instance is using the `ec2-centos` profile, which is in turn using the `ec2-config` provider, the payload for this tag would look like:

```json
{
    'name': 'web1',
    'profile': 'ec2-centos',
    'provider': 'ec2-config:ec2'
}
```
Available Events

When an instance is created in Salt Cloud, whether by map, profile, or directly through an API, a minimum of five events are normally fired. More may be available, depending upon the cloud provider being used. Some of the common events are described below.

salt/cloud/<minion_id>/creating

This event states simply that the process to create an instance has begun. At this point in time, no actual work has begun. The payload for this event includes:

name profile provider

salt/cloud/<minion_id>/requesting

Salt Cloud is about to make a request to the cloud provider to create an instance. At this point, all of the variables required to make the request have been gathered, and the payload of the event will reflect those variables which do not normally pose a security risk. What is returned here is dependent upon the cloud provider. Some common variables are:

name image size location

salt/cloud/<minion_id>/querying

The instance has been successfully requested, but the necessary information to log into the instance (such as IP address) is not yet available. This event marks the beginning of the process to wait for this information.

The payload for this event normally only includes the instance_id.

salt/cloud/<minion_id>/waiting_for_ssh

The information required to log into the instance has been retrieved, but the instance is not necessarily ready to be accessed. Following this event, Salt Cloud will wait for the IP address to respond to a ping, then wait for the specified port (usually 22) to respond to a connection, and on Linux systems, for SSH to become available. Salt Cloud will attempt to issue the date command on the remote system, as a means to check for availability. If no ssh_username has been specified, a list of usernames (starting with root) will be attempted. If one or more usernames was configured for ssh_username, they will be added to the beginning of the list, in order.

The payload for this event normally only includes the ip_address.

salt/cloud/<minion_id>/deploying

The necessary port has been detected as available, and now Salt Cloud can log into the instance, upload any files used for deployment, and run the deploy script. Once the script has completed, Salt Cloud will log back into the instance and remove any remaining files.

A number of variables are used to deploy instances, and the majority of these will be available in the payload. Any keys, passwords or other sensitive data will be scraped from the payload. Most of the variables returned will be related to the profile or provider config, and any default values that could have been changed in the profile or provider, but weren't.
salt/cloud/<minion_id>/created

The deploy sequence has completed, and the instance is now available, Salted, and ready for use. This event is the final task for Salt Cloud, before returning instance information to the user and exiting.

The payload for this event contains little more than the initial creating event. This event is required in all cloud providers.

Configuring the Event Reactor

The Event Reactor is built into the Salt Master process, and as such is configured via the master configuration file. Normally this will be a YAML file located at /etc/salt/master. Additionally, master configuration items can be stored, in YAML format, inside the /etc/salt/master.d/ directory.

These configuration items may be stored in either location; however, they may only be stored in one location. For organizational and security purposes, it may be best to create a single configuration file, which contains only Event Reactor configuration, at /etc/salt/master.d/reactor.

The Event Reactor uses a top-level configuration item called reactor. This block contains a list of tags to be watched for, each of which also includes a list of sls files. For instance:

```
reactor:
  - 'salt/minion/*/start':
  - '/srv/reactor/custom-reactor.sls'
  - 'salt/cloud/*/created':
  - '/srv/reactor/cloud-alert.sls'
  - 'salt/cloud/*/destroyed':
  - '/srv/reactor/cloud-destroy-alert.sls'
```

The above configuration configures reactors for three different tags: one which is fired when a minion process has started and is available to receive commands, one which is fired when a cloud instance has been created, and one which is fired when a cloud instance is destroyed.

Note that each tag contains a wildcard (*) in it. For each of these tags, this will normally refer to a minion_id. This is not required of event tags, but is very common.

Reactor SLS Files

Reactor sls files should be placed in the /srv/reactor/ directory for consistency between environments, but this is not currently enforced by Salt.

Reactor sls files follow a similar format to other sls files in Salt. By default they are written in YAML and can be templated using jinja, but since they are processed through Salt's rendering system, any available renderer (JSON, Mako, Cheetah, etc.) can be used.

As with other sls files, each stanza will start with a declaration ID, followed by the function to run, and then any arguments for that function. For example:

```
# /srv/reactor/cloud-alert.sls
new_instance_alert:
  cmd.pagerduty.create_event:
    - tgt: alertserver
    - kwarg:
      description: "New instance: {{ data['name'] }}"
      details: "New cloud instance created on {{ data['provider'] }}"
      service_key: 1626dead5ecafe46231e968eb1be29c4
      profile: my-pagerduty-account
```
When the Event Reactor receives an event notifying it that a new instance has been created, this SLS will create a new incident in PagerDuty, using the configured PagerDuty account.

The declaration ID in this example is `new_instance_alert`. The function called is `cmd.pagerduty.create_event`. The `cmd` portion of this function specifies that an execution module and function will be called, in this case, the `pagerduty.create_event` function.

Because an execution module is specified, a target (tgt) must be specified on which to call the function. In this case, a minion called `alertserver` has been used. Any arguments passed through to the function are declared in the kwarg block.

**Example: Reactor-Based Highstate**

When Salt Cloud creates an instance, by default it will install the Salt Minion onto the instance, along with any specified minion configuration, and automatically accept that minion’s keys on the master. One of the configuration options that can be specified is `startup_states`, which is commonly set to `highstate`. This will tell the minion to immediately apply a highstate, as soon as it is able to do so.

This can present a problem with some system images on some cloud hosts. For instance, Salt Cloud can be configured to log in as either the `root` user, or a user with `sudo` access. While some hosts commonly use images that lock out remote `root` access and require a user with `sudo` privileges to log in (notably EC2, with their `ec2-user` login), most cloud hosts fall back to `root` as the default login on all images, including for operating systems (such as Ubuntu) which normally disallow remote `root` login.

For users of these operating systems, it is understandable that a highstate would include configuration to block remote `root` logins again. However, Salt Cloud may not have finished cleaning up its deployment files by the time the minion process has started, and kicked off a highstate run. Users have reported errors from Salt Cloud getting locked out while trying to clean up after itself.

The goal of a startup state may be achieved using the Event Reactor. Because a minion fires an event when it is able to receive commands, this event can effectively be used inside the reactor system instead. The following will point the reactor system to the right `SLS` file:

```
reactor:
  - 'salt/cloud/*/created':
    - '/srv/reactor/startup_highstate.sls'
```

And the following `SLS` file will start a highstate run on the target minion:

```
# /srv/reactor/startup_highstate.sls
reactor_highstate:
  cmd.state.highstate:
    tgt: {{ data['name'] }}
```

Because this event will not be fired until Salt Cloud has cleaned up after itself, the highstate run will not step on Salt Cloud’s toes. And because every file on the minion is configurable, including `/etc/salt/minion`, the `startup_states` can still be configured for future minion restarts, if desired.
25.1 Writing netapi modules

netapi modules, put simply, bind a port and start a service. They are purposefully open-ended and can be used to present a variety of external interfaces to Salt, and even present multiple interfaces at once.

See also:
* The full list of netapi modules

25.1.1 Configuration

All netapi configuration is done in the Salt master config and takes a form similar to the following:

```yaml
rest_cherrypy:
  port: 8000
  debug: True
  ssl_crt: /etc/pki/tls/certs/localhost.crt
  ssl_key: /etc/pki/tls/certs/localhost.key
```

25.1.2 The __virtual__ function

Like all module types in Salt, netapi modules go through Salt’s loader interface to determine if they should be loaded into memory and then executed.

The __virtual__ function in the module makes this determination and should return False or a string that will serve as the name of the module. If the module raises an ImportError or any other errors, it will not be loaded.

25.1.3 The start function

The start() function will be called for each netapi module that is loaded. This function should contain the server loop that actually starts the service. This is started in a multiprocess.

25.1.4 Inline documentation

As with the rest of Salt, it is a best-practice to include liberal inline documentation in the form of a module docstring and docstrings on any classes, methods, and functions in your netapi module.
25.1.5 Loader “magic” methods

The loader makes the __opts__ data structure available to any function in a netapi module.

25.2 Introduction to netapi modules

netapi modules provide API-centric access to Salt. Usually externally-facing services such as REST or WebSockets, XMPP, XMLRPC, etc.

In general netapi modules bind to a port and start a service. They are purposefully open-ended. A single module can be configured to run as well as multiple modules simultaneously.

netapi modules are enabled by adding configuration to your Salt Master config file and then starting the salt-api daemon. Check the docs for each module to see external requirements and configuration settings.

Communication with Salt and Salt satellite projects is done using Salt’s own Python API. A list of available client interfaces is below.

salt-api

Prior to Salt’s 2014.7.0 release, netapi modules lived in the separate sister project salt-api. That project has been merged into the main Salt project.

See also:
The full list of netapi modules

25.3 Client interfaces

Salt’s client interfaces expose executing functions by crafting a dictionary of values that are mapped to function arguments. This allows calling functions simply by creating a data structure. (And this is exactly how much of Salt’s own internals work!)

class salt.netapi.NetapiClient(opts)

    Provide a uniform method of accessing the various client interfaces in Salt in the form of low-data data structures. For example:

    >>> client = NetapiClient(__opts__)
    >>> lowstate = {'client': 'local', 'tgt': '*', 'fun': 'test.ping', 'arg': ''}
    >>> client.run(lowstate)

local(*args, **kwargs)
    Run execution modules synchronously
    See salt.client.LocalClient.cmd() for all available parameters.
    Sends a command from the master to the targeted minions. This is the same interface that Salt’s own CLI uses. Note the arg and kwarg parameters are sent down to the minion(s) and the given function, fun, is called with those parameters.

        Returns Returns the result from the execution module

local_async(*args, **kwargs)
    Run execution modules asynchronously
    Wraps salt.client.LocalClient.run_job().
local_batch(*args, **kwargs)
    Run execution modules against batches of minions
    New in version 0.8.4.
    Wraps salt.client.LocalClient.cmd_batch()
    Returns Returns the result from the execution module for each batch of returns

runner(fun, timeout=None, **kwargs)
    Run runner modules <all-salt.runners> synchronously
    Wraps salt.runner.RunnerClient.cmd_sync().
    Note that runner functions must be called using keyword arguments. Positional arguments are not supported.
    Returns Returns the result from the runner module

wheel(fun, **kwargs)
    Run wheel modules synchronously
    Wraps salt.wheel.WheelClient.master_call().
    Note that wheel functions must be called using keyword arguments. Positional arguments are not supported.
    Returns Returns the result from the wheel module
The Salt Virt cloud controller capability was initially added to Salt in version 0.14.0 as an alpha technology. The initial Salt Virt system supports core cloud operations:

- Virtual machine deployment
- Inspection of deployed VMs
- Virtual machine migration
- Network profiling
- Automatic VM integration with all aspects of Salt
- Image Pre-seeding

Many features are currently under development to enhance the capabilities of the Salt Virt systems.

**Note:** It is noteworthy that Salt was originally developed with the intent of using the Salt communication system as the backbone to a cloud controller. This means that the Salt Virt system is not an afterthought, simply a system that took the back seat to other development. The original attempt to develop the cloud control aspects of Salt was a project called butter. This project never took off, but was functional and proves the early viability of Salt to be a cloud controller.

### 26.1 Salt Virt Tutorial

A tutorial about how to get Salt Virt up and running has been added to the tutorial section:

*Cloud Controller Tutorial*

### 26.2 The Salt Virt Runner

The point of interaction with the cloud controller is the `virt` runner. The `virt` runner comes with routines to execute specific virtual machine routines.

Reference documentation for the `virt` runner is available with the runner module documentation:

*Virt Runner Reference*
26.3 Based on Live State Data

The Salt Virt system is based on using Salt to query live data about hypervisors and then using the data gathered to make decisions about cloud operations. This means that no external resources are required to run Salt Virt, and that the information gathered about the cloud is live and accurate.

26.4 Deploy from Network or Disk

26.4.1 Virtual Machine Disk Profiles

Salt Virt allows for the disks created for deployed virtual machines to be finely configured. The configuration is a simple data structure which is read from the `config.option` function, meaning that the configuration can be stored in the minion config file, the master config file, or the minion's pillar.

This configuration option is called `virt.disk`. The default `virt.disk` data structure looks like this:

```
virt.disk:
  default:
    - system:
      size: 8192
      format: qcow2
      model: virtio
```

**Note:** The format and model does not need to be defined, Salt will default to the optimal format used by the underlying hypervisor, in the case of kvm this is `qcow2` and `virtio`.

This configuration sets up a disk profile called default. The default profile creates a single system disk on the virtual machine.

Define More Profiles

Many environments will require more complex disk profiles and may require more than one profile, this can be easily accomplished:

```
virt.disk:
  default:
    - system:
      size: 8192
  database:
    - system:
      size: 8192
    - data:
      size: 30720
  web:
    - system:
      size: 1024
    - logs:
      size: 5120
```

This configuration allows for one of three profiles to be selected, allowing virtual machines to be created with different storage needs of the deployed vm.
26.4.2 Virtual Machine Network Profiles

Salt Virt allows for the network devices created for deployed virtual machines to be finely configured. The configuration is a simple data structure which is read from the `config.option` function, meaning that the configuration can be stored in the minion config file, the master config file, or the minion’s pillar.

This configuration option is called `virt.nic`. By default the `virt.nic` option is empty but defaults to a data structure which looks like this:

```yaml
virt.nic:
  default:
    eth0:
    bridge: br0
    model: virtio
```

**Note:** The model does not need to be defined, Salt will default to the optimal model used by the underlying hypervisor; in the case of kvm this model is virtio.

This configuration sets up a network profile called default. The default profile creates a single Ethernet device on the virtual machine that is bridged to the hypervisor’s `br0` interface. This default setup does not require setting up the `virt.nic` configuration, and is the reason why a default install only requires setting up the `br0` bridge device on the hypervisor.

**Define More Profiles**

Many environments will require more complex network profiles and may require more than one profile, this can be easily accomplished:

```yaml
virt.nic:
  dual:
    eth0:
    bridge: service_br
    eth1:
    bridge: storage_br
  single:
    eth0:
    bridge: service_br
  triple:
    eth0:
    bridge: service_br
    eth1:
    bridge: storage_br
    eth2:
    bridge: dmz_br
  all:
    eth0:
    bridge: service_br
    eth1:
    bridge: storage_br
    eth2:
    bridge: dmz_br
    eth3:
    bridge: database_br
  dmz:
    eth0:
    bridge: service_br
    eth1:
```

26.4. Deploy from Network or Disk
bridge: dmz_br

database:
  eth0:
    bridge: service_br
  eth1:
    bridge: database_br

This configuration allows for one of six profiles to be selected, allowing virtual machines to be created which attach to different network depending on the needs of the deployed vm.
Understanding YAML

The default renderer for SLS files is the YAML renderer. YAML is a markup language with many powerful features. However, Salt uses a small subset of YAML that maps over very commonly used data structures, like lists and dictionaries. It is the job of the YAML renderer to take the YAML data structure and compile it into a Python data structure for use by Salt.

Though YAML syntax may seem daunting and terse at first, there are only three very simple rules to remember when writing YAML for SLS files.

### 27.1 Rule One: Indentation

YAML uses a fixed indentation scheme to represent relationships between data layers. Salt requires that the indentation for each level consists of exactly two spaces. Do not use tabs.

### 27.2 Rule Two: Colons

Python dictionaries are, of course, simply key-value pairs. Users from other languages may recognize this data type as hashes or associative arrays.

Dictionary keys are represented in YAML as strings terminated by a trailing colon. Values are represented by either a string following the colon, separated by a space:

```
my_key: my_value
```

In Python, the above maps to:

```
{ 'my_key': 'my_value' }
```

Alternatively, a value can be associated with a key through indentation.

```
my_key:
  my_value
```

Note: The above syntax is valid YAML but is uncommon in SLS files because most often, the value for a key is not singular but instead is a list of values.

In Python, the above maps to:
Dictionaries can be nested:
```
{ 'first_level_dict_key':
    { 'second_level_dict_key': 'value_in_second_level_dict' }
}
```

And in Python:
```
{
    'first_level_dict_key': {
        'second_level_dict_key': 'value_in_second_level_dict'
    }
}
```

### 27.3 Rule Three: Dashes

To represent lists of items, a single dash followed by a space is used. Multiple items are a part of the same list as a function of their having the same level of indentation.

```
- list_value_one
- list_value_two
- list_value_three
```

Lists can be the value of a key-value pair. This is quite common in Salt:
```
my_dictionary:
- list_value_one
- list_value_two
- list_value_three
```

In Python, the above maps to:
```
{ 'my_dictionary': ['list_value_one', 'list_value_two', 'list_value_three']}
```

### 27.4 Learning More

One easy way to learn more about how YAML gets rendered into Python data structures is to use an online YAML parser to see the Python output.

One excellent choice for experimenting with YAML parsing is: [http://yaml-online-parser.appspot.com/](http://yaml-online-parser.appspot.com/)
In 0.10.4 the `external_nodes` system was upgraded to allow for modular subsystems to be used to generate the top file data for a highstate run on the master.

The old `external_nodes` option has been removed. The master tops system contains a number of subsystems that are loaded via the Salt loader interfaces like modules, states, returners, runners, etc.

Using the new `master_top` option is simple:

```yaml
master_top:
  ext_nodes: cobbler-external-nodes
```

for **Cobbler** or:

```yaml
master_top:
  reclass:
    inventory_base_uri: /etc/reclass
    classes_uri: roles
```

for **Reclass**.

It's also possible to create custom master_top modules. These modules must go in a subdirectory called `tops` in the `extension_modules` directory. The `extension_modules` directory is not defined by default (the default `/srv/salt/_modules` will NOT work as of this release)

Custom tops modules are written like any other execution module, see the source for the two modules above for examples of fully functional ones. Below is a degenerate example:

```bash
/etc/salt/master:
extension_modules: /srv/salt/modules
master_top:
  custom_top: True

/srv/salt/modules/tops/customtop.py:

```python
import logging
import sys
# Define the module's virtual name
__virtualname__ = 'customtop'

log = logging.getLogger(__name__)

def __virtual__():
    return __virtualname__
```
```python
def top(**kwargs):
    log.debug('Calling top in customtop')
    return {'base': ['test']}
```

`salt minion state.show_top` should then display something like:

```
salt minion state.show_top

minion
    ----------
    base:
        - test
```
29.1 Getting Started

Salt SSH is very easy to use, simply set up a basic roster file of the systems to connect to and run `salt-ssh` commands in a similar way as standard `salt` commands.

- Salt ssh is considered production ready in version 2014.7.0
- Python is required on the remote system (unless using the `-r` option to send raw ssh commands)
- On many systems, the `salt-ssh` executable will be in its own package, usually named `salt-ssh`
- The Salt SSH system does not supercede the standard Salt communication systems, it simply offers an SSH-based alternative that does not require ZeroMQ and a remote agent. Be aware that since all communication with Salt SSH is executed via SSH it is substantially slower than standard Salt with ZeroMQ.
- At the moment fileserver operations must be wrapped to ensure that the relevant files are delivered with the `salt-ssh` commands. The state module is an exception, which compiles the state run on the master, and in the process finds all the references to `salt://` paths and copies those files down in the same tarball as the state run. However, needed fileserver wrappers are still under development.

29.2 Salt SSH Roster

The roster system in Salt allows for remote minions to be easily defined.

**Note:** See the *Roster documentation* for more details.

Simply create the roster file, the default location is `/etc/salt/roster`:

```plaintext
web1: 192.168.42.1
```

This is a very basic roster file where a Salt ID is being assigned to an IP address. A more elaborate roster can be created:

```plaintext
web1: 192.168.42.1 # The IP addr or DNS hostname
  host: 192.168.42.1  # Remote executions will be executed as user fred
  user: fred
  passwd: foobarbaz # The password to use for login, if omitted, keys are used
  sudo: True # Whether to sudo to root, not enabled by default
web2: 192.168.42.2
```
29.3 Calling Salt SSH

The `salt-ssh` command can be easily executed in the same way as a salt command:

```
salt-ssh '*' test.ping
```

Commands with `salt-ssh` follow the same syntax as the `salt` command.

The standard salt functions are available! The output is the same as `salt` and many of the same flags are available. Please see [http://docs.saltstack.com/ref/cli/salt-ssh.html](http://docs.saltstack.com/ref/cli/salt-ssh.html) for all of the available options.

29.3.1 Raw Shell Calls

By default `salt-ssh` runs Salt execution modules on the remote system, but `salt-ssh` can also execute raw shell commands:

```
salt-ssh '*' -r 'ifconfig'
```

29.4 States Via Salt SSH

The Salt State system can also be used with `salt-ssh`. The state system abstracts the same interface to the user in `salt-ssh` as it does when using standard `salt`. The intent is that Salt Formulas defined for standard `salt` will work seamlessly with `salt-ssh` and vice-versa.

The standard Salt States walkthroughs function by simply replacing `salt` commands with `salt-ssh`.

29.5 Targeting with Salt SSH

Due to the fact that the targeting approach differs in `salt-ssh`, only glob and regex targets are supported as of this writing, the remaining target systems still need to be implemented.

Note: By default, Grains are settable through `salt-ssh`. By default, these grains will not be persisted across reboots.

See the `"thin_dir"` setting in [Roster documentation](http://docs.saltstack.com) for more details.

29.6 Configuring Salt SSH

Salt SSH takes its configuration from a master configuration file. Normally, this file is in `/etc/salt/master`. If one wishes to use a customized configuration file, the `-c` option to Salt SSH facilitates passing in a directory to look inside for a configuration file named `master`.
29.6.1 Minion Config

New in version 2015.5.1.

Minion config options can be defined globally using the master configuration option `ssh_minion_opts`. It can also be defined on a per-minion basis with the `minion_opts` entry in the roster.

29.7 Running Salt SSH as non-root user

By default, Salt reads all the configuration from `/etc/salt/`. If you are running Salt SSH with a regular user you have to modify some paths or you will get "Permission denied" messages. You have to modify two parameters: `pki_dir` and `cachedir`. Those should point to a full path writable for the user.

It's recommended not to modify `/etc/salt` for this purpose. Create a private copy of `/etc/salt` for the user and run the command with `-c /new/config/path`.

29.8 Define CLI Options with Saltfile

If you are commonly passing in CLI options to `salt-ssh`, you can create a Saltfile to automatically use these options. This is common if you’re managing several different salt projects on the same server.

So you can `cd` into a directory that has a Saltfile with the following YAML contents:

```
salt-ssh:
  config_dir: path/to/config/dir
  max_procs: 30
  wipe_ssh: True
```

Instead of having to call `salt-ssh --config-dir=path/to/config/dir --max-procs=30 --wipe \
* test.ping` you can call `salt-ssh * test.ping`.

Boolean-style options should be specified in their YAML representation.

**Note:** The option keys specified must match the destination attributes for the options specified in the parser `salt.utils.parsers.SaltSSHOptionParser`. For example, in the case of the `--wipe` command line option, its `dest` is configured to be `wipe_ssh` and thus this is what should be configured in the Saltfile. Using the names of flags for this option, being `wipe: True` or `w: True`, will not work.
Salt rosters are pluggable systems added in Salt 0.17.0 to facilitate the salt-ssh system. The roster system was created because salt-ssh needs a means to identify which systems need to be targeted for execution.

See also:

*Full list of builtin roster modules*

Note: The Roster System is not needed or used in standard Salt because the master does not need to be initially aware of target systems, since the Salt Minion checks itself into the master.

Since the roster system is pluggable, it can be easily augmented to attach to any existing systems to gather information about what servers are presently available and should be attached to by salt-ssh. By default the roster file is located at /etc/salt/roster.

### 30.1 How Rosters Work

The roster system compiles a data structure internally referred to as targets. The targets is a list of target systems and attributes about how to connect to said systems. The only requirement for a roster module in Salt is to return the targets data structure.

#### 30.1.1 Targets Data

The information which can be stored in a roster target is the following:

```plaintext
<Salt ID>:  # The id to reference the target system with
host:      # The IP address or DNS name of the remote host
user:      # The user to log in as
passwd:    # The password to log in with

# Optional parameters
port:      # The target system's ssh port number
sudo:      # Boolean to run command via sudo
priv:      # File path to ssh private key, defaults to salt-ssh.rsa
timeout:   # Number of seconds to wait for response when establishing
            # an SSH connection
timeout:   # Number of seconds to wait for response
minion_opts:  # Dictionary of minion opts
thin_dir:   # The target system's storage directory for Salt
            # components. Defaults to /tmp/salt-<hash>
```
30.1.2 thin_dir

Salt needs to upload a standalone environment to the target system, and this defaults to /tmp/salt-<hash>. This directory will be cleaned up per normal systems operation.

If you need a persistent Salt environment, for instance to set persistent grains, this value will need to be changed.
31.1 Full list of builtin auth modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>auto</td>
<td>An &quot;Always Approved&quot; auth interface to test against, not intended for production use.</td>
</tr>
<tr>
<td>django</td>
<td>Provide authentication using Django Web Framework</td>
</tr>
<tr>
<td>keystone</td>
<td>Provide authentication using OpenStack Keystone</td>
</tr>
<tr>
<td>ldap</td>
<td>Provide authentication using simple LDAP binds</td>
</tr>
<tr>
<td>mysql</td>
<td>Provide authentication using MySQL.</td>
</tr>
<tr>
<td>pam</td>
<td>Authenticate against PAM</td>
</tr>
<tr>
<td>pki</td>
<td>Authenticate via a PKI certificate.</td>
</tr>
<tr>
<td>stormpath</td>
<td>Provide authentication using Stormpath.</td>
</tr>
<tr>
<td>yubico</td>
<td>Provide authentication using YubiKey.</td>
</tr>
</tbody>
</table>

31.1.1 salt.auth.auto

An "Always Approved" auth interface to test against, not intended for production use.

```
salt.auth.auto.auth(username, password)
```

Authenticate!

31.1.2 salt.auth.django

Provide authentication using Django Web Framework

```
depends
  - Django Web Framework
```

Django authentication depends on the presence of the django framework in the PYTHONPATH, the Django project's settings.py file being in the PYTHONPATH and accessible via the DJANGO_SETTINGS_MODULE environment variable.

Django auth can be defined like any other auth module:

```
external_auth:
  django:
    fred:
      - .*
      - '@runner'
```
This will authenticate Fred via Django and allow him to run any execution module and all runners.

The authorization details can optionally be located inside the Django database. The relevant entry in the models.py file would look like this:

```python
class SaltExternalAuthModel(models.Model):
    user_fk = models.ForeignKey(auth.User)
    minion_matcher = models.CharField()
    minion_fn = models.CharField()
```

The `external_auth` clause in the master config would then look like this:

```yaml
external_auth:
    django:
        ^model: <fully-qualified reference to model class>
```

When a user attempts to authenticate via Django, Salt will import the package indicated via the keyword `^model`. That model must have the fields indicated above, though the model DOES NOT have to be named `SaltExternalAuthModel`.

```python
salt.auth.django.auth(username, password)
    Simple Django auth
salt.auth.django.django_auth_setup()  
    Prepare the connection to the Django authentication framework
salt.auth.django.retrieve_auth_entries(u=None)
```

Parameters **u** -- Username to filter for

Returns Dictionary that can be slotted into the `__opts__` structure for eauth that designates the user associated ACL

Database records such as:

<table>
<thead>
<tr>
<th>username</th>
<th>minion_or_fn_matcher</th>
<th>minion_fn</th>
</tr>
</thead>
<tbody>
<tr>
<td>fred</td>
<td>test.ping</td>
<td></td>
</tr>
<tr>
<td>fred</td>
<td>server1</td>
<td>network.interfaces</td>
</tr>
<tr>
<td>fred</td>
<td>server1</td>
<td>raid.list</td>
</tr>
<tr>
<td>fred</td>
<td>server2</td>
<td>.*</td>
</tr>
<tr>
<td>guru</td>
<td>.*</td>
<td></td>
</tr>
<tr>
<td>smartadmin</td>
<td>server1</td>
<td>.*</td>
</tr>
</tbody>
</table>

Should result in an eauth config such as:

```yaml
fred:
    - test.ping
    - server1:
        - network.interfaces
        - raid.list
    - server2:
        - *
guru:
    - *
smartadmin:
    - server1:
        - *
```
31.1.3 salt.auth.keystone

Provide authentication using OpenStack Keystone

```python
depends
  - keystoneclient Python module

salt.auth.keystone.auth(username, password)
  Try and authenticate

salt.auth.keystone.get_auth_url()
  Try and get the URL from the config, else return localhost
```

31.1.4 salt.auth.ldap

Provide authentication using simple LDAP binds

```python
depends
  - ldap Python module

salt.auth.ldap.auth(username, password)
  Simple LDAP auth

salt.auth.ldap.groups(username, **kwargs)
  Authenticate against an LDAP group

  Behavior is highly dependent on if Active Directory is in use.

  AD handles group membership very differently than OpenLDAP. See the External Authentication documentation for a thorough discussion of available parameters for customizing the search.

  OpenLDAP allows you to search for all groups in the directory and returns members of those groups. Then we check against the username entered.
```

31.1.5 salt.auth.mysql

Provide authentication using MySQL.

When using MySQL as an authentication backend, you will need to create or use an existing table that has a username and a password column.

To get started, create a simple table that holds just a username and a password. The password field will hold a SHA256 checksum.

```sql
CREATE TABLE `users` (
  `id` int(11) NOT NULL AUTO_INCREMENT,
  `username` varchar(25) DEFAULT NULL,
  `password` varchar(70) DEFAULT NULL,
  PRIMARY KEY (`id`)
) ENGINE=InnoDB AUTO_INCREMENT=2 DEFAULT CHARSET=latin1;
```

To create a user within MySQL, execute the following statement.

```sql
INSERT INTO users VALUES (NULL, 'diana', SHA2('secret', 256))
```
mysql_auth:
  hostname: localhost
  database: SaltStack
  username: root
  password: letmein
  auth_sql: 'SELECT username FROM users WHERE username = "{0}" AND password = SHA2("{1}", 256)'

The auth_sql contains the SQL that will validate a user to ensure they are correctly authenticated. This is where you can specify other SQL queries to authenticate users.

Enable MySQL authentication.

external_auth:
  mysql:
    damian:
      - test.*

  depends
    • MySQL-python Python module

salt.auth.mysql.auth(username, password)
  Authenticate using a MySQL user table

31.1.6 salt.auth.pam

Authenticate against PAM

Provides an authenticate function that will allow the caller to authenticate a user against the Pluggable Authentication Modules (PAM) on the system.

Implemented using ctypes, so no compilation is necessary.

Note: PAM authentication will not work for the root user.

The Python interface to PAM does not support authenticating as root.

class salt.auth.pam.PamConv
  Wrapper class for pam_conv structure

  appdata_ptr
    Structure/Union member

  conv
    Structure/Union member

class salt.auth.pam.PamHandle
  Wrapper class for pam_handle_t

  handle
    Structure/Union member

class salt.auth.pam.PamMessage
  Wrapper class for pam_message structure

  msg
    Structure/Union member

  msg_style
    Structure/Union member
class salt.auth.pam.PamResponse
    Wrapper class for pam_response structure

    resp
        Structure/Union member

    resp_retcode
        Structure/Union member

salt.auth.pam.auth(username, password, **kwargs)
    Authenticate via pam

salt.auth.pam.authenticate(username, password, service='login')
    Returns True if the given username and password authenticate for the given service. Returns False otherwise
    username: the username to authenticate
    password: the password in plain text
    service: the PAM service to authenticate against. Defaults to `login`

salt.auth.pam.groups(username, *args, **kwargs)
    Retrieve groups for a given user for this auth provider
    Uses system groups

31.1.7 salt.auth.pki

Authenticate via a PKI certificate.

Note: This module is Experimental and should be used with caution

Provides an authenticate function that will allow the caller to authenticate a user via their public cert against a pre-defined Certificate Authority.

TODO: Add a `ca_dir` option to configure a directory of CA files, a la Apache.

depends
    - pyOpenSSL module

salt.auth.pki.auth(pem, **kwargs)
    Returns True if the given user cert was issued by the CA. Returns False otherwise.
    pem: a pem-encoded user public key (certificate)

Configure the CA cert in the master config file:

external_auth:
    pkI:
        ca_file: /etc/pki/tls/ca_certs/trusted-ca.crt

31.1.8 salt.auth.stormpath

Provide authentication using Stormpath.

This driver requires some extra configuration beyond that which Stormpath normally requires.
New in version 2015.8.0.

salt.auth.stormpath.auth(username, password)
Authenticate using a Stormpath directory or application

31.1.9 salt.auth.yubico

Provide authentication using YubiKey.
New in version 2015.5.0.

depends yubico-client Python module

To get your YubiKey API key you will need to visit the website below.
https://upgrade.yubico.com/getapikey/

The resulting page will show the generated Client ID (aka AuthID or API ID) and the generated API key (Secret Key). Make a note of both and use these two values in your /etc/salt/master configuration.

/etc/salt/master

  yubico_users:
    damian:
      id: 12345
      key: ABCDEFGHIJKLMNOPQRSTUVWXYZ
  
  external_auth:
    yubico:
      damian:
        - test.*

Please wait five to ten minutes after generating the key before testing so that the API key will be updated on all the YubiCloud servers.

salt.auth.yubico.auth(username, password)
Authenticate against yubico server

31.2 Command Line Reference

Salt can be controlled by a command line client by the root user on the Salt master. The Salt command line client uses the Salt client API to communicate with the Salt master server. The Salt client is straightforward and simple to use.

Using the Salt client commands can be easily sent to the minions.

Each of these commands accepts an explicit --config option to point to either the master or minion configuration file. If this option is not provided and the default configuration file does not exist then Salt falls back to use the environment variables SALT_MASTER_CONFIG and SALT_MINION_CONFIG.
See also:

*Configuration*

### 31.2.1 Using the Salt Command

The Salt command needs a few components to send information to the Salt minions. The target minions need to be defined, the function to call and any arguments the function requires.

#### Defining the Target Minions

The first argument passed to salt, defines the target minions, the target minions are accessed via their hostname. The default target type is a bash glob:

```
salt '*foo.com' sys.doc
```

Salt can also define the target minions with regular expressions:

```
salt -E '*.foo' cmd.run 'ls -l | grep foo'
```

Or to explicitly list hosts, salt can take a list:

```
salt -L foo.bar.baz,quo.qux cmd.run 'ps aux | grep foo'
```

#### More Powerful Targets

The simple target specifications, glob, regex, and list will cover many use cases, and for some will cover all use cases, but more powerful options exist.

#### Targeting with Grains

The Grains interface was built into Salt to allow minions to be targeted by system properties. So minions running on a particular operating system can be called to execute a function, or a specific kernel.

Calling via a grain is done by passing the -G option to salt, specifying a grain and a glob expression to match the value of the grain. The syntax for the target is the grain key followed by a glob expression: `os:Arch*`.

```
salt -G 'os:Fedora' test.ping
```

Will return True from all of the minions running Fedora.

To discover what grains are available and what the values are, execute the grains.item salt function:

```
salt '*' grains.items
```

more info on using targeting with grains can be found [here](#).

#### Targeting with Executions

As of 0.8.8 targeting with executions is still under heavy development and this documentation is written to reference the behavior of execution matching in the future.

Execution matching allows for a primary function to be executed, and then based on the return of the primary function the main function is executed.
Execution matching allows for matching minions based on any arbitrary running data on the minions.

**Compound Targeting**

New in version 0.9.5.

Multiple target interfaces can be used in conjunction to determine the command targets. These targets can then be combined using and or or statements. This is well defined with an example:

```shell
salt -C 'G@os:Debian and webser* or E@db.*' test.ping
```

In this example any minion who's id starts with `webser` and is running Debian, or any minion who's id starts with db will be matched.

The type of matcher defaults to glob, but can be specified with the corresponding letter followed by the @ symbol. In the above example a grain is used with G@ as well as a regular expression with E@. The `webser*` target does not need to be prefaced with a target type specifier because it is a glob.

More info on using compound targeting can be found [here](#).

**Node Group Targeting**

New in version 0.9.5.

For certain cases, it can be convenient to have a predefined group of minions on which to execute commands. This can be accomplished using what are called nodegroups. Nodegroups allow for predefined compound targets to be declared in the master configuration file, as a sort of shorthand for having to type out complicated compound expressions.

```yaml
nodegroups:
  group1: 'L@foo.domain.com,bar.domain.com,baz.domain.com and bl*.domain.com'
  group2: 'G@os:Debian and foo.domain.com'
  group3: 'G@os:Debian and N@group1'
```

**Calling the Function**

The function to call on the specified target is placed after the target specification.

New in version 0.9.8.

Functions may also accept arguments, space-delimited:

```shell
salt '*' cmd.exec_code python 'import sys; print sys.version'
```

Optional, keyword arguments are also supported:

```shell
salt '*' pip.install salt timeout=5 upgrade=True
```

They are always in the form of kwarg=argument.

Arguments are formatted as YAML:

```shell
salt '*' cmd.run 'echo "Hello: $FIRST_NAME"' env='{{FIRST_NAME: "Joe"}}'
```

Note: dictionaries must have curly braces around them (like the env keyword argument above). This was changed in 0.15.1: in the above example, the first argument used to be parsed as the dictionary {'echo "Hello": "$FIRST_NAME"'}. This was generally not the expected behavior.
If you want to test what parameters are actually passed to a module, use the `test.arg_repr` command:

```
salt '*' test.arg_repr 'echo "Hello: $FIRST_NAME"' env='{FIRST_NAME: "Joe"}';
```

Finding available minion functions

The Salt functions are self documenting, all of the function documentation can be retrieved from the minions via the `sys.doc()` function:

```
salt '*' sys.doc
```

### Compound Command Execution

If a series of commands needs to be sent to a single target specification then the commands can be sent in a single publish. This can make gathering groups of information faster, and lowers the stress on the network for repeated commands.

Compound command execution works by sending a list of functions and arguments instead of sending a single function and argument. The functions are executed on the minion in the order they are defined on the command line, and then the data from all of the commands are returned in a dictionary. This means that the set of commands are called in a predictable way, and the returned data can be easily interpreted.

Executing compound commands if done by passing a comma delimited list of functions, followed by a comma delimited list of arguments:

```
salt '*' cmd.run,test.ping,test.echo 'cat /proc/cpuinfo',,foo
```

The trick to look out for here, is that if a function is being passed no arguments, then there needs to be a placeholder for the absent arguments. This is why in the above example, there are two commas right next to each other. `test.ping` takes no arguments, so we need to add another comma, otherwise Salt would attempt to pass `"foo"` to `test.ping`.

If you need to pass arguments that include commas, then make sure you add spaces around the commas that separate arguments. For example:

```
salt '*' cmd.run,test.ping,test.echo 'echo "1,2,3"', , foo
```

You may change the arguments separator using the `--args-separator` option:

```
salt --args-separator=:: '*' some.fun,test.echo params with , comma :: foo
```

### 31.2.2 salt-call

#### salt-call

**Synopsis**

```
salt-call [options]
```
Description

The salt-call command is used to run module functions locally on a minion instead of executing them from the master. Salt-call is used to run a Standalone Minion, and was originally created for troubleshooting.

The Salt Master is contacted to retrieve state files and other resources during execution unless the --local option is specified.

Note: salt-call commands execute from the current user's shell context, while salt commands execute from the system's default context.

Options

--version
Print the version of Salt that is running.

--versions-report
Show program's dependencies and version number, and then exit

-h, --help
Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

--hard-crash
Raise any original exception rather than exiting gracefully Default: False

-g, --grains
Return the information generated by the Salt grains

-m MODULE_DIRS, --module-dirs=MODULE_DIRS
Specify an additional directory to pull modules from. Multiple directories can be provided by passing -m /--module-dirs multiple times.

-d, --doc, --documentation
Return the documentation for the specified module or for all modules if none are specified

--master=MASTER
Specify the master to use. The minion must be authenticated with the master. If this option is omitted, the master options from the minion config will be used. If multi masters are set up the first listed master that responds will be used.

--return RETURNER
Set salt-call to pass the return data to one or many returner interfaces. To use many returner interfaces specify a comma delimited list of returners.

--local
Run salt-call locally, as if there was no master running.

--file-root=FILE_ROOT
Set this directory as the base file root.

--pillar-root=PILLAR_ROOT
Set this directory as the base pillar root.

--retcode-passthrough
Exit with the salt call retcode and not the salt binary retcode
--metadata
  Print out the execution metadata as well as the return. This will print out the outputter data, the return code, etc.

--id=ID
  Specify the minion id to use. If this option is omitted, the id option from the minion config will be used.

--skip-grains
  Do not load grains.

--refresh-grains-cache
  Force a refresh of the grains cache

Logging Options
  Logging options which override any settings defined on the configuration files.

-\l LOG_LEVEL, --log-level=LOG_LEVEL
  Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: info.

--log-file=LOG_FILE
  Log file path. Default: /var/log/salt/minion.

--log-file-level=LOG_LEVEL_LOGFILE
  Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: info.

Output Options
--out
  Pass in an alternative outputter to display the return of data. This outputter can be any of the available outputters:

  grains, highstate, json, key, overstatetest, pprint, raw, txt, yaml

  Some outputters are formatted only for data returned from specific functions; for instance, the grains outputter will not work for non-grains data.

  If an outputter is used that does not support the data passed into it, then Salt will fall back on the pprint outputter and display the return data using the Python pprint standard library module.

  Note: If using --out=json, you will probably want --static as well. Without the static option, you will get a separate JSON string per minion which makes JSON output invalid as a whole. This is due to using an iterative outputter. So if you want to feed it to a JSON parser, use --static as well.

--out-indent OUTPUT_INDENT, --output-indent OUTPUT_INDENT
  Print the output indented by the provided value in spaces. Negative values disable indentation. Only applicable in outputters that support indentation.

--out-file=OUTPUT_FILE, --output-file=OUTPUT_FILE
  Write the output to the specified file.

--no-color
  Disable all colored output

--force-color
  Force colored output

  Note: When using colored output the color codes are as follows:

  green denotes success, red denotes failure, blue denotes changes and success and yellow denotes a expected future change in configuration.
See also

`salt(1) salt-master(1) salt-minion(1)`

### 31.2.3 `salt`

**Synopsis**

```
salt `*` [options] sys.doc
salt `-E` `*` [options] sys.doc cmd
salt `-G` `*` [options] test.ping
salt `-C` `*` `G@os:Arch.*` and `webserv*` or `G@kernel:FreeBSD` [options] test.ping
```

**Description**

Salt allows for commands to be executed across a swath of remote systems in parallel. This means that remote systems can be both controlled and queried with ease.

**Options**

- `--version`
  Print the version of Salt that is running.

- `--versions-report`
  Show program's dependencies and version number, and then exit

- `-h`, `--help`
  Show the help message and exit

- `-c CONFIG_DIR, --config-dir=CONFIG_dir`
  The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is `/etc/salt`.

- `-t TIMEOUT, --timeout=TIMEOUT`
  The timeout in seconds to wait for replies from the Salt minions. The timeout number specifies how long the command line client will wait to query the minions and check on running jobs. Default: 5

- `-s, --static`
  By default as of version 0.9.8 the salt command returns data to the console as it is received from minions, but previous releases would return data only after all data was received. Use the static option to only return the data with a hard timeout and after all minions have returned. Without the static option, you will get a separate JSON string per minion which makes JSON output invalid as a whole.

- `--async`
  Instead of waiting for the job to run on minions only print the job id of the started execution and complete.
--state-output=STATE_OUTPUT
New in version 0.17.
Override the configured state_output value for minion output. One of full, terse, mixed, changes or filter. Default: full.

--subset=SUBSET
Execute the routine on a random subset of the targeted minions. The minions will be verified that they have the named function before executing.

-v VERBOSE, --verbose
Turn on verbosity for the salt call, this will cause the salt command to print out extra data like the job id.

--hide-timeout
Instead of showing the return data for all minions. This option prints only the online minions which could be reached.

-b BATCH, --batch-size=BATCH
Instead of executing on all targeted minions at once, execute on a progressive set of minions. This option takes an argument in the form of an explicit number of minions to execute at once, or a percentage of minions to execute on.

-a EAUTH, --auth=EAUTH
Pass in an external authentication medium to validate against. The credentials will be prompted for. The options are auto, keystone, ldap, pam, and stormpath. Can be used with the -T option.

-T, --make-token
Used in conjunction with the -a option. This creates a token that allows for the authenticated user to send commands without needing to re-authenticate.

--return=RETURNER
Choose an alternative returner to call on the minion, if an alternative returner is used then the return will not come back to the command line but will be sent to the specified return system. The options are carbon, cassandra, couchbase, couchdb, elasticsearch, etcd, hipchat, local, local_cache, memcache, mongo, mysql, odbc, postgres, redis, sentry, slack, sms, smtp, sqlite3, syslog, and xmpp.

-d, --doc, --documentation
Return the documentation for the module functions available on the minions

--args-separator=ARGS_SEPARATOR
Set the special argument used as a delimiter between command arguments of compound commands. This is useful when one wants to pass commas as arguments to some of the commands in a compound command.

Logging Options
Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE

--log-file-level=LOG_LEVEL_LOGFILE
Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

Target Selection
-E, --pcre
The target expression will be interpreted as a PCRE regular expression rather than a shell glob.
**--list**  
The target expression will be interpreted as a comma-delimited list; example:  
server1.foo.bar,server2.foo.bar,example7.quo.qux

**--grain**  
The target expression matches values returned by the Salt grains system on the minions. The target expression is in the format of `<grain value>:<glob expression>`; example: `os:Arch`

This was changed in version 0.9.8 to accept glob expressions instead of regular expression. To use regular expression matching with grains, use the `--grain-pcre` option.

**--grain-pcre**  
The target expression matches values returned by the Salt grains system on the minions. The target expression is in the format of `<grain value>:<regular expression>`; example: `os:Arch.*`

**--nodegroup**  
Use a predefined compound target defined in the Salt master configuration file.

**--range**  
Instead of using shell globs to evaluate the target, use a range expression to identify targets. Range expressions look like `%cluster`.

Using the Range option requires that a range server is set up and the location of the range server is referenced in the master configuration file.

**--compound**  
Utilize many target definitions to make the call very granular. This option takes a group of targets separated by `and` or `or`. The default matcher is a glob as usual. If something other than a glob is used, preface it with the letter denoting the type; example: `webserv* and G@os:Debian or E@db*` Make sure that the compound target is encapsulated in quotes.

**--pillar**  
Instead of using shell globs to evaluate the target, use a pillar value to identify targets. The syntax for the target is the pillar key followed by a glob expression: `role:production*`

**--ipcidr**  
Match based on Subnet (CIDR notation) or IPv4 address.

**Output Options**

**--out**  
Pass in an alternative outputer to display the return of data. This outputer can be any of the available outputters:

```
grains, highstate, json, key, overstatetage, pprint, raw, txt, yaml
```

Some outputters are formatted only for data returned from specific functions; for instance, the grains outputer will not work for non-grains data.

If an outputter is used that does not support the data passed into it, then Salt will fall back on the pprint outputter and display the return data using the Python `pprint` standard library module.

**Note:** If using `--out=json`, you will probably want `--static` as well. Without the static option, you will get a separate JSON string per minion which makes JSON output invalid as a whole. This is due to using an iterative outputter. So if you want to feed it to a JSON parser, use `--static` as well.

**--out-indent**  
Print the output indented by the provided value in spaces. Negative values disable indentation. Only applicable in outputters that support indentation.
**--out-file**=OUTPUT_FILE, **--output-file**=OUTPUT_FILE
Write the output to the specified file.

**--no-color**
Disable all colored output

**--force-color**
Force colored output

Note: When using colored output the color codes are as follows:
green denotes success, red denotes failure, blue denotes changes and success and yellow denotes an expected future change in configuration.

See also

salt(7) salt-master(1) salt-minion(1)

31.2.4 salt-cloud

**salt-cloud**

Provision virtual machines in the cloud with Salt

**Synopsis**

salt-cloud -m /etc/salt/cloud.map
salt-cloud -m /etc/salt/cloud.map NAME
salt-cloud -m /etc/salt/cloud.map NAME1 NAME2
salt-cloud -p PROFILE NAME
salt-cloud -p PROFILE NAME1 NAME2 NAME3 NAME4 NAME5 NAME6

**Description**

Salt Cloud is the system used to provision virtual machines on various public clouds via a cleanly controlled profile and mapping system.

**Options**

**--version**
Print the version of Salt that is running.

**--versions-report**
Show program's dependencies and version number, and then exit

- **h**, **--help**
  Show the help message and exit
-c CONFIG_DIR, --config-dir=CONFIG_dir
   The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

Execution Options
-L LOCATION, --location=LOCATION
   Specify which region to connect to.
-a ACTION, --action=ACTION
   Perform an action that may be specific to this cloud provider. This argument requires one or more instance names to be specified.
-f <FUNC-NAME> <PROVIDER>, --function=<FUNC-NAME> <PROVIDER>
   Perform an function that may be specific to this cloud provider, that does not apply to an instance. This argument requires a provider to be specified (i.e.: nova).
-p PROFILE, --profile=PROFILE
   Select a single profile to build the named cloud VMs from. The profile must be defined in the specified profiles file.
-m MAP, --map=MAP
   Specify a map file to use. If used without any other options, this option will ensure that all of the mapped VMs are created. If the named VM already exists then it will be skipped.
-H, --hard
   When specifying a map file, the default behavior is to ensure that all of the VMs specified in the map file are created. If the --hard option is set, then any VMs that exist on configured cloud providers that are not specified in the map file will be destroyed. Be advised that this can be a destructive operation and should be used with care.
-d, --destroy
   Pass in the name(s) of VMs to destroy, salt-cloud will search the configured cloud providers for the specified names and destroy the VMs. Be advised that this is a destructive operation and should be used with care. Can be used in conjunction with the -m option to specify a map of VMs to be deleted.
-P, --parallel
   Normally when building many cloud VMs they are executed serially. The -P option will run each cloud vm build in a separate process allowing for large groups of VMs to be build at once.
   Be advised that some cloud provider's systems don't seem to be well suited for this influx of vm creation. When creating large groups of VMs watch the cloud providers carefully.
-u, --update-bootstrap
   Update salt-bootstrap to the latest develop version on GitHub.
-y, --assume-yes
   Default yes in answer to all confirmation questions.
-k, --keep-tmp
   Do not remove files from /tmp/ after deploy.sh finishes.
--show-deploy-args
   Include the options used to deploy the minion in the data returned.
--script-args=SCRIPT_ARGS
   Script arguments to be fed to the bootstrap script when deploying the VM.

Query Options
-Q, --query
   Execute a query and return some information about the nodes running on configured cloud providers
-F, --full-query
   Execute a query and print out all available information about all cloud VMs. Can be used in conjunction with -m to display only information about the specified map.

-S, --select-query
   Execute a query and print out selected information about all cloud VMs. Can be used in conjunction with -m to display only information about the specified map.

--list-providers
   Display a list of configured providers.

--list-profiles
   New in version 2014.7.0.

   Display a list of configured profiles. Pass in a cloud provider to view the provider's associated profiles, such as digital_ocean, or pass in all to list all the configured profiles.

Cloud Providers Listings

--list-locations=LIST_LOCATIONS
   Display a list of locations available in configured cloud providers. Pass the cloud provider that available locations are desired on, aka 'linode', or pass 'all' to list locations for all configured cloud providers

--list-images=LIST_IMAGES
   Display a list of images available in configured cloud providers. Pass the cloud provider that available images are desired on, aka 'linode', or pass 'all' to list images for all configured cloud providers

--list-sizes=LIST_SIZES
   Display a list of sizes available in configured cloud providers. Pass the cloud provider that available sizes are desired on, aka 'AWS', or pass 'all' to list sizes for all configured cloud providers

Cloud Credentials

--set-password=<USERNAME> <PROVIDER>
   Configure password for a cloud provider and save it to the keyring. PROVIDER can be specified with or without a driver, for example: `--set-password bob rackspace` or more specific `--set-password bob rackspace:openstack` DEPRECATED!

Output Options

--out
   Pass in an alternative outputter to display the return of data. This outputter can be any of the available outputters:

   grains, highstate, json, key, overstatestage, pprint, raw, txt, yaml

   Some outputters are formatted only for data returned from specific functions; for instance, the grains outputter will not work for non-grains data.

   If an outputter is used that does not support the data passed into it, then Salt will fall back on the pprint outputter and display the return data using the Python pprint standard library module.

   Note: If using --out=json, you will probably want --static as well. Without the static option, you will get a separate JSON string per minion which makes JSON output invalid as a whole. This is due to using an iterative outputter. So if you want to feed it to a JSON parser, use --static as well.

--out-indent OUTPUT_INDENT, --output-indent OUTPUT_INDENT
   Print the output indented by the provided value in spaces. Negative values disable indentation. Only applicable in outputters that support indentation.
**--out-file**=OUTPUT_FILE, **--output-file**=OUTPUT_FILE
Write the output to the specified file.

**--no-color**
Disable all colored output

**--force-color**
Force colored output

Note: When using colored output the color codes are as follows:
green denotes success, red denotes failure, blue denotes changes and success and yellow denotes a expected future change in configuration.

**Examples**

To create 4 VMs named web1, web2, db1, and db2 from specified profiles:
```
salt-cloud -p fedora_rackspace web1 web2 db1 db2
```

To read in a map file and create all VMs specified therein:
```
salt-cloud -m /path/to/cloud.map
```

To read in a map file and create all VMs specified therein in parallel:
```
salt-cloud -m /path/to/cloud.map -P
```

To delete any VMs specified in the map file:
```
salt-cloud -m /path/to/cloud.map -d
```

To delete any VMs NOT specified in the map file:
```
salt-cloud -m /path/to/cloud.map -H
```

To display the status of all VMs specified in the map file:
```
salt-cloud -m /path/to/cloud.map -Q
```

**See also**

salt-cloud(7) salt(7) salt-master(1) salt-minion(1)

---

**31.2.5 salt-cp**

**salt-cp**

Copy a file to a set of systems

**Synopsis**
Description

Salt copy copies a local file out to all of the Salt minions matched by the given target.

Note: salt-cp uses salt's publishing mechanism. This means the privacy of the contents of the file on the wire are completely dependant upon the transport in use. In addition, if the salt-master is running with debug logging it is possible that the contents of the file will be logged to disk.

Options

--version
Print the version of Salt that is running.

--versions-report
Show program's dependencies and version number, and then exit

-h, --help
Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

-t TIMEOUT, --timeout=TIMEOUT
The timeout in seconds to wait for replies from the Salt minions. The timeout number specifies how long the command line client will wait to query the minions and check on running jobs. Default: 5

Logging Options
Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE

--log-file-level=LOG_LEVEL_LOGFILE
Log file logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

Target Selection

-E, --pcre
The target expression will be interpreted as a PCRE regular expression rather than a shell glob.

-L, --list
The target expression will be interpreted as a comma-delimited list; example: server1.foo.bar,server2.foo.bar,example7.quo.qux
-G, --grain
The target expression matches values returned by the Salt grains system on the minions. The target expression is in the format of `<grain value>:<glob expression>`; example: `os:Arch`

This was changed in version 0.9.8 to accept glob expressions instead of regular expression. To use regular expression matching with grains, use the --grain-pcre option.

--grain-pcre
The target expression matches values returned by the Salt grains system on the minions. The target expression is in the format of `<grain value>:<regular expression>`; example: `os:Arch`.

-N, --nodegroup
Use a predefined compound target defined in the Salt master configuration file.

-R, --range
Instead of using shell globs to evaluate the target, use a range expression to identify targets. Range expressions look like %cluster.

Using the Range option requires that a range server is set up and the location of the range server is referenced in the master configuration file.

See also

salt(1) salt-master(1) salt-minion(1)

31.2.6 salt-key

salt-key

Synopsis

salt-key [ options ]

Description

Salt-key executes simple management of Salt server public keys used for authentication.

On initial connection, a Salt minion sends its public key to the Salt master. This key must be accepted using the salt-key command on the Salt master.

Salt minion keys can be in one of the following states:

- **unaccepted**: key is waiting to be accepted.
- **accepted**: key was accepted and the minion can communicate with the Salt master.
- **rejected**: key was rejected using the salt-key command. In this state the minion does not receive any communication from the Salt master.
- **denied**: key was rejected automatically by the Salt master. This occurs when a minion has a duplicate ID, or when a minion was rebuilt or had new keys generated and the previous key was not deleted from the Salt master. In this state the minion does not receive any communication from the Salt master.

To change the state of a minion key, use -d to delete the key and then accept or reject the key.
Options

--version
Print the version of Salt that is running.

--versions-report
Show program's dependencies and version number, and then exit

-h, --help
Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

-u USER, --user=USER
Specify user to run salt-key

--hard-crash
Raise any original exception rather than exiting gracefully. Default is False.

-q, --quiet
Suppress output

-y, --yes
Answer 'Yes' to all questions presented, defaults to False

--rotate-aes-key=ROTATE_AES_KEY
Setting this to False prevents the master from refreshing the key session when keys are deleted or rejected, this lowers the security of the key deletion/rejection operation. Default is True.

Logging Options  Logging options which override any settings defined on the configuration files.

--log-file=LOG_FILE
Log file path. Default: /var/log/salt/minion.

--log-file-level=LOG_LEVEL_LOGFILE
Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

Output Options

--out
Pass in an alternative outputter to display the return of data. This outputter can be any of the available outputters:

grains, highstate, json, key, overstatestage, pprint, raw, txt, yaml

Some outputters are formatted only for data returned from specific functions; for instance, the grains outputter will not work for non-grains data.

If an outputter is used that does not support the data passed into it, then Salt will fall back on the pprint outputter and display the return data using the Python pprint standard library module.

Note: If using --out=json, you will probably want --static as well. Without the static option, you will get a separate JSON string per minion which makes JSON output invalid as a whole. This is due to using an iterative outputter. So if you want to feed it to a JSON parser, use --static as well.
--out-indent OUTPUT_INDENT, --output-indent OUTPUT_INDENT
Print the output indented by the provided value in spaces. Negative values disable indentation. Only applicable in outputters that support indentation.

--out-file=OUTPUT_FILE, --output-file=OUTPUT_FILE
Write the output to the specified file.

--no-color
Disable all colored output

--force-color
Force colored output

Note: When using colored output the color codes are as follows:
green denotes success, red denotes failure, blue denotes changes and success and yellow denotes a expected future change in configuration.

Actions
-1 ARG, --list=ARG
List the public keys. The args pre, un, and unaccepted will list unaccepted/unsigned keys. acc or accepted will list accepted/signed keys. rej or rejected will list rejected keys. Finally, all will list all keys.
-L, --list-all
List all public keys. (Deprecated: use --list all)

-a ACCEPT, --accept=ACCEPT
Accept the specified public key (use --include-all to match rejected keys in addition to pending keys). Globs are supported.
-A, --accept-all
Accepts all pending keys.

-r REJECT, --reject=REJECT
Reject the specified public key (use --include-all to match accepted keys in addition to pending keys). Globs are supported.
-R, --reject-all
Rejects all pending keys.

--include-all
Include non-pending keys when accepting/rejecting.

-p PRINT, --print=PRINT
Print the specified public key.
-P, --print-all
Print all public keys

-d DELETE, --delete=DELETE
Delete the specified key. Globs are supported.

-D, --delete-all
Delete all keys.

-f FINGER, --finger=FINGER
Print the specified key's fingerprint.
-F, --finger-all
Print all keys' fingerprints.
Key Generation Options

`--gen-keys=GEN_KEYS`
Set a name to generate a keypair for use with salt

`--gen-keys-dir=GEN_KEYS_DIR`
Set the directory to save the generated keypair. Only works with `gen_keys_dir` option; default is the current directory.

`--keysize=KEYSIZE`
Set the keysize for the generated key, only works with the `--gen-keys' option, the key size must be 2048 or higher, otherwise it will be rounded up to 2048. The default is 2048.

`--gen-signature`
Create a signature file of the masters public-key named master_pubkey_signature. The signature can be send to a minion in the masters auth-reply and enables the minion to verify the masters public-key cryptographically. This requires a new signing-key- pair which can be auto-created with the `--auto-create` parameter.

`--priv=PRIV`
The private-key file to create a signature with

`--signature-path=SIGNATURE_PATH`
The path where the signature file should be written

`--pub=PUB`
The public-key file to create a signature for

`--auto-create`
Auto-create a signing key-pair if it does not yet exist

See also

salt(7) salt-master(1) salt-minion(1)

31.2.7 salt-master

salt-master

The Salt master daemon, used to control the Salt minions

Synopsis

```
salt-master [ options ]
```

Description

The master daemon controls the Salt minions

Options

`--version`
Print the version of Salt that is running.
--versions-report
    Show program's dependencies and version number, and then exit

-h, --help
    Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
    The location of the Salt configuration directory. This directory contains the configuration files for Salt master
    and minions. The default location on most systems is /etc/salt.

-u USER, --user=USER
    Specify user to run salt-master

-d, --daemon
    Run salt-master as a daemon

--pid-file PIDFILE
    Specify the location of the pidfile. Default: /var/run/salt-master.pid

Logging Options  Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
    Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE

--log-file-level=LOG_LEVEL_LOGFILE
    Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

See also

tsalt(1) salt(7) salt-minion(1)

31.2.8 salt-minion

salt-minion

The Salt minion daemon, receives commands from a remote Salt master.

Synopsis

    salt-minion [ options ]

Description

The Salt minion receives commands from the central Salt master and replies with the results of said commands.
Options

--version
Print the version of Salt that is running.

--versions-report
Show program's dependencies and version number, and then exit

-h, --help
Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

-u USER, --user=USER
Specify user to run salt-minion

-d, --daemon
Run salt-minion as a daemon

--pid-file PIDFILE
Specify the location of the pidfile. Default: /var/run/salt-minion.pid

Logging Options
Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE
Log file path. Default: /var/log/salt/minion.

--log-file-level=LOG_LEVEL_LOGFILE
Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

See also

salt(1) salt(7) salt-master(1)

31.2.9 salt-proxy

salt-proxy

Receives commands from a Salt master and proxies these commands to devices that are unable to run a full minion.

Synopsis

salt-proxy [ options ]
Description

The Salt proxy minion receives commands from a Salt master, transmits appropriate commands to devices that are unable to run a minion, and replies with the results of said commands.

Options

--proxyid
The minion id that this proxy will assume. This is required.

--version
Print the version of Salt that is running.

--versions-report
Show program's dependencies and version number, and then exit

-h, --help
Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

-u USER, --user=USER
Specify user to run salt-proxy

-d, --daemon
Run salt-proxy as a daemon

--pid-file PIDFILE
Specify the location of the pidfile. Default: /var/run/salt-proxy-<id>.pid

Logging Options
Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE
Log file path. Default: /var/log/salt/minion.

--log-file-level=LOG_LEVEL_LOGFILE
Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

See also

salt(1) salt(7) salt-master(1) salt-minion(1)

31.2.10 salt-run

salt-run

Execute a Salt runner
Synopsis

salt-run RUNNER

Description

salt-run is the frontend command for executing Salt Runners. Salt runners are simple modules used to execute convenience functions on the master

Options

--version
Print the version of Salt that is running.

--versions-report
Show program's dependencies and version number, and then exit

-h, --help
Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

-t TIMEOUT, --timeout=TIMEOUT
The timeout in seconds to wait for replies from the Salt minions. The timeout number specifies how long the command line client will wait to query the minions and check on running jobs. Default: 1

--hard-crash
Raise any original exception rather than exiting gracefully. Default is False.

-d, --doc, --documentation
Display documentation for runners, pass a module or a runner to see documentation on only that module/runner.

Logging Options
Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE

--log-file-level=LOG_LEVEL_LOGFILE
Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

See also

salt(1) salt-master(1) salt-minion(1)
31.2.11 salt-ssh

**salt-ssh**

Synopsis

```
salt-ssh 'x' [ options ] sys.doc
salt-ssh -E '.*' [ options ] sys.doc cmd
```

Description

Salt SSH allows for salt routines to be executed using only SSH for transport

Options

```
-r, --raw, --raw-shell
    Execute a raw shell command.
--priv
    Specify the SSH private key file to be used for authentication.
--roster
    Define which roster system to use, this defines if a database backend, scanner, or custom roster system is used. Default is the flat file roster.
--roster-file
    Define an alternative location for the default roster file location. The default roster file is called roster and is found in the same directory as the master config file.
    New in version 2014.1.0.
--refresh, --refresh-cache
    Force a refresh of the master side data cache of the target’s data. This is needed if a target’s grains have been changed and the auto refresh timeframe has not been reached.
--max-procs
    Set the number of concurrent minions to communicate with. This value defines how many processes are opened up at a time to manage connections, the more running process the faster communication should be, default is 25.
-i, --ignore-host-keys
    Ignore the ssh host keys which by default are honored and connections would ask for approval.
--passwd
    Set the default password to attempt to use when authenticating.
--key-deploy
    Set this flag to attempt to deploy the authorized ssh key with all minions. This combined with --passwd can make initial deployment of keys very fast and easy.
--version
    Print the version of Salt that is running.
--versions-report
    Show program’s dependencies and version number, and then exit
Salt Documentation, Release 2015.8.0

-h, --help
Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.

Target Selection
-E, --pcre
The target expression will be interpreted as a PCRE regular expression rather than a shell glob.

-L, --list
The target expression will be interpreted as a comma-delimited list; example: server1.foo.bar,server2.foo.bar.example7.quo.qux

-G, --grain
The target expression matches values returned by the Salt grains system on the minions. The target expression is in the format of `<grain value>:<glob expression>'; example: `os:Arch`

This was changed in version 0.9.8 to accept glob expressions instead of regular expression. To use regular expression matching with grains, use the --grain-pcre option.

--grain-pcre
The target expression matches values returned by the Salt grains system on the minions. The target expression is in the format of `<grain value>:<regular expression>'; example: `os:Arch.*'

-N, --nodegroup
Use a predefined compound target defined in the Salt master configuration file.

-R, --range
Instead of using shell globs to evaluate the target, use a range expression to identify targets. Range expressions look like %cluster.

Using the Range option requires that a range server is set up and the location of the range server is referenced in the master configuration file.

Logging Options
Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE

--log-file-level=LOG_LEVEL_LOGFILE
Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

Output Options
--out
Pass in an alternative outputter to display the return of data. This outputter can be any of the available out-putters:

grains, highstate, json, key, overstatestage, pprint, raw, txt, yaml

Some outputters are formatted only for data returned from specific functions; for instance, the grains outputter will not work for non-grains data.
If an outputter is used that does not support the data passed into it, then Salt will fall back on the `pprint` outputter and display the return data using the Python `pprint` standard library module.

**Note:** If using `--out=json`, you will probably want `--static` as well. Without the static option, you will get a separate JSON string per minion which makes JSON output invalid as a whole. This is due to using an iterative outputter. So if you want to feed it to a JSON parser, use `--static` as well.

```
--out-indent OUTPUT_INDENT, --output-indent OUTPUT_INDENT
Print the output indented by the provided value in spaces. Negative values disable indentation. Only applicable in outputters that support indentation.
```

```
--out-file=OUTPUT_FILE, --output-file=OUTPUT_FILE
Write the output to the specified file.
```

```
--no-color
Disable all colored output
```

```
--force-color
Force colored output
```

**Note:** When using colored output the color codes are as follows:
- **green** denotes success,
- **red** denotes failure,
- **blue** denotes changes and success
- **yellow** denotes a.

See also

salt(7) salt-master(1) salt-minion(1)

### 31.2.12 salt-syndic

#### salt-syndic

The Salt syndic daemon, a special minion that passes through commands from a higher master.

**Synopsis**

```
salt-syndic [ options ]
```

**Description**

The Salt syndic daemon, a special minion that passes through commands from a higher master.

**Options**

```
--version
Print the version of Salt that is running.
```

```
--versions-report
Show program's dependencies and version number, and then exit
```
-h, --help
    Show the help message and exit
-c CONFIG_DIR, --config-dir=CONFIG_dir
    The location of the Salt configuration directory. This directory contains the configuration files for Salt master and minions. The default location on most systems is /etc/salt.
-u USER, --user=USER
    Specify user to run salt-syndic
-d, --daemon
    Run salt-syndic as a daemon
--pid-file PIDFILE
    Specify the location of the pidfile. Default: /var/run/salt-syndic.pid

Logging Options
Logging options which override any settings defined on the configuration files.
-l LOG_LEVEL, --log-level=LOG_LEVEL
    Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.
--log-file=LOG_FILE
--log-file-level=LOG_LEVEL_LOGFILE
    Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

See also
salt(1) salt-master(1) salt-minion(1)

31.2.13 salt-api

salt-api
Start interfaces used to remotely connect to the salt master

Synopsis

salt-api

Description
The Salt API system manages network api connectors for the Salt Master

Options

--version
    Print the version of Salt that is running.
--versions-report
  Show program's dependencies and version number, and then exit

-h, --help
  Show the help message and exit

-c CONFIG_DIR, --config-dir=CONFIG_dir
  The location of the Salt configuration directory. This directory contains the configuration files for Salt master
  and minions. The default location on most systems is /etc/salt.

-d, --daemon
  Run the salt-api as a daemon

--pid-file=PIDFILE
  Specify the location of the pidfile. Default: /var/run/salt-api.pid

Logging Options  Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
  Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE

--log-file-level=LOG_LEVEL_LOGFILE
  Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

See also

salt-api(7) salt(7) salt-master(1)

31.2.14  spm

spm

Salt Package Manager

Synopsis

  spm <command> [argument]

Description

  spm is the frontend command for managing Salt packages. Packages normally only include formulas, meaning a
  group of SLS files that install into the file_roots on the Salt Master, but Salt modules can also be installed.
Options

-y, --assume-yes
Assume yes instead of prompting the other whether or not to proceed with a particular command. Default is False.

-f, --force
When presented with a course of action that spm would normally refuse to perform, that action will be performed anyway. This is often destructive, and should be used with caution.

Logging Options Logging options which override any settings defined on the configuration files.

-l LOG_LEVEL, --log-level=LOG_LEVEL
Console logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

--log-file=LOG_FILE

--log-file-level=LOG_LEVEL_LOGFILE
Logfile logging log level. One of all, garbage, trace, debug, info, warning, error, quiet. Default: warning.

Commands

update_repo
Connect to remote repositories locally configured on the system and download their metadata.

install
Install a package from a configured SPM repository. Requires a package name.

remove
Remove an installed package from the system. Requires a package name.

info
List information about an installed package. Requires a package name.

files
List files belonging to an installed package. Requires a package name.

local
Perform one of the above options (except for remove) on a package file, instead of on a package in a repository, or an installed package. Requires a valid path to a local file on the system.

build
Build a package from a directory containing a FORMULA file. Requires a valid path to a local directory on the system.

create_repo
Scan a directory for valid SPM package files and build an SPM-METADATA file in that directory which describes them.

See also

salt(1) salt-master(1) salt-minion(1)
31.3 Client ACL system

The salt client ACL system is a means to allow system users other than root to have access to execute select salt commands on minions from the master.

The client ACL system is configured in the master configuration file via the `client_acl` configuration option. Under the `client_acl` configuration option the users open to send commands are specified and then a list of regular expressions which specify the minion functions which will be made available to specified user. This configuration is much like the `peer` configuration:

```yaml
client_acl:
  # Allow thatch to execute anything.
  thatch:
    - *
  # Allow fred to use test and pkg, but only on "web*" minions.
  fred:
    - web*:
      - test.*
      - pkg.*
```

31.3.1 Permission Issues

Directories required for `client_acl` must be modified to be readable by the users specified:

```bash
chmod 755 /var/cache/salt /var/cache/salt/master /var/cache/salt/master/jobs /var/run/salt /var/run/salt/master
```

**Note:** In addition to the changes above you will also need to modify the permissions of `/var/log/salt` and the existing log file to be writable by the user(s) which will be running the commands. If you do not wish to do this then you must disable logging or Salt will generate errors as it cannot write to the logs as the system users.

If you are upgrading from earlier versions of salt you must also remove any existing user keys and re-start the Salt master:

```bash
rm /var/cache/salt/.*key
service salt-master restart
```

31.4 Python client API

Salt provides several entry points for interfacing with Python applications. These entry points are often referred to as `*Client()` APIs. Each client accesses different parts of Salt, either from the master or from a minion. Each client is detailed below.

**See also:**

There are many ways to access Salt programmatically.

Salt can be used from CLI scripts as well as via a REST interface.

See Salt's `outputter system` to retrieve structured data from Salt as JSON, or as shell-friendly text, or many other formats.

See the `state.event` runner to utilize Salt's event bus from shell scripts.

Salt's `netapi module` provides access to Salt externally via a REST interface. Review the `netapi module` documentation for more information.
31.4.1 Salt’s opts dictionary

Some clients require access to Salt’s opts dictionary. (The dictionary representation of the master or minion config files.)

A common pattern for fetching the opts dictionary is to defer to environment variables if they exist or otherwise fetch the config from the default location.

```python
salt.config.client_config(path, env_var='SALT_CLIENT_CONFIG', defaults=None)
```

Load Master configuration data

Usage:

```python
import salt.config
master_opts = salt.config.client_config('/etc/salt/master')
```

Returns a dictionary of the Salt Master configuration file with necessary options needed to communicate with a locally-running Salt Master daemon. This function searches for client specific configurations and adds them to the data from the master configuration.

This is useful for master-side operations like LocalClient.

```python
salt.config.minion_config(path, env_var='SALT_MINION_CONFIG', defaults=None, cache_minion_id=False)
```

Reads in the minion configuration file and sets up special options

This is useful for Minion-side operations, such as the Caller class, and manually running the loader interface.

```python
import salt.client
minion_opts = salt.config.minion_config('/etc/salt/minion')
```

31.4.2 Salt’s Loader Interface

Modules in the Salt ecosystem are loaded into memory using a custom loader system. This allows modules to have conditional requirements (OS, OS version, installed libraries, etc) and allows Salt to inject special variables (__salt__, __opts__, etc).

Most modules can be manually loaded. This is often useful in third-party Python apps or when writing tests. However some modules require and expect a full, running Salt system underneath. Notably modules that facilitate master-to-minion communication such as the mine, publish, and peer execution modules. The error KeyError: 'master_uri' is a likely indicator for this situation. In those instances use the Caller class to execute those modules instead.

Each module type has a corresponding loader function.

```python
salt.loader.minionMods(opts, context=None, utils=None, whitelist=None, include_errors=False, initial_load=False, loaded_base_name=None, notify=False)
```

Load execution modules

Returns a dictionary of execution modules appropriate for the current system by evaluating the __virtual__() function in each module.

Parameters

- **opts (dict)** -- The Salt options dictionary

- **context (dict)** -- A Salt context that should be made present inside generated modules in __context__

- **utils (dict)** -- Utility functions which should be made available to Salt modules in __utils__. See utils_dir in salt.config for additional information about configuration.
- **whitelist** *(list)* -- A list of modules which should be whitelisted.
- **include_errors** *(bool)* -- Deprecated flag! Unused.
- **initial_load** *(bool)* -- Deprecated flag! Unused.
- **loaded_base_name** *(str)* -- A string marker for the loaded base name.
- **notify** *(bool)* -- Flag indicating that an event should be fired upon completion of module loading.

```python
import salt.config
import salt.loader

__opts__ = salt.config.minion_config('/etc/salt/minion')
__grains__ = salt.loader.grains(__opts__)
__opts__['grains'] = __grains__
__salt__ = salt.loader.minion_mods(__opts__)
__salt__['test.ping']()
```

salt.loader.raw_mod*(opts, name, functions, mod='modules')*
Returns a single module loaded raw and bypassing the __virtual__ function

```python
import salt.config
import salt.loader

__opts__ = salt.config.minion_config('/etc/salt/minion')
testmod = salt.loader.raw_mod(__opts__, 'test', None)
testmod['test.ping']()
```

salt.loader.states*(opts, functions, utils, whitelist=None)*
Returns the state modules

Parameters
- **opts** *(dict)* -- The Salt options dictionary
- **functions** *(dict)* -- A dictionary of minion modules, with module names as keys and func as values.

```python
import salt.config
import salt.loader

__opts__ = salt.config.minion_config('/etc/salt/minion')
statemods = salt.loader.states(__opts__, None, None)
```

salt.loader.grains*(opts, force_refresh=False)*
Return the functions for the dynamic grains and the values for the static grains.

```python
import salt.config
import salt.loader

__opts__ = salt.config.minion_config('/etc/salt/minion')
__grains__ = salt.loader.grains(__opts__)
print __grains__['id']
```

salt.loader.grain_funcs*(opts)*
Returns the grain functions

```python
import salt.config
import salt.loader
```

442 Chapter 31. Reference
Salt Documentation, Release 2015.8.0

```python
__opts__ = salt.config.minion_config('/etc/salt/minion')
grainfuncs = salt.loader.grain_funcs(__opts__)
```

# 31.4.3 Salt’s Client Interfaces

**LocalClient**

class salt.client.LocalClient(c_path='/etc/salt/master', mopts=None, skip_perm_errors=False)

The interface used by the `salt` CLI tool on the Salt Master

LocalClient is used to send a command to Salt minions to execute execution modules and return the results to the Salt Master.

Importing and using LocalClient must be done on the same machine as the Salt Master and it must be done using the same user that the Salt Master is running as. (Unless external_auth is configured and authentication credentials are included in the execution).

```python
import salt.client
local = salt.client.LocalClient()
local.cmd('*', 'test.fib', [10])
```

**cmd** *(tgt, fun, arg=(), timeout=None, expr_form='glob', ret='', jid='', kwarg=None, **kwargs)*

Synchronously execute a command on targeted minions

The cmd method will execute and wait for the timeout period for all minions to reply, then it will return all minion data at once.

```python
>>> import salt.client
>>> local = salt.client.LocalClient()
>>> local.cmd('*', 'cmd.run', ['whoami'])
{'jerry': 'root'}
```

With extra keyword arguments for the command function to be run:

```python
local.cmd('*', 'test.arg', ['arg1', 'arg2'], kwarg={'foo': 'bar'})
```

Compound commands can be used for multiple executions in a single publish. Function names and function arguments are provided in separate lists but the index values must correlate and an empty list must be used if no arguments are required.

```python
>>> local.cmd('*', ['grains.items', 'sys.doc', 'cmd.run'], ['[', [
                [],
                [],
                ['uptime'],
                ]])
```

## Parameters

- **tgt** *(string or list)* -- Which minions to target for the execution. Default is shell glob. Modified by the `expr_form` option.
• **fun** *(string or list of strings)* -- The module and function to call on the specified minions of the form module.function. For example *test.ping* or *grains.items*.

**Compound commands** Multiple functions may be called in a single publish by passing a list of commands. This can dramatically lower overhead and speed up the application communicating with Salt.

This requires that the *arg* param is a list of lists. The *fun* list and the *arg* list must correlate by index meaning a function that does not take arguments must still have a corresponding empty list at the expected index.

• **arg** *(list or list-of-lists)* -- A list of arguments to pass to the remote function. If the function takes no arguments *arg* may be omitted except when executing a compound command.

• **timeout** -- Seconds to wait after the last minion returns but before all minions return.

• **expr_form** -- The type of *tgt*. Allowed values:
  - glob - Bash glob completion - Default
  - pcre - Perl style regular expression
  - list - Python list of hosts
  - grains - Match based on a grain comparison
  - grain_pcre - Grain comparison with a regex
  - pillargroup - Pillar data comparison
  - pillargroup_pcre - Pillar data comparison with a regex
  - nodegroup - Match on nodegroup
  - range - Use a Range server for matching
  - compound - Pass a compound match string

• **ret** -- The returner to use. The value passed can be single returner, or a comma delimited list of returners to call in order on the minions

• **kwarg** -- A dictionary with keyword arguments for the function.

• **kwargs** -- Optional keyword arguments. Authentication credentials may be passed when using *external_auth*.

For example: `local.cmd('*','test.ping', username='saltdev', password='saltdev', eauth='pam')`. Or: `local.cmd('*','test.ping', token='5871821ea51754fdce8153c1c745433')`

**Returns** A dictionary with the result of the execution, keyed by minion ID. A compound command will return a sub-dictionary keyed by function name.

```python
cmd_async(tgt, fun, arg=(), expr_form='glob', ret='ret', jid='', kwarg=None, **kwargs)
```

Asynchronously send a command to connected minions

The function signature is the same as *cmd()* with the following exceptions.

**Returns** A job ID or 0 on failure.

```python
>>> local.cmd_async('*','test.sleep', [300])
'20131219215921857715'
```
**cmd_batch** *(tgt, fun, arg=(), expr_form='glob', ret='\', kwarg=None, batch='10%', **kwargs)*

Iteratively execute a command on subsets of minions at a time. The function signature is the same as `cmd()` with the following exceptions.

**Parameters**

- **batch** -- The batch identifier of systems to execute on

**Returns**

A generator of minion returns

```python
>>> returns = local.cmd_batch('*', 'state.highstate', bat='10%')
```

```python
>>> for ret in returns:
...   print(ret)
{'jerry': {...}}
{'dave': {...}}
{'stewart': {...}}
```

**cmd_iter** *(tgt, fun, arg=(), timeout=None, expr_form='glob', ret='\', kwarg=None, **kwargs)*

Yields the individual minion returns as they come in. The function signature is the same as `cmd()` with the following exceptions.

**Returns**

A generator yielding the individual minion returns

```python
>>> ret = local.cmd_iter('*', 'test.ping')
```

```python
>>> for i in ret:
...   print(i)
{'jerry': {'ret': True}}
{'dave': {'ret': True}}
{'stewart': {'ret': True}}
```

**cmd_iter_no_block** *(tgt, fun, arg=(), timeout=None, expr_form='glob', ret='\', kwarg=None, **kwargs)*

Yields the individual minion returns as they come in, or `None` when no returns are available. The function signature is the same as `cmd()` with the following exceptions.

**Returns**

A generator yielding the individual minion returns, or `None` when no returns are available. This allows for actions to be injected in between minion returns.

```python
>>> ret = local.cmd_iter_no_block('*', 'test.ping')
```

```python
>>> for i in ret:
...   print(i)
None
{'jerry': {'ret': True}}
{'dave': {'ret': True}}
None
{'stewart': {'ret': True}}
```

**cmd_subset** *(tgt, fun, arg=(), expr_form='glob', ret='\', kwarg=None, sub=3, cli=False, progress=False, **kwargs)*

Execute a command on a random subset of the targeted systems. The function signature is the same as `cmd()` with the following exceptions.

**Parameters**

- **sub** -- The number of systems to execute on

```python
>>> SLC.cmd_subset('*', 'test.ping', sub=1)
{'jerry': True}
```

**get_cli_returns** *(jid, minions, timeout=None, tgt='\', tgt_type='glob', verbose=False, show_jid=False, **kwargs)*

Starts a watcher looking at the return data for a specified JID.
**Returns** all of the information for the JID

```python
def get_event_iter_returns(jid, minions, timeout=None):
    """Gather the return data from the event system, break hard when timeout is reached."
    pass
```

```python
def run_job(tgt, fun, arg=(), expr_form='glob', ret='*', timeout=None, jid='*', kwarg=None, **kwargs):
    """Asynchronously send a command to connected minions"
    pass
```

```python
>>> local.run_job('x', 'test.sleep', [300])
{'jid': '20131219215650131543', 'minions': ['jerry']}
```

### Salt Caller

**class** `salt.client.Caller(c_path='/etc/salt/minion', mopts=None)`

**Caller** is the same interface used by the `salt-call` command-line tool on the Salt Minion.

Changed in version 2015.8.0: Added the `cmd` method for consistency with the other Salt clients. The existing `function` and `sminion.functions` interfaces still exist but have been removed from the docs.

Importing and using `Caller` must be done on the same machine as a Salt Minion and it must be done using the same user that the Salt Minion is running as.

**Usage:**

```python
import salt.client
caller = salt.client.Caller()
caller.cmd('test.ping')
```

Note, a running master or minion daemon is not required to use this class. Running `salt-call --local` simply sets `file_client` to `local`. The same can be achieved at the Python level by including that setting in a minion config file.

New in version 2014.7.0: Pass the minion config as the `mopts` dictionary.

```python
import salt.client
import salt.config
__opts__ = salt.config.minion_config('/etc/salt/minion')
__opts__['file_client'] = 'local'
caller = salt.client.Caller(mopts=__opts__)
```

```python
def cmd(fun, *args, **kwargs):
    """Call an execution module with the given arguments and keyword arguments"
    pass
```

Changed in version 2015.8.0: Added the `cmd` method for consistency with the other Salt clients. The existing `function` and `sminion.functions` interfaces still exist but have been removed from the docs.

```python
caller.cmd('test.arg', 'Foo', 'Bar', baz='Baz')

caller.cmd('event.send', 'myco/myevent/something',
           data={'foo': 'Foo'}, with_env=['GIT_COMMIT'], with_grains=True)
```
RunnerClient

class salt.runner.RunnerClient(opts)
    The interface used by the `salt-run` CLI tool on the Salt Master

    It executes runner modules which run on the Salt Master.

    Importing and using RunnerClient must be done on the same machine as the Salt Master and it must be
done using the same user that the Salt Master is running as.

    Salt's external_auth can be used to authenticate calls. The eauth user must be authorized to execute
runner modules: (@runner). Only the `master_call()` below supports eauth.

    async (fun, low, user='UNKNOWN')
        Execute the function in a multiprocess and return the event tag to use to watch for the return

    cmd (fun, arg=None, pub_data=None, kwarg=None)
        Execute a function

>>> opts = salt.config.master_config('/etc/salt/master')
>>> runner = salt.runner.RunnerClient(opts)
>>> runner.cmd('jobs.list_jobs', [])
{
    '20131219215650131543': {
        'Arguments': [300],
        'Function': 'test.sleep',
        'StartTime': '2013, Dec 19 21:56:50.131543',
        'Target': '*',
        'Target-type': 'glob',
        'User': 'saltdev'
    },
    '20131219215921857715': {
        'Arguments': [300],
        'Function': 'test.sleep',
        'Target': '*',
        'Target-type': 'glob',
        'User': 'saltdev'
    }
}

cmd_async (low)
    Execute a runner function asynchronously; eauth is respected

    This function requires that external_auth is configured and the user is authorized to execute runner
functions: (@runner).

    runner.eauth_async({
        'fun': 'jobs.list_jobs',
        'username': 'saltdev',
        'password': 'saltdev',
        'eauth': 'pam',
    })

cmd_sync (low, timeout=None)
    Execute a runner function synchronously; eauth is respected

    This function requires that external_auth is configured and the user is authorized to execute runner
functions: (@runner).
```python
def runner.eauth_sync(
    fun='jobs.list_jobs',
    username='saltdev',
    password='saltdev',
    eauth='pam',
)
```

**WheelClient**

class salt.wheel.WheelClient(\n    opts=None\n)

An interface to Salt's wheel modules

Wheel modules interact with various parts of the Salt Master.

Importing and using WheelClient must be done on the same machine as the Salt Master and it must be done using the same user that the Salt Master is running as. Unless external_auth is configured and the user is authorized to execute wheel functions: (@wheel).

Usage:

```python
import salt.config
import salt.wheel

def _client():
    return WheelClient(salt.config.master_config('/etc/salt/master'))

t = _client()
```

```python
def _execute(jid, fun, arg, pub_data, kwarg):
    # Execute the function and return the event tag to watch for the return
    return t.cmd(jid, fun, arg, pub_data, kwarg)
```

```python
def wheel.eauth_sync(
    fun='jobs.list_jobs',
    username='saltdev',
    password='saltdev',
    eauth='pam',
)
```
CloudClient

```python
class salt.cloud.CloudClient(path=None, opts=None, config_dir=None, pillars=None):
    The client class to wrap cloud interactions

    action(fun=None, cloudmap=None, names=None, provider=None, instance=None, kwargs=None)
    Execute a single action via the cloud plugin backend
    Examples:
    client.action(fun='show_instance', names=['myinstance'])
    client.action(fun='show_image', provider='my-ec2-config',
                  kwargs={'image': 'ami-10314d79'})

create(provider, names, **kwargs)
    Create the named VMs, without using a profile
    Example:
    client.create(names=['myinstance'], provider='my-ec2-config',
                  kwargs={'image': 'ami-1624987f', 'size': 't1.micro',
                          'ssh_username': 'ec2-user', 'securitygroup': 'default',
                          'delvol_on_destroy': True})

destroy(names)
    Destroy the named VMs

distinct(key, names, **kwargs)
    Distinct action
    Example:
    client.distinct(names=['myinstance'], key='size',
                     provider='my-ec2-config',
                     kwargs={'value': 't1.micro'})

extra_action(names, provider, action, **kwargs)
    Perform actions with block storage devices
    Example:
    client.extra_action(names=['myblock'], action='volume_create',
                         provider='my-nova',
                         kwargs={'voltype': 'SSD', 'size': 1000})
    client.extra_action(names=['salt-net'], action='network_create',
                         provider='my-nova',
                         kwargs={'cidr': '192.168.100.0/24'})

full_query(query_type='list_nodes_full')
    Query all instance information

list_images(provider=None)
    List all available images in configured cloud systems

list_locations(provider=None)
    List all available locations in configured cloud systems

list_sizes(provider=None)
    List all available sizes in configured cloud systems

low(fun, low)
    Pass the cloud function and low data structure to run
```

map_run(path, **kwargs)
    Pass in a location for a map to execute

min_query(query_type='list_nodes_min')
    Query select instance information

profile(profile, names, vm_overrides=None, **kwargs)
    Pass in a profile to create, names is a list of vm names to allocate
    vm_overrides is a special dict that will be per node options overrides

Example:

```python
>>> client = salt.cloud.CloudClient(path='/etc/salt/cloud')
>>> client.profile('do_512_git', names=['minion01',])
{'minion01': {u'backups_active': 'False',
            u'created_at': '2014-09-04T18:10:15Z',
            u'droplet': {u'event_id': 31000502,
                         u'id': 2530006,
                         u'image_id': 5140006,
                         u'name': 'minion01',
                         u'size_id': 66},
            u'id': '2530006',
            u'image_id': '5140006',
            u'ip_address': '107.XXX.XXX.XXX',
            u'locked': 'True',
            u'name': 'minion01',
            u'private_ip_address': None,
            u'region_id': '4',
            u'size_id': '66',
            u'status': 'new'}}
```

query(query_type='list_nodes')
    Query basic instance information

select_query(query_type='list_nodes_select')
    Query select instance information

SSHClient

class salt.client.ssh.client.SSHClient(c_path=’/etc/salt/master’, mopts=None)
    Create a client object for executing routines via the salt-ssh backend

    New in version 2015.5.0.

cmd(tgt, fun, arg=(), timeout=None, expr_form='glob', kwarg=None, **kwargs)
    Execute a single command via the salt-ssh subsystem and return all routines at once

    New in version 2015.5.0.

cmd_iter(tgt, fun, arg=(), timeout=None, expr_form='glob', ret='`, kwarg=None, **kwargs)
    Execute a single command via the salt-ssh subsystem and return a generator

    New in version 2015.5.0.

31.5 Full list of Salt Cloud modules
### 31.5.1 salt.cloud.clouds.aliyun

**AliYun ECS Cloud Module**

New in version 2014.7.0.

The Aliyun cloud module is used to control access to the aliyun ECS. [http://www.aliyun.com/](http://www.aliyun.com/)

Use of this module requires the `id` and `key` parameter to be set. Set up the cloud configuration at `/etc/salt/cloud.providers` or `/etc/salt/cloud.providers.d/aliyun.conf`:

```yaml
my-aliyun-config:
    # aliyun Access Key ID
    id: wFGEwgregeqw3435gDger
    # aliyun Access Key Secret
    key: GDE43t43REGTrkilg43934t34qT43t4dgegerGEgg
    location: cn-qingdao
    driver: aliyun
```

**depends** requests

salt.cloud.clouds.aliyun.available_images(**kwargs=None, call=None**)  
Return a list of the images that are on the provider

salt.cloud.clouds.aliyun.available_locations(**call=None**)  
Return a dict of all available VM locations on the cloud provider with relevant data

salt.cloud.clouds.aliyun.available_sizes(**call=None**)  
Return a list of the image sizes that are on the provider
salt.cloud.clouds.aliyun.create(vm_)
Create a single VM from a data dict

salt.cloud.clouds.aliyun.create_node(kwargs)
Convenience function to make the rest api call for node creation.

salt.cloud.clouds.aliyun.destroy(name, call=None)
Destroy a node.

CLI Example:

salt-cloud -a destroy myinstance
salt-cloud -d myinstance

salt.cloud.clouds.aliyun.get_configured_provider()
Return the first configured instance.

salt.cloud.clouds.aliyun.get_dependencies()
Warn if dependencies aren't met.

salt.cloud.clouds.aliyun.get_image(vm_)
Return the image object to use

salt.cloud.clouds.aliyun.get_location(vm_=None)
Return the aliyun region to use, in this order:
- CLI parameter
- VM parameter
- Cloud profile setting

salt.cloud.clouds.aliyun.get_securitygroup(vm_)
Return the security group

salt.cloud.clouds.aliyun.get_size(vm_)
Return the VM's size. Used by create_node().

salt.cloud.clouds.aliyun.list_availability_zones(call=None)
List all availability zones in the current region

salt.cloud.clouds.aliyun.list_monitor_data(kwargs=None, call=None)
Get monitor data of the instance. If instance name is missing, will show all the instance monitor data on the region.

CLI Examples:

salt-cloud -f list_monitor_data aliyun
salt-cloud -f list_monitor_data aliyun name=AY14051311071990225bd

salt.cloud.clouds.aliyun.list_nodes(call=None)
Return a list of the VMs that are on the provider

salt.cloud.clouds.aliyun.list_nodes_full(call=None)
Return a list of the VMs that are on the provider

salt.cloud.clouds.aliyun.list_nodes_min(call=None)
Return a list of the VMs that are on the provider. Only a list of VM names, and their state, is returned. This is the minimum amount of information needed to check for existing VMs.

salt.cloud.clouds.aliyun.list_nodes_select(call=None)
Return a list of the VMs that are on the provider, with select fields
salt.cloud.clouds.aliyun.list_securitygroup(call=None)
    Return a list of security group

salt.cloud.clouds.aliyun.query(params=None)
    Make a web call to aliyun ECS REST API

salt.cloud.clouds.aliyun.reboot(name, call=None)
    Reboot a node
    CLI Examples:
    salt-cloud -a reboot myinstance

salt.cloud.clouds.aliyun.script(vm_)
    Return the script deployment object

salt.cloud.clouds.aliyun.show_disk(name, call=None)
    Show the disk details of the instance
    CLI Examples:
    salt-cloud -a show_disk aliyun myinstance

salt.cloud.clouds.aliyun.show_image(kwargs, call=None)
    Show the details from aliyun image

salt.cloud.clouds.aliyun.show_instance(name, call=None)
    Show the details from aliyun instance

salt.cloud.clouds.aliyun.start(name, call=None)
    Start a node
    CLI Examples:
    salt-cloud -a start myinstance

salt.cloud.clouds.aliyun.stop(name, force=False, call=None)
    Stop a node
    CLI Examples:
    salt-cloud -a stop myinstance
    salt-cloud -a stop myinstance force=True

31.5.2 salt.cloud.clouds.botoCore_aws

The AWS Cloud Module

The AWS cloud module is used to interact with the Amazon Web Services system.

This module has been replaced by the EC2 cloud module, and is no longer supported. The documentation shown here is for reference only; it is highly recommended to change all usages of this driver over to the EC2 driver.

If this driver is still needed, set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/aws.conf:

```bash
my-aws-botoCore-config:
    # The AWS API authentication id
    id: GKTADJGHEIQSXMKKRBJ08H
    # The AWS API authentication key
```

31.5. Full list of Salt Cloud modules
### salt.cloud.clouds.botocore_aws.disable_term_protect

Disable termination protection on a node

**CLI Example:**
```
salt-cloud -a disable_term_protect mymachine
```

### salt.cloud.clouds.botocore_aws.enable_term_protect

Enable termination protection on a node

**CLI Example:**
```
salt-cloud -a enable_term_protect mymachine
```

### salt.cloud.clouds.botocore_aws.get_configured_provider

Return the first configured instance.

### salt.cloud.clouds.botocore_aws.get_dependencies

Warn if dependencies aren’t met.

## 31.5.3 salt.cloud.clouds.cloudstack

### CloudStack Cloud Module

The CloudStack cloud module is used to control access to a CloudStack based Public Cloud.

#### depends

**libcloud**

Use of this module requires the `apikey`, `secretkey`, `host` and `path` parameters.

**my-cloudstack-cloud-config:**
```
apikey: <your api key >
secretkey: <your secret key >
host: localhost
path: /client/api
driver: cloudstack
```

### salt.cloud.clouds.cloudstack.avail_images

Return a dict of all available VM images on the cloud provider with relevant data

### salt.cloud.clouds.cloudstack.avail_locations

Return a dict of all available VM locations on the cloud provider with relevant data

### salt.cloud.clouds.cloudstack.avail_sizes

Return a dict of all available VM images on the cloud provider with relevant data

### salt.cloud.clouds.cloudstack.block_device_mappings

Return the block device mapping:
```
[['DeviceName': '/dev/sdb', 'VirtualName': 'ephemeral0'],
 {'DeviceName': '/dev/sdc', 'VirtualName': 'ephemeral1']
```
salt.cloud.clouds.cloudstack.cloudstack_displayname(vm_)
    Return display name of VM:
    = \"minion1\"
salt.cloud.clouds.cloudstack.create(vm_)
    Create a single VM from a data dict
salt.cloud.clouds.cloudstack.destroy(name, conn=None, call=None)
    Delete a single VM, and all of its volumes
salt.cloud.clouds.cloudstack.get_configured_provider()
    Return the first configured instance.
salt.cloud.clouds.cloudstack.get_conn()
    Return a conn object for the passed VM data
salt.cloud.clouds.cloudstack.get_dependencies()
    Warn if dependencies aren't met.
salt.cloud.clouds.cloudstack.get_image(conn, vm_)
    Return the image object to use
salt.cloud.clouds.cloudstack.get_ip(data)
    Return the IP address of the VM. If the VM has public IP as defined by libcloud module then use it. Otherwise try to extract the private IP and use that one.
salt.cloud.clouds.cloudstack.get_key()
    Returns the ssh private key for VM access
salt.cloud.clouds.cloudstack.get_keypair(vm_)
    Return the keypair to use
salt.cloud.clouds.cloudstack.get_location(conn, vm_)
    Return the node location to use
salt.cloud.clouds.cloudstack.get_networkid(vm_)
    Return the networkid to use, only valid for Advanced Zone
salt.cloud.clouds.cloudstack.get_node(conn, name)
    Return a libcloud node for the named VM
salt.cloud.clouds.cloudstack.get_password(vm_)
    Return the password to use
salt.cloud.clouds.cloudstack.get_project(conn, vm_)
    Return the project to use.
salt.cloud.clouds.cloudstack.get_size(conn, vm_)
    Return the VM's size object
salt.cloud.clouds.cloudstack.list_nodes(conn=None, call=None)
    Return a list of the VMs that are on the provider
salt.cloud.clouds.cloudstack.list_nodes_full(conn=None, call=None)
    Return a list of the VMs that are on the provider, with all fields
salt.cloud.clouds.cloudstack.list_nodes_select(conn=None, call=None)
    Return a list of the VMs that are on the provider, with select fields
salt.cloud.clouds.cloudstack.script(vm_)
    Return the script deployment object
salt.cloud.clouds.cloudstack.show_instance(name, call=None)
    Show the details from the provider concerning an instance

31.5.4 salt.cloud.clouds.digital_ocean

DigitalOcean Cloud Module

The DigitalOcean cloud module is used to control access to the DigitalOcean VPS system.

Use of this module requires a personal_access_token, an ssh_key_file, and at least one SSH key name in ssh_key_names. More ssh_key_names can be added by separating each key with a comma. The personal_access_token can be found in the DigitalOcean web interface in the "Apps & API" section. The SSH key name can be found under the "SSH Keys" section.

```
# Note: This example is for /etc/salt/cloud.providers or any file in the
# /etc/salt/cloud.providers.d/ directory.

my-digital-ocean-config:
  personal_access_token: xxx
  ssh_key_file: /path/to/ssh/key/file
  ssh_key_names: my-key-name,my-key-name-2
  driver: digital_ocean

  depends requests

salt.cloud.clouds.digital_ocean.avail_images(call=None)
    Return a list of the images that are on the provider

salt.cloud.clouds.digital_ocean.avail_locations(call=None)
    Return a dict of all available VM locations on the cloud provider with relevant data

salt.cloud.clouds.digital_ocean.avail_sizes(call=None)
    Return a list of the image sizes that are on the provider

salt.cloud.clouds.digital_ocean.create(vm_)
    Create a single VM from a data dict

salt.cloud.clouds.digital_ocean.create_dns_record(hostname, ip_address)
    Creates a DNS record for the given hostname if the domain is managed with DO.

salt.cloud.clouds.digital_ocean.create_key(kwars=None, call=None)
    Upload a public key

salt.cloud.clouds.digital_ocean.create_node(args)
    Create a node

salt.cloud.clouds.digital_ocean.delete_dns_record(hostname)
    Deletes a DNS for the given hostname if the domain is managed with DO.

salt.cloud.clouds.digital_ocean.destroy(name, call=None)
    Destroy a node. Will check termination protection and warn if enabled.

    CLI Example:
    salt-cloud --destroy mymachine

salt.cloud.clouds.digital_ocean.get_configured_provider()
    Return the first configured instance.

salt.cloud.clouds.digital_ocean.get_dependencies()
    Warn if dependencies aren't met.
salt.cloud.clouds.digital_ocean.get_image(vm_)
    Return the image object to use
salt.cloud.clouds.digital_ocean.get_keyid(keyname)
    Return the ID of the keyname
salt.cloud.clouds.digital_ocean.get_location(vm_)
    Return the VM's location
salt.cloud.clouds.digital_ocean.get_size(vm_)
    Return the VM's size. Used by create_node().
salt.cloud.clouds.digital_ocean.list_keypairs(call=None)
    Return a dict of all available VM locations on the cloud provider with relevant data
salt.cloud.clouds.digital_ocean.list_nodes(call=None)
    Return a list of the VMs that are on the provider
salt.cloud.clouds.digital_ocean.list_nodes_full(call=None, forOutput=True)
    Return a list of the VMs that are on the provider
salt.cloud.clouds.digital_ocean.list_nodes_select(call=None)
    Return a list of the VMs that are on the provider, with select fields
salt.cloud.clouds.digital_ocean.query(method='droplets', droplet_id=None, command=None, args=None, http_method='get')
    Make a web call to DigitalOcean
salt.cloud.clouds.digital_ocean.remove_key(kwargs=None, call=None)
    Delete public key
salt.cloud.clouds.digital_ocean.script(vm_)
    Return the script deployment object
salt.cloud.clouds.digital_ocean.show_instance(name, call=None)
    Show the details from DigitalOcean concerning a droplet
salt.cloud.clouds.digital_ocean.show_keypair(kwargs=None, call=None)
    Show the details of an SSH keypair
salt.cloud.clouds.digital_ocean.show_pricing(kwargs=None, call=None)
    Show pricing for a particular profile. This is only an estimate, based on unofficial pricing sources.
    New in version 2015.8.0.
    CLI Examples:
    ```
    salt-cloud -f show_pricing my-digitalocean-config profile=my-profile
    ```

31.5.5 salt.cloud.clouds.ec2

The EC2 Cloud Module

The EC2 cloud module is used to interact with the Amazon Elastic Cloud Computing.

To use the EC2 cloud module, set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/ec2.conf:

```
my-ec2-config:
    # The EC2 API authentication id, set this and/or key to
    # 'use-instance-role-credentials' to use the instance role credentials
```

31.5. Full list of Salt Cloud modules
# from the meta-data if running on an AWS instance
id: GKTADJGHEIQSXMKKRBJ08H
# The EC2 API authentication key, set this and/or id to
# 'use-instance-role-credentials' to use the instance role credentials
# from the meta-data if running on an AWS instance
key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
# The ssh keyname to use
keyname: default
# The amazon security group
securitygroup: ssh_open
# The location of the private key which corresponds to the keyname
private_key: /root/default.pem

# Be default, service_url is set to amazonaws.com. If you are using this
# driver for something other than Amazon EC2, change it here:
service_url: amazonaws.com

# The endpoint that is ultimately used is usually formed using the region
# and the service_url. If you would like to override that entirely, you
# can explicitly define the endpoint:
endpoint: myendpoint.example.com:1138/services/Cloud

# SSH Gateways can be used with this provider. Gateways can be used
# when a salt-master is not on the same private network as the instance
# that is being deployed.

# Defaults to None
# Required
ssh_gateway: gateway.example.com

# Defaults to port 22
# Optional
ssh_gateway_port: 22

# Defaults to root
# Optional
ssh_gateway_username: root

# One authentication method is required. If both
# are specified, Private key wins.

# Private key defaults to None
ssh_gateway_private_key: /path/to/key.pem

# Password defaults to None
ssh_gateway_password: ExamplePasswordHere

driver: ec2

depends requests

salt.cloud.clouds.ec2.attach_volume(name=None, kwargs=None, instance_id=None, call=None)
Attach a volume to an instance

salt.cloud.clouds.ec2.avail_images(kwargs=None, call=None)
Return a dict of all available VM images on the cloud provider.

salt.cloud.clouds.ec2.avail_locations(call=None)
List all available locations

```python
salt.cloud.clouds.ec2.avail_sizes(call=None)
```

Return a dict of all available VM sizes on the cloud provider with relevant data. Latest version can be found at:


```python
salt.cloud.clouds.ec2.block_device_mappings(vm_)
```

Return the block device mapping:

```python
[]
```

```python
salt.cloud.clouds.ec2.copy_snapshot(kwargs=None, call=None)
```

Copy a snapshot

```python
salt.cloud.clouds.ec2.create(vm_=None, call=None)
```

Create a single VM from a data dict

```python
salt.cloud.clouds.ec2.create_attach_volumes(name, kwargs, call=None, wait_to_finish=True)
```

Create and attach volumes to created node

```python
salt.cloud.clouds.ec2.create_keypair(kwargs=None, call=None)
```

Create an SSH keypair

```python
salt.cloud.clouds.ec2.create_snapshot(kwargs=None, call=None, wait_to_finish=False)
```

Create a snapshot.

```python
volume_id The ID of the Volume from which to create a snapshot.
description The optional description of the snapshot.
```

CLI Exampes:

```bash
salt-cloud -f create_snapshot my-ec2-config volume_id=vol-351d8826
salt-cloud -f create_snapshot my-ec2-config volume_id=vol-351d8826 \
    description="My Snapshot Description"
```

```python
salt.cloud.clouds.ec2.create_volume(kwargs=None, call=None, wait_to_finish=False)
```

Create a volume

CLI Examples:

```bash
salt-cloud -f create_volume my-ec2-config zone=us-east-1b
salt-cloud -f create_volume my-ec2-config zone=us-east-1b tags='{"tag1": "val1", "tag2", "val2"}"
```

```python
salt.cloud.clouds.ec2.del_tags(name=None, kwargs=None, call=None, instance_id=None, resource_id=None)
```

Delete tags for a resource. Normally a VM name or instance_id is passed in, but a resource_id may be passed instead. If both are passed in, the instance_id will be used.

CLI Examples:

```bash
salt-cloud -a del_tags mymachine tags=mytag,
salt-cloud -a del_tags mymachine tags=tag1,tag2,tag3
salt-cloud -a del_tags resource_id=vol-3267ab32 tags=tag1,tag2,tag3
```

```python
salt.cloud.clouds.ec2.delete_keypair(kwargs=None, call=None)
```

Delete an SSH keypair
salt.cloud.clouds.ec2.delete_snapshot(**kwargs=None, call=None)**

Delete a snapshot

salt.cloud.clouds.ec2.delete_volume(name=None, **kwargs=None, instance_id=None, call=None)**

Delete a volume

salt.cloud.clouds.ec2.delvol_on_destroy(name, **kwargs=None, call=None)**

Delete all/specified EBS volumes upon instance termination

CLI Example:

```bash
salt-cloud -a delvol_on_destroy mymachine
```

salt.cloud.clouds.ec2.describe_snapshots(**kwargs=None, call=None)**

Describe a snapshot (or snapshots)

- snapshot_id: One or more snapshot IDs. Multiple IDs must be separated by ",".
- owner: Return the snapshots owned by the specified owner. Valid values include: self, amazon, <AWS Account ID>. Multiple values must be separated by ",".
- restorable_by: One or more AWS accounts IDs that can create volumes from the snapshot. Multiple aws account IDs must be separated by ",".

TODO: Add all of the filters.

salt.cloud.clouds.ec2.describe_volumes(**kwargs=None, call=None)**

Describe a volume (or volumes)

- volume_id: One or more volume IDs. Multiple IDs must be separated by ",".

TODO: Add all of the filters.

salt.cloud.clouds.ec2.destroy(name, call=None)**

Destroy a node. Will check termination protection and warn if enabled.

CLI Example:

```bash
salt-cloud --destroy mymachine
```

salt.cloud.clouds.ec2.detach_volume(name=None, **kwargs=None, instance_id=None, call=None)**

Detach a volume from an instance

salt.cloud.clouds.ec2.disable_term_protect(name, call=None)**

Disable termination protection on a node

CLI Example:

```bash
salt-cloud -a disable_term_protect mymachine
```

salt.cloud.clouds.ec2.enable_term_protect(name, call=None)**

Enable termination protection on a node

CLI Example:

```bash
salt-cloud -a enable_term_protect mymachine
```

salt.cloud.clouds.ec2.get_availability_zone(vm_)

Return the availability zone to use

salt.cloud.clouds.ec2.get_configured_provider()

Return the first configured instance.
salt.cloud.clouds.ec2.get_console_output(name=None, location=None, instance_id=None, call=None, kwargs=None)

    Show the console output from the instance.
    By default, returns decoded data, not the Base64-encoded data that is actually returned from the EC2 API.

salt.cloud.clouds.ec2.get_dependencies()

    Warn if dependencies aren't met.

salt.cloud.clouds.ec2.get_location(vm_=None)

    Return the EC2 region to use, in this order:
        • CLI parameter
        • VM parameter
        • Cloud profile setting

salt.cloud.clouds.ec2.get_password_data(name=None, kwargs=None, instance_id=None, call=None)

    Return password data for a Windows instance.
    By default only the encrypted password data will be returned. However, if a key_file is passed in, then a
decrypted password will also be returned.
    Note that the key_file references the private key that was used to generate the keypair associated with this
instance. This private key will _not_ be transmitted to Amazon; it is only used internally inside of Salt Cloud
to decrypt data _after_ it has been received from Amazon.

    CLI Examples:
    
    ```
    salt-cloud -a get_password_data mymachine
    salt-cloud -a get_password_data mymachine key_file=/root/ec2key.pem
    ```
    
    Note: PKCS1_v1_5 was added in PyCrypto 2.5

salt.cloud.clouds.ec2.get_placementgroup(vm_)

    Returns the PlacementGroup to use

salt.cloud.clouds.ec2.get_provider(vm_=None)

    Extract the provider name from vm

salt.cloud.clouds.ec2.get_spot_config(vm_)

    Returns the spot instance configuration for the provided vm

salt.cloud.clouds.ec2.get_ssh_gateway_config(vm_)

    Return the ssh_gateway configuration.

salt.cloud.clouds.ec2.get_subnetid(vm_)

    Returns the SubnetId to use

salt.cloud.clouds.ec2.get_tags(name=None, instance_id=None, call=None, location=None, kwargs=None, resource_id=None)

    Retrieve tags for a resource. Normally a VM name or instance_id is passed in, but a resource_id may be passed
instead. If both are passed in, the instance_id will be used.

    CLI Examples:
    
    ```
    salt-cloud -a get_tags mymachine
    salt-cloud -a get_tags resource_id=vol-3267ab32
    ```

salt.cloud.clouds.ec2.get_tenancy(vm_)

    Returns the Tenancy to use.

31.5. Full list of Salt Cloud modules 461
Can be ’dedicated’ or ’default’. Cannot be present for spot instances.

salt.cloud.clouds.ec2.iam_profile(vm_)

Return the IAM profile.

The IAM instance profile to associate with the instances. This is either the Amazon Resource Name (ARN) of the instance profile or the name of the role.

Type: String
Default: None
Required: No
Example: arn:aws:iam::111111111111:instance-profile/s3access
Example: s3access

salt.cloud.clouds.ec2.keepvol_on_destroy(name, kwargs=None, call=None)

Do not delete all/specified EBS volumes upon instance termination

CLI Example:

   salt-cloud -a keepvol_on_destroy mymachine

salt.cloud.clouds.ec2.keyname(vm_)

Return the keyname

salt.cloud.clouds.ec2.list_nodes(call=None)

Return a list of the VMs that are on the provider

salt.cloud.clouds.ec2.list_nodes_full(location=None, call=None)

Return a list of the VMs that are on the provider

salt.cloud.clouds.ec2.list_nodes_min(location=None, call=None)

Return a list of the VMs that are on the provider. Only a list of VM names, and their state, is returned. This is the minimum amount of information needed to check for existing VMs.

salt.cloud.clouds.ec2.list_nodes_select(call=None)

Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.ec2.optimize_providers(providers)

Return an optimized list of providers.

   We want to reduce the duplication of querying the same region.

   If a provider is using the same credentials for the same region the same data will be returned for each provider, thus causing un-wanted duplicate data and API calls to EC2.

salt.cloud.clouds.ec2.query(params=None, setname=None, requesturl=None, location=None, return_url=False, return_root=False)

salt.cloud.clouds.ec2.query_instance(vm_=None, call=None)

Query an instance upon creation from the EC2 API

salt.cloud.clouds.ec2.queue_instances(instances)

Queue a set of instances to be provisioned later. Expects a list.

Currently this only queries node data, and then places it in the cloud cache (if configured). If the salt-cloud-reactor is being used, these instances will be automatically provisioned using that.

For more information about the salt-cloud-reactor, see:

   https://github.com/saltstack-formulas/salt-cloud-reactor
salt.cloud.clouds.ec2.reboot(name, call=None)
    Reboot a node.
    CLI Example:
    >>> salt-cloud -a reboot mymachine

salt.cloud.clouds.ec2.rename(name, kwargs, call=None)
    Properly rename a node. Pass in the new name as `new name`.
    CLI Example:
    >>> salt-cloud -a rename mymachine newname=yourmachine

salt.cloud.clouds.ec2.request_instance(vm_=None, call=None)
    Put together all of the information necessary to request an instance on EC2, and then fire off the request the
    instance.
    Returns data about the instance

salt.cloud.clouds.ec2.script(vm_)
    Return the script deployment object

salt.cloud.clouds.ec2.securitygroup(vm_)
    Return the security group

salt.cloud.clouds.ec2.securitygroupid(vm_)
    Returns the SecurityGroupId

salt.cloud.clouds.ec2.set_tags(name=None, tags=None, call=None, location=None, instance_id=None, resource_id=None, kwargs=None)
    Set tags for a resource. Normally a VM name or instance_id is passed in, but a resource_id may be passed
    instead. If both are passed in, the instance_id will be used.
    CLI Examples:
    >>> salt-cloud -a set_tags mymachine tag1=somestuff tag2='Other stuff'
    >>> salt-cloud -a set_tags resource_id=vol-3267ab32 tag=somestuff

salt.cloud.clouds.ec2.show_delvol_on_destroy(name, kwargs=None, call=None)
    Do not delete all/specified EBS volumes upon instance termination
    CLI Example:
    >>> salt-cloud -a show_delvol_on_destroy mymachine

salt.cloud.clouds.ec2.show_image(kwargs, call=None)
    Show the details from EC2 concerning an AMI

salt.cloud.clouds.ec2.show_instance(name=None, instance_id=None, call=None, kwargs=None)
    Show the details from EC2 concerning an AMI.
    Can be called as an action (which requires a name):
    >>> salt-cloud -a show_instance myinstance
    ...or as a function (which requires either a name or instance_id):
    >>> salt-cloud -f show_instance my-ec2 name=myinstance
    >>> salt-cloud -f show_instance my-ec2 instance_id=i-d34db33f
salt.cloud.clouds.ec2.show_keypair(kwargs=None, call=None)
Show the details of an SSH keypair

salt.cloud.clouds.ec2.show_pricing(kwargs=None, call=None)
Show pricing for a particular profile. This is only an estimate, based on unofficial pricing sources.

CLI Examples:
```
salt-cloud -f show_pricing my-ec2-config profile=my-profile
```

If pricing sources have not been cached, they will be downloaded. Once they have been cached, they will not be updated automatically. To manually update all prices, use the following command:
```
salt-cloud -f update_pricing <provider>
```

New in version 2015.8.0.

salt.cloud.clouds.ec2.show_term_protect(name=None, instance_id=None, call=None, quiet=False)
Show the details from EC2 concerning an AMI

salt.cloud.clouds.ec2.show_volume(kwargs=None, call=None)
Wrapper around describe_volumes. Here just to keep functionality. Might be depreciated later.

salt.cloud.clouds.ec2.sign(key, msg)

salt.cloud.clouds.ec2.ssh_interface(vm_)
Return the ssh_interface type to connect to. Either 'public_ips' (default) or 'private_ips'.

salt.cloud.clouds.ec2.start(name, call=None)
Start a node

salt.cloud.clouds.ec2.stop(name, call=None)
Stop a node

salt.cloud.clouds.ec2.update_pricing(kwargs=None, call=None)
Download most recent pricing information from AWS and convert to a local JSON file.

CLI Examples:
```
salt-cloud -f update_pricing my-ec2-config
salt-cloud -f update_pricing my-ec2-config type=linux
```

New in version 2015.8.0.

salt.cloud.clouds.ec2.wait_for_instance(vm_=None, data=None, ip_address=None, display_ssh_output=True, call=None)
Wait for an instance upon creation from the EC2 API, to become available

31.5.6 salt.cloud.clouds.gce

Copyright 2013 Google Inc. All Rights Reserved.

Licensed under the Apache License, Version 2.0 (the `License`); you may not use this file except in compliance with the License. You may obtain a copy of the License at

http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.
Google Compute Engine Module

The Google Compute Engine module. This module interfaces with Google Compute Engine. To authenticate to GCE, you will need to create a Service Account.

Setting up Service Account Authentication:

- Go to the Cloud Console at: https://cloud.google.com/console.
- Create or navigate to your desired Project.
- Make sure Google Compute Engine service is enabled under the Services section.
- Go to "APIs and auth" section, and then the "Credentials" link.
- Click the "CREATE NEW CLIENT ID" button.
- Select "Service Account" and click "Create Client ID" button.
- This will automatically download a .json file; ignore it.
- Look for a new "Service Account" section in the page, click on the "Generate New P12 key" button.
- Copy the Email Address for inclusion in your /etc/salt/cloud file in the `service_account_email_address` setting.
- Download the Private Key
- The key that you download is a PKCS12 key. It needs to be converted to the PEM format.
- Convert the key using OpenSSL (the default password is `notasecret`): C{openssl pkcs12 -in PRIVKEY.p12 -passin pass:notasecret -nodes -nocerts | openssl rsa -out ~/PRIVKEY.pem}
- Add the full path name of the converted private key to your /etc/salt/cloud file as `service_account_private_key` setting.
- Consider using a more secure location for your private key.

my-gce-config:

```yaml
# The Google Cloud Platform Project ID
project: "my-project-id"
# The Service Account client ID
service_account_email_address: 1234567890@developer.gserviceaccount.com
# The location of the private key (PEM format)
service_account_private_key: /home/erjohnso/PRIVKEY.pem
driver: gce
# Specify whether to use public or private IP for deploy script.
# Valid options are:
#    private_ips - The salt-master is also hosted with GCE
#    public_ips - The salt-master is hosted outside of GCE
ssh_interface: public_ips
```

maintainer Eric Johnson <erjohnso@google.com>
depends libcloud >= 0.14.1

depends pycrypto >= 2.1

salt.cloud.clouds.gce.attach_disk(name=None, kwargs=None, call=None)

Attach an existing disk to an existing instance.

CLI Example:

```
salt-cloud -a attach_disk myinstance disk_name=mydisk mode=READ_WRITE
```
**salt.cloud.clouds.gce.attach_lb** *(kwargs=None, call=None)*

Add an existing node/member to an existing load-balancer configuration.

**CLI Example:**
```
salt-cloud -f attach_lb gce name=lb member=myinstance
```

**salt.cloud.clouds.gce.avail_images** *(conn=None)*

Return a dict of all available VM images on the cloud provider with relevant data

Note that for GCE, there are custom images within the project, but the generic images are in other projects. This returns a dict of images in the project plus images in `debian-cloud` and `centos-cloud` (if there is overlap in names, the one in the current project is used.)

**salt.cloud.clouds.gce.avail_locations** *(conn=None, call=None)*

Return a dict of all available VM locations on the cloud provider with relevant data

**salt.cloud.clouds.gce.avail_sizes** *(conn=None)*

Return a dict of available instances sizes (a.k.a machine types) and convert them to something more serializable.

**salt.cloud.clouds.gce.create** *(vm_=None, call=None)*

Create a single GCE instance from a data dict.

**salt.cloud.clouds.gce.create_address** *(kwargs=None, call=None)*

Create a static address in a region.

**CLI Example:**
```
salt-cloud -f create_address gce name=my-ip region=us-central1 address=IP
```

**salt.cloud.clouds.gce.create_disk** *(kwargs=None, call=None)*

Create a new persistent disk. Must specify `disk_name` and `location`. Can also specify an `image` or `snapshot` but if neither of those are specified, a `size` (in GB) is required.

**CLI Example:**
```
salt-cloud -f create_disk gce disk_name=pd size=300 location=us-central1-b
```

**salt.cloud.clouds.gce.create_fwrule** *(kwargs=None, call=None)*

Create a GCE firewall rule. The `default` network is used if not specified.

**CLI Example:**
```
salt-cloud -f create_fwrule gce name=allow-http allow=tcp:80
```

**salt.cloud.clouds.gce.create_hc** *(kwargs=None, call=None)*

Create an HTTP health check configuration.

**CLI Example:**
```
salt-cloud -f create_hc gce name=hc path=/healthy port=80
```

**salt.cloud.clouds.gce.create_lb** *(kwargs=None, call=None)*

Create a load-balancer configuration.

**CLI Example:**
```
salt-cloud -f create_lb gce name=lb region=us-central1 ports=80
```

**salt.cloud.clouds.gce.create_network** *(kwargs=None, call=None)*

Create a GCE network.

**CLI Example:**
salt.cloud.clouds.gce.create_network(name='mynet', cidr='10.10.10.0/24')

Create a new network. Must specify `name` and `cidr`.

CLI Example:

```
salt-cloud -f create_network gce name=mynet cidr=10.10.10.0/24
```

salt.cloud.clouds.gce.create_snapshot(**kwargs=None, call=None)**

Create a new disk snapshot. Must specify `name` and `disk_name`.

CLI Example:

```
salt-cloud -f create_snapshot gce name=snap1 disk_name=pd
```

salt.cloud.clouds.gce.delete_address(**kwargs=None, call=None)**

Permanently delete a static address.

CLI Example:

```
salt-cloud -f delete_address gce name=my-ip
```

salt.cloud.clouds.gce.delete_disk(**kwargs=None, call=None)**

Permanently delete a persistent disk.

CLI Example:

```
salt-cloud -f delete_disk gce disk_name=pd
```

salt.cloud.clouds.gce.delete_fwrule(**kwargs=None, call=None)**

Permanently delete a firewall rule.

CLI Example:

```
salt-cloud -f delete_fwrule gce name=allow-http
```

salt.cloud.clouds.gce.delete_HC(**kwargs=None, call=None)**

Permanently delete a health check.

CLI Example:

```
salt-cloud -f delete_HC gce name=hc
```

salt.cloud.clouds.gce.delete_lb(**kwargs=None, call=None)**

Permanently delete a load-balancer.

CLI Example:

```
salt-cloud -f delete_lb gce name=lb
```

salt.cloud.clouds.gce.delete_network(**kwargs=None, call=None)**

Permanently delete a network.

CLI Example:

```
salt-cloud -f delete_network gce name=mynet
```

salt.cloud.clouds.gce.delete_snapshot(**kwargs=None, call=None)**

Permanently delete a disk snapshot.

CLI Example:

```
salt-cloud -f delete_snapshot gce name=disk-snap-1
```

salt.cloud.clouds.gce.destroy(*vm_name, call=None)**

Call `destroy` on the instance. Can be called with `-a destroy` or -d

CLI Example:

```
salt-cloud -f destroy gce
```
salt-cloud -a destroy myinstance1 myinstance2 ...
salt-cloud -d myinstance1 myinstance2 ...

```
salt.cloud.clouds.gce.detach_disk(name=None, kwargs=None, call=None)
```

Detach a disk from an instance.

CLI Example:
```
salt-cloud -a detach_disk myinstance disk_name=mydisk
```

```
salt.cloud.clouds.gce.detach_lb(kwargs=None, call=None)
```

Remove an existing node/member from an existing load-balancer configuration.

CLI Example:
```
salt-cloud -f detach_lb gce name=lb member=myinstance
```

```
salt.cloud.clouds.gce.get_configured_provider()
```

Return the first configured instance.

```
salt.cloud.clouds.gce.get_conn()
```

Return a conn object for the passed VM data

```
salt.cloud.clouds.gce.get_dependencies()
```

Warn if dependencies aren't met.

```
salt.cloud.clouds.gce.get_lb_conn(gce_driver=None)
```

Return a load-balancer conn object

```
salt.cloud.clouds.gce.list_nodes(conn=None, call=None)
```

Return a list of the VMs that are on the provider

```
salt.cloud.clouds.gce.list_nodes_full(conn=None, call=None)
```

Return a list of the VMs that are on the provider, with all fields

```
salt.cloud.clouds.gce.list_nodes_select(conn=None, call=None)
```

Return a list of the VMs that are on the provider, with select fields

```
salt.cloud.clouds.gce.reboot(vm_name, call=None)
```

Call GCE 'reset' on the instance.

CLI Example:
```
salt-cloud -a reboot myinstance
```

```
salt.cloud.clouds.gce.script(vm_)
```

Return the script deployment object

```
salt.cloud.clouds.gce.show_address(kwargs=None, call=None)
```

Show the details of an existing static address.

CLI Example:
```
salt-cloud -f show_address gce name=mysnapshot region=us-central1
```

```
salt.cloud.clouds.gce.show_disk(name=None, kwargs=None, call=None)
```

Show the details of an existing disk.

CLI Example:
```
salt-cloud -a show_disk myinstance disk_name=mydisk
salt-cloud -f show_disk gce disk_name=mydisk
```
salt.cloud.clouds.gce.show_fwrule(**kwargs=None, call=None)**
Show the details of an existing firewall rule.

CLI Example:

```
salt-cloud -f show_fwrule gce name=allow-http
```

salt.cloud.clouds.gce.show_hc(**kwargs=None, call=None)**
Show the details of an existing health check.

CLI Example:

```
salt-cloud -f show_hc gce name=hc
```

salt.cloud.clouds.gce.show_instance(**vm_name, call=None)**
Show the details of the existing instance.

salt.cloud.clouds.gce.show_lb(**kwargs=None, call=None)**
Show the details of an existing load-balancer.

CLI Example:

```
salt-cloud -f show_lb gce name=lb
```

salt.cloud.clouds.gce.show_network(**kwargs=None, call=None)**
Show the details of an existing network.

CLI Example:

```
salt-cloud -f show_network gce name=mynet
```

salt.cloud.clouds.gce.show_pricing(**kwargs=None, call=None)**
Show pricing for a particular profile. This is only an estimate, based on unofficial pricing sources.

New in version 2015.8.0.

CLI Examples:

```
salt-cloud -f show_pricing my-gce-config profile=my-profile
```

salt.cloud.clouds.gce.show_snapshot(**kwargs=None, call=None)**
Show the details of an existing snapshot.

CLI Example:

```
salt-cloud -f show_snapshot gce name=mysnapshot
```

salt.cloud.clouds.gce.update_pricing(**kwargs=None, call=None)**
Download most recent pricing information from GCE and save locally

CLI Examples:

```
salt-cloud -f update_pricing my-gce-config
```

New in version 2015.8.0.
31.5.7 salt.cloud.clouds.gogrid

GoGrid Cloud Module

The GoGrid cloud module. This module interfaces with the gogrid public cloud service. To use Salt Cloud with GoGrid log into the GoGrid web interface and create an api key. Do this by clicking on `My Account` and then going to the API Keys tab.

Set up the cloud configuration at `/etc/salt/cloud.providers` or `/etc/salt/cloud.providers.d/gogrid.conf`:

```yaml
my-gogrid-config:
  # The generated api key to use
  apikey: asdff7896asdh789
  # The apikey's shared secret
  sharedsecret: saltybacon
  driver: gogrid
```

**Note:** A Note about using Map files with GoGrid:

Due to limitations in the GoGrid API, instances cannot be provisioned in parallel with the GoGrid driver. Map files will work with GoGrid, but the `-P` argument should not be used on maps referencing GoGrid instances.

**Note:** A Note about using Map files with GoGrid:

Due to limitations in the GoGrid API, instances cannot be provisioned in parallel with the GoGrid driver. Map files will work with GoGrid, but the `-P` argument should not be used on maps referencing GoGrid instances.

### Methods

- `salt.cloud.clouds.gogrid.avail_images()`: Available images
- `salt.cloud.clouds.gogrid.avail_locations()`: Available locations
- `salt.cloud.clouds.gogrid.avail_sizes()`: Available sizes
- `salt.cloud.clouds.gogrid.create(vm_)`: Create a single VM from a data dict
- `salt.cloud.clouds.gogrid.destroy(name, call=None)`: Destroy a machine by name
  
  CLI Example:
  ```
  salt-cloud -d vm_name
  ```
- `salt.cloud.clouds.gogrid.get_configured_provider()`: Return the first configured instance.
- `salt.cloud.clouds.gogrid.list_common_lookups(kwargs=None, call=None)`: List common lookups for a particular type of item
  
  New in version 2015.8.0.
- `salt.cloud.clouds.gogrid.list_nodes(full=False, call=None)`: List of nodes, keeping only a brief listing
  
  CLI Example:
salt-cloud -Q

salt.cloud.clouds.gogrid.list_nodes_full(call=None)
    List nodes, with all available information
    CLI Example:
    
    salt-cloud -F

salt.cloud.clouds.gogrid.list_nodes_select(call=None)
    Return a list of the VMs that are on the provider, with select fields
    CLI Example:

    salt-cloud -S

salt.cloud.clouds.gogrid.list_passwords(kwargs=None, call=None)
    List all password on the account
    New in version 2015.8.0.

salt.cloud.clouds.gogrid.list_public_ips(kwargs=None, call=None)
    List all available public IPs.
    CLI Example: .. code-block:: bash
                  
                  salt-cloud -f list_public_ips <provider>
                  To list unavailable (assigned) IPs, use:
                  CLI Example: .. code-block:: bash
                  
                  salt-cloud -f list_public_ips <provider> state=assigned
    New in version 2015.8.0.

salt.cloud.clouds.gogrid.reboot(name, call=None)
    Reboot a machine by name
    CLI Example:

    salt-cloud -a reboot vm_name
    New in version 2015.8.0.

salt.cloud.clouds.gogrid.show_instance(name, call=None)
    Start a machine by name
    CLI Example:

    salt-cloud -a show_instance vm_name
    New in version 2015.8.0.

salt.cloud.clouds.gogrid.start(name, call=None)
    Start a machine by name
    CLI Example:

    salt-cloud -a start vm_name
    New in version 2015.8.0.

31.5. Full list of Salt Cloud modules
salt.cloud.clouds.gogrid.stop(name, call=\None)
Stop a machine by name

CLI Example:
```
salt-cloud -a stop vm_name
```

New in version 2015.8.0.

31.5.8  salt.cloud.clouds.joyent

Joyent Cloud Module

The Joyent Cloud module is used to interact with the Joyent cloud system.

Set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/joyent.conf:

```
my-joyent-config:
  driver: joyent
  # The Joyent login user
  user: fred
  # The Joyent user's password
  password: saltybacon
  # The location of the ssh private key that can log into the new VM
  private_key: /root/mykey.pem
  # The name of the private key
  private_key: mykey
```

When creating your profiles for the joyent cloud, add the location attribute to the profile, this will automatically get picked up when performing tasks associated with that vm. An example profile might look like:

```
joyent_512:
  provider: my-joyent-config
  size: Extra Small 512 MB
  image: centos-6
  location: us-east-1
```

This driver can also be used with the Joyent SmartDataCenter project. More details can be found at:

Using SDC requires that an api_host_suffix is set. The default value for this is .api.joyentcloud.com. All characters, including the leading ., should be included:

```
api_host_suffix: .api.myhostname.com
```

**depends**  PyCrypto

salt.cloud.clouds.joyent.avail_images(call=\None)
Get list of available images

CLI Example:
```
salt-cloud --list-images
```

Can use a custom URL for images. Default is:
```
image_url: images.joyent.com/image
```

salt.cloud.clouds.joyent.avail_locations(call=\None)
List all available locations
salt.cloud.clouds.joyent.avail_sizes(call=None)
   get list of available packages
   CLI Example:
      salt-cloud --list-sizes

salt.cloud.clouds.joyent.create(vm_)
   Create a single VM from a data dict
   CLI Example:
      salt-cloud -p profile_name vm_name

salt.cloud.clouds.joyent.create_node(**kwargs)
   convenience function to make the rest api call for node creation.

salt.cloud.clouds.joyent.delete_key(kwargs=None, call=None)
   List the keys available
   CLI Example:
      salt-cloud -f delete_key joyent keyname=mykey

salt.cloud.clouds.joyent.destroy(name, call=None)
   destroy a machine by name
   Parameters
   - name -- name given to the machine
   - call -- call value in this case is 'action'
   Returns array of booleans, true if successfully stopped and true if successfully removed
   CLI Example:
      salt-cloud -d vm_name

salt.cloud.clouds.joyent.get_configured_provider()
   Return the first configured instance.

salt.cloud.clouds.joyent.get_image(vm_)
   Return the image object to use

salt.cloud.clouds.joyent.get_location(vm_=None)
   Return the joyent data center to use, in this order:
   - CLI parameter
   - VM parameter
   - Cloud profile setting

salt.cloud.clouds.joyent.get_location_path(location='us-east-1',
   api_host_suffix='api.joyentcloud.com')
   create url from location variable :param location: joyent data center location :return: url

salt.cloud.clouds.joyent.get_node(name)
   gets the node from the full node list by name :param name: name of the vm :return: node object

salt.cloud.clouds.joyent.get_size(vm_)
   Return the VM's size object
salt.cloud.clouds.joyent.has_method(obj, method_name)
    Find if the provided object has a specific method

salt.cloud.clouds.joyent.import_key(kwargs=None, call=None)
    List the keys available
    CLI Example:
    salt-cloud -f import_key joyent keyname=mykey keyfile=/tmp/mykey.pub

salt.cloud.clouds.joyent.joyent_node_state(id_)
    Convert joyent returned state to state common to other data center return values for consistency
    Parameters id -- joyent state value
    Returns state value

salt.cloud.clouds.joyent.key_list(items=None)
    convert list to dictionary using the key as the identifier :param items: array to iterate over :return: dictionary

salt.cloud.clouds.joyent.list_keys(kwargs=None, call=None)
    List the keys available

salt.cloud.clouds.joyent.list_nodes(full=False, call=None)
    list of nodes, keeping only a brief listing
    CLI Example:
    salt-cloud -Q

salt.cloud.clouds.joyent.list_nodes_full(call=None)
    list of nodes, maintaining all content provided from joyent listings
    CLI Example:
    salt-cloud -F

salt.cloud.clouds.joyent.list_nodes_select(call=None)
    Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.joyent.query(action=None, command=None, args=None, method='GET', location=None, data=None)
    Make a web call to Joyent

salt.cloud.clouds.joyent.query_instance(vm_=None, call=None)
    Query an instance upon creation from the Joyent API

salt.cloud.clouds.joyent.reboot(name, call=None)
    reboot a machine by name :param name: name given to the machine :param call: call value in this case is 'action':return: true if successful
    CLI Example:
    salt-cloud -a reboot vm_name

salt.cloud.clouds.joyent.reformat_node(item=None, full=False)
    Reformat the returned data from joyent, determine public/private IPs and strip out fields if necessary to provide either full or brief content.
    Parameters
    • item -- node dictionary
    • full -- full or brief output
Returns  dict

```
salt.cloud.clouds.joyent.show_instance(name, call=None)
    get details about a machine
    :param name: name given to the machine
    :param call: call value in this case is `action`
    :return: machine information

    CLI Example:
    
    salt-cloud -a show_instance vm_name
```

```
salt.cloud.clouds.joyent.show_key(**kwargs, call=None)
    List the keys available
```

```
salt.cloud.clouds.joyent.ssh_interface(vm_)
    Return the ssh_interface type to connect to. Either `public_ips` (default) or `private_ips`.
```

```
salt.cloud.clouds.joyent.start(name, call=None)
    start a machine by name
    :param name: name given to the machine
    :param call: call value in this case is `action`
    :return: true if successful

    CLI Example:
    
    salt-cloud -a start vm_name
```

```
salt.cloud.clouds.joyent.stop(name, call=None)
    stop a machine by name
    :param name: name given to the machine
    :param call: call value in this case is `action`
    :return: true if successful

    CLI Example:
    
    salt-cloud -a stop vm_name
```

```
salt.cloud.clouds.joyent.take_action(name=None, call=None, command=None, data=None, method='GET', location='us-east-1')
    take action call used by start, stop, reboot
    :param name: name given to the machine
    :param call: call value in this case is `action`
    :param command: api path
    :param data: any data to be passed to the api, must be in json format
    :param method: GET, POST, or DELETE
    :param location: data center to execute the command on
    :return: true if successful
```

### 31.5.9 salt.cloud.clouds.libcloud_aws

The AWS Cloud Module

The AWS cloud module is used to interact with the Amazon Web Services system.

This module has been replaced by the EC2 cloud module, and is no longer supported. The documentation shown here is for reference only; it is highly recommended to change all usages of this driver over to the EC2 driver.

If this driver is still needed, set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/aws.conf:

```
my-aws-config:
    # The AWS API authentication id
    id: GKTADJGHEIQSXMKKRBJ08H
    # The AWS API authentication key
    key: askdjghsdfjkghWuwUjasdflkdfklgjhsdjfajkghs
    # The ssh keyname to use
    keyname: default
    # The amazon security group
    securitygroup: ssh_open
    # The location of the private key which corresponds to the keyname
```

31.5. Full list of Salt Cloud modules 475
private_key: /root/default.pem

driver: aws

salt.cloud.clouds.libcloud_aws.block_device_mappings(vm_)
Return the block device mapping:

```
[{
'DeviceName': '/dev/sdb', 'VirtualName': 'ephemeral0'},
{'DeviceName': '/dev/sdc', 'VirtualName': 'ephemeral1'}]
```

salt.cloud.clouds.libcloud_aws.create(vm_)
Create a single VM from a data dict

salt.cloud.clouds.libcloud_aws.create_attach_volumes(volumes, location, data)
Create and attach volumes to created node

salt.cloud.clouds.libcloud_aws.del_tags(name, kwargs, call=None)
Delete tags for a node

CLI Example:

```
salt-cloud -a del_tags mymachine tag1,tag2,tag3
```

salt.cloud.clouds.libcloud_aws.destroy(name)
Wrap core libcloud funs destroy method, adding check for termination protection

salt.cloud.clouds.libcloud_aws.get_availability_zone(conn, vm_)
Return the availability zone to use

salt.cloud.clouds.libcloud_aws.get_configured_provider()
Return the first configured instance.

salt.cloud.clouds.libcloud_aws.get_conn(**kwargs)
Return a conn object for the passed VM data

salt.cloud.clouds.libcloud_aws.get_dependencies()
Warn if dependencies aren’t met.

salt.cloud.clouds.libcloud_aws.get_location(vm_=None)
Return the AWS region to use, in this order:
- CLI parameter
- Cloud profile setting
- Global salt-cloud config

salt.cloud.clouds.libcloud_aws.get_tags(name, call=None)
Retrieve tags for a node

salt.cloud.clouds.libcloud_aws.iam_profile(vm_)
Return the IAM role

salt.cloud.clouds.libcloud_aws.keyname(vm_)
Return the keyname

salt.cloud.clouds.libcloud_aws.rename(name, kwargs, call=None)
Properly rename a node. Pass in the new name as ”new name”.

CLI Example:

```
salt-cloud -a rename mymachine newname=yourmachine
```
salt.cloud.clouds.libcloud_aws.securitygroup(vm_)
    Return the security group

salt.cloud.clouds.libcloud_aws.set_tags(name, tags, call=None)
    Set tags for a node

    CLI Example:
    salt-cloud -a set_tags mymachine tag1=somestuff tag2='Other stuff'

salt.cloud.clouds.libcloud_aws.ssh_interface(vm_)
    Return the ssh_interface type to connect to. Either 'public_ips' (default) or 'private_ips'.

salt.cloud.clouds.libcloud_aws.ssh_username(vm_)
    Return the ssh_username. Defaults to 'ec2-user'.

salt.cloud.clouds.libcloud_aws.start(name, call=None)
    Start a node

salt.cloud.clouds.libcloud_aws.stop(name, call=None)
    Stop a node

31.5.10 salt.cloud.clouds.linode

Linode Cloud Module using Linode’s REST API

The Linode cloud module is used to control access to the Linode VPS system.

Use of this module only requires the apikey parameter. However, the default root password for new instances also needs to be set. The password needs to be 8 characters and contain lowercase, uppercase, and numbers.

Set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/linode.conf:

```yaml
my-linode-provider:
    apikey: f4ZsmwtB1c7f8S5Jodu43RgXVDFlNjuJaeIYV8QMftTqKScEB2vSosFSr...
    password: F00barbaz
    driver: linode
    ssh_key_file: /tmp/salt-cloud_pubkey
    ssh_pubkey: ssh-rsa AAAAB3NzaC1yc2EA...

linode-profile:
    provider: my-linode-provider
    size: Linode 1024
    image: CentOS 7
    location: London, England, UK
    private_ip: true
```

To clone, add a profile with a clonefrom key, and a script_args: -C. clonefrom should be the name of the VM (linode) that is the source for the clone. script_args: -C passes a -C to the bootstrap script, which only configures the minion and doesn’t try to install a new copy of salt-minion. This way the minion gets new keys and the keys get pre-seeded on the master, and the /etc/salt/minion file has the right ‘id:’ declaration.

Cloning requires a post 2015-02-01 salt-bootstrap.

salt.cloud.clouds.linode.avail_images(call=None)
    Return available Linode images.

    CLI Example:
salt-cloud --list-images my-linode-config
salt-cloud -f avail_images my-linode-config

salt.cloud.clouds.linode.avail_locations(call=None)

Return available Linode datacenter locations.

CLI Example:
salt-cloud --list-locations my-linode-config
salt-cloud -f avail_locations my-linode-config

salt.cloud.clouds.linode.avail_sizes(call=None)

Return available Linode sizes.

CLI Example:
salt-cloud --list-sizes my-linode-config
salt-cloud -f avail_sizes my-linode-config

salt.cloud.clouds.linode.boot(name=None, kwargs=None, call=None)

Boots a Linode.

- **name** The name of the Linode to boot. Can be used instead of linode_id.
- **linode_id** The ID of the Linode to boot. If provided, will be used as an alternative to name and reduces the number of API calls to Linode by one. Will be preferred over name.
- **config_id** The ID of the Config to boot. Required.
- **check_running** Defaults to True. If set to False, overrides the call to check if the VM is running before calling the linode.boot API call. Change check_running to True is useful during the boot call in the create function, since the new VM will not be running yet.

Can be called as an action (which requires a name):
salt-cloud -a boot my-instance config_id=10

...or as a function (which requires either a name or linode_id):
salt-cloud -f boot my-linode-config name=my-instance config_id=10
salt-cloud -f boot my-linode-config linode_id=1225876 config_id=10

salt.cloud.clouds.linode.clone(kwargs=None, call=None)

Clone a Linode.

- **linode_id** The ID of the Linode to clone. Required.
- **datacenter_id** The ID of the Datacenter where the Linode will be placed. Required.
- **plan_id** The ID of the plan (size) of the Linode. Required.

CLI Example:
salt-cloud -f clone my-linode-config linode_id=1234567 datacenter_id=2 plan_id=5

salt.cloud.clouds.linode.create(vm_)

Create a single Linode VM.

salt.cloud.clouds.linode.create_config(kwargs=None, call=None)

Creates a Linode Configuration Profile.

- **name** The name of the VM to create the config for.
linode_id  The ID of the Linode to create the configuration for.

root_disk_id  The Root Disk ID to be used for this config.

swap_disk_id  The Swap Disk ID to be used for this config.

kernel_id  The ID of the kernel to use for this configuration profile.

\[
\text{salt.cloud.clouds.linode.create_disk_from_distro}(\text{vm}, \text{linode_id}, \text{swap_size=\text{None}})
\]
Creates the disk for the Linode from the distribution.

\[
\text{vm} \quad \text{The VM profile to create the disk for.}
\]

\[
\text{linode_id} \quad \text{The ID of the Linode to create the distribution disk for. Required.}
\]

\[
\text{swap_size} \quad \text{The size of the disk, in MB.}
\]

\[
\text{salt.cloud.clouds.linode.create_private_ip}(\text{vm}, \text{linode_id})
\]
Creates a private IP for the specified Linode.

\[
\text{vm} \quad \text{The VM profile to create the swap disk for.}
\]

\[
\text{linode_id} \quad \text{The ID of the Linode to create the IP address for.}
\]

\[
\text{salt.cloud.clouds.linode.create_swap_disk}(\text{vm}, \text{linode_id}, \text{swap_size=\text{None}})
\]
Creates the disk for the specified Linode.

\[
\text{vm} \quad \text{The VM profile to create the swap disk for.}
\]

\[
\text{linode_id} \quad \text{The ID of the Linode to create the swap disk for.}
\]

\[
\text{swap_size} \quad \text{The size of the disk, in MB.}
\]

\[
\text{salt.cloud.clouds.linode.destroy}(\text{name}, \text{call=\text{None}})
\]
Destroys a Linode by name.

\[
\text{name} \quad \text{The name of VM to be destroyed.}
\]

CLI Example:

```
salt-cloud -d vm_name
```

\[
\text{salt.cloud.clouds.linode.get_config_id}(\text{kwargs=\text{None}}, \text{call=\text{None}})
\]
Returns a config_id for a given linode.

New in version 2015.8.0.

\[
\text{name} \quad \text{The name of the Linode for which to get the config_id. Can be used instead of linode_id.}
\]

\[
\text{linode_id} \quad \text{The ID of the Linode for which to get the config_id. Can be used instead of name.}
\]

CLI Example:

```
salt-cloud -f get_config_id my-linode-config name=my-linode
salt-cloud -f get_config_id my-linode-config linode_id=1234567
```

\[
\text{salt.cloud.clouds.linode.get_configured_provider}()
\]
Return the first configured instance.

\[
\text{salt.cloud.clouds.linode.get_datacenter_id}(\text{location})
\]
Returns the Linode Datacenter ID.

\[
\text{location} \quad \text{The location, or name, of the datacenter to get the ID from.}
\]

\[
\text{salt.cloud.clouds.linode.get_disk_size}(\text{vm}, \text{swap})
\]
Returns the size of of the root disk in MB.

\[
\text{vm} \quad \text{The VM to get the disk size for.}
\]

31.5. Full list of Salt Cloud modules
salt.cloud.clouds.linode.get_distribution_id(vm_)
    Returns the distribution ID for a VM
    vm_  The VM to get the distribution ID for

salt.cloud.clouds.linode.get_ips(linode_id=None)
    Returns public and private IP addresses.
    linode_id  Limits the IP addresses returned to the specified Linode ID.

salt.cloud.clouds.linode.get_linode(kwargs=None, call=None)
    Returns data for a single named Linode.
    name  The name of the Linode for which to get data. Can be used instead
          of linode_id. Note this will induce
          an additional API call compared to using linode_id.
    linode_id  The ID of the Linode for which to get data. Can be used instead of name.

    CLI Example:
    salt-cloud -f get_linode my-linode-config
    name=my-instance
    salt-cloud -f get_linode my-linode-config linode_id=1234567

salt.cloud.clouds.linode.get_linode_id_from_name(name)
    Returns the Linode ID for a VM from the provided name.
    name  The name of the Linode from which to get the Linode ID. Required.

salt.cloud.clouds.linode.get_password(vm_)
    Return the password to use for a VM.
    vm_  The configuration to obtain the password from.

salt.cloud.clouds.linode.get_plan_id(kwargs=None, call=None)
    Returns the Linode Plan ID.
    label  The label, or name, of the plan to get the ID from.

    CLI Example:
    salt-cloud -f get_plan_id linode label="Linode 1024"

salt.cloud.clouds.linode.get_private_ip(vm_)
    Return True if a private ip address is requested

salt.cloud.clouds.linode.get_pub_key(vm_)
    Return the SSH pub key.
    vm_  The configuration to obtain the public key from.

salt.cloud.clouds.linode.get_swap_size(vm_)
    Returns the amount of swap space to be used in MB.
    vm_  The VM profile to obtain the swap size from.

salt.cloud.clouds.linode.get_vm_size(vm_)
    Returns the VM's size.
    vm_  The VM to get the size for.

salt.cloud.clouds.linode.list_nodes(call=None)
    Returns a list of linodes, keeping only a brief listing.

    CLI Example:
salt-cloud -Q
salt-cloud --query
salt-cloud -f list_nodes my-linode-config

**Note:** The image label only displays information about the VM’s distribution vendor, such as `Debian` or `RHEL` and does not display the actual image name. This is due to a limitation of the Linode API.

### salt.cloud.clouds.linode.list_nodes_full(call=None)

List linodes, with all available information.

**CLI Example:**
salt-cloud -F
salt-cloud --full-query
salt-cloud -f list_nodes_full my-linode-config

**Note:** The image label only displays information about the VM’s distribution vendor, such as `Debian` or `RHEL` and does not display the actual image name. This is due to a limitation of the Linode API.

### salt.cloud.clouds.linode.list_nodes_min(call=None)

Return a list of the VMs that are on the provider. Only a list of VM names and their state is returned. This is the minimum amount of information needed to check for existing VMs.

New in version 2015.8.0.

**CLI Example:**
salt-cloud -f list_nodes_min my-linode-config
salt-cloud --function list_nodes_min my-linode-config

### salt.cloud.clouds.linode.reboot(name, call=None)

Reboot a linode.

New in version 2015.8.0.

**name** The name of the VM to reboot.

**CLI Example:**
salt-cloud -a reboot vm_name

### salt.cloud.clouds.linode.show_instance(name, call=None)

Displays details about a particular Linode VM. Either a name or a linode_id must be provided.

New in version 2015.8.0.

**name** The name of the VM for which to display details.

**CLI Example:**
salt-cloud -a show_instance vm_name

**Note:** The image label only displays information about the VM’s distribution vendor, such as `Debian` or `RHEL` and does not display the actual image name. This is due to a limitation of the Linode API.

### salt.cloud.clouds.linode.show_pricing(kwargs=None, call=None)

Show pricing for a particular profile. This is only an estimate, based on unofficial pricing sources.

New in version 2015.8.0.
CLI Example:
```
salt-cloud -f show_pricing my-linode-config profile=my-linode-profile
```

```
salt.cloud.clouds.linode.start(name, call=None)
```
Start a VM in Linode.

- **name** The name of the VM to start.

CLI Example:
```
salt-cloud -a stop vm_name
```

```
salt.cloud.clouds.linode.stop(name, call=None)
```
Stop a VM in Linode.

- **name** The name of the VM to stop.

CLI Example:
```
salt-cloud -a stop vm_name
```

```
salt.cloud.clouds.linode.update_linode(linode_id, update_args=None)
```
Updates a Linode's properties.

- **linode_id** The ID of the Linode to shutdown. Required.
- **update_args** The args to update the Linode with. Must be in dictionary form.

### 31.5.11 salt.cloud.clouds.lxc

**Install Salt on an LXC Container**

New in version 2014.7.0.

Please read [core config documentation](#).

```
salt.cloud.clouds.lxc.avail_images()
```

```
salt.cloud.clouds.lxc.create(vm_, call=None)
```
Create an lxc Container. This function is idempotent and will try to either provision or finish the provision of an lxc container.

NOTE: Most of the initialization code has been moved and merged with the lxc runner and lxc.init functions

```
salt.cloud.clouds.lxc.destroy(vm_, call=None)
```
Destroy a lxc container

```
salt.cloud.clouds.lxc.get_configured_provider(vm_=None)
```
Return the contextual provider of None if no configured one can be found.

```
salt.cloud.clouds.lxc.get_provider(name)
```

```
salt.cloud.clouds.lxc.list_nodes(conn=None, call=None)
```

```
salt.cloud.clouds.lxc.list_nodes_full(conn=None, call=None)
```

```
salt.cloud.clouds.lxc.list_nodes_select(call=None)
```
Return a list of the VMs that are on the provider, with select fields

```
salt.cloud.clouds.lxc.show_instance(name, call=None)
```
Show the details from the provider concerning an instance
31.5.12 salt.cloud.clouds.msazure

Azure Cloud Module

The Azure cloud module is used to control access to Microsoft Azure

depends

- Microsoft Azure SDK for Python >= 0.11.1
- python-requests, for Python < 2.7.9

configuration Required provider parameters:

- apikey
- certificate_path
- subscription_id
- requests_lib

A Management Certificate (.pem and .crt files) must be created and the .pem file placed on the same machine that salt-cloud is run from. Information on creating the pem file to use, and uploading the associated cer file can be found at:


For users with Python < 2.7.9, requests_lib must currently be set to True.

Example /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/azure.conf configuration:

```
my-azure-config:
  driver: azure
  subscription_id: 3287abc8-f98a-c678-3bde-326766fd3617
  certificate_path: /etc/salt/azure.pem
  management_host: management.core.windows.net
```

salt.cloud.clouds.msazure.add_input_endpoint(kwags=None, conn=None, call=None)

New in version 2015.8.0.

Add an input endpoint to the deployment. Please note that there may be a delay before the changes show up.

CLI Example:

```
salt-cloud -f add_input_endpoint my-azure service=myservice \
  deployment=mydeployment role=myrole name=HTTP local_port=80 \
  port=80 protocol=tcp enable_direct_server_return=False \
  timeout_for_tcp_idle_connection=4
```

salt.cloud.clouds.msazure.add_management_certificate(kwags=None, conn=None, call=None)

New in version 2015.8.0.

Add a new management certificate

CLI Example:

```
salt-cloud -f add_management_certificate my-azure public_key='...PUBKEY...' \
  thumbprint=0123456789ABCDEF data='...CERT_DATA...'```
salt.cloud.clouds.msazure.add_service_certificate(kwars=None, conn=None, call=None)

New in version 2015.8.0.
Add a new service certificate

CLI Example:
```
salt-cloud -f add_service_certificate my-azure name=my_service_certificate \
data='...CERT_DATA...' certificate_format=sha1 password=verybadpass
```

salt.cloud.clouds.msazure.avail_images(conn=None, call=None)
List available images for Azure

salt.cloud.clouds.msazure.avail_locations(conn=None, call=None)
List available locations for Azure

salt.cloud.clouds.msazure.avail_sizes(call=None)
Return a list of sizes from Azure

salt.cloud.clouds.msazure.cleanup_unattached_disks(kwars=None, conn=None, call=None)
New in version 2015.8.0.
Cleans up all disks associated with the account, which are not attached. *CAUTION* This is a destructive function with no undo button, and no ```Are you sure?``` confirmation!

CLI Examples:
```
salt-cloud -f cleanup_unattached_disks my-azure name=my_disk
salt-cloud -f cleanup_unattached_disks my-azure name=my_disk delete_vhd=True
```

salt.cloud.clouds.msazure.create(vm_)
Create a single VM from a data dict

salt.cloud.clouds.msazure.create_affinity_group(kwars=None, conn=None, call=None)
New in version 2015.8.0.
Create a new affinity group

CLI Example:
```
salt-cloud -f create_affinity_group my-azure name=my_affinity_group
```

salt.cloud.clouds.msazure.create_attach_volumes(name, kwars=None, conn=None, call=None, wait_to_finish=True)
Create and attach volumes to created node

salt.cloud.clouds.msazure.create_service(kwars=None, conn=None, call=None)
New in version 2015.8.0.
Create a new hosted service

CLI Example:
```
salt-cloud -f create_service my-azure name=my_service label=my_service location='West US'
```

salt.cloud.clouds.msazure.create_storage(kwars=None, conn=None, call=None)
New in version 2015.8.0.
Create a new storage account

CLI Example:
salt-cloud -f create_storage my-azure name=my_storage label=my_storage location='West US'

salt.cloud.clouds.msazure.create_storage_container(kwargs=None, storage_conn=None, call=None)

New in version 2015.8.0.
Create a storage container
CLI Example:
salt-cloud -f create_storage_container my-azure name=mycontainer

name: Name of container to create.
meta_name_values: Optional. A dict with name_value pairs to associate with the container as metadata.
Example:{'Category':'test'}
blob_public_access: Optional. Possible values include: container, blob
fail_on_exist: Specify whether to throw an exception when the container exists.

salt.cloud.clouds.msazure.delete_affinity_group(kwargs=None, conn=None, call=None)

New in version 2015.8.0.
Delete a specific affinity group associated with the account
CLI Examples:
salt-cloud -f delete_affinity_group my-azure name=my_affinity_group

salt.cloud.clouds.msazure.delete_disk(kwargs=None, conn=None, call=None)

New in version 2015.8.0.
Delete a specific disk associated with the account
CLI Examples:
salt-cloud -f delete_disk my-azure name=my_disk
salt-cloud -f delete_disk my-azure name=my_disk delete_vhd=True

salt.cloud.clouds.msazure.delete_input_endpoint(kwargs=None, conn=None, call=None)

New in version 2015.8.0.
Delete an input endpoint from the deployment. Please note that there may be a delay before the changes show up.
CLI Example:
salt-cloud -f delete_input_endpoint my-azure service=myservice \
    deployment=mydeployment role=myrole name=HTTP

salt.cloud.clouds.msazure.delete_management_certificate(kwargs=None, conn=None, call=None)

New in version 2015.8.0.
Delete a specific certificate associated with the management
CLI Examples:
salt-cloud -f delete_management_certificate my-azure name=my_management_certificate \
    thumbalgorithm=sha1 thumbprint=0123456789ABCDEF

31.5. Full list of Salt Cloud modules
salt.cloud.clouds.msazure.delete_service(kwargs=None, conn=None, call=None)

New in version 2015.8.0.
Delete a specific service associated with the account

CLI Examples:

```
salt-cloud -f delete_service my-azure name=my_service
```

salt.cloud.clouds.msazure.delete_service_certificate(kwargs=None, conn=None, call=None)

New in version 2015.8.0.
Delete a specific certificate associated with the service

CLI Examples:

```
salt-cloud -f delete_service_certificate my-azure name=my_service_certificate \
    thumbalgorithm=sha1 thumbprint=0123456789ABCDEF
```

salt.cloud.clouds.msazure.delete_storage(kwargs=None, conn=None, call=None)

New in version 2015.8.0.
Delete a specific storage account

CLI Examples:

```
salt-cloud -f delete_storage my-azure name=my_storage
```

salt.cloud.clouds.msazure.delete_storage_container(kwargs=None, storage_conn=None, call=None)

New in version 2015.8.0.
Delete a container associated with the storage account

CLI Example:

```
salt-cloud -f delete_storage_container my-azure name=mycontainer
```

- **name**: Name of container to create.
- **fail_not_exist**: Specify whether to throw an exception when the container exists.
- **lease_id**: If specified, delete_storage_container only succeeds if the container's lease is active and matches this ID.

salt.cloud.clouds.msazure.destroy(name, conn=None, call=None, kwargs=None)

Destroy a VM

CLI Examples:

```
salt-cloud -d myminion
salt-cloud -a destroy myminion service_name=myservice
```

salt.cloud.clouds.msazure.get_affinity_group(kwargs=None, conn=None, call=None)

New in version 2015.8.0.
Show an affinity group associated with the account

CLI Example:

```
salt-cloud -f show_affinity_group my-azure service=myservice \ 
    deployment=mydeployment name=SSH
```
salt.cloud.clouds.msazure.get_blob(kwags=\textit{None}, storage\_conn=\textit{None}, call=\textit{None})

New in version 2015.8.0.

Download a blob

CLI Example:

```
salt-cloud -f get_blob my-azure container=base name=top.sls local\_path=/srv/salt/top.sls
salt-cloud -f get_blob my-azure container=base name=content.txt return\_content=True
```

**container**: Name of existing container.

**name**: Name of existing blob.

**local\_path**: The path on the local machine to download the blob to. Either this or return\_content must be specified.

**return\_content**: Whether or not to return the content directly from the blob. If specified, must be True or False. Either this or the local\_path must be specified.

**snapshot**: Optional. The snapshot parameter is an opaque DateTime value that, when present, specifies the blob snapshot to retrieve.

**lease\_id**: Required if the blob has an active lease.

**progress\_callback**: callback for progress with signature function\(\text{current, total}\) where current is the number of bytes transferred so far, and total is the size of the blob.

**max\_connections**: Maximum number of parallel connections to use when the blob size exceeds 64MB. Set to 1 to download the blob chunks sequentially. Set to 2 or more to download the blob chunks in parallel. This uses more system resources but will download faster.

**max\_retries**: Number of times to retry download of blob chunk if an error occurs.

**retry\_wait**: Sleep time in secs between retries.

salt.cloud.clouds.msazure.get_blob\_properties(kwags=\textit{None}, storage\_conn=\textit{None}, call=\textit{None})

New in version 2015.8.0.

Returns all user-defined metadata, standard HTTP properties, and system properties for the blob.

CLI Example:

```
salt-cloud -f show\_blob\_properties my-azure container=mycontainer blob=myblob
```

**container**: Name of existing container.

**blob**: Name of existing blob.

**lease\_id**: Required if the blob has an active lease.

salt.cloud.clouds.msazure.get_blob\_service\_properties(kwags=\textit{None}, storage\_conn=\textit{None}, call=\textit{None})

New in version 2015.8.0.

Show a blob’s service properties

CLI Example:

```
salt-cloud -f show\_blob\_service\_properties my-azure
```
Salt Documentation, Release 2015.8.0

salt.cloud.clouds.msazure.get_configured_provider()
   Return the first configured instance.

salt.cloud.clouds.msazure.get_conn()
   Return a conn object for the passed VM data

salt.cloud.clouds.msazure.get_dependencies()
   Warn if dependencies aren't met.

salt.cloud.clouds.msazure.get_deployment(**kwargs=None, conn=None, call=None)
   New in version 2015.8.0.
   Return information about a deployment
   CLI Example:
   ```
   salt-cloud -f show_deployment my-azure name=my_deployment
   ```

salt.cloud.clouds.msazure.get_disk(**kwargs=None, conn=None, call=None)
   New in version 2015.8.0.
   Return information about a disk
   CLI Example:
   ```
   salt-cloud -f show_disk my-azure name=my_disk
   ```

salt.cloud.clouds.msazure.get_input_endpoint(**kwargs=None, conn=None, call=None)
   New in version 2015.8.0.
   Show an input endpoint associated with the deployment
   CLI Example:
   ```
   salt-cloud -f show_input_endpoint my-azure service=myservice \
   deployment=mydeployment name=SSH
   ```

salt.cloud.clouds.msazure.get_management_certificate(**kwargs=None, conn=None, call=None)
   New in version 2015.8.0.
   Return information about a management_certificate
   CLI Example:
   ```
   salt-cloud -f get_management_certificate my-azure name=my_management_certificate \
   thumbalgorithm=sha1 thumbprint=0123456789abcdef
   ```

salt.cloud.clouds.msazure.get_operation_status(**kwargs=None, conn=None, call=None)
   New in version 2015.2.
   Get Operation Status, based on a request ID
   CLI Example:
   ```
   salt-cloud -f get_operation_status my-azure id=0123456789abcdef0123456789abcdef
   ```

salt.cloud.clouds.msazure.get_service_certificate(**kwargs=None, conn=None, call=None)
   New in version 2015.8.0.
   Return information about a service certificate
   CLI Example:
salt.cloud -f show_service_certificate my-azure name=my_service_certificate \
    thumbalgorithm=sha1 thumbprint=0123456789ABCDEF

salt.cloud.clouds.msazure.get_storage(kwars=None, conn=None, call=None)
New in version 2015.8.0.
List storage service properties
CLI Example:
salt-cloud -f show_storage my-azure name=my_storage

salt.cloud.clouds.msazure.get_storage_conn(storage_account=None, storage_key=None, storage_conn=None, conn_kwargs=None)
New in version 2015.8.0.
Return a storage_conn object for the storage account

salt.cloud.clouds.msazure.get_storage_container(kwars=None, conn_kwargs=None, storage_conn=None, call=None)
New in version 2015.8.0.
Show a container associated with the storage account
CLI Example:
salt-cloud -f show_storage_container my-azure name=myservice

    name: Name of container to show.

salt.cloud.clouds.msazure.get_storage_container_acl(kwars=None, storage_conn=None, call=None)
New in version 2015.8.0.
Show a storage container's acl
CLI Example:
salt-cloud -f show_storage_container_acl my-azure name=myservice

    name: Name of existing container.
    lease_id: If specified, show_storage_container_acl only succeeds if the container's lease is active and matches this ID.

salt.cloud.clouds.msazure.get_storage_container_metadata(kwars=None, storage_conn=None, call=None)
New in version 2015.8.0.
Show a storage container's metadata
CLI Example:
salt-cloud -f show_storage_container_metadata my-azure name=myservice

    name: Name of container to show.
    lease_id: If specified, show_storage_container_metadata only succeeds if the container's lease is active and matches this ID.
salt.cloud.clouds.msazure.get_storage_keys(kwars=None, conn=None, call=None)
    New in version 2015.8.0.
    Show storage account keys
    CLI Example:
    
    salt-cloud -f show_storage_keys my-azure name=my_storage

salt.cloud.clouds.msazure.lease_storage_container(kwars=None, storage_conn=None, call=None)
    New in version 2015.8.0.
    Lease a container associated with the storage account
    CLI Example:
    
    salt-cloud -f lease_storage_container my-azure name=mycontainer

    name: Name of container to create.
    lease_action: Required. Possible values: acquire|renew|release|break|change
    lease_id: Required if the container has an active lease.
    lease_duration: Specifies the duration of the lease, in seconds, or negative one (-1) for a lease that never
        expires. A non-infinite lease can be between 15 and 60 seconds. A lease duration cannot be changed
        using renew or change. For backwards compatibility, the default is 60, and the value is only used on an
        acquire operation.
    lease_break_period: Optional. For a break operation, this is the proposed duration of seconds that the lease
        should continue before it is broken, between 0 and 60 seconds. This break period is only used if it is
        shorter than the time remaining on the lease. If longer, the time remaining on the lease is used. A new
        lease will not be available before the break period has expired, but the lease may be held for longer than
        the break period. If this header does not appear with a break operation, a fixed-duration lease breaks
        after the remaining lease period elapses, and an infinite lease breaks immediately.
    proposed_lease_id: Optional for acquire, required for change. Proposed lease ID, in a GUID string format.

salt.cloud.clouds.msazure.list_affinity_groups(kwars=None, conn=None, call=None)
    New in version 2015.8.0.
    List input endpoints associated with the deployment
    CLI Example:
    
    salt-cloud -f list_affinity_groups my-azure

salt.cloud.clouds.msazure.list_blobs(kwars=None, storage_conn=None, call=None)
    New in version 2015.8.0.
    List blobs associated with the container
    CLI Example:
    
    salt-cloud -f list_blobs my-azure container=mycontainer

    container: The name of the storage container
    prefix: Optional. Filters the results to return only blobs whose names begin with the specified prefix.
**marker:** Optional. A string value that identifies the portion of the list to be returned with the next list operation. The operation returns a marker value within the response body if the list returned was not complete. The marker value may then be used in a subsequent call to request the next set of list items. The marker value is opaque to the client.

**maxresults:** Optional. Specifies the maximum number of blobs to return, including all BlobPrefix elements. If the request does not specify maxresults or specifies a value greater than 5,000, the server will return up to 5,000 items. Setting maxresults to a value less than or equal to zero results in error response code 400 (Bad Request).

**include:** Optional. Specifies one or more datasets to include in the response. To specify more than one of these options on the URI, you must separate each option with a comma. Valid values are:

- **snapshots:** Specifies that snapshots should be included in the enumeration. Snapshots are listed from oldest to newest in the response.
- **metadata:** Specifies that blob metadata be returned in the response.
- **uncommittedblobs:** Specifies that blobs for which blocks have been uploaded, but which have not been committed using Put Block List (REST API), be included in the response.
- **copy:** Version 2012-02-12 and newer. Specifies that metadata related to any current or previous Copy Blob operation should be included in the response.

**delimiter:** Optional. When the request includes this parameter, the operation returns a BlobPrefix element in the response body that acts as a placeholder for all blobs whose names begin with the same substring up to the appearance of the delimiter character. The delimiter may be a single character or a string.

```python
salt.cloud.clouds.msazure.list_disks(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
List disks associated with the account

CLI Example:
```
salt-cloud -f list_disks my-azure
```

```pythonsalt.cloud.clouds.msazure.list_hosted_services(conn=None, call=None)
List VMs on this Azure account, with full information
```

```python
salt.cloud.clouds.msazure.list_input_endpoints(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
List input endpoints associated with the deployment

CLI Example:
```
salt-cloud -f list_input_endpoints my-azure service=myservice deployment=mydeployment
```

```python
salt.cloud.clouds.msazure.list_management_certificates(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
List management certificates associated with the subscription

CLI Example:
```
salt-cloud -f list_management_certificates my-azure name=my_management
```

```python
salt.cloud.clouds.msazure.list_nodes(conn=None, call=None)
List VMs on this Azure account
```
salt.cloud.clouds.msazure.list_nodes_full(conn=None, call=None)
List VMs on this Azure account, with full information

salt.cloud.clouds.msazure.list_nodes_select(conn=None, call=None)
Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.msazure.list_service_certificates(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
List certificates associated with the service
CLI Example:
salt-cloud -f list_service_certificates my-azure name=my_service

salt.cloud.clouds.msazure.list_services(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
List hosted services associated with the account
CLI Example:
salt-cloud -f list_services my-azure

salt.cloud.clouds.msazure.list_storage(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
List storage accounts associated with the account
CLI Example:
salt-cloud -f list_storage my-azure

salt.cloud.clouds.msazure.list_storage_containers(kwargs=None, storage_conn=None, call=None)
New in version 2015.8.0.
List containers associated with the storage account
CLI Example:
salt-cloud -f list_storage_containers my-azure

salt.cloud.clouds.msazure.list_storage_services(conn=None, call=None)
List VMs on this Azure account, with full information

salt.cloud.clouds.msazure.list_virtual_networks(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
List input endpoints associated with the deployment
CLI Example:
salt-cloud -f list_virtual_networks my-azure service=myservice deployment=mydeployment

salt.cloud.clouds.msazure.make_blob_url(kwargs=None, storage_conn=None, call=None)
New in version 2015.8.0.
Create the URL to access a blob
CLI Example:
salt-cloud -f make_blob_url my-azure container=mycontainer blob=myblob

container: Name of the container.

blob: Name of the blob.

account: Name of the storage account. If not specified, derives the host base from the provider configuration.

protocol: Protocol to use: 'http' or 'https'. If not specified, derives the host base from the provider configuration.

host_base: Live host base URL. If not specified, derives the host base from the provider configuration.

salt.cloud.clouds.msazure.put_blob(_kwargs=None, storage_conn=None, call=None)
New in version 2015.8.0.

Upload a blob

CLI Examples:

```
salt-cloud -f put_blob my-azure container=base name=top.sls blob_path=/srv/salt/top.sls
salt-cloud -f put_blob my-azure container=base name=content.txt blob_content='Some content'
```

container: Name of existing container.

name: Name of existing blob.

blob_path: The path on the local machine of the file to upload as a blob. Either this or blob_content must be specified.

blob_content: The actual content to be uploaded as a blob. Either this or blob_path must me specified.

cache_control: Optional. The Blob service stores this value but does not use or modify it.

content_language: Optional. Specifies the natural languages used by this resource.

cache_content_md5: Optional. An MD5 hash of the blob content. This hash is used to verify the integrity of the blob during transport. When this header is specified, the storage service checks the hash that has arrived with the one that was sent. If the two hashes do not match, the operation will fail with error code 400 (Bad Request).

blob_content_type: Optional. Set the blob's content type.

blob_content_encoding: Optional. Set the blob's content encoding.

blob_content_language: Optional. Set the blob's content language.

blob_content_md5: Optional. Set the blob's MD5 hash.

blob_cache_control: Optional. Set the blob's cache control.

meta_name_values: A dict containing name, value for metadata.

lease_id: Required if the blob has an active lease.

salt.cloud.clouds.msazure.query(path, method='GET', data=None, params=None, header_dict=None, decode=True)
Perform a query directly against the Azure REST API

salt.cloud.clouds.msazure.regenerate_storage_keys( kwargs=None, conn=None, call=None)
New in version 2015.8.0.

Regenerate storage account keys. Requires a key_type ("primary" or "secondary") to be specified.
CLI Example:

```
salt-cloud -f regenerate_storage_keys my-azure name=my_storage key_type=primary
```

```
salt.cloud.clouds.msazure.script(vm_)
    Return the script deployment object
```

```
salt.cloud.clouds.msazure.set_blob_properties(kwargs=None, storage_conn=None, call=None)
    New in version 2015.8.0.
    Set a blob's properties
    CLI Example:

```
salt-cloud -f set_blob_properties my-azure
```

- **container**: Name of existing container.
- **blob**: Name of existing blob.
- **blob_cache_control**: Optional. Modifies the cache control string for the blob.
- **blob_content_type**: Optional. Sets the blob's content type.
- **blob_content_md5**: Optional. Sets the blob's MD5 hash.
- **blob_content_encoding**: Optional. Sets the blob's content encoding.
- **blob_content_language**: Optional. Sets the blob's content language.
- **lease_id**: Required if the blob has an active lease.
- **blob_content_disposition**: Optional. Sets the blob's Content-Disposition header. The Content-Disposition response header field conveys additional information about how to process the response payload, and also can be used to attach additional metadata. For example, if set to attachment, it indicates that the user-agent should not display the response, but instead show a Save As dialog with a filename other than the blob name specified.

```
salt.cloud.clouds.msazure.set_blob_service_properties(kwargs=None, storage_conn=None, call=None)
    New in version 2015.8.0.
    Sets the properties of a storage account's Blob service, including Windows Azure Storage Analytics. You can also use this operation to set the default request version for all incoming requests that do not have a version specified.
    CLI Example:

```
salt-cloud -f set_blob_service_properties my-azure
```

- **properties**: a StorageServiceProperties object.
- **timeout**: Optional. The timeout parameter is expressed in seconds.

```
salt.cloud.clouds.msazure.set_storage_container_acl(kwargs=None, storage_conn=None, call=None)
    New in version 2015.8.0.
    Set a storage container's acl
    CLI Example:
```
```bash
salt-cloud -f set_storage_container my-azure name=mycontainer
```

**name**: Name of existing container.

**signed_identifiers**: SignedIdentifiers instance

**blob_public_access**: Optional. Possible values include: container, blob

**lease_id**: If specified, set_storage_container_acl only succeeds if the container's lease is active and matches this ID.

```python
salt.cloud.clouds.msazure.set_storage_container_metadata(kwargs=None, storage_conn=None, call=None)
```

New in version 2015.8.0.

Set a storage container's metadata

CLI Example:

```bash
salt-cloud -f set_storage_container my-azure name=mycontainer \
            x_ms_meta_name_values='{"my_name": "my_value"}';
```

**name**: Name of existing container.

**meta_name_values**: A dict containing name, value for metadata. Example: {'category':'test'}

**lease_id**: If specified, set_storage_container_metadata only succeeds if the container's lease is active and matches this ID.

```python
salt.cloud.clouds.msazure.show_affinity_group(kwargs=None, conn=None, call=None)
```

New in version 2015.8.0.

Show an affinity group associated with the account

CLI Example:

```bash
salt-cloud -f show_affinity_group my-azure service=myservice \
            deployment=mydeployment name=SSH
```

```python
salt.cloud.clouds.msazure.show_blob_properties(kwargs=None, storage_conn=None, call=None)
```

New in version 2015.8.0.

Returns all user-defined metadata, standard HTTP properties, and system properties for the blob.

CLI Example:

```bash
salt-cloud -f show_blob_properties my-azure container=mycontainer blob=myblob
```

**container**: Name of existing container.

**blob**: Name of existing blob.

**lease_id**: Required if the blob has an active lease.

```python
salt.cloud.clouds.msazure.show_blob_service_properties(kwargs=None, storage_conn=None, call=None)
```

New in version 2015.8.0.

Show a blob's service properties
CLI Example:
```
salt-cloud -f show_blob_service_properties my-azure
```

salt.cloud.clouds.msazure.show_deployment(*kwargs=None, conn=None, call=None*)
New in version 2015.8.0.
Return information about a deployment
CLI Example:
```
salt-cloud -f show_deployment my-azure name=my_deployment
```

salt.cloud.clouds.msazure.show_disk(*kwargs=None, conn=None, call=None*)
New in version 2015.8.0.
Return information about a disk
CLI Example:
```
salt-cloud -f show_disk my-azure name=my_disk
```

salt.cloud.clouds.msazure.show_input_endpoint(*kwargs=None, conn=None, call=None*)
New in version 2015.8.0.
Show an input endpoint associated with the deployment
CLI Example:
```
salt-cloud -f show_input_endpoint my-azure service=myservice \ 
deployment=mydeployment name=SSH
```

salt.cloud.clouds.msazure.show_instance(name, call=None)
Show the details from the provider concerning an instance

salt.cloud.clouds.msazure.show_management_certificate(*kwargs=None, conn=None, call=None*)
New in version 2015.8.0.
Return information about a management_certificate
CLI Example:
```
salt-cloud -f get_management_certificate my-azure name=my_management_certificate \ 
thumbalgorithm=sha1 thumbprint=0123456789ABCDEF
```

salt.cloud.clouds.msazure.show_service(*kwargs=None, conn=None, call=None*)
New in version 2015.8.0.
List hosted service properties
CLI Example:
```
salt-cloud -f show_service my-azure name=my_service
```

salt.cloud.clouds.msazure.show_service_certificate(*kwargs=None, conn=None, call=None*)
New in version 2015.8.0.
Return information about a service certificate
CLI Example:
salt.cloud -f show_service_certificate my-azure name=my_service_certificate \ 
  thumbalgorithm=sha1 thumbprint=0123456789ABCDEF

salt.cloud.clouds.msazure.show_storage(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
List storage service properties
CLI Example:
  salt-cloud -f show_storage my-azure name=my_storage

salt.cloud.clouds.msazure.show_storage_container(kwargs=None, storage_conn=None, call=None)
New in version 2015.8.0.
Show a container associated with the storage account
CLI Example:
  salt-cloud -f show_storage_container my-azure name=myservice

  name: Name of container to show.

salt.cloud.clouds.msazure.show_storage_container_acl(kwargs=None, storage_conn=None, call=None)
New in version 2015.8.0.
Show a storage container's acl
CLI Example:
  salt-cloud -f show_storage_container_acl my-azure name=myservice

  name: Name of existing container.
  lease_id: If specified, show_storage_container_acl only succeeds if the container's lease is active and matches this ID.

salt.cloud.clouds.msazure.show_storage_container_metadata(kwargs=None, storage_conn=None, call=None)
New in version 2015.8.0.
Show a storage container's metadata
CLI Example:
  salt-cloud -f show_storage_container_metadata my-azure name=myservice

  name: Name of container to show.
  lease_id: If specified, show_storage_container_metadata only succeeds if the container's lease is active and matches this ID.

salt.cloud.clouds.msazure.show_storage_keys(kwargs=None, conn=None, call=None)
New in version 2015.8.0.
Show storage account keys
CLI Example:
salt.cloud -f show_storage_keys my-azure name=my_storage

```python
salt.cloud.clouds.msazure.update_affinity_group(kwags=) None, conn=None, call=None)
    Update an affinity group’s properties
    CLI Example:
    salt-cloud -f update_affinity_group my-azure name=my_group label=my_group
```

salt.cloud.clouds.msazure.update_disk(kwags=) None, conn=None, call=None)
    Update a disk’s properties
    CLI Example:
    salt-cloud -f update_disk my-azure name=my_disk label=my_disk
    salt-cloud -f update_disk my-azure name=my_disk new_name=another_disk

salt.cloud.clouds.msazure.update_input_endpoint(kwags=) None, conn=None, call=None,
    activity='update')
    Update an input endpoint associated with the deployment. Please note that there may be a delay before the changes show up.
    CLI Example:
    salt-cloud -f update_input_endpoint my-azure service=myservice \
    deployment=mydeployment role=myrole name=HTTP local_port=80 \ 
    port=80 protocol=tcp enable_direct_server_return=False \ 
    timeout_for_tcp_idle_connection=4

salt.cloud.clouds.msazure.update_storage(kwags=) None, conn=None, call=None)
    Update a storage account’s properties
    CLI Example:
    salt-cloud -f update_storage my-azure name=my_storage label=my_storage

31.5.13 salt.cloud.clouds.nova

OpenStack Nova Cloud Module

OpenStack is an open source project that is in use by a number a cloud providers, each of which have their own ways of using it.

The OpenStack Nova module for Salt Cloud was bootstrapped from the OpenStack module for Salt Cloud, which uses a libcloud-based connection. The Nova module is designed to use the nova and glance modules already built into Salt.

These modules use the Python novaclient and glanceclient libraries, respectively. In order to use this module, the proper salt configuration must also be in place. This can be specified in the master config, the minion config, a set of grains or a set of pillars.
my_openstack_profile:
  keystone.user: admin
  keystone.password: verybadpass
  keystone.tenant: admin
  keystone.auth_url: 'http://127.0.0.1:5000/v2.0/

Note that there is currently a dependency upon netaddr. This can be installed on Debian-based systems by means of the python-netaddr package.

This module currently requires the latest develop branch of Salt to be installed.

This module has been tested to work with HP Cloud and Rackspace. See the documentation for specific options for either of these providers. These examples could be set up in the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/openstack.conf:

my-openstack-config:
  # The ID of the minion that will execute the salt nova functions
  auth_minion: myminion
  # The name of the configuration profile to use on said minion
  config_profile: my_openstack_profile

  ssh_key_name: mykey

  driver: nova
  userdata_file: /tmp/userdata.txt

For local installations that only use private IP address ranges, the following option may be useful. Using the old syntax:

Note: For api use, you will need an auth plugin. The base novaclient does not support apikeys, but some providers such as rackspace have extended keystone to accept them

my-openstack-config:
  # Ignore IP addresses on this network for bootstrap
  ignore_cidr: 192.168.50.0/24

my-nova:
  identity_url: 'https://identity.api.rackspacecloud.com/v2.0/
  compute_region: IAD
  user: myusername
  password: mypassword
  tenant: <userid>
  driver: nova

my-api:
  identity_url: 'https://identity.api.rackspacecloud.com/v2.0/
  compute_region: IAD
  user: myusername
  api_key: <api_key>
  os_auth_plugin: rackspace
  tenant: <userid>
  driver: nova
  networks:
    - net-id: 47a38ff2-fe21-4800-8604-42bd1848e743
    - net-id: 00000000-0000-0000-0000-000000000000
    - net-id: 11111111-1111-1111-1111-111111111111

Note: You must include the default net-ids when setting networks or the server will be created without the rest of the interfaces
Note: For rackconnect v3, rackconnectv3 needs to be specified with the rackconnect v3 cloud network as its variable.

```python
salt.cloud.clouds.nova.attach_volume(name, server_name, device='/dev/xvdb', **kwargs)
    Attach block volume

salt.cloud.clouds.nova.avail_images()
    Return a dict of all available VM images on the cloud provider.

salt.cloud.clouds.nova.avail_locations(conn=None, call=None)
    Return a list of locations

salt.cloud.clouds.nova.avail_sizes()
    Return a dict of all available VM sizes on the cloud provider.

salt.cloud.clouds.nova.cloudnetwork(vm_)
    Determine if we should use an extranetwork to bootstrap Either 'False' (default) or 'True'.

salt.cloud.clouds.nova.create(vm_)
    Create a single VM from a data dict

salt.cloud.clouds.nova.create_attach_volumes(name, call=None, **kwargs)
    Create and attach volumes to created node

salt.cloud.clouds.nova.create_volume(name, size=100, snapshot=None, voltype=None, **kwargs)
    Create block storage device

salt.cloud.clouds.nova.destroy(name, conn=None, call=None)
    Delete a single VM

salt.cloud.clouds.nova.get_configured_provider()
    Return the first configured instance.

salt.cloud.clouds.nova.get_conn()
    Return a conn object for the passed VM data

salt.cloud.clouds.nova.get_dependencies()
    Warn if dependencies aren't met.

salt.cloud.clouds.nova.get_image(conn, vm_)
    Return the image object to use

salt.cloud.clouds.nova.get_size(conn, vm_)
    Return the VM's size object

salt.cloud.clouds.nova.ignore_cidr(vm_, ip)
    Return True if we are to ignore the specified IP. Compatible with IPv4.

salt.cloud.clouds.nova.list_nodes(call=None, **kwargs)
    Return a list of the VMs that in this location

salt.cloud.clouds.nova.list_nodes_full(call=None, **kwargs)
    Return a list of the VMs that in this location

salt.cloud.clouds.nova.list_nodes_select(call=None)
    Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.nova.managedcloud(vm_)
    Determine if we should wait for the managed cloud automation before running. Either 'False' (default) or 'True'.

salt.cloud.clouds.nova.network_create(name, **kwargs)
    Create private networks
```
salt.cloud.clouds.nova.network_list(call=None, **kwargs)
List private networks
	salt.cloud.clouds.nova.preferred_ip(vm_, ips)
Return the preferred Internet protocol. Either `ipv4` (default) or `ipv6`.
	salt.cloud.clouds.nova.rackconnect(vm_)
Determine if we should wait for rackconnect automation before running. Either `False` (default) or `True`.
	salt.cloud.clouds.nova.reboot(name, conn=None)
Reboot a single VM
	salt.cloud.clouds.nova.request_instance(vm_=None, call=None)
Put together all of the information necessary to request an instance through Novaclient and then fire off the request the instance.

Returns data about the instance
	salt.cloud.clouds.nova.script(vm_)
Return the script deployment object
	salt.cloud.clouds.nova.show_instance(name, call=None)
Show the details from the provider concerning an instance
	salt.cloud.clouds.nova.ssh_interface(vm_)
Return the ssh_interface type to connect to. Either `public_ips` (default) or `private_ips`.
	salt.cloud.clouds.nova.virtual_interface_create(name, net_name, **kwargs)
Create private networks
	salt.cloud.clouds.nova.virtual_interface_list(name, **kwargs)
Create private networks
	salt.cloud.clouds.nova.volume_attach(name, server_name, device='/dev/xvdb', **kwargs)
Attach block volume
	salt.cloud.clouds.nova.volume_create(name, size=100, snapshot=None, voltype=None, **kwargs)
Create block storage device
	salt.cloud.clouds.nova.volume_create_attach(name, call=None, **kwargs)
Create and attach volumes to created node
	salt.cloud.clouds.nova.volume_delete(name, **kwargs)
Delete block storage device
	salt.cloud.clouds.nova.volume_detach(name, **kwargs)
Detach block volume
	salt.cloud.clouds.nova.volume_list(**kwargs)
List block devices

31.5.14 salt.cloud.clouds.opennebula

OpenNebula Cloud Module

The OpenNebula cloud module is used to control access to an OpenNebula cloud.

depends lxml

Use of this module requires the xml_rpc, user and password parameter to be set. Set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/opennebula.conf:

31.5. Full list of Salt Cloud modules
my-opennebula-config:
  xml_rpc: http://localhost:2633/RPC2
  user: oneadmin
  password: JHGhgsayu32jsa
  driver: opennebula

salt.cloud.clouds.opennebula.avail_images(call=None)
  Return a list of the templates that are on the provider

salt.cloud.clouds.opennebula.avail_locations(call=None)
  Return a dict of all available VM locations on the cloud provider with relevant data

salt.cloud.clouds.opennebula.avail_sizes(call=None)
  Because sizes are built into templates with OpenNebula, there will be no sizes to return here

salt.cloud.clouds.opennebula.create(vm_)
  Create a single VM from a data dict

salt.cloud.clouds.opennebula.destroy(name, call=None)
  Destroy a node. Will check termination protection and warn if enabled.

  CLI Example:
  salt-cloud --destroy mymachine

salt.cloud.clouds.opennebula.get_configured_provider()
  Return the first configured instance.

salt.cloud.clouds.opennebula.get_dependencies()
  Warn if dependencies aren't met.

salt.cloud.clouds.opennebula.get_image(vm_)
  Return the image object to use

salt.cloud.clouds.opennebula.get_location(vm_)
  Return the VM's location

salt.cloud.clouds.opennebula.list_nodes(call=None)
  Return a list of the VMs that are on the provider

salt.cloud.clouds.opennebula.list_nodes_full(call=None)
  Return a list of the VMs that are on the provider

salt.cloud.clouds.opennebula.list_nodes_select(call=None)
  Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.opennebula.script(vm_)
  Return the script deployment object

salt.cloud.clouds.opennebula.show_instance(name, call=None)
  Show the details from OpenNebula concerning a VM

31.5.15 salt.cloud.clouds.openstack

OpenStack Cloud Module

OpenStack is an open source project that is in use by a number a cloud providers, each of which have their own ways of using it.

  depends libcloud >= 0.13.2
OpenStack provides a number of ways to authenticate. This module uses password-based authentication, using auth v2.0. It is likely to start supporting other methods of authentication provided by OpenStack in the future.

Note that there is currently a dependency upon netaddr. This can be installed on Debian-based systems by means of the python-netaddr package.

This module has been tested to work with HP Cloud and Rackspace. See the documentation for specific options for either of these providers. Some examples, using the old cloud configuration syntax, are provided below:

Set up in the cloud configuration at `/etc/salt/cloud.providers` or `/etc/salt/cloud.providers.d/openstack.conf`:

```yaml
my-openstack-config:
  # The OpenStack identity service url
  identity_url: https://region-b.geo-1.identity.hpcloudsvc.com:35357/v2.0/
  # The OpenStack compute region
  compute_region: region-b.geo-1
  # The OpenStack compute service name
  compute_name: Compute
  # The OpenStack tenant name (not tenant ID)
  tenant: myuser-tenant1
  # The OpenStack user name
  user: myuser
  # The OpenStack keypair name
  ssh_key_name: mykey
  # Skip SSL certificate validation
  insecure: false
  # The ssh key file
  ssh_key_file: /path/to/keyfile/test.pem
  # The OpenStack network UUIDs
  networks:
    - fixed:
      - 4402cd51-37ee-435e-a966-8245956dc0e6
    - floating:
      - Ext-Net
  files:
    /path/to/dest.txt:
      /local/path/to/src.txt
      # Skips the service catalog API endpoint, and uses the following
  driver: openstack
  userdata_file: /tmp/userdata.txt
  # config_drive is required for userdata at rackspace
  config_drive: True
```

For in-house Openstack Essex installation, libcloud needs the `service_type`:

```yaml
my-openstack-config:
  identity_url: http://control.openstack.example.org:5000/v2.0/
  compute_name: Compute Service
  service_type: compute
```

Either a password or an API key must also be specified:

```yaml
my-openstack-password-or-api-config:
  # The OpenStack password
  password: letmein
  # The OpenStack API key
  apikey: 901d3f579h23c8v73q9
```

31.5. Full list of Salt Cloud modules
Optionally, if you don’t want to save plain-text password in your configuration file, you can use keyring:

```
my-openstack-keyring-config:
    # The OpenStack password is stored in keyring
    # don't forget to set the password by running something like:
    # salt-cloud --set-password=myuser my-openstack-keyring-config
    password: USE_KEYRING
```

For local installations that only use private IP address ranges, the following option may be useful. Using the old syntax:

```
my-openstack-config:
    # Ignore IP addresses on this network for bootstrap
    ignore_cidr: 192.168.50.0/24
```

It is possible to upload a small set of files (no more than 5, and nothing too large) to the remote server. Generally this should not be needed, as salt itself can upload to the server after it is spun up, with nowhere near the same restrictions.

```
my-openstack-config:
    files:
        /path/to/dest.txt:
            /local/path/to/src.txt
```

Alternatively, one could use the private IP to connect by specifying:

```
my-openstack-config:
    ssh_interface: private_ips
```

Salt provides several functions to interact with OpenStack cloud provider:

```python
salt.cloud.clouds.openstack.avail_images(conn=None, call=None)
    Return a dict of all available VM images on the cloud provider with relevant data

salt.cloud.clouds.openstack.avail_locations(conn=None, call=None)
    Return a dict of all available VM locations on the cloud provider with relevant data

salt.cloud.clouds.openstack.avail_sizes(conn=None, call=None)
    Return a dict of all available VM images on the cloud provider with relevant data

salt.cloud.clouds.openstack.create(vm_)
    Create a single VM from a data dict

salt.cloud.clouds.openstack.destroy(name, conn=None, call=None)
    Delete a single VM

salt.cloud.clouds.openstack.get_configured_provider()
    Return the first configured instance.

salt.cloud.clouds.openstack.get_conn()
    Return a conn object for the passed VM data

salt.cloud.clouds.openstack.get_dependencies()
    Warn if dependencies aren’t met.

salt.cloud.clouds.openstack.get_image(conn, vm_)
    Return the image object to use

salt.cloud.clouds.openstack.get_node(conn, name)
    Return a libcloud node for the named VM

salt.cloud.clouds.openstack.get_size(conn, vm_)
    Return the VM’s size object
```
salt.cloud.clouds.openstack.ignore_cidr(vm_, ip)
    Return True if we are to ignore the specified IP. Compatible with IPv4.

salt.cloud.clouds.openstack.list_nodes(conn=None, call=None)
    Return a list of the VMs that are on the provider

salt.cloud.clouds.openstack.list_nodes_full(conn=None, call=None)
    Return a list of the VMs that are on the provider, with all fields

salt.cloud.clouds.openstack.list_nodes_select(conn=None, call=None)
    Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.openstack.managedcloud(vm_)
    Determine if we should wait for the managed cloud automation before running. Either 'False' (default) or 'True'.

salt.cloud.clouds.openstack.networks(vm_, kwargs=None)

salt.cloud.clouds.openstack.preferred_ip(vm_, ips)
    Return the preferred Internet protocol. Either 'ipv4' (default) or 'ipv6'.

salt.cloud.clouds.openstack.rackconnect(vm_)
    Determine if we should wait for rackconnect automation before running. Either 'False' (default) or 'True'.

salt.cloud.clouds.openstack.reboot(name, conn=None)
    Reboot a single VM

salt.cloud.clouds.openstack.request_instance(vm_=None, call=None)
    Put together all of the information necessary to request an instance on Openstack and then fire off the request
    the instance.

    Returns data about the instance

salt.cloud.clouds.openstack.script(vm_)
    Return the script deployment object

salt.cloud.clouds.openstack.show_instance(name, call=None)
    Show the details from the provider concerning an instance

salt.cloud.clouds.openstack.ssh_interface(vm_)
    Return the ssh_interface type to connect to. Either 'public_ips' (default) or 'private_ips'.

31.5.16 salt.cloud.clouds.parallels

Parallels Cloud Module

The Parallels cloud module is used to control access to cloud providers using the Parallels VPS system.

Set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/parallels.conf:

```
my-parallels-config:
  # Parallels account information
  user: myuser
  password: mypassword
  url: https://api.cloud.xmission.com:4465/paci/v1.0/
  driver: parallels
```

salt.cloud.clouds.parallels.avail_images(call=None)
    Return a list of the images that are on the provider

31.5. Full list of Salt Cloud modules
salt.cloud.clouds.parallels.create(vm_)
    Create a single VM from a data dict

salt.cloud.clouds.parallels.create_node(vm_)
    Build and submit the XML to create a node

salt.cloud.clouds.parallels.destroy(name, call=None)
    Destroy a node.
    CLI Example:
    ```
    salt-cloud --destroy mymachine
    ```

salt.cloud.clouds.parallels.get_configured_provider()
    Return the first configured instance.

salt.cloud.clouds.parallels.get_image(vm_)
    Return the image object to use

salt.cloud.clouds.parallels.list_nodes(call=None)
    Return a list of the VMs that are on the provider

salt.cloud.clouds.parallels.list_nodes_full(call=None)
    Return a list of the VMs that are on the provider

salt.cloud.clouds.parallels.list_nodes_select(call=None)
    Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.parallels.query(action=None, command=None, args=None, method='GET', data=None)
    Make a web call to a Parallels provider

salt.cloud.clouds.parallels.script(vm_)
    Return the script deployment object

salt.cloud.clouds.parallels.show_image(kwargs, call=None)
    Show the details from Parallels concerning an image

salt.cloud.clouds.parallels.show_instance(name, call=None)
    Show the details from Parallels concerning an instance

salt.cloud.clouds.parallels.start(name, call=None)
    Start a node.
    CLI Example:
    ```
    salt-cloud -a start mymachine
    ```

salt.cloud.clouds.parallels.stop(name, call=None)
    Stop a node.
    CLI Example:
    ```
    salt-cloud -a stop mymachine
    ```

salt.cloud.clouds.parallels.wait_until(name, state, timeout=300)
    Wait until a specific state has been reached on a node
31.5.17 salt.cloud.clouds.proxmox

Proxmox Cloud Module

New in version 2014.7.0.

The Proxmox cloud module is used to control access to cloud providers using the Proxmox system (KVM / OpenVZ).

Set up the cloud configuration at `/etc/salt/cloud.providers` or `/etc/salt/cloud.providers.d/proxmox.conf`:

```
my-proxmox-config:
    # Proxmox account information
    user: myuser@pam or myuser@pve
    password: mypassword
    url: hypervisor.domain.tld
    driver: proxmox
    verify_ssl: True
```

**maintainer** Frank Klaassen <frank@cloudright.nl>

**depends** requests >= 2.2.1

**depends** IPy >= 0.81

**salt.cloud.clouds.proxmox.avail_images** *(call=None, location='local')*

Return a list of the images that are on the provider

CLI Example:

```
salt-cloud --list-images my-proxmox-config
```

**salt.cloud.clouds.proxmox.avail_locations** *(call=None)*

Return a list of the hypervisors (nodes) which this Proxmox PVE machine manages

CLI Example:

```
salt-cloud --list-locations my-proxmox-config
```

**salt.cloud.clouds.proxmox.create** *(vm_)*

Create a single VM from a data dict

CLI Example:

```
salt-cloud -p proxmox-ubuntu vmhostname
```

**salt.cloud.clouds.proxmox.create_node** *(vm_)*

Build and submit the requestdata to create a new node

**salt.cloud.clouds.proxmox.destroy** *(name, call=None)*

Destroy a node.

CLI Example:

```
salt-cloud --destroy mymachine
```

**salt.cloud.clouds.proxmox.get_configured_provider** *

Return the first configured instance.

**salt.cloud.clouds.proxmox.get_dependencies** *

Warn if dependencies aren’t met.
salt.cloud.clouds.proxmox.get_resources_nodes(call=None, resFilter=None)
Retrieve all hypervisors (nodes) available on this environment
CLI Example:
    salt-cloud -f get_resources_nodes my-proxmox-config

salt.cloud.clouds.proxmox.get_resources_vms(call=None, resFilter=None, includeConfig=True)
Retrieve all VMs available on this environment
CLI Example:
    salt-cloud -f get_resources_vms my-proxmox-config

salt.cloud.clouds.proxmox.get_vm_status(vmid=None, name=None)
Get the status for a VM, either via the ID or the hostname

salt.cloud.clouds.proxmox.get_vmconfig(vmid, node=None, node_type='openvz')
Get VM configuration

salt.cloud.clouds.proxmox.list_nodes(call=None)
Return a list of the VMs that are managed by the provider
CLI Example:
    salt-cloud -Q my-proxmox-config

salt.cloud.clouds.proxmox.list_nodes_full(call=None)
Return a list of the VMs that are on the provider
CLI Example:
    salt-cloud -F my-proxmox-config

salt.cloud.clouds.proxmox.list_nodes_select(call=None)
Return a list of the VMs that are on the provider, with select fields
CLI Example:
    salt-cloud -S my-proxmox-config

salt.cloud.clouds.proxmox.query(conn_type, option, post_data=None)
Execute the HTTP request to the API

salt.cloud.clouds.proxmox.script(vm_)
Return the script deployment object

salt.cloud.clouds.proxmox.set_vm_status(status, name=None, vmid=None)
Convenience function for setting VM status

salt.cloud.clouds.proxmox.show_instance(name, call=None)
Show the details from Proxmox concerning an instance

salt.cloud.clouds.proxmox.shutdown(name=None, vmid=None, call=None)
Shutdown a node via ACPI.
CLI Example:
    salt-cloud -a shutdown mymachine

salt.cloud.clouds.proxmox.start(name, vmid=None, call=None)
Start a node.
CLI Example:
salt-cloud -a start mymachine

salt.cloud.clouds.proxmox.stop(name, vmid=None, call=None)
   Stop a node ("pulling the plug").
   CLI Example:
   
salt-cloud -a stop mymachine

salt.cloud.clouds.proxmox.wait_for_created(upid, timeout=300)
   Wait until a the vm has been created successfully
salt.cloud.clouds.proxmox.wait_for_state(vmid, state, timeout=300)
   Wait until a specific state has been reached on a node

31.5.18 salt.cloud.clouds.pyrax

Pyrax Cloud Module

PLEASE NOTE: This module is currently in early development, and considered to be experimental and unstable. It is not recommended for production use. Unless you are actively developing code in this module, you should use the OpenStack module instead.

salt.cloud.clouds.pyrax.get_configured_provider()
   Return the first configured instance.

salt.cloud.clouds.pyrax.get_conn(conn_type)
   Return a conn object for the passed VM data

salt.cloud.clouds.pyrax.get_dependencies()
   Warn if dependencies aren't met.

salt.cloud.clouds.pyraxqueues_create(call, kwargs)

salt.cloud.clouds.pyrax.queue_delete(call, kwargs)

salt.cloud.clouds.pyrax.queue_exists(call, kwargs)

salt.cloud.clouds.pyrax.queue_show(call, kwargs)

31.5.19 salt.cloud.clouds.rackspace

Rackspace Cloud Module

The Rackspace cloud module. This module uses the preferred means to set up a libcloud based cloud module and should be used as the general template for setting up additional libcloud based modules.

  depends libcloud >= 0.13.2

Please note that the rackspace driver is only intended for 1st gen instances, aka, "the old cloud" at Rackspace. It is required for 1st gen instances, but will not work with OpenStack-based instances. Unless you explicitly have a reason to use it, it is highly recommended that you use the openstack driver instead.

The rackspace cloud module interfaces with the Rackspace public cloud service and requires that two configuration parameters be set for use, user and apikey.

Set up the cloud configuration at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/rackspace.conf
my-rackspace-config:
  driver: rackspace
  # The Rackspace login user
  user: fred
  # The Rackspace user's apikey
  apikey: 901d3f579h23c8v73q9

salt.cloud.clouds.rackspace.avail_images(conn=None, call=None)
  Return a dict of all available VM images on the cloud provider with relevant data

salt.cloud.clouds.rackspace.avail_locations(conn=None, call=None)
  Return a dict of all available VM locations on the cloud provider with relevant data

salt.cloud.clouds.rackspace.avail_sizes(conn=None, call=None)
  Return a dict of all available VM images on the cloud provider with relevant data

salt.cloud.clouds.rackspace.create(vm_)
  Create a single VM from a data dict

salt.cloud.clouds.rackspace.destroy(name, conn=None, call=None)
  Delete a single VM

salt.cloud.clouds.rackspace.get_configured_provider()
  Return the first configured instance.

salt.cloud.clouds.rackspace.get_conn()
  Return a conn object for the passed VM data

salt.cloud.clouds.rackspace.get_dependencies()
  Warn if dependencies aren't met.

salt.cloud.clouds.rackspace.get_image(conn, vm_)
  Return the image object to use

salt.cloud.clouds.rackspace.get_size(conn, vm_)
  Return the VM's size object

salt.cloud.clouds.rackspace.list_nodes(conn=None, call=None)
  Return a list of the VMs that are on the provider

salt.cloud.clouds.rackspace.list_nodes_full(conn=None, call=None)
  Return a list of the VMs that are on the provider, with all fields

salt.cloud.clouds.rackspace.list_nodes_select(conn=None, call=None)
  Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.rackspace.preferred_ip(vm_, ips)
  Return the preferred Internet protocol. Either 'ipv4' (default) or 'ipv6'.

salt.cloud.clouds.rackspace.script(vm_)
  Return the script deployment object

salt.cloud.clouds.rackspace.show_instance(name, call=None)
  Show the details from the provider concerning an instance

salt.cloud.clouds.rackspace.ssh_interface(vm_)
  Return the ssh_interface type to connect to. Either 'public_ips' (default) or 'private_ips'.
31.5.20 salt.cloud.clouds.saltify

Saltify Module

The Saltify module is designed to install Salt on a remote machine, virtual or bare metal, using SSH. This module is useful for provisioning machines which are already installed, but not Salted.

Use of this module requires some configuration in cloud profile and provider files as described in the *Getting Started with Saltify* documentation.

```python
salt.cloud.clouds.saltify.create(vm_)
    Provision a single machine

salt.cloud.clouds.saltify.get_configured_provider()
    Return the first configured instance.

salt.cloud.clouds.saltify.list_nodes()
    Because this module is not specific to any cloud providers, there will be no nodes to list.

salt.cloud.clouds.saltify.list_nodes_full()
    Because this module is not specific to any cloud providers, there will be no nodes to list.

salt.cloud.clouds.saltify.list_nodes_select()
    Because this module is not specific to any cloud providers, there will be no nodes to list.
```

31.5.21 salt.cloud.clouds.softlayer

SoftLayer Cloud Module

The SoftLayer cloud module is used to control access to the SoftLayer VPS system.

Use of this module only requires the `apikey` parameter. Set up the cloud configuration at:

```
/etc/salt/cloud.providers or /etc/salt/cloud.providers.d/softlayer.conf:
```

```yaml
my-softlayer-config:
  # SoftLayer account api key
  user: MYLOGIN
  apikey: JVkbSJDGHSKUKSDJfhsdklfjgsjdjkflhjlsdfhgdgjkenrtuin
  driver: softlayer
```

The SoftLayer Python Library needs to be installed in order to use the SoftLayer salt.cloud modules. See: https://pypi.python.org/pypi/SoftLayer

```python
depends softlayer

salt.cloud.clouds.softlayer.avail_images(call=None)
    Return a dict of all available VM images on the cloud provider.

salt.cloud.clouds.softlayer.avail_locations(call=None)
    List all available locations

salt.cloud.clouds.softlayer.avail_sizes(call=None)
    Return a dict of all available VM sizes on the cloud provider with relevant data. This data is provided in three dicts.

salt.cloud.clouds.softlayer.create(vm_)
    Create a single VM from a data dict
```
salt.cloud.clouds.softlayer.destroy(name, call=None)
    Destroy a node.

    CLI Example:
    salt-cloud --destroy mymachine

salt.cloud.clouds.softlayer.get_configured_provider()
    Return the first configured instance.

salt.cloud.clouds.softlayer.get_conn(service='SoftLayer_Virtual_Guest')
    Return a conn object for the passed VM data

salt.cloud.clouds.softlayer.get_dependencies()
    Warn if dependencies aren’t met.

salt.cloud.clouds.softlayer.get_location(vm_=None)
    Return the location to use, in this order:
    - CLI parameter
    - VM parameter
    - Cloud profile setting

salt.cloud.clouds.softlayer.list_custom_images(call=None)
    Return a dict of all custom VM images on the cloud provider.

salt.cloud.clouds.softlayer.list_nodes(call=None)
    Return a list of the VMs that are on the provider

salt.cloud.clouds.softlayer.list_nodes_full(mask='mask[id]', call=None)
    Return a list of the VMs that are on the provider

salt.cloud.clouds.softlayer.list_nodes_select(call=None)
    Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.softlayer.list_vlans(call=None)
    List all VLANs associated with the account

salt.cloud.clouds.softlayer.script(vm_)
    Return the script deployment object

salt.cloud.clouds.softlayer.show_instance(name, call=None)
    Show the details from SoftLayer concerning a guest

### 31.5.22 salt.cloud.clouds.softlayer_hw

**SoftLayer HW Cloud Module**

The SoftLayer HW cloud module is used to control access to the SoftLayer hardware cloud system

Use of this module only requires the apikey parameter. Set up the cloud configuration at:

```
/etc/salt/cloud.providers or /etc/salt/cloud.providers.d/softlayer.conf:
```

```
my-softlayer-config:
    # SoftLayer account api key
    user: MYLOGIN
    apikey: JVkb5JDGHSKUKSDJfhsdklfgsjdkfhlhjlsdfhghdgjkenrtuin
    driver: softlayer_hw
```
The SoftLayer Python Library needs to be installed in order to use the SoftLayer salt.cloud modules. See: https://pypi.python.org/pypi/SoftLayer

```python
depends softlayer

salt.cloud.clouds.softlayer_hw.avail_images(call=None)
Return a dict of all available VM images on the cloud provider.

salt.cloud.clouds.softlayer_hw.avail_locations(call=None)
List all available locations

salt.cloud.clouds.softlayer_hw.avail_sizes(call=None)
Return a dict of all available VM sizes on the cloud provider with relevant data. This data is provided in three dicts.

salt.cloud.clouds.softlayer_hw.create(vm_)
Create a single VM from a data dict

salt.cloud.clouds.softlayer_hw.destroy(name, call=None)
Destroy a node.

CLI Example:

```salt-cloud --destroy mymachine```

salt.cloud.clouds.softlayer_hw.get_configured_provider()
Return the first configured instance.

salt.cloud.clouds.softlayer_hw.get_conn(service='SoftLayer_Hardware')
Return a conn object for the passed VM data

salt.cloud.clouds.softlayer_hw.get_dependencies()
Warn if dependencies aren't met.

salt.cloud.clouds.softlayer_hw.get_location(vm_=None)
Return the location to use, in this order:

- CLI parameter
- VM parameter
- Cloud profile setting

salt.cloud.clouds.softlayer_hw.list_nodes(call=None)
Return a list of the VMs that are on the provider

salt.cloud.clouds.softlayer_hw.list_nodes_full(mask='mask[id, hostname, primaryIpAddress, primaryBackendIpAddress, processorPhysicalCoreAmount, memoryCount]', call=None)

Return a list of the VMs that are on the provider

salt.cloud.clouds.softlayer_hw.list_nodes_select(call=None)
Return a list of the VMs that are on the provider, with select fields

salt.cloud.clouds.softlayer_hw.list_vlans(call=None)
List all VLANs associated with the account

salt.cloud.clouds.softlayer_hw.script(vm_)
Return the script deployment object

salt.cloud.clouds.softlayer_hw.show_all_prices(call=None, kwargs=None)
Return a dict of all available VM images on the cloud provider.

31.5. Full list of Salt Cloud modules
salt.cloud.clouds.softlayer_hw.show_instance(name, call=None)
Show the details from SoftLayer concerning a guest

salt.cloud.clouds.softlayer_hw.show_pricing(kwargs=None, call=None)
Show pricing for a particular profile. This is only an estimate, based on unofficial pricing sources.

CLI Examples:

salt-cloud -f show_pricing my-softlayerhw-config profile=my-profile

If pricing sources have not been cached, they will be downloaded. Once they have been cached, they will not
be updated automatically. To manually update all prices, use the following command:

salt-cloud -f update_pricing <provider>

New in version 2015.8.0.

31.5.23 salt.cloud.clouds.vmware

VMware Cloud Module

New in version 2015.5.4.

The VMware cloud module allows you to manage VMware ESX, ESXi, and vCenter.

See Getting started with VMware to get started.

codeauthor Nitin Madhok <nmadhok@clemson.edu>
depends pyVmomi Python module

Note: Ensure python pyVmomi module is installed by running following one-liner check. The output should be 0.

python -c "import pyVmomi" ; echo $? 

To use this module, set up the vCenter URL, username and password in the cloud configuration at
/etc/salt/cloud.providers or /etc/salt/cloud.providers.d/vmware.conf:

my-vmware-config:
  driver: vmware
  user: 'DOMAIN\user'
  password: 'verybadpass'
  url: '10.20.30.40'

vcenter01:
  driver: vmware
  user: 'DOMAIN\user'
  password: 'verybadpass'
  url: 'vcenter01.domain.com'
  protocol: 'https'
  port: 443

vcenter02:
  driver: vmware
  user: 'DOMAIN\user'
  password: 'verybadpass'
  url: 'vcenter02.domain.com'
  protocol: 'http'
  port: 80
Note: Optionally, protocol and port can be specified if the vCenter server is not using the defaults. Default is protocol: https and port: 443.

To test the connection for my-vmware-config specified in the cloud configuration, run

test_vcenter_connection()

salt.cloud.clouds.vmware.add_host(kwargs=None, call=None)

Add a host system to the specified cluster or datacenter in this VMware environment

Note: To use this function, you need to specify esxi_host_user and esxi_host_password under your provider configuration set up at /etc/salt/cloud.providers or /etc/salt/cloud.providers.d/vmware.conf:

vcenter01:
    driver: vmware
    user: 'DOMAIN\user'
    password: 'verybadpass'
    url: 'vcenter01.domain.com'

    # Required when adding a host system
    esxi_host_user: 'root'
    esxi_host_password: 'myhostpassword'

    # Optional fields that can be specified when adding a host system

The SSL thumbprint of the host system can be optionally specified by setting esxi_host_ssl_thumbprint under your provider configuration. To get the SSL thumbprint of the host system, execute the following command from a remote server:

```
echo -n | openssl s_client -connect <YOUR-HOSTSYSTEM-DNS/IP>:443 2>/dev/null | openssl x509 -noout -fingerprint -sha1
```

CLI Example:

```
salt-cloud -f add_host my-vmware-config host="myHostSystemName" cluster="myClusterName"
salt-cloud -f add_host my-vmware-config host="myHostSystemName" datacenter="myDatacenterName"
```

salt.cloud.clouds.vmware.avail_images(call=None)

Return a list of all the templates present in this VMware environment with basic details

CLI Example:

```
salt-cloud --list-images my-vmware-config
```

salt.cloud.clouds.vmware.avail_locations(call=None)

Return a list of all the available locations/datacenters in this VMware environment

CLI Example:

```
salt-cloud --list-locations my-vmware-config
```

salt.cloud.clouds.vmware.avail_sizes(call=None)

Return a list of all the available sizes in this VMware environment.

CLI Example:

```
salt-cloud --list-sizes my-vmware-config
```

Note: Since sizes are built into templates, this function will return an empty dictionary.
salt.cloud.clouds.vmware.connect_host(kwags=None, call=None)
    Connect the specified host system in this VMware environment
    
    CLI Example:
    
    salt-cloud -f connect_host my-vmware-config host="myHostSystemName"

salt.cloud.clouds.vmware.create(vm_)
    To create a single VM in the VMware environment.
    
    Sample profile and arguments that can be specified in it can be found here.
    
    CLI Example:
    
    salt-cloud -p vmware-centos6.5 vmname

salt.cloud.clouds.vmware.create_cluster(kwags=None, call=None)
    Create a new cluster under the specified datacenter in this VMware environment
    
    CLI Example:
    
    salt-cloud -f create_cluster my-vmware-config name="myNewCluster" datacenter="datacenterName"

salt.cloud.clouds.vmware.create_datacenter(kwags=None, call=None)
    Create a new data center in this VMware environment
    
    CLI Example:
    
    salt-cloud -f create_datacenter my-vmware-config name="MyNewDatacenter"

salt.cloud.clouds.vmware.create_datastore_cluster(kwags=None, call=None)
    Create a new datastore cluster for the specified datacenter in this VMware environment
    
    CLI Example:
    
    salt-cloud -f create_datastore_cluster my-vmware-config name="datastoreClusterName" datacenter="datacenterName"

salt.cloud.clouds.vmware.create_folder(kwags=None, call=None)
    Create the specified folder path in this VMware environment
    
    Note: To create a Host and Cluster Folder under a Datacenter, specify path="/yourDatacenterName/host/yourFolderName"
    
    To create a Network Folder under a Datacenter, specify path="/yourDatacenterName/network/yourFolderName"
    
    To create a Storage Folder under a Datacenter, specify path="/yourDatacenterName/datastore/yourFolderName"
    
    To create a VM and Template Folder under a Datacenter, specify path="/yourDatacenterName/vm/yourFolderName"
    
    CLI Example:
    
    salt-cloud -f create_folder my-vmware-config path="/Local/a/b/c"
    salt-cloud -f create_folder my-vmware-config path="/MyDatacenter/vm/MyVMFolder"
    salt-cloud -f create_folder my-vmware-config path="/MyDatacenter/host/MyHostFolder"
    salt-cloud -f create_folder my-vmware-config path="/MyDatacenter/network/MyNetworkFolder"
    salt-cloud -f create_folder my-vmware-config path="/MyDatacenter/storage/MyStorageFolder"

salt.cloud.clouds.vmware.create_snapshot(name, kwags=None, call=None)
    Create a snapshot of the specified virtual machine in this VMware environment
Note: If the VM is powered on, the internal state of the VM (memory dump) is included in the snapshot by default which will also set the power state of the snapshot to ‘powered on’. You can set memdump=False to override this. This field is ignored if the virtual machine is powered off or if the VM does not support snapshots with memory dumps. Default is memdump=True

Note: If the VM is powered on when the snapshot is taken, VMware Tools can be used to quiesce the file system in the virtual machine by setting quiesce=True. This field is ignored if the virtual machine is powered off; if VMware Tools are not available or if memdump=True. Default is quiesce=False

CLI Example:

```
salt-cloud -a create_snapshot vmname snapshot_name="mySnapshot"
salt-cloud -a create_snapshot vmname snapshot_name="mySnapshot" [description="My Snapshot"] [memdump=False] [quiesce=True]
```

salt.cloud.clouds.vmware.destroy(name, call=None)
To destroy a VM from the VMware environment

CLI Example:

```
salt-cloud -d vmname
salt-cloud --destroy vmname
salt-cloud -a destroy vmname
```

salt.cloud.clouds.vmware.disconnect_host(kwargs=None, call=None)
Disconnect the specified host system in this VMware environment

CLI Example:

```
salt-cloud -f disconnect_host my-vmware-config host="myHostSystemName"
```

salt.cloud.clouds.vmware.enter_maintenance_mode(kwargs=None, call=None)
To put the specified host system in maintenance mode in this VMware environment

CLI Example:

```
salt-cloud -f enter_maintenance_mode my-vmware-config host="myHostSystemName"
```

salt.cloud.clouds.vmware.exit_maintenance_mode(kwargs=None, call=None)
To take the specified host system out of maintenance mode in this VMware environment

CLI Example:

```
salt-cloud -f exit_maintenance_mode my-vmware-config host="myHostSystemName"
```

salt.cloud.clouds.vmware.get_dependencies()
Warn if dependencies aren’t met.

salt.cloud.clouds.vmware.get_vcenter_version(kwargs=None, call=None)
Show the vCenter Server version with build number.

CLI Example:

```
salt-cloud -f get_vcenter_version my-vmware-config
```

salt.cloud.clouds.vmware.list_clusters(kwargs=None, call=None)
List all the clusters for this VMware environment

CLI Example:
salt.cloud -f list_clusters my-vmware-config

salt.cloud.clouds.vmware.list_clusters_by_datacenter(kwargs=None, call=None)
List clusters for each datacenter; or clusters for a specified datacenter in this VMware environment

To list clusters for each datacenter:
CLI Example:
salt-cloud -f list_clusters_by_datacenter my-vmware-config

To list clusters for a specified datacenter:
CLI Example:
salt-cloud -f list_clusters_by_datacenter my-vmware-config datacenter="datacenterName"

salt.cloud.clouds.vmware.list_datacenters(kwargs=None, call=None)
List all the data centers for this VMware environment

CLI Example:
salt-cloud -f list_datacenters my-vmware-config

salt.cloud.clouds.vmware.list_datastore_clusters(kwargs=None, call=None)
List all the datastore clusters for this VMware environment

CLI Example:
salt-cloud -f list_datastore_clusters my-vmware-config

salt.cloud.clouds.vmware.list_datastores(kwargs=None, call=None)
List all the datastores for this VMware environment

CLI Example:
salt-cloud -f list_datastores my-vmware-config

salt.cloud.clouds.vmware.list_dvs(kwargs=None, call=None)
List all the distributed virtual switches for this VMware environment

CLI Example:
salt-cloud -f list_dvs my-vmware-config

salt.cloud.clouds.vmware.list_folders(kwargs=None, call=None)
List all the folders for this VMware environment

CLI Example:
salt-cloud -f list_folders my-vmware-config

salt.cloud.clouds.vmware.list_hbas(kwargs=None, call=None)
List all HBAs for each host system; or all HBAs for a specified host system; or HBAs of specified type for each
host system; or HBAs of specified type for a specified host system in this VMware environment

Note: You can specify type as either parallel, iscsi, block or fibre.

To list all HBAs for each host system:
CLI Example:
salt-cloud -f list_hbas my-vmware-config

To list all HBAs for a specified host system:
CLI Example:
salt-cloud -f list_hbas my-vmware-config host="hostSystemName"

To list HBAs of specified type for each host system:
CLI Example:
salt-cloud -f list_hbas my-vmware-config type="HBAType"

To list HBAs of specified type for a specified host system:
CLI Example:
salt-cloud -f list_hbas my-vmware-config host="hostSystemName" type="HBAType"

salt.cloud.clouds.vmware.list_hosts (kwargs=None, call=None)
List all the hosts for this VMware environment
CLI Example:
salt-cloud -f list_hosts my-vmware-config

salt.cloud.clouds.vmware.list_hosts_by_cluster (kwargs=None, call=None)
List hosts for each cluster; or hosts for a specified cluster in this VMware environment
To list hosts for each cluster:
CLI Example:
salt-cloud -f list_hosts_by_cluster my-vmware-config

To list hosts for a specified cluster:
CLI Example:
salt-cloud -f list_hosts_by_cluster my-vmware-config cluster="clusterName"

salt.cloud.clouds.vmware.list_hosts_by_datacenter (kwargs=None, call=None)
List hosts for each datacenter; or hosts for a specified datacenter in this VMware environment
To list hosts for each datacenter:
CLI Example:
salt-cloud -f list_hosts_by_datacenter my-vmware-config

To list hosts for a specified datacenter:
CLI Example:
salt-cloud -f list_hosts_by_datacenter my-vmware-config datacenter="datacenterName"

salt.cloud.clouds.vmware.list_networks (kwargs=None, call=None)
List all the standard networks for this VMware environment
CLI Example:
salt-cloud -f list_networks my-vmware-config

`salt.cloud.clouds.vmware.list_nodes`(kwargs=None, call=None)
Return a list of all VMs and templates that are on the specified provider, with basic fields

CLI Example:
salt-cloud -f list_nodes my-vmware-config

to return a list of all VMs and templates present on ALL configured providers, with basic fields:

CLI Example:
salt-cloud -Q

`salt.cloud.clouds.vmware.list_nodes_full`(kwargs=None, call=None)
Return a list of all VMs and templates that are on the specified provider, with full details

CLI Example:
salt-cloud -f list_nodes_full my-vmware-config

to return a list of all VMs and templates present on ALL configured providers, with full details:

CLI Example:
salt-cloud -F

`salt.cloud.clouds.vmware.list_nodes_min`(kwargs=None, call=None)
Return a list of all VMs and templates that are on the specified provider, with no details

CLI Example:
salt-cloud -f list_nodes_min my-vmware-config

`salt.cloud.clouds.vmware.list_nodes_select`(call=None)
Return a list of all VMs and templates that are on the specified provider, with fields specified under query.selection in /etc/salt/cloud

CLI Example:
salt-cloud -f list_nodes_select my-vmware-config

to return a list of all VMs and templates present on ALL configured providers, with fields specified under query.selection in /etc/salt/cloud:

CLI Example:
salt-cloud -S

`salt.cloud.clouds.vmware.list_resourcepools`(kwargs=None, call=None)
List all the resource pools for this VMware environment

CLI Example:
salt-cloud -f list_resourcepools my-vmware-config

`salt.cloud.clouds.vmware.list_snapshots`(kwargs=None, call=None)
List snapshots either for all VMs and templates or for a specific VM/template in this VMware environment

To list snapshots for all VMs and templates:

CLI Example:
To list snapshots for a specific VM/template:

**CLI Example:**

```bash
salt-cloud -f list_snapshots my-vmware-config name="vmname"
```

### `salt.cloud.clouds.vmware.list_templates` (kwargs=None, call=None)

List all the templates present in this VMware environment

**CLI Example:**

```bash
salt-cloud -f list_templates my-vmware-config
```

### `salt.cloud.clouds.vmware.list_vapps` (kwargs=None, call=None)

List all the vApps for this VMware environment

**CLI Example:**

```bash
salt-cloud -f list_vapps my-vmware-config
```

### `salt.cloud.clouds.vmware.reboot_host` (kwargs=None, call=None)

Reboot the specified host system in this VMware environment

**Note:** If the host system is not in maintenance mode, it will not be rebooted. If you want to reboot the host system regardless of whether it is in maintenance mode, set `force=True`. Default is `force=False`.

**CLI Example:**

```bash
salt-cloud -f reboot_host my-vmware-config host="myHostSystemName" [force=True]
```

### `salt.cloud.clouds.vmware.remove_all_snapshots` (name, kwargs=None, call=None)

Remove all the snapshots present for the specified virtual machine.

**Note:** All the snapshots higher up in the hierarchy of the current snapshot tree are consolidated and their virtual disks are merged. To override this behavior and only remove all snapshots, set `merge_snapshots=False`. Default is `merge_snapshots=True`.

**CLI Example:**

```bash
salt-cloud -a remove_all_snapshots vmname [merge_snapshots=False]
```

### `salt.cloud.clouds.vmware.remove_host` (kwargs=None, call=None)

Remove the specified host system from this VMware environment

**CLI Example:**

```bash
salt-cloud -f remove_host my-vmware-config host="myHostSystemName"
```

### `salt.cloud.clouds.vmware.rescan_hba` (kwargs=None, call=None)

To rescan a specified HBA or all the HBAs on the Host System

**CLI Example:**

```bash
salt-cloud -f rescan_hba my-vmware-config host="hostSystemName"
salt-cloud -f rescan_hba my-vmware-config hba="hbaDeviceName" host="hostSystemName"
```
salt.cloud.clouds.vmware.reset(name, call=None)

To reset a VM using its name

CLI Example:
```
salt-cloud -a reset vmname
```

salt.cloud.clouds.vmware.revert_to_snapshot(name, kwargs=None, call=None)

Revert virtual machine to its current snapshot. If no snapshot exists, the state of the virtual machine remains unchanged.

**Note:** The virtual machine will be powered on if the power state of the snapshot when it was created was set to "Powered On". Set `power_off=True` so that the virtual machine stays powered off regardless of the power state of the snapshot when it was created. Default is `power_off=False`.

If the power state of the snapshot when it was created was "Powered On" and if `power_off=True`, the VM will be put in suspended state after it has been reverted to the snapshot.

CLI Example:
```
salt-cloud -a revert_to_snapshot vmname [power_off=True]
```

salt.cloud.clouds.vmware.show_instance(name, call=None)

List all available details of the specified VM

CLI Example:
```
salt-cloud -a show_instance vmname
```

salt.cloud.clouds.vmware.start(name, call=None)

To start/power on a VM using its name

CLI Example:
```
salt-cloud -a start vmname
```

salt.cloud.clouds.vmware.stop(name, call=None)

To stop/power off a VM using its name

CLI Example:
```
salt-cloud -a stop vmname
```

salt.cloud.clouds.vmware.suspend(name, call=None)

To suspend a VM using its name

CLI Example:
```
salt-cloud -a suspend vmname
```

salt.cloud.clouds.vmware.terminate(name, call=None)

To do an immediate power off of a VM using its name. A SIGKILL is issued to the vmx process of the VM

CLI Example:
```
salt-cloud -a terminate vmname
```

salt.cloud.clouds.vmware.test_vcenter_connection(kwargs=None, call=None)

Test if the connection can be made to the vCenter server using the specified credentials inside `/etc/salt/cloud.providers` or `/etc/salt/cloud.providers.d/vmware.conf`

CLI Example:
salt-cloud -f test_vcenter_connection my-vmware-config

```
salt.cloud.clouds.vmware.upgrade_tools(name, reboot=False, call=None)
```
To upgrade VMware Tools on a specified virtual machine.

**Note:** If the virtual machine is running Windows OS, use `reboot=True` to reboot the virtual machine after VMware tools upgrade. Default is `reboot=False`

**CLI Example:**
```
salt-cloud -a upgrade_tools vmname
salt-cloud -a upgrade_tools vmname reboot=True
```

```
salt.cloud.clouds.vmware.upgrade_tools_all(call=None)
```
To upgrade VMware Tools on all virtual machines present in the specified provider.

**Note:** If the virtual machine is running Windows OS, this function will attempt to suppress the automatic reboot caused by a VMware Tools upgrade.

**CLI Example:**
```
salt-cloud -f upgrade_tools_all my-vmware-config
```

### 31.5.24 salt.cloud.clouds.vsphere

**vSphere Cloud Module**

**Note:** Deprecated since version Carbon: The `vsphere` cloud driver has been deprecated in favor of the `vmware` cloud driver and will be removed in Salt Carbon. Please refer to [Getting started with VMware](#) to get started and convert your vsphere provider configurations to use the vmware driver.

The vSphere cloud module is used to control access to VMware vSphere.

**depends** PySphere Python module >= 0.1.8

Note: Ensure python pysphere module is installed by running following one-liner check. The output should be 0.
```
python -c "import pysphere" ; echo $?  
# if this fails install using
pip install https://pysphere.googlecode.com/files/pysphere-0.1.8.zip
```

Use of this module only requires a URL, username and password. Set up the cloud configuration at:

```
/etc/salt/cloud.providers or /etc/salt/cloud.providers.d/vsphere.conf:
```

```
my-vsphere-config:
  driver: vsphere
  user: myuser
  password: verybadpass
  template_user: root
  template_password: mybadVMpassword
  url: 'https://10.1.1.1:443'
```

Note: Your URL may or may not look like any of the following, depending on how your VMWare installation is configured:

---

### 31.5. Full list of Salt Cloud modules

523
folder Name of the folder that will contain the new VM. If not set, the VM will be added to the folder the original VM belongs to.

resourcepool MOR of the resourcepool to be used for the new vm. If not set, it uses the same resourcepool than the original vm.

datastore MOR of the datastore where the virtual machine should be located. If not specified, the current datastore is used.

host MOR of the host where the virtual machine should be registered.

   **Id not specified:**
   - if resourcepool is not specified, current host is used.
   - if resourcepool is specified, and the target pool represents a stand-alone host, the host is used.
   - if resourcepool is specified, and the target pool represents a DRS-enabled cluster, a host selected by DRS is used.
   - if resourcepool is specified and the target pool represents a cluster without DRS enabled, an InvalidArgument exception will be thrown.

template Specifies whether or not the new virtual machine should be marked as a template. Default is False.

template_user Specifies the user to access the VM. Should be

template_password The password with which to access the VM.

sudo The user to access the VM with sudo privileges.

   New in version 2015.5.2.

sudo_password The password corresponding to the sudo user to access the VM with sudo privileges.

   New in version 2015.5.2.

salt.cloud.clouds.vsphere.avail_images() Return a dict of all available VM images on the cloud provider.

salt.cloud.clouds.vsphere.avail_locations() Return a dict of all available VM locations on the cloud provider with relevant data

salt.cloud.clouds.vsphere.create(vm_) Create a single VM from a data dict

salt.cloud.clouds.vsphere.create_snapshot(**kwargs=\{None, call=None\}) Create a snapshot

   @name: Name of the virtual machine to snapshot @snapshot: Name of the snapshot @description: Description of the snapshot (optional) @memory: Dump of the internal state of the virtual machine (optional)

   New in version 2015.8.0.

   CLI Example:

```
salt-cloud -f create_snapshot [PROVIDER] name=myvm.example.com snapshot=mysnapshot
salt-cloud -f create_snapshot [PROVIDER] name=myvm.example.com snapshot=mysnapshot description=''
```
**salt.cloud.clouds.vsphere.delete_snapshot** *(kwargs=\text{None}, \text{call}=\text{None})*
Delete snapshot

New in version 2015.8.0.

CLI Example:
```
salt-cloud -f delete_snapshot [PROVIDER] name=myvm.example.com snapshot=mysnapshot
```

**salt.cloud.clouds.vsphere.destroy**(name, \text{call}=\text{None})*
Destroy a node.

CLI Example:
```
salt-cloud --destroy mymachine
```

**salt.cloud.clouds.vsphere.get_configured_provider()**
Return the first configured instance.

**salt.cloud.clouds.vsphere.get_conn()**
Return a conn object for the passed VM data

**salt.cloud.clouds.vsphere.get_dependencies()**
Warn if dependencies aren’t met.

**salt.cloud.clouds.vsphere.list_clusters**(kwargs=\text{None}, \text{call}=\text{None})*
List the clusters for this VMware environment

**salt.cloud.clouds.vsphere.list_datacenters**(kwargs=\text{None}, \text{call}=\text{None})*
List the data centers for this VMware environment

**salt.cloud.clouds.vsphere.list_datastores**(kwargs=\text{None}, \text{call}=\text{None})*
List the datastores for this VMware environment

**salt.cloud.clouds.vsphere.list_folders**(kwargs=\text{None}, \text{call}=\text{None})*
List the folders for this VMware environment

**salt.cloud.clouds.vsphere.list_hosts**(kwargs=\text{None}, \text{call}=\text{None})*
List the hosts for this VMware environment

**salt.cloud.clouds.vsphere.list_nodes**(kwargs=\text{None}, \text{call}=\text{None})*
Return a list of the VMs that are on the provider, with basic fields

**salt.cloud.clouds.vsphere.list_nodes_full**(kwargs=\text{None}, \text{call}=\text{None})*
Return a list of the VMs that are on the provider with full details

**salt.cloud.clouds.vsphere.list_nodes_min**(kwargs=\text{None}, \text{call}=\text{None})*
Return a list of the nodes in the provider, with no details

**salt.cloud.clouds.vsphere.list_nodes_select()**
Return a list of the VMs that are on the provider, with select fields

**salt.cloud.clouds.vsphere.list_resourcepools**(kwargs=\text{None}, \text{call}=\text{None})*
List the hosts for this VMware environment

**salt.cloud.clouds.vsphere.reset**(name, \text{call}=\text{None})*
To reset a VM using its name

CLI Example:
```
salt-cloud -a reset vmname
```

**salt.cloud.clouds.vsphere.script**(vm_)*
Return the script deployment object
salt.cloud.clouds.vsphere.show_instance(name, call=None)
    Show the details from vSphere concerning a guest

salt.cloud.clouds.vsphere.snapshot_list(kwarg=None, call=None)
    List virtual machines with snapshots
    New in version 2015.8.0.
    CLI Example:
    ```
salt-cloud -f snapshot_list
    ```

salt.cloud.clouds.vsphere.start(name, call=None)
    To start/power on a VM using its name
    CLI Example:
    ```
salt-cloud -a start vmname
    ```

salt.cloud.clouds.vsphere.status(name, call=None)
    To check the status of a VM using its name
    CLI Example:
    ```
salt-cloud -a status vmname
    ```

salt.cloud.clouds.vsphere.stop(name, call=None)
    To stop/power off a VM using its name
    CLI Example:
    ```
salt-cloud -a stop vmname
    ```

salt.cloud.clouds.vsphere.suspend(name, call=None)
    To suspend a VM using its name
    CLI Example:
    ```
salt-cloud -a suspend vmname
    ```

salt.cloud.clouds.vsphere.wait_for_ip(vm_)

31.6 Configuration file examples

- Example master configuration file
- Example minion configuration file

31.6.1 Example master configuration file

```
##### Primary configuration settings #####
###############################################################
# This configuration file is used to manage the behavior of the Salt Master. #
# Values that are commented out but have an empty line after the comment are #
# defaults that do not need to be set in the config. If there is no blank line #
# after the comment then the value is presented as an example and is not the #
# default.
```
# Per default, the master will automatically include all config files
# from master.d/*.conf (master.d is a directory in the same directory
# as the main master config file).
#default_include: master.d/*.conf

# The address of the interface to bind to:
#interface: 0.0.0.0

# Whether the master should listen for IPv6 connections. If this is set to True,
# the interface option must be adjusted, too. (For example: "interface: '::")
#ipv6: False

# The tcp port used by the publisher:
#publish_port: 4505

# The user under which the salt master will run. Salt will update all
# permissions to allow the specified user to run the master. The exception is
# the job cache, which must be deleted if this user is changed. If the
# modified files cause conflicts, set verify_env to False.
#user: root

# Max open files
#
# Each minion connecting to the master uses AT LEAST one file descriptor, the
# master subscription connection. If enough minions connect you might start
# seeing on the console (and then salt-master crashes):
# Too many open files (tcp_listener.cpp:335)
# Aborted (core dumped)
#
# By default this value will be the one of `ulimit -Hn`, ie, the hard limit for
# max open files.
#
# If you wish to set a different value than the default one, uncomment and
# configure this setting. Remember that this value CANNOT be higher than the
# hard limit. Raising the hard limit depends on your OS and/or distribution,
# a good way to find the limit is to search the internet. For example:
# raise max open files hard limit debian
#
#max_open_files: 100000

# The number of worker threads to start. These threads are used to manage
# return calls made from minions to the master. If the master seems to be
# running slowly, increase the number of threads. This setting can not be
# set lower than 3.
#worker_threads: 5

# The port used by the communication interface. The ret (return) port is the
# interface used for the file server, authentication, job returns, etc.
#ret_port: 4506

# Specify the location of the daemon process ID file:
#pidfile: /var/run/salt-master.pid

# The root directory prepended to these options: pki_dir, cachedir,
# sock_dir, log_file, autosign_file, autoreject_file, extension_modules,
# key_logfile, pidfile:
#root_dir: /
# Directory used to store public key data:
#pki_dir: /etc/salt/pki/master

# Directory to store job and cache data:
# This directory may contain sensitive data and should be protected accordingly.
#
#cachedir: /var/cache/salt/master

# Directory for custom modules. This directory can contain subdirectories for
# each of Salt's module types such as "runners", "output", "wheel", "modules",
# "states", "returners", etc.
#extension_modules: <no default>

# Directory for custom modules. This directory can contain subdirectories for
# each of Salt's module types such as "runners", "output", "wheel", "modules",
# "states", "returners", etc.
# Like 'extension_modules' but can take an array of paths
#module_dirs: <no default>
# - /var/cache/salt/minion/extmods

# Verify and set permissions on configuration directories at startup:
#verify_env: True

# Set the number of hours to keep old job information in the job cache:
#keep_jobs: 24

# Set the default timeout for the salt command and api. The default is 5
# seconds.
#timeout: 5

# The loop_interval option controls the seconds for the master's maintenance
# process check cycle. This process updates file server backends, cleans the
# job cache and executes the scheduler.
#loop_interval: 60

# Set the default outputter used by the salt command. The default is "nested".
#output: nested

# Return minions that timeout when running commands like test.ping
#show_timeout: True

# By default, output is colored. To disable colored output, set the color value
# to False.
#color: True

# Do not strip off the colored output from nested results and state outputs
# (true by default).
#strip_colors: False

# Set the directory used to hold unix sockets:
#sock_dir: /var/run/salt/master

# The master can take a while to start up when lspci and/or dmidecode is used
# to populate the grains for the master. Enable if you want to see GPU hardware
# data for your master.
#enable_gpu_grains: False

# The master maintains a job cache. While this is a great addition, it can be
# a burden on the master for larger deployments (over 5000 minions).
Disabling the job cache will make previously executed jobs unavailable to
the jobs system and is not generally recommended.

```
#job_cache: True
```

# Cache minion grains and pillar data in the cachedir.
```
#minion_data_cache: True
```

# Store all returns in the given returner.
Setting this option requires that any returner-specific configuration also
be set. See various returners in salt/returners for details on required
configuration values. (See also, event_return_queue below.)
```
#event_return: mysql
```

On busy systems, enabling event_returns can cause a considerable load on
the storage system for returners. Events can be queued on the master and
stored in a batched fashion using a single transaction for multiple events.
By default, events are not queued.

```
#event_return_queue: 0
```

# Only events returns matching tags in a whitelist
```
#event_return_whitelist:
#    - salt/master/a_tag
#    - salt/master/another_tag
```

# Store all event returns _except_ the tags in a blacklist
```
#event_return_blacklist:
#    - salt/master/not_this_tag
#    - salt/master/or_this_one
```

Passing very large events can cause the minion to consume large amounts of
memory. This value tunes the maximum size of a message allowed onto the
master event bus. The value is expressed in bytes.
```
#max_event_size: 1048576
```

By default, the master AES key rotates every 24 hours. The next command
following a key rotation will trigger a key refresh from the minion which may
result in minions which do not respond to the first command after a key refresh.

```
#ping_on_rotate: False
```

To tell the master to ping all minions immediately after an AES key refresh, set
`ping_on_rotate` to True. This should mitigate the issue where a minion does not
appear to initially respond after a key is rotated.

```
# Note that ping_on_rotate may cause high load on the master immediately after
# the key rotation event as minions reconnect. Consider this carefully if this
# salt master is managing a large number of minions.
```

If disabled, it is recommended to handle this event by listening for the
'aes_key_rotate' event with the 'key' tag and acting appropriately.
```
# WARNING: This may have security implications if compromised minions auth with
# a previous deleted minion ID.
```
#preserve_minion_cache: False

# If max_minions is used in large installations, the master might experience
# high-load situations because of having to check the number of connected
# minions for every authentication. This cache provides the minion-ids of
# all connected minions to all MWorker-processes and greatly improves the
# performance of max_minions.
# con_cache: False

# The master can include configuration from other files. To enable this,
# pass a list of paths to this option. The paths can be either relative or
# absolute; if relative, they are considered to be relative to the directory
# the main master configuration file lives in (this file). Paths can make use
# of shell-style globbing. If no files are matched by a path passed to this
# option, then the master will log a warning message.
#
# Include a config file from some other path:
# include: /etc/salt/extra_config
#
# Include config from several files and directories:
# include:
# - /etc/salt/extra_config

####### Security settings #######

Security settings

# Enable "open mode", this mode still maintains encryption, but turns off
# authentication, this is only intended for highly secure environments or for
# the situation where your keys end up in a bad state. If you run in open mode
# you do so at your own risk!
#open_mode: False

# Enable auto_accept, this setting will automatically accept all incoming
# public keys from the minions. Note that this is insecure.
#auto_accept: False

# Time in minutes that a incoming public key with a matching name found in
# pki_dir/minion_autosign/keyid is automatically accepted. Expired autosign keys
# are removed when the master checks the minion_autosign directory.
# 0 equals no timeout
# autosign_timeout: 120

# If the autosign_file is specified, incoming keys specified in the
# autosign_file will be automatically accepted. This is insecure. Regular
# expressions as well as globing lines are supported.
# autosign_file: /etc/salt/autosign.conf

# Works like autosign_file, but instead allows you to specify minion IDs for
# which keys will automatically be rejected. Will override both membership in
# the autosign_file and the auto_accept setting.
# autoreject_file: /etc/salt/autoreject.conf

# Enable permissive access to the salt keys. This allows you to run the
# master or minion as root, but have a non-root group be given access to
# your pki_dir. To make the access explicit, root must belong to the group
# you've given access to. This is potentially quite insecure. If an autosign_file
# is specified, enabling permissive_pki_access will allow group access to that
# specific file.
#permissive_pki_access: False

# Allow users on the master access to execute specific commands on minions.
# This setting should be treated with care since it opens up execution
# capabilities to non root users. By default this capability is completely
# disabled.
#client_acl:
# larry:
#  - test.ping
#  - network.*
#
# Blacklist any of the following users or modules
#
# This example would blacklist all non sudo users, including root from
# running any commands. It would also blacklist any use of the "cmd"
# module. This is completely disabled by default.
#client_acl_blacklist:
# users:
#  - root
#  - '^(?![?!sudo_]).*$' # all non sudo users
# modules:
#  - cmd

# Enforce client_acl & client_acl_blacklist when users have sudo
# access to the salt command.
#
#sudo_acl: False

# The external auth system uses the Salt auth modules to authenticate and
# validate users to access areas of the Salt system.
#external_auth:
# pam:
#  fred:
#   - test.*
#
# Time (in seconds) for a newly generated token to live. Default: 12 hours
#token_expire: 43200

# Allow minions to push files to the master. This is disabled by default, for
# security purposes.
#file_recv: False

# Set a hard-limit on the size of the files that can be pushed to the master.
# It will be interpreted as megabytes. Default: 100
#file_recv_max_size: 100

# Signature verification on messages published from the master.
# This causes the master to cryptographically sign all messages published to its event
# bus, and minions then verify that signature before acting on the message.
#
# This is False by default.
#
# Note that to facilitate interoperability with masters and minions that are different
# versions, if sign_pub_messages is True but a message is received by a minion with
# no signature, it will still be accepted, and a warning message will be logged.
# Conversely, if sign_pub_messages is False, but a minion receives a signed
# message it will be accepted, the signature will not be checked, and a warning message
# will be logged. This behavior went away in Salt 2014.1.0 and these two situations
# will cause minion to throw an exception and drop the message.
# sign_pub_messages: False

##### Salt-SSH Configuration #####

# Pass in an alternative location for the salt-ssh roster file
#roster_file: /etc/salt/roster

# Pass in minion option overrides that will be inserted into the SHIM for
# salt-ssh calls. The local minion config is not used for salt-ssh. Can be
# overridden on a per-minion basis in the roster (`minion_opts`)
#ssh_minion_opts:
#  gpg_keydir: /root/gpg

##### Master Module Management #####

# Manage how master side modules are loaded.

# Add any additional locations to look for master runners:
#runner_dirs: []

# Enable Cython for master side modules:
#cython_enable: False

##### State System settings #####

# The state system uses a "top" file to tell the minions what environment to
# use and what modules to use. The state_top file is defined relative to the
# root of the base environment as defined in "File Server settings" below.
#state_top: top.sls

# The master_tops option replaces the external_nodes option by creating
# a pluggable system for the generation of external top data. The external_nodes
# option is deprecated by the master_tops option.
#master_tops:
#  ext_nodes: <Shell command which returns yaml>
#master_tops: {}
# (block, not variable tag!). Defaults to False, corresponds to the Jinja
# environment init variable "trim_blocks".
#jinja_trim_blocks: False
#
# If this is set to True leading spaces and tabs are stripped from the start
# of a line to a block. Defaults to False, corresponds to the Jinja
# environment init variable "lstrip_blocks".
#jinja_lstrip_blocks: False
#
# The failhard option tells the minions to stop immediately after the first
# failure detected in the state execution, defaults to False
#failhard: False
#
# The state_verbose and state_output settings can be used to change the way
# state system data is printed to the display. By default all data is printed.
# The state_verbose setting can be set to True or False, when set to False
# all data that has a result of True and no changes will be suppressed.
#state_verbose: True
#
# The state_output setting changes if the output is the full multi line
# output for each changed state if set to 'full', but if set to 'terse'
# the output will be shortened to a single line. If set to 'mixed', the output
# will be terse unless a state failed, in which case that output will be full.
# If set to 'changes', the output will be full unless the state didn't change.
#state_output: full
#
# Automatically aggregate all states that have support for mod_aggregate by
# setting to 'True'. Or pass a list of state module names to automatically
# aggregate just those types.
#
# state_aggregate:
# - pkg
#
#state_aggregate: False
#
# Send progress events as each function in a state run completes execution
# by setting to 'True'. Progress events are in the format
# 'salt/job/<JID>/prog/<MID>/<RUN NUM>'
#state_events: False
#
##### File Server settings #####
##########################################
# Salt runs a lightweight file server written in zeromq to deliver files to
# minions. This file server is built into the master daemon and does not
# require a dedicated port.
#
# The file server works on environments passed to the master, each environment
# can have multiple root directories, the subdirectories in the multiple file
# roots cannot match, otherwise the downloaded files will not be able to be
# reliably ensured. A base environment is required to house the top file.
# Example:
# file_roots:
# base:
# - /srv/salt/
# dev:
# - /srv/salt/dev/services
# - /srv/salt/dev/states
# prod:
# - /srv/salt/prod/services
# - /srv/salt/prod/states
#
#file_roots:
# base:
# - /srv/salt
#

# When using multiple environments, each with their own top file, the
# default behaviour is an unordered merge. To prevent top files from
# being merged together and instead to only use the top file from the
# requested environment, set this value to 'same'.
#top_file_merging_strategy: merge
#
# To specify the order in which environments are merged, set the ordering
# in the env_order option. Given a conflict, the last matching value will
# win.
#env_order: ['base', 'dev', 'prod']
#
# If top_file_merging_strategy is set to 'same' and an environment does not
# contain a top file, the top file in the environment specified by default_top
# will be used instead.
#default_top: base
#
# The hash_type is the hash to use when discovering the hash of a file on
# the master server. The default is md5, but sha1, sha224, sha256, sha384
# and sha512 are also supported.
#
# Prior to changing this value, the master should be stopped and all Salt
# caches should be cleared.
#hash_type: md5
#
# The buffer size in the file server can be adjusted here:
#file_buffer_size: 1048576
#
# A regular expression (or a list of expressions) that will be matched
# against the file path before syncing the modules and states to the minions.
# This includes files affected by the file.recurse state.
# For example, if you manage your custom modules and states in subversion
# and don't want all the '.svn' folders and content synced to your minions,
# you could set this to '/\./svn($|/)'. By default nothing is ignored.
#file_ignore_regex:
# - '/\./svn($|/)'
# - '/\./git($|/)'
#
# A file glob (or list of file globs) that will be matched against the file
# path before syncing the modules and states to the minions. This is similar
# to file_ignore_regex above, but works on globs instead of regex. By default
# nothing is ignored.
#file_ignore_glob:
# - '*.pyc'
# - '*somefolder/*.bak'
# - '*.swp'

# File Server Backend
#
# Salt supports a modular fileserver backend system, this system allows
# the salt master to link directly to third party systems to gather and
# manage the files available to minions. Multiple backends can be
# configured and will be searched for the requested file in the order in which
# they are defined here. The default setting only enables the standard backend
# "roots" which uses the "file_roots" option.
#fileserver_backend:
# - roots
#
# To use multiple backends list them in the order they are searched:
#fileserver_backend:
# - git
# - roots
#
# Uncomment the line below if you do not want the file_server to follow
# symlinks when walking the filesystem tree. This is set to True
# by default. Currently this only applies to the default roots
#fileserver_followsymlinks: False
#
# Uncomment the line below if you do not want symlinks to be
# treated as the files they are pointing to. By default this is set to
# False. By uncommenting the line below, any detected symlink while listing
# files on the Master will not be returned to the Minion.
#fileserver_ignoresymlinks: True
#
# By default, the Salt fileserver recurses fully into all defined environments
# to attempt to find files. To limit this behavior so that the fileserver only
# traverses directories with SLS files and special Salt directories like _modules,
# enable the option below. This might be useful for installations where a file root
# has a very large number of files and performance is impacted. Default is False.
#fileserver_limit_traversal: False
#
# The fileserver can fire events off every time the fileserver is updated,
# these are disabled by default, but can be easily turned on by setting this
# flag to True
#fileserver_events: False

# Git File Server Backend Configuration
#
# Gitfs can be provided by one of two python modules: GitPython or pygit2. If
# using pygit2, both libgit2 and git must also be installed.
#gitfs_provider: gitpython
#
# When using the git fileserver backend at least one git remote needs to be
# defined. The user running the salt master will need read access to the repo.
# The repos will be searched in order to find the file requested by a client
# and the first repo to have the file will return it.
# When using the git backend branches and tags are translated into salt
# environments.
# Note: file:// repos will be treated as a remote, so refs you want used must
# exist in that repo as *local* refs.
#gitfs_remotes:
# - git://github.com/saltstack/salt-states.git
# - file:///var/git/saltmaster
#
# The gitfs_ssl_verify option specifies whether to ignore ssl certificate
# errors when contacting the gitfs backend. You might want to set this to
# false if you're using a git backend that uses a self-signed certificate but
# keep in mind that setting this flag to anything other than the default of True
# is a security concern, you may want to try using the ssh transport.
#gitfs_ssl_verify: True
#
# The gitfs_root option gives the ability to serve files from a subdirectory
# within the repository. The path is defined relative to the root of the
# repository and defaults to the repository root.
#gitfs_root: somefolder/otherfolder
#
### Pillar settings ###
Salt Pillars allow for the building of global data that can be made selectively
available to different minions based on minion grain filtering. The Salt
Pillar is laid out in the same fashion as the file server, with environments,
a top file and sls files. However, pillar data does not need to be in the
highstate format, and is generally just key/value pairs.
#pillar_roots:
#  base:
#  - /srv/pillar
#ext_pillar:
#  - hiera: /etc/hiera.yaml
#  - cmd_yaml: cat /etc/salt/yaml

# The ext_pillar_first option allows for external pillar sources to populate
# before file system pillar. This allows for targeting file system pillar from
# ext_pillar.
#ext_pillar_first: False

# The pillar_gitfs_ssl_verify option specifies whether to ignore ssl certificate
# errors when contacting the pillar gitfs backend. You might want to set this to
# false if you're using a git backend that uses a self-signed certificate but
# keep in mind that setting this flag to anything other than the default of True
# is a security concern, you may want to try using the ssh transport.
#pillar_gitfs_ssl_verify: True

# The pillar_opts option adds the master configuration file data to a dict in
# the pillar called "master". This is used to set simple configurations in the
# master config file that can then be used on minions.
#pillar_opts: False

# The pillar_safe_render_error option prevents the master from passing pillar
# render errors to the minion. This is set on by default because the error could
# contain templating data which would give that minion information it shouldn't
# have, like a password! When set true the error message will only show:
#  Rendering SLS 'my.sls' failed. Please see master log for details.
#pillar_safe_render_error: True

# The pillar_source_merging_strategy option allows you to configure merging strategy
# between different sources. It accepts four values: recurse, aggregate, overwrite,
# or smart. Recurse will merge recursively mapping of data. Aggregate instructs
# aggregation of elements between sources that use the `!yamlex` renderer. Overwrite
# will overwrite elements according the order in which they are processed. This is
# behavior of the 2014.1 branch and earlier. Smart guesses the best strategy based
# on the "renderer" setting and is the default value.
#pillar_source_merging_strategy: smart
# Syndic settings

The Salt syndic is used to pass commands through a master from a higher master. Using the syndic is simple. If this is a master that will have syndic servers(s) below it, then set the "order_masters" setting to True. If this is a master that will be running a syndic daemon for passthrough, then the "syndic_master" setting needs to be set to the location of the master server to receive commands from.

Set the order_masters setting to True if this master will command lower masters' syndic interfaces.

```yaml
#order_masters: False
```

If this master will be running a salt syndic daemon, syndic_master tells this master where to receive commands from.

```yaml
#syndic_master: masterofmaster
```

This is the 'ret_port' of the MasterOfMaster:

```yaml
#syndic_master_port: 4506
```

PID file of the syndic daemon:

```yaml
#syndic_pidfile: /var/run/salt-syndic.pid
```

LOG file of the syndic daemon:

```yaml
#syndic_log_file: syndic.log
```

# Peer Publish settings

Salt minions can send commands to other minions, but only if the minion is allowed to. By default "Peer Publication" is disabled, and when enabled it is enabled for specific minions and specific commands. This allows secure compartmentalization of commands based on individual minions.

The configuration uses regular expressions to match minions and then a list of regular expressions to match functions. The following will allow the minion authenticated as foo.example.com to execute functions from the test and pkg modules.

```yaml
#peer:
# foo.example.com:
# - test.*
# - pkg.*
```

This will allow all minions to execute all commands:

```yaml
#peer:
# .*:
# - .*
```

This is not recommended, since it would allow anyone who gets root on any single minion to instantly have root on all of the minions!

Minions can also be allowed to execute runners from the salt master. Since executing a runner from the minion could be considered a security risk, it needs to be enabled. This setting functions just like the peer setting except that it opens up runners instead of module functions.

```yaml
# All peer runner support is turned off by default and must be enabled before
```
# using. This will enable all peer runners for all minions:
#peer_run:
#  .*:
#    - .*
#    
# To enable just the manage.up runner for the minion foo.example.com:
#peer_run:
#  foo.example.com:
#    - manage.up
#
##### Mine settings #####
##########################################
# Restrict mine.get access from minions. By default any minion has a full access
# to get all mine data from master cache. In acl definition below, only pcre matches
# are allowed.
#mine_get:
#  .*:
#    - .*
#    
# The example below enables minion foo.example.com to get 'network.interfaces' mine
data only, minions web* to get all network.* and disk.* mine data and all other
# minions won't get any mine data.
#mine_get:
#  foo.example.com:
#    - network.interfaces
#  web.*:
#    - network.*
#    - disk.*

##### Logging settings #####
##########################################
# The location of the master log file
# The master log can be sent to a regular file, local path name, or network
# location. Remote logging works best when configured to use rsyslogd(8) (e.g.:
# `file:///dev/log`), with rsyslogd(8) configured for network logging. The URI
# format is: <file|udp|tcp>:<host|socketpath>:<port-if-required>/<log-facility>
#log_file: /var/log/salt/master
#log_file: file:///dev/log
#log_file: udp://loghost:10514

#log_file: /var/log/salt/master
#key_logfile: /var/log/salt/key

# The level of messages to send to the console.
# One of 'garbage', 'trace', 'debug', 'info', 'warning', 'error', 'critical'.
#log_level: warning

# The level of messages to send to the log file.
# One of 'garbage', 'trace', 'debug', 'info', 'warning', 'error', 'critical'.
# If using 'log_granular_levels' this must be set to the highest desired level.
#log_level_logfile: warning

# The date and time format used in log messages. Allowed date/time formatting
# can be seen here: http://docs.python.org/library/time.html#time.strftime
#log_datefmt: '%H:%M:%S'
#log_datefmt_logfile: '%Y-%m-%d %H:%M:%S'
# The format of the console logging messages. Allowed formatting options can
# be seen here: http://docs.python.org/library/logging.html#logrecord-attributes
#
# Console log colors are specified by these additional formatters:
#
# %(colorlevel)s
# %(colormsg)s
#
# Since it is desirable to include the surrounding brackets, '[' and ']', in
# the coloring of the messages, these color formatters also include padding as
# well. Color LogRecord attributes are only available for console logging.
#
#log_fmt_console: '%(colorlevel)s %(colormsg)s'
#log_fmt_console: '
#log_fmt_logfile: '%(asctime)s,%(msecs)03.0f [%(name)-17s][%(levelname)-8s] %(message)s'
#
# This can be used to control logging levels more specifically. This
# example sets the main salt library at the 'warning' level, but sets
# 'salt.modules' to log at the 'debug' level:
#log_granular_levels:
#   'salt': 'warning'
#   'salt.modules': 'debug'
#
#log_granular_levels: {}

##### Node Groups ####
############################################################
# Node groups allow for logical groupings of minion nodes. A group consists of a group
# name and a compound target.
#nodegroups:
#   group1: 'L@foo.domain.com,bar.domain.com,baz.domain.com and bl*.domain.com'
#   group2: 'G@os:Debian and foo.domain.com'

##### Range Cluster settings ####
############################################################
# The range server (and optional port) that serves your cluster information
# https://github.com/ytoolshed/range/wiki/%22yamlfile%22-module-file-spec
#range_server: range:80

##### Windows Software Repo settings ####
############################################################
# Location of the repo on the master:
#win_repo: '/srv/salt/win/repo'
#
# Location of the master's repo cache file:
#win_repo_mastercachefile: '/srv/salt/win/repo/winrepo.p'
#
# List of git repositories to include with the local repo:
#win_gitrepos:
# - 'https://github.com/saltstack/salt-winrepo.git'
##### Returner settings ######

# Which returner(s) will be used for minion's result:
#return: mysql

## 31.6.2 Example minion configuration file

##### Primary configuration settings #####

# This configuration file is used to manage the behavior of the Salt Minion.
# With the exception of the location of the Salt Master Server, values that are
# commented out but have an empty line after the comment are defaults that need
# not be set in the config. If there is no blank line after the comment, the
# value is presented as an example and is not the default.

# Per default the minion will automatically include all config files
# from minion.d/*.conf (minion.d is a directory in the same directory
# as the main minion config file).
#default_include: minion.d/*.conf

# Set the location of the salt master server. If the master server cannot be
# resolved, then the minion will fail to start.
#master: salt

# If multiple masters are specified in the 'master' setting, the default behavior
# is to always try to connect to them in the order they are listed. If random_master is
# set to True, the order will be randomized instead. This can be helpful in distributing
# the load of many minions executing salt-call requests, for example, from a cron job.
# If only one master is listed, this setting is ignored and a warning will be logged.
#random_master: False

# Minions can connect to multiple masters simultaneously (all masters
# are "hot"), or can be configured to failover if a master becomes
# unavailable. Multiple hot masters are configured by setting this
# value to "str". Failover masters can be requested by setting
# to "failover". MAKE SURE TO SET master_alive_interval if you are
# using failover.
#master_type: str

# Poll interval in seconds for checking if the master is still there. Only
# respected if master_type above is "failover".
#master_alive_interval: 30

# Set whether the minion should connect to the master via IPv6:
#ipv6: False

# Set the number of seconds to wait before attempting to resolve
# the master hostname if name resolution fails. Defaults to 30 seconds.
# Set to zero if the minion should shutdown and not retry.
#retry_dns: 30

# Set the port used by the master reply and authentication server.
#master_port: 4506

# The user to run salt.
#user: root
# Setting sudo_user will cause salt to run all execution modules under an sudo
# to the user given in sudo_user. The user under which the salt minion process
# itself runs will still be that provided in the user config above, but all
# execution modules run by the minion will be rerouted through sudo.
#sudo_user: saltdev

# Specify the location of the daemon process ID file.
#pidfile: /var/run/salt-minion.pid

# The root directory prepended to these options: pki_dir, cachedir, log_file,
# sock_dir, pidfile.
#root_dir:

# The directory to store the pki information in
#pki_dir: /etc/salt/pki/minion

# Explicitly declare the id for this minion to use, if left commented the id
# will be the hostname as returned by the python call: socket.getfqdn()
# Since salt uses detached ids it is possible to run multiple minions on the
# same machine but with different ids, this can be useful for salt compute
# clusters.
#id:

# Append a domain to a hostname in the event that it does not exist. This is
# useful for systems where socket.getfqdn() does not actually result in a
# FQDN (for instance, Solaris).
#append_domain:

# Custom static grains for this minion can be specified here and used in SLS
# files just like all other grains. This example sets 4 custom grains, with
# the 'roles' grain having two values that can be matched against.
#grains:
#  roles:
#    - webserver
#    - memcache
#  deployment: datacenter4
#  cabinet: 13
#  cab_u: 14-15
#
# Where cache data goes.
# This data may contain sensitive data and should be protected accordingly.
cachedir: /var/cache/salt/minion

# Verify and set permissions on configuration directories at startup.
#verify_env: True

# The minion can locally cache the return data from jobs sent to it, this
# can be a good way to keep track of jobs the minion has executed
# (on the minion side). By default this feature is disabled, to enable, set
# cache_jobs to True.
#cache_jobs: False

# Set the directory used to hold unix sockets.
#sock_dir: /var/run/salt/minion

# Set the default outputter used by the salt-call command. The default is
# "nested".
#output: nested
# By default output is colored. To disable colored output, set the color value # to False.
#color: True

# Do not strip off the colored output from nested results and state outputs
# (true by default).
# strip_colors: False

# Backup files that are replaced by file.managed and file.recurse under 
# 'cachedir'/file_backups relative to their original location and appended 
# with a timestamp. The only valid setting is "minion". Disabled by default.
# Alternatively this can be specified for each file in state files: 
#/etc/ssh/sshd_config:
# file.managed:
#   - source: salt://ssh/sshd_config
#   - backup: minion
#
# backup_mode: minion

# When waiting for a master to accept the minion's public key, salt will 
# continuously attempt to reconnect until successful. This is the time, in 
# seconds, between those reconnection attempts.
# acceptance_wait_time: 10

# If this is nonzero, the time between reconnection attempts will increase by 
# acceptance_wait_time seconds per iteration, up to this maximum. If this is 
# set to zero, the time between reconnection attempts will stay constant.
# acceptance_wait_time_max: 0

# If the master rejects the minion's public key, retry instead of exiting.
# Rejected keys will be handled the same as waiting on acceptance.
# rejected_retry: False

# When the master key changes, the minion will try to re-auth itself to receive
# the new master key. In larger environments this can cause a SYN flood on the
# master because all minions try to re-auth immediately. To prevent this and
# have a minion wait for a random amount of time, use this optional parameter.
# The wait-time will be a random number of seconds between 0 and the defined value.
# random_reauth_delay: 60

# When waiting for a master to accept the minion's public key, salt will 
# continuously attempt to reconnect until successful. This is the timeout value, 
# in seconds, for each individual attempt. After this timeout expires, the minion 
# will wait for acceptance_wait_time seconds before trying again. Unless your master 
# is under unusually heavy load, this should be left at the default.
# auth_timeout: 60

# Number of consecutive SaltReqTimeoutError that are acceptable when trying to 
# authenticate.
# auth_tries: 7

# If authentication fails due to SaltReqTimeoutError during a ping_interval, 
# cause sub minion process to restart.
# auth_safemode: False

# Ping Master to ensure connection is alive (minutes).
#ping_interval: 0

# To auto recover minions if master changes IP address (DDNS)
# auth_tries: 10
# auth_safemode: False
# ping_interval: 90
#
# Minions won't know master is missing until a ping fails. After the ping fail,
# the minion will attempt authentication and likely fails out and cause a restart.
# When the minion restarts it will resolve the masters IP and attempt to reconnect.

# If you don't have any problems with syn-floods, don't bother with the
# three recon_* settings described below, just leave the defaults!
# The ZeroMQ pull-socket that binds to the masters publishing interface tries
# to reconnect immediately, if the socket is disconnected (for example if
# the master processes are restarted). In large setups this will have all
# minions reconnect immediately which might flood the master (the ZeroMQ-default
# is usually a 100ms delay). To prevent this, these three recon_* settings
# can be used.
# recon_default: the interval in milliseconds that the socket should wait before
# trying to reconnect to the master (1000ms = 1 second)
#
# recon_max: the maximum time a socket should wait. each interval the time to wait
# is calculated by doubling the previous time. if recon_max is reached,
# it starts again at recon_default. Short example:
#
# reconnect 1: the socket will wait 'recon_default' milliseconds
# reconnect 2: 'recon_default' * 2
# reconnect 3: ('recon_default' * 2) * 2
# reconnect 4: value from previous interval * 2
# reconnect 5: value from previous interval * 2
# reconnect x: if value >= recon_max, it starts again with recon_default
#
# recon_randomize: generate a random wait time on minion start. The wait time will
# be a random value between recon_default and recon_default +
# recon_max. Having all minions reconnect with the same recon_default
# and recon_max value kind of defeats the purpose of being able to
# change these settings. If all minions have the same values and your
# setup is quite large (several thousand minions), they will still
# flood the master. The desired behavior is to have timeframe within
# all minions try to reconnect.
#
# Example on how to use these settings. The goal: have all minions reconnect within a
# 60 second timeframe on a disconnect.
# recon_default: 1000
# recon_max: 59000
# recon_randomize: True
#
# Each minion will have a randomized reconnect value between 'recon_default'
# and 'recon_default + recon_max', which in this example means between 1000ms
# 60000ms (or between 1 and 60 seconds). The generated random-value will be
# doubled after each attempt to reconnect. Lets say the generated random
# value is 11 seconds (or 11000ms).
# reconnect 1: wait 11 seconds
# reconnect 2: wait 22 seconds
# reconnect 3: wait 33 seconds
# reconnect 4: wait 44 seconds
# reconnect 5: wait 55 seconds
# reconnect 6: wait time is bigger than 60 seconds (recon_default + recon_max)
# reconnect 7: wait 11 seconds
# reconnect 8: wait 22 seconds
# reconnect 9: wait 33 seconds
# reconnect x: etc.
#
# In a setup with ~6000 thousand hosts these settings would average the reconnects
to about 100 per second and all hosts would be reconnected within 60 seconds.
# recon_default: 100
# recon_max: 5000
# recon_randomize: False
#
# The loop_interval sets how long in seconds the minion will wait between
# evaluating the scheduler and running cleanup tasks. This defaults to a
# sane 60 seconds, but if the minion scheduler needs to be evaluated more
# often lower this value
#loop_interval: 60

# The grains_refresh_every setting allows for a minion to periodically check
# its grains to see if they have changed and, if so, to inform the master
# of the new grains. This operation is moderately expensive, therefore
# care should be taken not to set this value too low.
#
# Note: This value is expressed in __minutes__!
#
# A value of 10 minutes is a reasonable default.
#
# If the value is set to zero, this check is disabled.
#grains_refresh_every: 1

# Cache grains on the minion. Default is False.
#grains_cache: False

# Grains cache expiration, in seconds. If the cache file is older than this
# number of seconds then the grains cache will be dumped and fully re-populated
# with fresh data. Defaults to 5 minutes. Will have no effect if 'grains_cache'
# is not enabled.
#grains_cache_expiration: 300

# Windows platforms lack posix IPC and must rely on slower TCP based inter-
# process communications. Set ipc_mode to 'tcp' on such systems
#ipc_mode: ipc

# Overwrite the default tcp ports used by the minion when in tcp mode
#tcp_pub_port: 4510
#tcp_pull_port: 4511

# Passing very large events can cause the minion to consume large amounts of
# memory. This value tunes the maximum size of a message allowed onto the
# minion event bus. The value is expressed in bytes.
#max_event_size: 1048576

# To detect failed master(s) and fire events on connect/disconnect, set
# master_alive_interval to the number of seconds to poll the masters for
# connection events.
#
#master_alive_interval: 30

# The minion can include configuration from other files. To enable this, # pass a list of paths to this option. The paths can be either relative or # absolute; if relative, they are considered to be relative to the directory # the main minion configuration file lives in (this file). Paths can make use # of shell-style globbing. If no files are matched by a path passed to this # option then the minion will log a warning message.

# Include a config file from some other path:
# include: /etc/salt/extra_config

# Include config from several files and directories:
# include:
#   - /etc/salt/extra_config
#   - /etc/roles/webserver
#
#
######## Minion module management ########
#################################################################################################################
# Disable specific modules. This allows the admin to limit the level of # access the master has to the minion.
#disable_modules: [cmd,test]
#disable_returners: []

# Modules can be loaded from arbitrary paths. This enables the easy deployment # of third party modules. Modules for returners and minions can be loaded. # Specify a list of extra directories to search for minion modules and # returners. These paths must be fully qualified!
#module_dirs: []
#returner_dirs: []
#states_dirs: []
#render_dirs: []
#utils_dirs: []

# A module provider can be statically overwritten or extended for the minion # via the providers option, in this case the default module will be # overwritten by the specified module. In this example the pkg module will # be provided by the yumpkg5 module instead of the system default.
#providers:
#   pkg: yumpkg5

# Enable Cython modules searching and loading. (Default: False)
cython_enable: False

# Specify a max size (in bytes) for modules on import. This feature is currently # only supported on *nix operating systems and requires psutil.
#modules_max_memory: -1

##### State Management Settings ######
#################################################################################################################
# The state management system executes all of the state templates on the minion # to enable more granular control of system state management. The type of # template and serialization used for state management needs to be configured # on the minion, the default renderer is yaml_jinja. This is a yaml file # rendered from a jinja template, the available options are:
# renderer: yaml_jinja
#
# The failhard option tells the minions to stop immediately after the first
# failure detected in the state execution. Defaults to False.
#failhard: False
#
# Reload the modules prior to a highstate run.
#autoload_dynamic_modules: True
#
# clean_dynamic_modules keeps the dynamic modules on the minion in sync with
# the dynamic modules on the master, this means that if a dynamic module is
# not on the master it will be deleted from the minion. By default, this is
# enabled and can be disabled by changing this value to False.
#clean_dynamic_modules: True
#
# Normally, the minion is not isolated to any single environment on the master
# when running states, but the environment can be isolated on the minion side
# by statically setting it. Remember that the recommended way to manage
# environments is to isolate via the top file.
#environment: None
#
# If using the local file directory, then the state top file name needs to be
# defined, by default this is top.sls.
#state_top: top.sls
#
# Run states when the minion daemon starts. To enable, set startup_states to:
# 'highstate' -- Execute state.highstate
# 'sls' -- Read in the sls_list option and execute the named sls files
# 'top' -- Read top_file option and execute based on that file on the Master
#startup_states: ''
#
# List of states to run when the minion starts up if startup_states is 'sls':
#sls_list:
#  - edit.vim
#  - hyper
#
# Top file to execute if startup_states is 'top':
top_file: ''
#
# Automatically aggregate all states that have support for mod_aggregate by
# setting to True. Or pass a list of state module names to automatically
# aggregate just those types.
#
# state_aggregate:
#  - pkg
#
#state_aggregate: False

##### File Directory Settings #####
##########################################
# The Salt Minion can redirect all file server operations to a local directory,
# this allows for the same state tree that is on the master to be used if
# copied completely onto the minion. This is a literal copy of the settings on
# the master but used to reference a local directory on the minion.

# Set the file client. The client defaults to looking on the master server for
# files, but can be directed to look at the local file directory setting
# defined below by setting it to local.
#file_client: remote

# The file directory works on environments passed to the minion, each environment
# can have multiple root directories, the subdirectories in the multiple file
# roots cannot match, otherwise the downloaded files will not be able to be
# reliably ensured. A base environment is required to house the top file.
# Example:
# file_roots:
#   base:
#     - /srv/salt/
#   dev:
#     - /srv/salt/dev/services
#     - /srv/salt/dev/states
#   prod:
#     - /srv/salt/prod/services
#     - /srv/salt/prod/states
#
#file_roots:
# base:
# - /srv/salt

# By default, the Salt fileserver recurses fully into all defined environments
# to attempt to find files. To limit this behavior so that the fileserver only
# traverses directories with SLS files and special Salt directories like _modules,
# enable the option below. This might be useful for installations where a file root
# has a very large number of files and performance is negatively impacted. Default
# is False.
#fileserver_limit_traversal: False

# The hash_type is the hash to use when discovering the hash of a file in
# the local fileserver. The default is md5, but sha1, sha224, sha256, sha384
# and sha512 are also supported.
#
# Warning: Prior to changing this value, the minion should be stopped and all
# Salt caches should be cleared.
#hash_type: md5

# The Salt pillar is searched for locally if file_client is set to local. If
# this is the case, and pillar data is defined, then the pillar_roots need to
# also be configured on the minion:
#pillar_roots:
# base:
# - /srv/pillar
#
#
# Security settings

# Enable "open mode", this mode still maintains encryption, but turns off
# authentication, this is only intended for highly secure environments or for
# the situation where your keys end up in a bad state. If you run in open mode
# you do so at your own risk!
#open_mode: False

# Enable permissive access to the salt keys. This allows you to run the master or minion as root, but have a non-root group be given access to your pki_dir. To make the access explicit, root must belong to the group you've given access to. This is potentially quite insecure.
#permissive_pki_access: False

# The state_verbose and state_output settings can be used to change the way state system data is printed to the display. By default all data is printed. The state_verbose setting can be set to True or False, when set to False all data that has a result of True and no changes will be suppressed.
#state_verbose: True

# The state_output setting changes if the output is the full multi line output for each changed state if set to 'full', but if set to 'terse' the output will be shortened to a single line.
#state_output: full

# The state_output_diff setting changes whether or not the output from successful states is returned. Useful when even the terse output of these states is cluttering the logs. Set it to True to ignore them.
#state_output_diff: False

# The state_output_profile setting changes whether profile information will be shown for each state run.
#state_output_profile: True

# Fingerprint of the master public key to validate the identity of your Salt master before the initial key exchange. The master fingerprint can be found by running "salt-key -F master" on the Salt master.
#master_finger: ''

##### Thread settings #####
###########################################
# Disable multiprocessing support, by default when a minion receives a publication a new process is spawned and the command is executed therein.
#multiprocessing: True

##### Logging settings #####
##########################################
# The location of the minion log file
# The minion log can be sent to a regular file, local path name, or network location. Remote logging works best when configured to use rsyslogd(8) (e.g.: `file:///dev/log`), with rsyslogd(8) configured for network logging. The URI format is: <file|udp|tcp>://<host|socketpath>:<port-if-required>/<log-facility>
#log_file: /var/log/salt/minion
#log_file: file:///dev/log
#log_file: udp://loghost:10514
#log_file: /var/log/salt/minion
#key_logfile: /var/log/salt/key

# The level of messages to send to the console. One of 'garbage', 'trace', 'debug', 'info', 'warning', 'error', 'critical'. Default: 'warning'
#log_level: warning

# The level of messages to send to the log file.  
# One of 'garbage', 'trace', 'debug', info', 'warning', 'error', 'critical'.  
# If using 'log_granular_levels' this must be set to the highest desired level.  
# Default: 'warning'

#log_level_logfile:

# The date and time format used in log messages. Allowed date/time formatting  
# can be seen here: http://docs.python.org/library/time.html#time.strftime  
#log_datefmt: '%H:%M:%S'  
#log_datefmt_logfile: '%Y-%m-%d %H:%M:%S'

# The format of the console logging messages. Allowed formatting options can  
# be seen here: http://docs.python.org/library/logging.html#logrecord-attributes  
# Console log colors are specified by these additional formatters:  
#  
#  %%(colorlevel)s  
#  %%(colormessage)s  
#  %%(colorprocess)s  
#  %%(colormessage)s  
#  
# Since it is desirable to include the surrounding brackets, '[' and ']', in  
# the coloring of the messages, these color formatters also include padding as  
# well. Color LogRecord attributes are only available for console logging.  
#  
#log_fmt_console: '%(colorlevel)s %(colormessage)s'  
#log_fmt_console: '[%(levelname)-8s] %%(message)s'  
#log_fmt_logfile: '%(asctime)s,%(msecs)03.0f [%(name)-17s][%(levelname)-8s] %%(message)s'

# This can be used to control logging levels more specifically. This  
# example sets the main salt library at the 'warning' level, but sets  
# 'salt.modules' to log at the 'debug' level:  
#  
#log_granular_levels:  
#  'salt': 'warning'  
#  'salt.modules': 'debug'

#log_granular_levels: {}

# To diagnose issues with minions disconnecting or missing returns, ZeroMQ  
# supports the use of monitor sockets # to log connection events. This  
# feature requires ZeroMQ 4.0 or higher.  
# To enable ZeroMQ monitor sockets, set 'zmq_monitor' to 'True' and log at a  
# debug level or higher.  
# A sample log event is as follows:  
#  
#  [DEBUG ] ZeroMQ event: {'endpoint': 'tcp://127.0.0.1:4505', 'event': 512,  
#  'value': 27, 'description': 'EVENT_DISCONNECTED'}  
# All events logged will include the string 'ZeroMQ event'. A connection event  
# should be logged on the as the minion starts up and initially connects to the  
# master. If not, check for debug log level and that the necessary version of  
# ZeroMQ is installed.
#zmq_monitor: False

##### Module configuration #####

Salt allows for modules to be passed arbitrary configuration data, any data passed here in valid yaml format will be passed on to the salt minion modules for use. It is STRONGLY recommended that a naming convention be used in which the module name is followed by a . and then the value. Also, all top level data must be applied via the yaml dict construct, some examples:

# You can specify that all modules should run in test mode:
#test: True
#
# A simple value for the test module:
#test.foo: foo
#
# A list for the test module:
#test.bar: [baz, quo]
#
# A dict for the test module:
#test.baz: {spam: sausage, cheese: bread}
#

##### Update settings #####

Using the features in Esky, a salt minion can both run as a frozen app and be updated on the fly. These options control how the update process (saltutil.update()) behaves.

# The url for finding and downloading updates. Disabled by default.
#update_url: False
#
# The list of services to restart after a successful update. Empty by default.
#update_restart_services: []

##### Keepalive settings #####

ZeroMQ now includes support for configuring SO_KEEPALIVE if supported by the OS. If connections between the minion and the master pass through a state tracking device such as a firewall or VPN gateway, there is the risk that it could tear down the connection the master and minion without informing either party that their connection has been taken away. Enabling TCP Keepalives prevents this from happening.

# Overall state of TCP Keepalives, enable (1 or True), disable (0 or False)
# or leave to the OS defaults (-1), on Linux, typically disabled. Default True, enabled.
tcp_keepalive: True
#
# How long before the first keepalive should be sent in seconds. Default 300
# to send the first keepalive after 5 minutes, OS default (-1) is typically 7200 seconds.
# on Linux see /proc/sys/net/ipv4/tcp_keepalive_time.
tcp_keepalive_idle: 300
#
# How many lost probes are needed to consider the connection lost. Default -1
# to use OS defaults, typically 9 on Linux, see /proc/sys/net/ipv4/tcp_keepalive_probes.
tcp_keepalive_cnt: -1

550 Chapter 31. Reference
31.7 Configuring Salt

Salt configuration is very simple. The default configuration for the master will work for most installations and the only requirement for setting up a minion is to set the location of the master in the minion configuration file.

The configuration files will be installed to /etc/salt and are named after the respective components, /etc/salt/master, and /etc/salt/minion.

31.7.1 Master Configuration

By default the Salt master listens on ports 4505 and 4506 on all interfaces (0.0.0.0). To bind Salt to a specific IP, redefine the `interface` directive in the master configuration file, typically /etc/salt/master, as follows:

```
- #interface: 0.0.0.0
+ interface: 10.0.0.1
```

After updating the configuration file, restart the Salt master. See the master configuration reference for more details about other configurable options.

31.7.2 Minion Configuration

Although there are many Salt Minion configuration options, configuring a Salt Minion is very simple. By default a Salt Minion will try to connect to the DNS name `salt`; if the Minion is able to resolve that name correctly, no configuration is needed.

If the DNS name `salt` does not resolve to point to the correct location of the Master, redefine the `master` directive in the minion configuration file, typically /etc/salt/minion, as follows:

```
- #master: salt
+ master: 10.0.0.1
```

After updating the configuration file, restart the Salt minion. See the minion configuration reference for more details about other configurable options.
31.7.3 Running Salt

1. Start the master in the foreground (to daemonize the process, pass the `-d` flag):
   ```bash
   salt-master
   ```

2. Start the minion in the foreground (to daemonize the process, pass the `-d` flag):
   ```bash
   salt-minion
   ```

**Having trouble?**

The simplest way to troubleshoot Salt is to run the master and minion in the foreground with `log level` set to `debug`:

```bash
salt-master --log-level=debug
```

For information on salt's logging system please see the [logging document](#).

**Run as an unprivileged (non-root) user**

To run Salt as another user, set the `user` parameter in the master config file.

Additionally, ownership, and permissions need to be set such that the desired user can read from and write to the following directories (and their subdirectories, where applicable):

- `/etc/salt`
- `/var/cache/salt`
- `/var/log/salt`
- `/var/run/salt`

More information about running salt as a non-privileged user can be found [here](#).

There is also a full troubleshooting guide available.

31.7.4 Key Identity

Salt provides commands to validate the identity of your Salt master and Salt minions before the initial key exchange. Validating key identity helps avoid inadvertently connecting to the wrong Salt master, and helps prevent a potential MiTM attack when establishing the initial connection.

**Master Key Fingerprint**

Print the master key fingerprint by running the following command on the Salt master:

```bash
salt-key -F master
```

Copy the `master.pub` fingerprint from the `Local Keys` section, and then set this value as the `master_finger` in the minion configuration file. Save the configuration file and then restart the Salt minion.

**Minion Key Fingerprint**

Run the following command on each Salt minion to view the minion key fingerprint:
salt-call --local key.finger

Compare this value to the value that is displayed when you run the `salt-key --finger <MINION_ID>` command on the Salt master.

### 31.7.5 Key Management

Salt uses AES encryption for all communication between the Master and the Minion. This ensures that the commands sent to the Minions cannot be tampered with, and that communication between Master and Minion is authenticated through trusted, accepted keys.

Before commands can be sent to a Minion, its key must be accepted on the Master. Run the `salt-key` command to list the keys known to the Salt Master:

```
[root@master ~]# salt-key -L
Unaccepted Keys:
alpha
bravo
charlie
delta
Accepted Keys:
```

This example shows that the Salt Master is aware of four Minions, but none of the keys has been accepted. To accept the keys and allow the Minions to be controlled by the Master, again use the `salt-key` command:

```
[root@master ~]# salt-key -A
[root@master ~]# salt-key -L
Unaccepted Keys:
Accepted Keys:
alpha
bravo
charlie
delta
```

The `salt-key` command allows for signing keys individually or in bulk. The example above, using `-A` bulk-accepts all pending keys. To accept keys individually use the lowercase of the same option, `-a keyname`.

See also:

`salt-key manpage`

### 31.7.6 Sending Commands

Communication between the Master and a Minion may be verified by running the `test.ping` command:

```
[root@master ~]# salt alpha test.ping
alpha: True
```

Communication between the Master and all Minions may be tested in a similar way:

```
[root@master ~]# salt '*' test.ping
alpha:
   True
bravo:
   True
charlie:
```
Each of the Minions should send a True response as shown above.

### 31.7.7 What's Next?

Understanding targeting is important. From there, depending on the way you wish to use Salt, you should also proceed to learn about States and Execution Modules.

### 31.8 Configuring the Salt Master

The Salt system is amazingly simple and easy to configure, the two components of the Salt system each have a respective configuration file. The salt-master is configured via the master configuration file, and the salt-minion is configured via the minion configuration file.

See also:

example master configuration file

The configuration file for the salt-master is located at /etc/salt/master by default. A notable exception is FreeBSD, where the configuration file is located at /usr/local/etc/salt. The available options are as follows:

#### 31.8.1 Primary Master Configuration

**interface**

Default: 0.0.0.0 (all interfaces)

The local interface to bind to.

interface: 192.168.0.1

**ipv6**

Default: False

Whether the master should listen for IPv6 connections. If this is set to True, the interface option must be adjusted too (for example: `interface: '::'`)

ipv6: True

**publish_port**

Default: 4505

The network port to set up the publication interface.

publish_port: 4505
**master_id**

Default: None

The id to be passed in the publish job to minions. This is used for MultiSyndics to return the job to the requesting master.

*Note:* This must be the same string as the syndic is configured with.

```
master_id: MasterOfMaster
```

**user**

Default: root

The user to run the Salt processes

```
user: root
```

**max_open_files**

Default: 100000

Each minion connecting to the master uses AT LEAST one file descriptor, the master subscription connection. If enough minions connect you might start seeing on the console(and then salt-master crashes):

```
Too many open files (tcp_listener.cpp:335)
Aborted (core dumped)
```

```
max_open_files: 100000
```

By default this value will be the one of `ulimit -Hn`, i.e., the hard limit for max open files.

To set a different value than the default one, uncomment, and configure this setting. Remember that this value CANNOT be higher than the hard limit. Raising the hard limit depends on the OS and/or distribution, a good way to find the limit is to search the internet for something like this:

```
raise max open files hard limit debian
```

**worker_threads**

Default: 5

The number of threads to start for receiving commands and replies from minions. If minions are stalling on replies because you have many minions, raise the worker_threads value.

Worker threads should not be put below 3 when using the peer system, but can drop down to 1 worker otherwise.

*Note:* When the master daemon starts, it is expected behaviour to see multiple salt-master processes, even if `worker_threads` is set to `1`. At a minimum, a controlling process will start along with a Publisher, an Event-Publisher, and a number of MWorker processes will be started. The number of MWorker processes is tuneable by the `worker_threads` configuration value while the others are not.
worker_threads: 5

**ret_port**
Default: 4506
The port used by the return server, this is the server used by Salt to receive execution returns and command executions.
ret_port: 4506

**pidfile**
Default: /var/run/salt-master.pid
Specify the location of the master pidfile.
pidfile: /var/run/salt-master.pid

**root_dir**
Default: /
The system root directory to operate from, change this to make Salt run from an alternative root.
root_dir: /

Note: This directory is prepended to the following options: pki_dir, cachedir, sock_dir, log_file, autosign_file, autoreject_file, pidfile.

**pki_dir**
Default: /etc/salt/pki
The directory to store the pki authentication keys.
pki_dir: /etc/salt/pki

**extension_modules**
Directory for custom modules. This directory can contain subdirectories for each of Salt's module types such as `runners`, `output`, `wheel`, `modules`, `states`, `returners`, etc. This path is appended to root_dir.
extension_modules: srv/modules

**module_dirs**
Default: []
Like extension_modules, but a list of extra directories to search for Salt modules.
module_dirs:
- /var/cache/salt/minion/extmods

cachedir

Default: /var/cache/salt
The location used to store cache information, particularly the job information for executed salt commands.
This directory may contain sensitive data and should be protected accordingly.
cachedir: /var/cache/salt

verify_env

Default: True
Verify and set permissions on configuration directories at startup.
verify_env: True

keep_jobs

Default: 24
Set the number of hours to keep old job information.

timeout

Default: 5
Set the default timeout for the salt command and api.

loop_interval

Default: 60
The loop_interval option controls the seconds for the master’s maintenance process check cycle. This process updates file server backends, cleans the job cache and executes the scheduler.

output

Default: nested
Set the default outputter used by the salt command.
color

Default: True
By default output is colored, to disable colored output set the color value to False.

<table>
<thead>
<tr>
<th>color</th>
</tr>
</thead>
<tbody>
<tr>
<td>color: False</td>
</tr>
</tbody>
</table>

sock_dir

Default: /var/run/salt/master
Set the location to use for creating Unix sockets for master process communication.

<table>
<thead>
<tr>
<th>sock_dir</th>
</tr>
</thead>
<tbody>
<tr>
<td>sock_dir: /var/run/salt/master</td>
</tr>
</tbody>
</table>

enable_gpu_grains

Default: True
Enable GPU hardware data for your master. Be aware that the master can take a while to start up when lspci and/or dmidecode is used to populate the grains for the master.

job_cache

Default: True
The master maintains a job cache, while this is a great addition it can be a burden on the master for larger deployments (over 5000 minions). Disabling the job cache will make previously executed jobs unavailable to the jobs system and is not generally recommended. Normally it is wise to make sure the master has access to a faster IO system or a tmpfs is mounted to the jobs dir.

<table>
<thead>
<tr>
<th>minion_data_cache</th>
</tr>
</thead>
<tbody>
<tr>
<td>minion_data_cache: True</td>
</tr>
</tbody>
</table>

minion_data_cache

Default: True
The minion data cache is a cache of information about the minions stored on the master, this information is primarily the pillar and grains data. The data is cached in the Master cachedir under the name of the minion and used to predetermine what minions are expected to reply from executions.

ext_job_cache

Default: ''
Used to specify a default returner for all minions, when this option is set the specified returner needs to be properly configured and the minions will always default to sending returns to this returner. This will also disable the local job cache on the master.

<table>
<thead>
<tr>
<th>ext_job_cache</th>
</tr>
</thead>
<tbody>
<tr>
<td>ext_job_cache: redis</td>
</tr>
</tbody>
</table>
**event_return**

New in version 2015.5.0.

Default: ' '  

Specify the returner to use to log events. A returner may have installation and configuration requirements. Read the returner's documentation.

**Note:** Not all returners support event returns. Verify that a returner has an `event_return()` function before configuring this option with a returner.

```
event_return: cassandra_cql
```

**master_job_cache**

New in version 2014.7.

Default: `local_cache`

Specify the returner to use for the job cache. The job cache will only be interacted with from the salt master and therefore does not need to be accessible from the minions.

```
master_job_cache: redis
```

**enforce_mine_cache**

Default: False

By-default when disabling the minion_data_cache mine will stop working since it is based on cached data, by enabling this option we explicitly enabling only the cache for the mine system.

```
enforce_mine_cache: False
```

**max_minions**

Default: 0

The number of minions the master should allow to connect. Use this to accommodate the number of minions per master if you have different types of hardware serving your minions. The default of 0 means unlimited connections. Please note, that this can slow down the authentication process a bit in large setups.

```
max_minions: 100
```

**con_cache**

Default: False

If `max_minions` is used in large installations, the master might experience high-load situations because of having to check the number of connected minions for every authentication. This cache provides the minion-ids of all connected minions to all MWorker-processes and greatly improves the performance of `max_minions`.

```
con_cache: True
```
**presence_events**

Default: False

Causes the master to periodically look for actively connected minions. *Presence events* are fired on the event bus on a regular interval with a list of connected minions, as well as events with lists of newly connected or disconnected minions. This is a master-only operation that does not send executions to minions. Note, this does not detect minions that connect to a master via localhost.

```plaintext
presence_events: False
```

### 31.8.2 Salt-SSH Configuration

**roster_file**

Default: `/etc/salt/roster`

Pass in an alternative location for the salt-ssh roster file.

```plaintext
roster_file: /root/roster
```

**ssh_minion_opts**

Default: None

Pass in minion option overrides that will be inserted into the SHIM for salt-ssh calls. The local minion config is not used for salt-ssh. Can be overridden on a per-minion basis in the roster (`minion_opts`)

```plaintext
minion_opts:
    gpg_keydir: /root/gpg
```

### 31.8.3 Master Security Settings

**open_mode**

Default: False

Open mode is a dangerous security feature. One problem encountered with pki authentication systems is that keys can become `mixed up` and authentication begins to fail. Open mode turns off authentication and tells the master to accept all authentication. This will clean up the pki keys received from the minions. Open mode should not be turned on for general use. Open mode should only be used for a short period of time to clean up pki keys. To turn on open mode set this value to `True`.

```plaintext
open_mode: False
```

**auto_accept**

Default: False

Enable auto_accept. This setting will automatically accept all incoming public keys from minions.

```plaintext
auto_accept: False
```
**autosign_timeout**

New in version 2014.7.0.

Default: 120

Time in minutes that a incoming public key with a matching name found in pki_dir/minion_autosign/keyid is automatically accepted. Expired autosign keys are removed when the master checks the minion_autosign directory. This method to auto accept minions can be safer than an autosign_file because the keyid record can expire and is limited to being an exact name match. This should still be considered a less than secure option, due to the fact that trust is based on just the requesting minion id.

**autosign_file**

Default: not defined

If the autosign_file is specified incoming keys specified in the autosign_file will be automatically accepted. Matches will be searched for first by string comparison, then by globbing, then by full-string regex matching. This should still be considered a less than secure option, due to the fact that trust is based on just the requesting minion id.

**autoreject_file**

New in version 2014.1.0.

Default: not defined

Works like autosign_file, but instead allows you to specify minion IDs for which keys will automatically be rejected. Will override both membership in the autosign_file and the auto_accept setting.

**client_acl**

Default: {}

Enable user accounts on the master to execute specific modules. These modules can be expressed as regular expressions.

```
client_acl:
    fred:
        - test.ping
        - pkg.*
```

**client_acl_blacklist**

Default: {}

Blacklist users or modules

This example would blacklist all non sudo users, including root from running any commands. It would also blacklist any use of the `cmd` module.

This is completely disabled by default.
client_acl_blacklist:
  users:
    - root
    - '^(?!sudo_).*'$  # all non sudo users
modules:
  - cmd

external_auth

Default: {}

The external auth system uses the Salt auth modules to authenticate and validate users to access areas of the Salt system.

external_auth:
  pam:
    fred:
      - test.*

token_expire

Default: 43200

Time (in seconds) for a newly generated token to live.

Default: 12 hours

token_expire: 43200

file_recv

Default: False

Allow minions to push files to the master. This is disabled by default, for security purposes.

file_recv: False

master_sign_pubkey

Default: False

Sign the master auth-replies with a cryptographic signature of the masters public key. Please see the tutorial how to use these settings in the Multimaster-PKI with Failover Tutorial

master_sign_pubkey: True

master_sign_key_name

Default: master_sign

The customizable name of the signing-key-pair without suffix.

master_sign_key_name: <filename_without_suffix>
master_pubkey_signature

Default: master_pubkey_signature
The name of the file in the masters pki-directory that holds the pre-calculated signature of the masters public-key.

\[\text{master_pubkey_signature: <filename>}\]

master_use_pubkey_signature

Default: False
Instead of computing the signature for each auth-reply, use a pre-calculated signature. The master_pubkey_signature must also be set for this.

\[\text{master_use_pubkey_signature: True}\]

rotate_aes_key

Default: True
Rotate the salt-masters AES-key when a minion-public is deleted with salt-key. This is a very important security-setting. Disabling it will enable deleted minions to still listen in on the messages published by the salt-master. Do not disable this unless it is absolutely clear what this does.

\[\text{rotate_aes_key: True}\]

31.8.4 Master Module Management

runner_dirs

Default: []
Set additional directories to search for runner modules.

cython_enable

Default: False
Set to true to enable Cython modules (.pyx files) to be compiled on the fly on the Salt master.

\[\text{cython_enable: False}\]

31.8.5 Master State System Settings

state_top

Default: top.sls
The state system uses a `top` file to tell the minions what environment to use and what modules to use. The state_top file is defined relative to the root of the base environment.
state_top: top.sls

**master_tops**

Default: {}

The master_tops option replaces the external_nodes option by creating a pluggable system for the generation of external top data. The external_nodes option is deprecated by the master_tops option. To gain the capabilities of the classic external_nodes system, use the following configuration:

```yaml
master_tops:
  ext_nodes: <Shell command which returns yaml>
```

**external_nodes**

Default: None

The external_nodes option allows Salt to gather data that would normally be placed in a top file from an external node controller. The external_nodes option is the executable that will return the ENC data. Remember that Salt will look for external nodes AND top files and combine the results if both are enabled and available!

```yaml
external_nodes: cobbler-ext-nodes
```

**renderer**

Default: yaml_jinja

The renderer to use on the minions to render the state data.

```yaml
renderer: yaml_jinja
```

**failhard**

Default: False

Set the global failhard flag, this informs all states to stop running states at the moment a single state fails.

```yaml
failhard: False
```

**state_verbose**

Default: True

Controls the verbosity of state runs. By default, the results of all states are returned, but setting this value to False will cause Salt to only display output for states which either failed, or succeeded without making any changes to the minion.

```yaml
state_verbose: False
```
**state_output**

Default: full

The state_output setting changes if the output is the full multi line output for each changed state if set to 'full', but if set to 'terse' the output will be shortened to a single line. If set to 'mixed', the output will be terse unless a state failed, in which case that output will be full. If set to 'changes', the output will be full unless the state didn't change.

```
state_output: full
```

**state_aggregate**

Default: False

Automatically aggregate all states that have support for mod_aggregate by setting to True. Or pass a list of state module names to automatically aggregate just those types.

```
state_aggregate:
  - pkg

state_aggregate: True
```

**state_events**

Default: False

Send progress events as each function in a state run completes execution by setting to True. Progress events are in the format salt/job/<JID>/prog/<MID>/<RUN NUM>.

```
state_events: True
```

**yaml_utf8**

Default: False

Enable extra routines for YAML renderer used states containing UTF characters.

```
yaml_utf8: False
```

**test**

Default: False

Set all state calls to only test if they are going to actually make changes or just post what changes are going to be made.

```
test: False
```

31.8.6 Master File Server Settings

**fileservr_backend**

Default: ['roots']
Salt supports a modular fileserver backend system, this system allows the salt master to link directly to third party systems to gather and manage the files available to minions. Multiple backends can be configured and will be searched for the requested file in the order in which they are defined here. The default setting only enables the standard backend roots, which is configured using the `file_roots` option.

Example:

```yaml
fileserver_backend:
  - roots
  - git
```

**hash_type**

Default: md5

The hash_type is the hash to use when discovering the hash of a file on the master server. The default is md5, but sha1, sha224, sha256, sha384, and sha512 are also supported.

```yaml
hash_type: md5
```

**file_buffer_size**

Default: 1048576

The buffer size in the file server in bytes.

```yaml
file_buffer_size: 1048576
```

**file_ignore_regex**

Default: ''

A regular expression (or a list of expressions) that will be matched against the file path before syncing the modules and states to the minions. This includes files affected by the file.recurse state. For example, if you manage your custom modules and states in subversion and don’t want all the `.svn` folders and content synced to your minions, you could set this to `'/\.svn($|/)'. By default nothing is ignored.

```yaml
file_ignore_regex:
  - '/\.svn($|)'
  - '/\.git($|)'
```

**file_ignore_glob**

Default: ''

A file glob (or list of file globs) that will be matched against the file path before syncing the modules and states to the minions. This is similar to `file_ignore_regex` above, but works on globs instead of regex. By default nothing is ignored.

```yaml
file_ignore_glob:
  - '*.pyc'
  - '*/somefolder/*.bak'
  - '*/.swp'
```
Note: Vim’s .swp files are a common cause of Unicode errors in file.recurse states which use templating. Unless there is a good reason to distribute them via the fileserver, it is good practice to include ‘\*\.swp’ in the file_ignore_glob.

roots: Master’s Local File Server

file_roots

Default:

base:
    - /srv/salt

Salt runs a lightweight file server written in ZeroMQ to deliver files to minions. This file server is built into the master daemon and does not require a dedicated port.

The file server works on environments passed to the master. Each environment can have multiple root directories. The subdirectories in the multiple file roots cannot match, otherwise the downloaded files will not be able to be reliably ensured. A base environment is required to house the top file.

Example:

file_roots:
    base:
        - /srv/salt
    dev:
        - /srv/salt/dev/services
        - /srv/salt/dev/states
    prod:
        - /srv/salt/prod/services
        - /srv/salt/prod/states

git: Git Remote File Server Backend

gitfs_remotes

Default: []

When using the git fileserver backend at least one git remote needs to be defined. The user running the salt master will need read access to the repo.

The repos will be searched in order to find the file requested by a client and the first repo to have the file will return it. Branches and tags are translated into salt environments.

gitfs_remotes:
    - git://github.com/saltstack/salt-states.git
    - file:///var/git/saltmaster

Note: file:// repos will be treated as a remote and copied into the master’s gitfs cache, so only the local refs for those repos will be exposed as fileserver environments.

As of 2014.7.0, it is possible to have per-repo versions of several of the gitfs configuration parameters. For more information, see the GitFS Walkthrough.
gitfs_provider

New in version 2014.7.0.
Optional parameter used to specify the provider to be used for gitfs. More information can be found in the *GitFS Walkthrough*.
Must be one of the following: pygit2, gitpython, or dulwich. If unset, then each will be tried in that same order, and the first one with a compatible version installed will be the provider that is used.

```yaml
gitfs_provider: dulwich
```

gitfs_ssl_verify

Default: True
Specifies whether or not to ignore SSL certificate errors when contacting the remote repository. You might want to set this to `False` if you're using a git repo that uses a self-signed certificate. However, keep in mind that setting this to anything other `True` is a considered insecure, and using an SSH-based transport (if available) may be a better option.

```yaml
gitfs_ssl_verify: True
```

gitfs_mountpoint

New in version 2014.7.0.
Default: ''
Specifies a path on the salt fileserver from which gitfs remotes are served. Can be used in conjunction with `gitfs_root`. Can also be configured on a per-remote basis, see here for more info.

```yaml
gitfs_mountpoint: salt://foo/bar
```

Note: The `salt://` protocol designation can be left off (in other words, `foo/bar` and `salt://foo/bar` are equivalent).

gitfs_root

Default: ''
Serve files from a subdirectory within the repository, instead of the root. This is useful when there are files in the repository that should not be available to the Salt fileserver. Can be used in conjunction with `gitfs_mountpoint`.

```yaml
gitfs_root: somefolder/otherfolder
```

Changed in version 2014.7.0: Ability to specify gitfs roots on a per-remote basis was added. See here for more info.

gitfs_base

Default: master
Defines which branch/tag should be used as the base environment.
**gitfs_base**: `salt`

Changed in version 2014.7.0: Ability to specify the base on a per-remote basis was added. See [here](#) for more info.

**gitfs_env_whitelist**

New in version 2014.7.0.

Default: `[]`

Used to restrict which environments are made available. Can speed up state runs if the repos in `gitfs_remotes` contain many branches/tags. More information can be found in the *GitFS Walkthrough*.

```yaml
gitfs_env_whitelist:
  - base
  - v1.*
  - 'mybranch\d+'
```

**gitfs_env_blacklist**

New in version 2014.7.0.

Default: `[]`

Used to restrict which environments are made available. Can speed up state runs if the repos in `gitfs_remotes` contain many branches/tags. More information can be found in the *GitFS Walkthrough*.

```yaml
gitfs_env_blacklist:
  - base
  - v1.*
  - 'mybranch\d+'
```

**GitFS Authentication Options**

These parameters only currently apply to the pygit2 gitfs provider. Examples of how to use these can be found in the *GitFS Walkthrough*.

**gitfs_user**  New in version 2014.7.0.

Default: `''`

Along with `gitfs_password`, is used to authenticate to HTTPS remotes.

```yaml
gitfs_user: git
```

**gitfs_password**  New in version 2014.7.0.

Default: `''`

Along with `gitfs_user`, is used to authenticate to HTTPS remotes. This parameter is not required if the repository does not use authentication.

```yaml
gitfs_password: mypassword
```
**gitfs_insecure_auth**  New in version 2014.7.0.
Default: False
By default, Salt will not authenticate to an HTTP (non-HTTPS) remote. This parameter enables authentication over HTTP. Enable this at your own risk.

```yaml
gitfs_insecure_auth: True
```

**gitfs_pubkey**  New in version 2014.7.0.
Default: ''
Along with `gitfs_privkey` (and optionally `gitfs_passphrase`), is used to authenticate to SSH remotes. This parameter (or its per-remote counterpart) is required for SSH remotes.

```yaml
gitfs_pubkey: /path/to/key.pub
```

**gitfs_privkey**  New in version 2014.7.0.
Default: ''
Along with `gitfs_pubkey` (and optionally `gitfs_passphrase`), is used to authenticate to SSH remotes. This parameter (or its per-remote counterpart) is required for SSH remotes.

```yaml
gitfs_privkey: /path/to/key
```

**gitfs_passphrase**  New in version 2014.7.0.
Default: ''
This parameter is optional, required only when the SSH key being used to authenticate is protected by a passphrase.

```yaml
gitfs_passphrase: mypassphrase
```

**hg: Mercurial Remote File Server Backend**

**hgfs_remotes**

New in version 0.17.0.
Default: []
When using the hg fileserver backend at least one mercurial remote needs to be defined. The user running the salt master will need read access to the repo.
The repos will be searched in order to find the file requested by a client and the first repo to have the file will return it. Branches and/or bookmarks are translated into salt environments, as defined by the `hgfs_branch_method` parameter.

```yaml
hgfs_remotes:
  - https://username@bitbucket.org/username/reponame
```

Note:  As of 2014.7.0, it is possible to have per-repo versions of the `hgfs_root`, `hgfs_mountpoint`, `hgfs_base`, and `hgfs_branch_method` parameters. For example:
hgfs_remotes:
- https://username@bitbucket.org/username/repo1
  - base: saltstates
- https://username@bitbucket.org/username/repo2:
  - root: salt
  - mountpoint: salt://foo/bar/baz
- https://username@bitbucket.org/username/repo3:
  - root: salt/states
  - branch_method: mixed

**hgfs_branch_method**

New in version 0.17.0.
Default: branches
Defines the objects that will be used as fileserver environments.

- **branches** - Only branches and tags will be used
- **bookmarks** - Only bookmarks and tags will be used
- **mixed** - Branches, bookmarks, and tags will be used

**hgfs_branch_method**: mixed

**Note**: Starting in version 2014.1.0, the value of the `hgfs_base` parameter defines which branch is used as the base environment, allowing for a base environment to be used with an `hgfs_branch_method` of bookmarks. Prior to this release, the default branch will be used as the base environment.

**hgfs_mountpoint**

New in version 2014.7.0.
Default: ''
Specifies a path on the salt fileserver from which hgfs remotes are served. Can be used in conjunction with `hgfs_root`. Can also be configured on a per-remote basis, see here for more info.

**hgfs_mountpoint**: salt://foo/bar

**Note**: The salt:// protocol designation can be left off (in other words, foo/bar and salt://foo/bar are equivalent).

**hgfs_root**

New in version 0.17.0.
Default: ''
Serve files from a subdirectory within the repository, instead of the root. This is useful when there are files in the repository that should not be available to the Salt fileserver. Can be used in conjunction with `hgfs_mountpoint`.

31.8. Configuring the Salt Master
**hgfs_root: somefolder/otherfolder**

Changed in version 2014.7.0: Ability to specify hgfs roots on a per-remote basis was added. See here for more info.

**hgfs_base**

New in version 2014.1.0.

Default: default

Defines which branch should be used as the base environment. Change this if `hgfs_branch_method` is set to bookmarks to specify which bookmark should be used as the base environment.

`hgfs_base: salt`

**hgfs_env_whitelist**

New in version 2014.7.0.

Default: []

Used to restrict which environments are made available. Can speed up state runs if your hgfs remotes contain many branches/bookmarks/tags. Full names, globs, and regular expressions are supported. If using a regular expression, the expression must match the entire minion ID.

If used, only branches/bookmarks/tags which match one of the specified expressions will be exposed as fileserver environments.

If used in conjunction with `hgfs_env_blacklist`, then the subset of branches/bookmarks/tags which match the whitelist but do not match the blacklist will be exposed as fileserver environments.

`hgfs_env_whitelist:
  - base
  - v1.*
  - 'mybranch\d+'`

**hgfs_env_blacklist**

New in version 2014.7.0.

Default: []

Used to restrict which environments are made available. Can speed up state runs if your hgfs remotes contain many branches/bookmarks/tags. Full names, globs, and regular expressions are supported. If using a regular expression, the expression must match the entire minion ID.

If used, branches/bookmarks/tags which match one of the specified expressions will not be exposed as fileserver environments.

If used in conjunction with `hgfs_env_whitelist`, then the subset of branches/bookmarks/tags which match the whitelist but do not match the blacklist will be exposed as fileserver environments.

`hgfs_env_blacklist:
  - base
  - v1.*
  - 'mybranch\d+'`
svn: Subversion Remote File Server Backend

**svnfs_remotes**

New in version 0.17.0.

Default: `[]`

When using the `svn` fileserver backend at least one subversion remote needs to be defined. The user running the salt master will need read access to the repo.

The repos will be searched in order to find the file requested by a client and the first repo to have the file will return it. The trunk, branches, and tags become environments, with the trunk being the base environment.

```
svnfs_remotes:
  - svn://foo.com/svn/myproject
```

**Note:** As of 2014.7.0, it is possible to have per-repo versions of the following configuration parameters:

- `svnfs_root`
- `svnfs_mountpoint`
- `svnfs_trunk`
- `svnfs_branches`
- `svnfs_tags`

For example:

```
svnfs_remotes:
  - svn://foo.com/svn/project1
  - svn://foo.com/svn/project2:
    - root: salt
    - mountpoint: salt://foo/bar/baz
  - svn://foo.com/svn/project3:
    - root: salt/states
    - branches: branch
    - tags: tag
```

**svnfs_mountpoint**

New in version 2014.7.0.

Default: `''

Specifies a path on the salt fileserver from which svnfs remotes are served. Can be used in conjunction with `svnfs_root`. Can also be configured on a per-remote basis, see here for more info.

```
svnfs_mountpoint: salt://foo/bar
```

**Note:** The `salt://` protocol designation can be left off (in other words, `foo/bar` and `salt://foo/bar` are equivalent).
**svnfs_root**

New in version 0.17.0.

Default: ''

Serve files from a subdirectory within the repository, instead of the root. This is useful when there are files in the repository that should not be available to the Salt fileserver. Can be used in conjunction with `svnfs_mountpoint`.

```
svnfs_root: somefolder/otherfolder
```

Changed in version 2014.7.0: Ability to specify svnfs roots on a per-remote basis was added. See [here](#) for more info.

**svnfs_trunk**

New in version 2014.7.0.

Default: trunk

Path relative to the root of the repository where the trunk is located. Can also be configured on a per-remote basis, see [here](#) for more info.

```
svnfs_trunk: trunk
```

**svnfs_branches**

New in version 2014.7.0.

Default: branches

Path relative to the root of the repository where the branches are located. Can also be configured on a per-remote basis, see [here](#) for more info.

```
svnfs_branches: branches
```

**svnfs_tags**

New in version 2014.7.0.

Default: tags

Path relative to the root of the repository where the tags are located. Can also be configured on a per-remote basis, see [here](#) for more info.

```
svnfs_tags: tags
```

**svnfs_env_whitelist**

New in version 2014.7.0.

Default: []

Used to restrict which environments are made available. Can speed up state runs if your svnfs remotes contain many branches/tags. Full names, globs, and regular expressions are supported. If using a regular expression, the expression must match the entire minion ID.
If used, only branches/tags which match one of the specified expressions will be exposed as fileserver environments.

If used in conjunction with `svnfs_env_blacklist`, then the subset of branches/tags which match the whitelist but do not match the blacklist will be exposed as fileserver environments.

```plaintext
svnfs_env_whitelist:
  - base
  - v1.*
  - 'mybranch\d+
```

```
svnfs_env_blacklist:
  - base
  - v1.*
  - 'mybranch\d+
```

### `svnfs_env_blacklist`

New in version 2014.7.0.

Default: `[]`

Used to restrict which environments are made available. Can speed up state runs if your svnfs remotes contain many branches/tags. Full names, globs, and regular expressions are supported. If using a regular expression, the expression must match the entire minion ID.

If used, branches/tags which match one of the specified expressions will *not* be exposed as fileserver environments.

If used in conjunction with `svnfs_env_whitelist`, then the subset of branches/tags which match the whitelist but do not match the blacklist will be exposed as fileserver environments.

```plaintext
svnfs_env_blacklist:
  - base
  - v1.*
  - 'mybranch\d+
```

### Minion: MinionFS Remote File Server Backend

#### `minionfs_env`

New in version 2014.7.0.

Default: `base`

Environment from which MinionFS files are made available.

```plaintext
minionfs_env: minionfs
```

### `minionfs_mountpoint`

New in version 2014.7.0.

Default: `'`

Specifies a path on the salt fileserver from which minionfs files are served.

```plaintext
minionfs_mountpoint: salt://foo/bar
```

Note: The `salt://` protocol designation can be left off (in other words, `foo/bar` and `salt://foo/bar` are equivalent).
**minionfs_whitelist**

New in version 2014.7.0.

Default: `[]`

Used to restrict which minions' pushed files are exposed via minionfs. If using a regular expression, the expression must match the entire minion ID.

If used, only the pushed files from minions which match one of the specified expressions will be exposed.

If used in conjunction with `minionfs_blacklist`, then the subset of hosts which match the whitelist but do not match the blacklist will be exposed.

```
minionfs_whitelist:
  - base
  - v1.*
  - 'mybranch\d+'
```

**minionfs_blacklist**

New in version 2014.7.0.

Default: `[]`

Used to restrict which minions' pushed files are exposed via minionfs. If using a regular expression, the expression must match the entire minion ID.

If used, only the pushed files from minions which match one of the specified expressions will not be exposed.

If used in conjunction with `minionfs_whitelist`, then the subset of hosts which match the whitelist but do not match the blacklist will be exposed.

```
minionfs_blacklist:
  - base
  - v1.*
  - 'mybranch\d+'
```

### 31.8.7 Pillar Configuration

**pillar_roots**

Default:

```
pillar_roots:
  base:
    - /srv/pillar
```

Set the environments and directories used to hold pillar sls data. This configuration is the same as `file_roots`:

```
pillar_roots:
  base:
    - /srv/pillar
  dev:
    - /srv/pillar/dev
  prod:
    - /srv/pillar/prod
```
**ext_pillar**

The ext_pillar option allows for any number of external pillar interfaces to be called when populating pillar data. The configuration is based on ext_pillar functions. The available ext_pillar functions can be found herein:

https://github.com/saltstack/salt/blob/develop/salt/pillar

By default, the ext_pillar interface is not configured to run.

Default: None

```yaml
ext_pillar:
  - hiera: /etc/hiera.yaml
  - cmd_yaml: cat /etc/salt/yaml
  - reclass:
    - inventory_base_uri: /etc/reclass
```

There are additional details at Pillars

**ext_pillar_first**

New in version 2015.5.0.

Default: False

This option allows for external pillar sources to be evaluated before pillar_roots. This allows for targeting file system pillar from ext_pillar.

```
ext_pillar_first: False
```

**Git External Pillar (git_pillar) Configuration Options**

**git_pillar_provider**

New in version 2015.8.0.

Specify the provider to be used for git_pillar. Must be either pygit2 or gitpython. If unset, then both will be tried in that same order, and the first one with a compatible version installed will be the provider that is used.

```
git_pillar_provider: gitpython
```

**git_pillar_base**

New in version 2015.8.0.

Default: master

If the desired branch matches this value, and the environment is omitted from the git_pillar configuration, then the environment for that git_pillar remote will be base. For example, in the configuration below, the foo branch/tag would be assigned to the base environment, while bar would be mapped to the bar environment.

```
git_pillar_base: foo
```

```yaml
ext_pillar:
  - git:
    - foo https://mygitserver/git-pillar.git
    - bar https://mygitserver/git-pillar.git
```
**git_pillar_branch**

New in version 2015.8.0.

Default: `master`

If the branch is omitted from a git_pillar remote, then this branch will be used instead. For example, in the configuration below, the first two remotes would use the `pillardata` branch/tag, while the third would use the `foo` branch/tag.

```
git_pillar_branch: pillardata

ext_pillar:
  - git:
    - https://mygitserver/pillar1.git
    - https://mygitserver/pillar2.git:
      - root: pillar
    - foo https://mygitserver/pillar3.git
```

**git_pillar_env**

New in version 2015.8.0.

Default: `''` (unset)

Environment to use for git_pillar remotes. This is normally derived from the branch/tag (or from a per-remote env parameter), but if set this will override the process of deriving the env from the branch/tag name. For example, in the configuration below the `foo` branch would be assigned to the `base` environment, while the `bar` branch would need to explicitly have `bar` configured as it's environment to keep it from also being mapped to the `base` environment.

```
git_pillar_env: base

ext_pillar:
  - git:
    - foo https://mygitserver/git-pillar.git
    - bar https://mygitserver/git-pillar.git:
      - env: bar
```

For this reason, this option is recommended to be left unset, unless the use case calls for all (or almost all) of the git_pillar remotes to use the same environment irrespective of the branch/tag being used.

**git_pillar_root**

New in version 2015.8.0.

Default: `''`

Path relative to the root of the repository where the git_pillar top file and SLS files are located. In the below configuration, the pillar top file and SLS files would be looked for in a subdirectory called `pillar`.

```
git_pillar_root: pillar

ext_pillar:
  - git:
    - master https://mygitserver/pillar1.git
    - master https://mygitserver/pillar2.git
```
Note: This is a global option. If only one or two repos need to have their files sourced from a subdirectory, then `git_pillar_root` can be omitted and the root can be specified on a per-remote basis, like so:

```
ext_pillar:
  - git:
    - master https://mygitserver/pillar1.git
    - master https://mygitserver/pillar2.git:
      - root: pillar
```

In this example, for the first remote the top file and SLS files would be looked for in the root of the repository, while in the second remote the pillar data would be retrieved from the `pillar` subdirectory.

**git_pillar_ssl_verify**

New in version 2015.8.0.

Default: True

Specifies whether or not to ignore SSL certificate errors when contacting the remote repository. You might want to set this to `False` if you're using a git repo that uses a self-signed certificate. However, keep in mind that setting this to anything other than `True` is considered insecure, and using an SSH-based transport (if available) may be a better option.

```
git_pillar_ssl_verify: True
```

**Git External Pillar Authentication Options**

These parameters only currently apply to the `pygit2 git_pillar_provider`. Authentication works the same as it does in `gitfs`, as outlined in the `GitFS Walkthrough`, though the global configuration options are named differently to reflect that they are for `gitpillar` instead of `gitfs`.

**git_pillar_user**  New in version 2015.8.0.

Default: ''

Along with `git_pillar_password`, is used to authenticate to HTTPS remotes.

```
git_pillar_user: git
```

**git_pillar_password**  New in version 2015.8.0.

Default: ''

Along with `git_pillar_user`, is used to authenticate to HTTPS remotes. This parameter is not required if the repository does not use authentication.

```
git_pillar_password: mypassword
```

**git_pillar_insecure_auth**  New in version 2015.8.0.

Default: False
By default, Salt will not authenticate to an HTTP (non-HTTPS) remote. This parameter enables authentication over HTTP. Enable this at your own risk.

```
git_pillar_insecure_auth: True
```

**git_pillar_pubkey**  New in version 2015.8.0.

Default: ''

Along with `git_pillar_privkey` (and optionally `git_pillar_passphrase`), is used to authenticate to SSH remotes.

```
git_pillar_pubkey: /path/to/key.pub
```

**git_pillar_privkey**  New in version 2015.8.0.

Default: ''

Along with `git_pillar_pubkey` (and optionally `git_pillar_passphrase`), is used to authenticate to SSH remotes.

```
git_pillar_privkey: /path/to/key
```

**git_pillar_passphrase**  New in version 2015.8.0.

Default: ''

This parameter is optional, required only when the SSH key being used to authenticate is protected by a passphrase.

```
git_pillar_passphrase: mypassphrase
```

**pillar_source_merging_strategy**

New in version 2014.7.0.

Default: `smart`

The pillar_source_merging_strategy option allows you to configure merging strategy between different sources. It accepts 4 values:

- `recurse`:

  it will merge recursively mapping of data. For example, theses 2 sources:

  ```
  foo: 42
  bar:
    element1: True

  bar:
    element2: True
  baz: quux
  ```

  will be merged as:

  ```
  foo: 42
  bar:
    element1: True
    element2: True
  baz: quux
  ```
• aggregate:
  instructs aggregation of elements between sources that use the `#!yamlex renderer.
  For example, these two documents:

  ```yaml
  #!yamlex
  foo: 42
  bar: !aggregate {
    element1: True
  }
  baz: !aggregate quux
  ```

  ```yaml
  #!yamlex
  bar: !aggregate {
    element2: True
  }
  baz: !aggregate quux2
  ```

  will be merged as:

  ```yaml
  foo: 42
  bar:
    element1: True
    element2: True
  baz:
    - quux
    - quux2
  ```

• overwrite:
  Will use the behaviour of the 2014.1 branch and earlier.
  Overwrites elements according the order in which they are processed.

  First pillar processed:

  ```yaml
  A:
    first_key: blah
    second_key: blah
  ```

  Second pillar processed:

  ```yaml
  A:
    third_key: blah
    fourth_key: blah
  ```

  will be merged as:

  ```yaml
  A:
    third_key: blah
    fourth_key: blah
  ```

• smart (default):
  Guesses the best strategy based on the `renderer` setting.
31.8.8 Syndic Server Settings

A Salt syndic is a Salt master used to pass commands from a higher Salt master to minions below the syndic. Using the syndic is simple. If this is a master that will have syndic servers(s) below it, set the `order_masters` setting to True.

If this is a master that will be running a syndic daemon for passthrough the `syndic_master` setting needs to be set to the location of the master server.

Do not forget that, in other words, it means that it shares with the local minions its ID and PKI_DIR.

**order_masters**

Default: False

Extra data needs to be sent with publications if the master is controlling a lower level master via a syndic minion. If this is the case the order_masters value must be set to True

| order_masters: False |

**syndic_master**

Default: None

If this master will be running a salt-syndic to connect to a higher level master, specify the higher level master with this configuration value.

| syndic_master: masterofmasters |

You can optionally connect a syndic to multiple higher level masters by setting the `syndic_master` value to a list:

<table>
<thead>
<tr>
<th>syndic_master:</th>
</tr>
</thead>
<tbody>
<tr>
<td>masterofmasters1</td>
</tr>
<tr>
<td>masterofmasters2</td>
</tr>
</tbody>
</table>

Each higher level master must be set up in a multimaster configuration.

**syndic_master_port**

Default: 4506

If this master will be running a salt-syndic to connect to a higher level master, specify the higher level master port with this configuration value.

| syndic_master_port: 4506 |

**syndic_pidfile**

Default: salt-syndic.pid

If this master will be running a salt-syndic to connect to a higher level master, specify the pidfile of the syndic daemon.

| syndic_pidfile: syndic.pid |
syndic_log_file

Default: syndic.log

If this master will be running a salt-syndic to connect to a higher level master, specify the log_file of the syndic daemon.

syndic_log_file: salt-syndic.log

31.8.9 Peer Publish Settings

Salt minions can send commands to other minions, but only if the minion is allowed to. By default "Peer Publication" is disabled, and when enabled it is enabled for specific minions and specific commands. This allows secure compartmentalization of commands based on individual minions.

peer

Default: {}

The configuration uses regular expressions to match minions and then a list of regular expressions to match functions. The following will allow the minion authenticated as foo.example.com to execute functions from the test and pkg modules.

peer:
  foo.example.com:
    - test.*
    - pkg.*

This will allow all minions to execute all commands:

peer:
  .*:
    - *

This is not recommended, since it would allow anyone who gets root on any single minion to instantly have root on all of the minions!

By adding an additional layer you can limit the target hosts in addition to the accessible commands:

peer:
  foo.example.com:
    "db*":
      - test.*
      - pkg.*

peer_run

Default: {}

The peer_run option is used to open up runners on the master to access from the minions. The peer_run configuration matches the format of the peer configuration.

The following example would allow foo.example.com to execute the manage.up runner:

peer_run:
  foo.example.com:
    - manage.up
### 31.8.10 Master Logging Settings

**log_file**

Default: `/var/log/salt/master`

The master log can be sent to a regular file, local path name, or network location. See also `log_file`.

Examples:

<table>
<thead>
<tr>
<th>log_file</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/var/log/salt/master</code></td>
</tr>
<tr>
<td><code>file:///dev/log</code></td>
</tr>
<tr>
<td><code>udp://loghost:10514</code></td>
</tr>
</tbody>
</table>

**log_level**

Default: `warning`

The level of messages to send to the console. See also `log_level`.

<table>
<thead>
<tr>
<th>log_level</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>warning</code></td>
</tr>
</tbody>
</table>

**log_level_logfile**

Default: `warning`

The level of messages to send to the log file. See also `log_level_logfile`. When it is not set explicitly it will inherit the level set by `log_level` option.

<table>
<thead>
<tr>
<th>log_level_logfile</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>warning</code></td>
</tr>
</tbody>
</table>

**log_datefmt**

Default: `%H:%M:%S`

The date and time format used in console log messages. See also `log_datefmt`.

<table>
<thead>
<tr>
<th>log_datefmt</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>%H:%M:%S</code></td>
</tr>
</tbody>
</table>

**log_datefmt_logfile**

Default: `%Y-%m-%d %H:%M:%S`

The date and time format used in log file messages. See also `log_datefmt_logfile`.

<table>
<thead>
<tr>
<th>log_datefmt_logfile</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>%Y-%m-%d %H:%M:%S</code></td>
</tr>
</tbody>
</table>
**log_fmt_console**

Default: `[%{(levelname)-8s}] %(message)s`

The format of the console logging messages. See also `log_fmt_console`.

**Note:** Log colors are enabled in `log_fmt_console` rather than the `color` config since the logging system is loaded before the master config.

Console log colors are specified by these additional formatters:

`%(colorlevel)s %(colorname)s %(colorprocess)s %(colormsg)s`

Since it is desirable to include the surrounding brackets, `[' and ']`, in the coloring of the messages, these color formatters also include padding as well. Color LogRecord attributes are only available for console logging.

```
log_fmt_console: '(%(colorlevel)s%(colormsg)s')
```

```
log_fmt_console: '(%(levelname)-8s)%(message)s'
```

**log_fmt_logfile**

Default: `%(%asctime)s,%(msecs)03.0f [%(name)-17s][%(levelname)-8s] %(message)s`

The format of the log file logging messages. See also `log_fmt_logfile`.

```
log_fmt_logfile: '%(asctime)s,%(msecs)03.0f [%(name)-17s][%(levelname)-8s] %(message)s'
```

**log_granular_levels**

Default: `{}`

This can be used to control logging levels more specifically. See also `log_granular_levels`.

### 31.8.11 Node Groups

Default: `{}`

Node groups allow for logical groupings of minion nodes. A group consists of a group name and a compound target.

```
nodegroups:
  group1: 'L@foo.domain.com,bar.domain.com,baz.domain.com or bl*.domain.com'
  group2: 'G@os:Debian and foo.domain.com'
  group3: 'G@os:Debian and N@group1'
```

More information on using nodegroups can be found [here](#).

### 31.8.12 Range Cluster Settings

**range_server**

Default: `'`

The range server (and optional port) that serves your cluster information

`https://github.com/ytoolshed/range/wiki/%22yamlfile%22-module-file-spec`
31.8.13 Include Configuration

**default_include**

Default: `master.d/*.conf`

The master can include configuration from other files. Per default the master will automatically include all config files from `master.d/*.conf` where `master.d` is relative to the directory of the master configuration file.

**include**

Default: `not defined`

The master can include configuration from other files. To enable this, pass a list of paths to this option. The paths can be either relative or absolute; if relative, they are considered to be relative to the directory the main minion configuration file lives in. Paths can make use of shell-style globbing. If no files are matched by a path passed to this option then the master will log a warning message.

```bash
# Include files from a master.d directory in the same
directory as the master config file
include: master.d/*/ 

# Include a single extra file into the configuration
include: /etc/roles/webserver

# Include several files and the master.d directory
include:
  - extra_config
  - master.d/*
  - /etc/roles/webserver
```

31.8.14 Windows Software Repo Settings

**winrepo_provider**

New in version 2015.8.0.

Specify the provider to be used for winrepo. Must be either pygit2 or gitpython. If unset, then both will be tried in that same order, and the first one with a compatible version installed will be the provider that is used.

```bash
winrepo_provider: gitpython
```

**winrepo_dir**

Changed in version 2015.8.0: Renamed from `win_repo` to `winrepo_dir`

Default: `/srv/salt/win/repo`

Location on the master where the `winrepo_remotes` are checked out.
**winrepo_dir**

Path relative to `winrepo_dir` where the winrepo cache should be created.

```
winrepo_dir: /srv/salt/win/repo
```

**winrepo_cachefile**

Changed in version 2015.8.0: Renamed from `win_repo_mastercachefile` to `winrepo_cachefile`

Default: `winrepo.p`

```
winrepo_cachefile: winrepo.p
```

**winrepo_remotes**

Changed in version 2015.8.0: Renamed from `win_gitrepos` to `winrepo_remotes`

Default: `['https://github.com/saltstack/salt-winrepo.git']`

List of git repositories to checkout and include in the winrepo

```
winrepo_remotes:
  - https://github.com/saltstack/salt-winrepo.git
```

To specify a specific revision of the repository, prepend a commit ID to the URL of the the repository:

```
winrepo_remotes:
  - '<commit_id> https://github.com/saltstack/salt-winrepo.git'
```

Replace `<commit_id>` with the SHA1 hash of a commit ID. Specifying a commit ID is useful in that it allows one to revert back to a previous version in the event that an error is introduced in the latest revision of the repo.

**winrepo_branch**

New in version 2015.8.0.

Default: `master`

If the branch is omitted from a winrepo remote, then this branch will be used instead. For example, in the configuration below, the first two remotes would use the `winrepo` branch/tag, while the third would use the `foo` branch/tag.

```
winrepo_branch: winrepo
```

```
ext_pillar:
  - git:
    - https://mygitserver/winrepo1.git
    - https://mygitserver/winrepo2.git:
      - foo https://mygitserver/winrepo3.git
```

**winrepo_ssl_verify**

New in version 2015.8.0.

Default: `True`
Specifies whether or not to ignore SSL certificate errors when contacting the remote repository. You might want to set this to `False` if you’re using a git repo that uses a self-signed certificate. However, keep in mind that setting this to anything other `True` is a considered insecure, and using an SSH-based transport (if available) may be a better option.

```
winrepo_ssl_verify: True
```

### Winrepo Authentication Options

These parameters only currently apply to the `pygit2` `winrepo_provider`. Authentication works the same as it does in gitfs, as outlined in the `GitFS Walkthrough`, though the global configuration options are named differently to reflect that they are for winrepo instead of gitfs.

**winrepo_user**

New in version 2015.8.0.

Default: `''`

Along with `winrepo_password`, is used to authenticate to HTTPS remotes.

```
winrepo_user: git
```

**winrepo_password**

New in version 2015.8.0.

Default: `''`

Along with `winrepo_user`, is used to authenticate to HTTPS remotes. This parameter is not required if the repository does not use authentication.

```
winrepo_password: mypassword
```

**winrepo_insecure_auth**

New in version 2015.8.0.

Default: `False`

By default, Salt will not authenticate to an HTTP (non-HTTPS) remote. This parameter enables authentication over HTTP. **Enable this at your own risk.**

```
winrepo_insecure_auth: True
```

**winrepo_pubkey**

New in version 2015.8.0.

Default: `''`

Along with `winrepo_privkey` (and optionally `winrepo_passphrase`), is used to authenticate to SSH remotes.
**winrepo_pubkey**: /path/to/key.pub

**winrepo_privkey**

New in version 2015.8.0.
Default: ''
Along with **winrepo_pubkey** (and optionally **winrepo_passphrase**), is used to authenticate to SSH remotes.

**winrepo_passphrase**

New in version 2015.8.0.
Default: ''
This parameter is optional, required only when the SSH key being used to authenticate is protected by a passphrase.

31.9 Configuring the Salt Minion

The Salt system is amazingly simple and easy to configure. The two components of the Salt system each have a respective configuration file. The **salt-master** is configured via the master configuration file, and the **salt-minion** is configured via the minion configuration file.

See also:

*example minion configuration file*

The Salt Minion configuration is very simple. Typically, the only value that needs to be set is the master value so the minion knows where to locate its master.

By default, the salt-minion configuration will be in /etc/salt/minion. A notable exception is FreeBSD, where the configuration will be in /usr/local/etc/salt/minion.

### 31.9.1 Minion Primary Configuration

**master**

Default: salt
The hostname or ipv4 of the master.
Default: salt

```yaml
master: salt
```

The option can also be set to a list of masters, enabling **multi-master** mode.

```yaml
master:
  - address1
  - address2
```
Changed in version 2014.7.0: The master can be dynamically configured. The `master` value can be set to an module function which will be executed and will assume that the returning value is the ip or hostname of the desired master. If a function is being specified, then the `master_type` option must be set to `func`, to tell the minion that the value is a function to be run and not a fully-qualified domain name.

```
master: module.function
master_type: func
```

In addition, instead of using multi-master mode, the minion can be configured to use the list of master addresses as a failover list, trying the first address, then the second, etc. until the minion successfully connects. To enable this behavior, set `master_type` to `failover`:

```
master:
  - address1
  - address2
master_type: failover
```

**master_type**

New in version 2014.7.0.

Default: `str`

The type of the `master` variable. Can be `str`, `failover` or `func`.

```
master_type: failover
```

If this option is set to `failover`, `master` must be a list of master addresses. The minion will then try each master in the order specified in the list until it successfully connects. `master_alive_interval` must also be set, this determines how often the minion will verify the presence of the master.

```
master_type: func
```

If the master needs to be dynamically assigned by executing a function instead of reading in the static master value, set this to `func`. This can be used to manage the minion’s master setting from an execution module. By simply changing the algorithm in the module to return a new master ip/fqdn, restart the minion and it will connect to the new master.

**master_alive_interval**

```
master_alive_interval: 30
```

Configures how often, in seconds, the minion will verify that the current master is alive and responding. The minion will try to establish a connection to the next master in the list if it finds the existing one is dead.

**master_shuffle**

New in version 2014.7.0.

Default: `False`

If `master` is a list of addresses, shuffle them before trying to connect to distribute the minions over all available masters. This uses Python's `random.shuffle` method.

```
master_shuffle: True
```
**retry_dns**

Default: 30

Set the number of seconds to wait before attempting to resolve the master hostname if name resolution fails. Defaults to 30 seconds. Set to zero if the minion should shutdown and not retry.

retry_dns: 30

**master_port**

Default: 4506

The port of the master ret server, this needs to coincide with the ret_port option on the Salt master.

master_port: 4506

**user**

Default: root

The user to run the Salt processes

user: root

**sudo_runas**

Default: None

The user to run salt remote execution commands as via sudo. If this option is enabled then sudo will be used to change the active user executing the remote command. If enabled the user will need to be allowed access via the sudoers file for the user that the salt minion is configured to run as. The most common option would be to use the root user. If this option is set the user option should also be set to a non-root user. If migrating from a root minion to a non root minion the minion cache should be cleared and the minion pki directory will need to be changed to the ownership of the new user.

sudo_runas: root

**sudo_user**

Default: ''

Setting sudo_user will cause salt to run all execution modules under an sudo to the user given in sudo_user. The user under which the salt minion process itself runs will still be that provided in user above, but all execution modules run by the minion will be rerouted through sudo.

sudo_user: saltadm

**pidfile**

Default: /var/run/salt-minion.pid

The location of the daemon's process ID file
pidfile: /var/run/salt-minion.pid

root_dir
Default: /
This directory is prepended to the following options: pki_dir, cachedir, log_file, sock_dir, and pid-file.
root_dir: /

pki_dir
Default: /etc/salt/pki
The directory used to store the minion's public and private keys.
pki_dir: /etc/salt/pki

id
Default: the system's hostname
See also:
Salt Walkthrough
The Setting up a Salt Minion section contains detailed information on how the hostname is determined.
Explicitly declare the id for this minion to use. Since Salt uses detached ids it is possible to run multiple minions on
the same machine but with different ids.
id: foo.bar.com

append_domain
Default: None
Append a domain to a hostname in the event that it does not exist. This is useful for systems where
socket.getfqdn() does not actually result in a FQDN (for instance, Solaris).
append_domain: foo.org

cachedir
Default: /var/cache/salt
The location for minion cache data.
This directory may contain sensitive data and should be protected accordingly.
cachedir: /var/cache/salt
**verify_env**

Default: True
Verify and set permissions on configuration directories at startup.

| verify_env: True |

**Note:** When marked as True the verify_env option requires WRITE access to the configuration directory (/etc/salt/). In certain situations such as mounting /etc/salt/ as read-only for templating this will create a stack trace when state.highstate is called.

**cache_jobs**

Default: False
The minion can locally cache the return data from jobs sent to it, this can be a good way to keep track of the minion side of the jobs the minion has executed. By default this feature is disabled, to enable set cache_jobs to True.

| cache_jobs: False |

**grains_cache**

Default: False
The minion can locally cache grain data instead of refreshing the data each time the grain is referenced. By default this feature is disabled, to enable set grains_cache to True.

| grains_cache: False |

**sock_dir**

Default: /var/run/salt/minion
The directory where Unix sockets will be kept.

| sock_dir: /var/run/salt/minion |

**backup_mode**

Default: []
Backup files replaced by file.managed and file.recurse under cachedir.

| backup_mode: minion |

**acceptance_wait_time**

Default: 10
The number of seconds to wait until attempting to re-authenticate with the master.
**random_reauth_delay**

When the master key changes, the minion will try to re-auth itself to receive the new master key. In larger environments this can cause a syn-flood on the master because all minions try to re-auth immediately. To prevent this and have a minion wait for a random amount of time, use this optional parameter. The wait-time will be a random number of seconds between 0 and the defined value.

| random_reauth_delay: 60 |

**acceptance_wait_time_max**

Default: None

The maximum number of seconds to wait until attempting to re-authenticate with the master. If set, the wait will increase by acceptance_wait_time_seconds each iteration.

| acceptance_wait_time_max: None |

**recon_default**

Default: 1000

The interval in milliseconds that the socket should wait before trying to reconnect to the master (1000ms = 1 second).

| recon_default: 1000 |

**recon_max**

Default: 10000

The maximum time a socket should wait. Each interval the time to wait is calculated by doubling the previous time. If recon_max is reached, it starts again at the recon_default.

**Short example:**

- reconnect 1: the socket will wait `recon_default` milliseconds
- reconnect 2: `recon_default` * 2
- reconnect 3: (`recon_default` * 2) * 2
- reconnect 4: value from previous interval * 2
- reconnect 5: value from previous interval * 2
- reconnect x: if value >= recon_max, it starts again with recon_default

| recon_max: 10000 |
**recon_randomize**

Default: True

Generate a random wait time on minion start. The wait time will be a random value between recon_default and recon_default and recon_max. Having all minions reconnect with the same recon_default and recon_max value kind of defeats the purpose of being able to change these settings. If all minions have the same values and the setup is quite large (several thousand minions), they will still flood the master. The desired behavior is to have time-frame within all minions try to reconnect.

| recon_randomize: True |

**cache_sreqs**

Default: True

The connection to the master ret_port is kept open. When set to False, the minion creates a new connection for every return to the master. environment, set this value to False.

| cache_sreqs: True |

**ipc_mode**

Default: ipc

Windows platforms lack POSIX IPC and must rely on slower TCP based inter-process communications. Set ipc_mode to tcp on such systems.

| ipc_mode: ipc |

**tcp_pub_port**

Default: 4510

Publish port used when ipc_mode is set to tcp.

| tcp_pub_port: 4510 |

**tcp_pull_port**

Default: 4511

Pull port used when ipc_mode is set to tcp.

| tcp_pull_port: 4511 |

### 31.9.2 Minion Module Management

**disable_modules**

Default: [] (all modules are enabled by default)
The event may occur in which the administrator desires that a minion should not be able to execute a certain module. The sys module is built into the minion and cannot be disabled. This setting can also tune the minion, as all modules are loaded into ram disabling modules will lower the minion’s ram footprint.

<table>
<thead>
<tr>
<th>disable_modules:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- test</td>
</tr>
<tr>
<td>- solr</td>
</tr>
</tbody>
</table>

**disable_returners**

Default: [] (all returners are enabled by default)

If certain returners should be disabled, this is the place

<table>
<thead>
<tr>
<th>disable_returners:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- mongo_return</td>
</tr>
</tbody>
</table>

**module_dirs**

Default: []

A list of extra directories to search for Salt modules

<table>
<thead>
<tr>
<th>module_dirs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- /var/lib/salt/modules</td>
</tr>
</tbody>
</table>

**returner_dirs**

Default: []

A list of extra directories to search for Salt returners

<table>
<thead>
<tr>
<th>returners_dirs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- /var/lib/salt/returners</td>
</tr>
</tbody>
</table>

**states_dirs**

Default: []

A list of extra directories to search for Salt states

<table>
<thead>
<tr>
<th>states_dirs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- /var/lib/salt/states</td>
</tr>
</tbody>
</table>

**grains_dirs**

Default: []

A list of extra directories to search for Salt grains

<table>
<thead>
<tr>
<th>grains_dirs:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- /var/lib/salt/grains</td>
</tr>
</tbody>
</table>
**render_dirs**

Default: []
A list of extra directories to search for Salt renderers

```yaml
render_dirs:
  - /var/lib/salt/renderers
```

**cython_enable**

Default: False
Set this value to true to enable auto-loading and compiling of `.pyx` modules. This setting requires that `gcc` and `cython` are installed on the minion

```yaml
cython_enable: False
```

**enable_zip_modules**

New in version 2015.8.0.
Default: False
Set this value to true to enable loading of zip archives as extension modules. This allows for packing module code with specific dependencies to avoid conflicts and/or having to install specific modules' dependencies in system libraries.

```yaml
enable_zip_modules: False
```

**providers**

Default: (empty)
A module provider can be statically overwritten or extended for the minion via the `providers` option. This can be done on an individual basis in an SLS file, or globally here in the minion config, like below.

```yaml
providers:
  service: systemd
```

### 31.9.3 State Management Settings

**renderer**

Default: `yaml_jinja`
The default renderer used for local state executions

```yaml
renderer: yaml_jinja
```
state_verbose

Default: False

state_verbose allows for the data returned from the minion to be more verbose. Normally only states that fail or states that have changes are returned, but setting `state_verbose` to True will return all states that were checked.

```
state_verbose: True
```

state_output

Default: full

The state_output setting changes if the output is the full multi line output for each changed state if set to `full`, but if set to `terse` the output will be shortened to a single line.

```
state_output: full
```

autoload_dynamic_modules

Default: True

autoload_dynamic_modules Turns on automatic loading of modules found in the environments on the master. This is turned on by default, to turn off auto-loading modules when states run set this value to False.

```
autoload_dynamic_modules: True
```

Default: True

clean_dynamic_modules keeps the dynamic modules on the minion in sync with the dynamic modules on the master, this means that if a dynamic module is not on the master it will be deleted from the minion. By default this is enabled and can be disabled by changing this value to False.

```
clean_dynamic_modules: True
```

evironment

Default: None

Normally the minion is not isolated to any single environment on the master when running states, but the environment can be isolated on the minion side by statically setting it. Remember that the recommended way to manage environments is to isolate via the top file.

```
environment: None
```

31.9.4 File Directory Settings

file_client

Default: remote

The client defaults to looking on the master server for files, but can be directed to look on the minion by setting this parameter to local.
file_client: remote

**use_master_when_local**

Default: False

When using a local `file_client`, this parameter is used to allow the client to connect to a master for remote execution.

use_master_when_local: False

**file_roots**

Default:

```plaintext
base: /srv/salt
```

When using a local `file_client`, this parameter is used to setup the fileserver’s environments. This parameter operates identically to the `master config parameter` of the same name.

```plaintext
file_roots:
   base:
      - /srv/salt
   dev:
      - /srv/salt/dev/services
      - /srv/salt/dev/states
   prod:
      - /srv/salt/prod/services
      - /srv/salt/prod/states
```

**hash_type**

Default: md5

The `hash_type` is the hash to use when discovering the hash of a file on the local fileserver. The default is md5, but sha1, sha224, sha256, sha384, and sha512 are also supported.

hash_type: md5

**pillar_roots**

Default:

```plaintext
base: /srv/pillar
```

When using a local `file_client`, this parameter is used to setup the pillar environments.

```plaintext
pillar_roots:
   base:
      - /srv/pillar
   dev:
      - /srv/pillar/dev
```
31.9.5 Security Settings

open_mode

Default: False
Open mode can be used to clean out the PKI key received from the Salt master, turn on open mode, restart the minion, then turn off open mode and restart the minion to clean the keys.

open_mode: False

master_finger

Default: ''
Fingerprint of the master public key to validate the identity of your Salt master before the initial key exchange. The master fingerprint can be found by running ``salt-key -F master'' on the Salt master.


verify_master_pubkey_sign

Default: False
Enables verification of the master-public-signature returned by the master in auth-replies. Please see the tutorial on how to configure this properly Multimaster-PKI with Failover Tutorial
New in version 2014.7.0.

verify_master_pubkey_sign: True

If this is set to True, master_sign_pubkey must be also set to True in the master configuration file.

master_sign_key_name

Default: master_sign
The filename without the .pub suffix of the public key that should be used for verifying the signature from the master. The file must be located in the minion's pki directory.
New in version 2014.7.0.

master_sign_key_name: <filename_without_suffix>

always_verify_signature

Default: False
If verify_master_pubkey_sign is enabled, the signature is only verified, if the public-key of the master changes. If the signature should always be verified, this can be set to True.
New in version 2014.7.0.

always_verify_signature: True

### 31.9.6 Thread Settings

Default: True

Disable multiprocessing support by default when a minion receives a publication a new process is spawned and the command is executed therein.

multiprocessing: True

### 31.9.7 Minion Logging Settings

**log_file**

Default: /var/log/salt/minion

The minion log can be sent to a regular file, local path name, or network location. See also log_file.

Examples:

<table>
<thead>
<tr>
<th>log_file</th>
</tr>
</thead>
<tbody>
<tr>
<td>/var/log/salt/minion</td>
</tr>
<tr>
<td>file:///dev/log</td>
</tr>
<tr>
<td>udp://loghost:10514</td>
</tr>
</tbody>
</table>

**log_level**

Default: warning

The level of messages to send to the console. See also log_level.

<table>
<thead>
<tr>
<th>log_level</th>
</tr>
</thead>
<tbody>
<tr>
<td>warning</td>
</tr>
</tbody>
</table>

**log_level_logfile**

Default: warning

The level of messages to send to the log file. See also log_level_logfile. When it is not set explicitly it will inherit the level set by log_level option.

<table>
<thead>
<tr>
<th>log_level_logfile</th>
</tr>
</thead>
<tbody>
<tr>
<td>warning</td>
</tr>
</tbody>
</table>

**log_datefmt**

Default: %H:%M:%S

The date and time format used in console log messages. See also log_datefmt.
log_datefmt: \'%H:%M:%S\'

**log_datefmt_logfile**

Default: \%Y-\%m-\%d \%H:\%M:\%S

The date and time format used in log file messages. See also log_datefmt_logfile.

log_datefmt_logfile: \'%Y-\%m-\%d \%H:\%M:\%S\'

**log_fmt_console**

Default: \[\%(levelname)-8s\] \%(message)s

The format of the console logging messages. See also log_fmt_console.

Note: Log colors are enabled in log_fmt_console rather than the color config since the logging system is loaded before the minion config.

Console log colors are specified by these additional formatters:

\%(colorlevel)s \%(colormsg)s

Since it is desirable to include the surrounding brackets, '[' and ']', in the coloring of the messages, these color formatters also include padding as well. Color LogRecord attributes are only available for console logging.

log_fmt_console: \'(colorlevel)s \(colormsg)s\'
log_fmt_console: \'[%(levelname)-8s] \%(message)s\'

**log_fmt_logfile**

Default: \%(asctime)s,\%(msecs)03.0f \[\%(name)-17s]\%(levelname)-8s \%(message)s

The format of the log file logging messages. See also log_fmt_logfile.

log_fmt_logfile: \'(asctime)s,\%(msecs)03.0f \[\%(name)-17s]\%(levelname)-8s \%(message)s\'

**log_granular_levels**

Default: \{

This can be used to control logging levels more specifically. See also log_granular_levels.

**failhard**

Default: False

Set the global failhard flag, this informs all states to stop running states at the moment a single state fails.

failhard: False
31.9.8 Include Configuration

**default_include**

Default: minion.d/*.conf

The minion can include configuration from other files. Per default the minion will automatically include all config files from **minion.d/*.conf** where minion.d is relative to the directory of the minion configuration file.

**include**

Default: not defined

The minion can include configuration from other files. To enable this, pass a list of paths to this option. The paths can be either relative or absolute; if relative, they are considered to be relative to the directory the main minion configuration file lives in. Paths can make use of shell-style globbing. If no files are matched by a path passed to this option then the minion will log a warning message.

```bash
# Include files from a minion.d directory in the same directory as the minion config file
include: minion.d/*.conf

# Include a single extra file into the configuration
include: /etc/roles/webserver

# Include several files and the minion.d directory
include:
  - extra_config
  - minion.d/*
  - /etc/roles/webserver
```

31.9.9 Frozen Build Update Settings

These options control how `salt.modules.saltutil.update()` works with esky frozen apps. For more information look at https://github.com/cloudmatrix/esky/.

**update_url**

Default: False (Update feature is disabled)

The url to use when looking for application updates. Esky depends on directory listings to search for new versions. A webserver running on your Master is a good starting point for most setups.

```bash
update_url: 'http://salt.example.com/minion-updates'
```

**update_restart_services**

Default: [] (service restarting on update is disabled)

A list of services to restart when the minion software is updated. This would typically just be a list containing the minion's service name, but you may have other services that need to go with it.

```bash
update_restart_services: ['salt-minion']
```
31.9.10 Standalone Minion Windows Software Repo Settings

**Important:** To use these config options, the minion must be running in masterless mode (set file_client to local).

---

**winrepo_dir**

Changed in version 2015.8.0: Renamed from win_repo to winrepo_dir. Also, this option did not have a default value until this version.

Default: C:\salt\srv\salt\win\repo

Location on the minion where the winrepo_remotes are checked out.

```
winrepo_dir: 'D:\winrepo'
```

---

**winrepo_cachefile**

Changed in version 2015.8.0: Renamed from win_repo_cachefile to winrepo_cachefile. Also, this option did not have a default value until this version.

Default: winrepo.p

Path relative to winrepo_dir where the winrepo cache should be created.

```
winrepo_cachefile: winrepo.p
```

---

**winrepo_remotes**

Changed in version 2015.8.0: Renamed from win_gitrepos to winrepo_remotes. Also, this option did not have a default value until this version.

New in version 2015.8.0.

Default: ['https://github.com/saltstack/salt-winrepo.git']

List of git repositories to checkout and include in the winrepo

```
winrepo_remotes:
  - https://github.com/saltstack/salt-winrepo.git
```

To specify a specific revision of the repository, prepend a commit ID to the URL of the the repository:

```
winrepo_remotes:
  - '<commit_id> https://github.com/saltstack/salt-winrepo.git'
```

Replace <commit_id> with the SHA1 hash of a commit ID. Specifying a commit ID is useful in that it allows one to revert back to a previous version in the event that an error is introduced in the latest revision of the repo.

---

31.10 Running the Salt Master/Minion as an Unprivileged User

While the default setup runs the master and minion as the root user, some may consider it an extra measure of security to run the master as a non-root user. Keep in mind that doing so does not change the master's capability
to access minions as the user they are running as. Due to this many feel that running the master as a non-root user does not grant any real security advantage which is why the master has remained as root by default.

**Note:** Some of Salt's operations cannot execute correctly when the master is not running as root, specifically the pam external auth system, as this system needs root access to check authentication.

As of Salt 0.9.10 it is possible to run Salt as a non-root user. This can be done by setting the `user` parameter in the master configuration file, and restarting the `salt-master` service.

The minion has its own `user` parameter as well, but running the minion as an unprivileged user will keep it from making changes to things like users, installed packages, etc. unless access controls (sudo, etc.) are setup on the minion to permit the non-root user to make the needed changes.

In order to allow Salt to successfully run as a non-root user, ownership, and permissions need to be set such that the desired user can read from and write to the following directories (and their subdirectories, where applicable):

- `/etc/salt`
- `/var/cache/salt`
- `/var/log/salt`
- `/var/run/salt`

Ownership can be easily changed with `chown`, like so:

```
# chown -R user /etc/salt /var/cache/salt /var/log/salt /var/run/salt
```

**Warning:** Running either the master or minion with the `root_dir` parameter specified will affect these paths, as will setting options like `pki_dir`, `cachedir`, `log_file`, and other options that normally live in the above directories.

### 31.11 Logging

The salt project tries to get the logging to work for you and help us solve any issues you might find along the way.

If you want to get some more information on the nitty-gritty of salt's logging system, please head over to the [logging development document](https://docs.saltstack.com/en/latest/ref/logging.html), if all you're after is salt's logging configurations, please continue reading.

### 31.11.1 Available Configuration Settings

**log_file**

The log records can be sent to a regular file, local path name, or network location. Remote logging works best when configured to use rsyslogd(8) (e.g.: `file:///dev/log`), with rsyslogd(8) configured for network logging. The format for remote addresses is: `<file|udp|tcp>://<host|socketpath>:<port-if-required>>/<log-facility>.

Default: Dependent of the binary being executed, for example, for `salt-master`, `/var/log/salt/master`.

Examples:

<table>
<thead>
<tr>
<th>log_file</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>/var/log/salt/master</code></td>
</tr>
<tr>
<td><code>/var/log/salt/minion</code></td>
</tr>
</tbody>
</table>
log_file: file:///dev/log
log_file: udp://loghost:10514

**log_level**

Default: warning

The level of log record messages to send to the console. One of all, garbage, trace, debug, info, warning, error, critical, quiet.

log_level: warning

**log_level_logfile**

Default: warning

The level of messages to send to the log file. One of all, garbage, trace, debug, info, warning, error, critical, quiet.

log_level_logfile: warning

**log_datefmt**

Default: %H:%M:%S

The date and time format used in console log messages. Allowed date/time formatting can be seen on `time.strftime`.

log_datefmt: '%H:%M:%S'

**log_datefmt_logfile**

Default: %Y-%m-%d %H:%M:%S

The date and time format used in log file messages. Allowed date/time formatting can be seen on `time.strftime`.

log_datefmt_logfile: '%Y-%m-%d %H:%M:%S'

**log_fmt_console**

Default: [%levelname]-8s %message

The format of the console logging messages. All standard python logging `LogRecord` attributes can be used. Salt also provides these custom LogRecord attributes to colorize console log output:

- '%(colorlevel)s'  # log level name colorized by level
- '%(colormsg)s'    # log message colorized by level
- '%(colorname)s'   # colorized module name
- '%(colorprocess)s' # colorized process number

606 Chapter 31. Reference
Note: The %(colorlevel)s, %(colormname)s, and %(colorprocess)s LogRecord attributes also include padding and enclosing brackets, [ and ] to match the default values of their collateral non-colorized LogRecord attributes.

log_fmt_console: '[(levelname)-8s] %(message)s'

log_fmt_logfile

Default: %(asctime)s,%(msecs)03.0f [%(name)-17s][%(levelname)-8s] %(message)s

The format of the log file logging messages. All standard python logging LogRecord attributes can be used. Salt also provides these custom LogRecord attributes that include padding and enclosing brackets [ and ]:

%(bracketlevel)s  # equivalent to [%s(levelname)-8s]
%(bracketname)s   # equivalent to [%s(name)-17s]
%(bracketprocess)s # equivalent to [%s(process)5s]

log_fmt_logfile: '[(asctime)s,%(msecs)03.0f [%(name)-17s][%(levelname)-8s] %(message)s'

log_granular_levels

Default: {}

This can be used to control logging levels more specifically. The example sets the main salt library at the 'warning' level, but sets salt.modules to log at the debug level:

log_granular_levels:
'盐': 'warning'
'salt.modules': 'debug'

External Logging Handlers

Besides the internal logging handlers used by salt, there are some external which can be used, see the external logging handlers document.

31.12 External Logging Handlers

<table>
<thead>
<tr>
<th>logstash_mod</th>
<th>Logstash Logging Handler</th>
</tr>
</thead>
<tbody>
<tr>
<td>sentry_mod</td>
<td>Sentry Logging Handler</td>
</tr>
</tbody>
</table>

31.12.1 Logstash Logging Handler

New in version 0.17.0.

This module provides some Logstash logging handlers.
UDP Logging Handler

For versions of Logstash before 1.2.0:

In the salt configuration file:

```yaml
logstash_udp_handler:
  host: 127.0.0.1
  port: 9999
  version: 0
```

In the Logstash configuration file:

```yaml
input {
  udp {
    type => "udp-type"
    format => "json_event"
  }
}
```

For version 1.2.0 of Logstash and newer:

In the salt configuration file:

```yaml
logstash_udp_handler:
  host: 127.0.0.1
  port: 9999
  version: 1
```

In the Logstash configuration file:

```yaml
input {
  udp {
    port => 9999
    codec => json
  }
}
```

Please read the UDP input configuration page for additional information.

ZeroMQ Logging Handler

For versions of Logstash before 1.2.0:

In the salt configuration file:

```yaml
logstash_zmq_handler:
  address: tcp://127.0.0.1:2021
  version: 0
```

In the Logstash configuration file:

```yaml
input {
  zeromq {
    type => "zeromq-type"
    mode => "server"
    topology => "pubsub"
    address => "tcp://0.0.0.0:2021"
    charset => "UTF-8"
    format => "json_event"
  }
}
```
For version 1.2.0 of Logstash and newer:

In the salt configuration file:

```yaml
logstash_zmq_handler:
  address: tcp://127.0.0.1:2021
  version: 1
```

In the Logstash configuration file:

```yaml
input {
  zeromq {
    topology => "pubsub"
    address => "tcp://0.0.0.0:2021"
    codec => json
  }
}
```

Please read the ZeroMQ input configuration page for additional information.

### Important Logstash Setting

One of the most important settings that you should not forget on your Logstash configuration file regarding these logging handlers is **format**. Both the UDP and ZeroMQ inputs need to have **format** as **json_event** which is what we send over the wire.

### Log Level

Both the `logstash_udp_handler` and the `logstash_zmq_handler` configuration sections accept an additional setting **log_level**. If not set, the logging level used will be the one defined for **log_level** in the global configuration file section.

### HWM

The **high water mark** for the ZMQ socket setting. Only applicable for the `logstash_zmq_handler`.

### Inspiration

This work was inspired in pylogstash, python-logstash, canary and the PyZMQ logging handler.

### 31.12.2 Sentry Logging Handler

New in version 0.17.0.

This module provides a Sentry logging handler.

### Note

The Raven library needs to be installed on the system for this logging handler to be available.
Configuring the python Sentry client, Raven, should be done under the `sentry_handler` configuration key. Additional context may be provided for corresponding grain item(s). At the bare minimum, you need to define the DSN. As an example:

```python
sentry_handler:
    dsn: https://pub-key:secret-key@app.getsentry.com/app-id
```

More complex configurations can be achieved, for example:

```python
sentry_handler:
    servers:
        - https://sentry.example.com
        - http://192.168.1.1
    project: app-id
    public_key: deadbeefdeadbeefdeadbeefdeadbeef
    secret_key: beefdeadbeefdeadbeefdeadbeefdead
    context:
        - os
        - master
        - saltversion
        - cpuarch
        - ec2.tags.environment
```

All the client configuration keys are supported, please see the Raven client documentation.

The default logging level for the sentry handler is ERROR. If you wish to define a different one, define `log_level` under the `sentry_handler` configuration key:

```python
sentry_handler:
    dsn: https://pub-key:secret-key@app.getsentry.com/app-id
    log_level: warning
```

The available log levels are those also available for the salt cli tools and configuration; `salt --help` should give you the required information.

### Threaded Transports

Raven's documents rightly suggest using its threaded transport for critical applications. However, don't forget that if you start having troubles with Salt after enabling the threaded transport, please try switching to a non-threaded transport to see if that fixes your problem.

#### 31.13 Salt File Server

Salt comes with a simple file server suitable for distributing files to the Salt minions. The file server is a stateless ZeroMQ server that is built into the Salt master.

The main intent of the Salt file server is to present files for use in the Salt state system. With this said, the Salt file server can be used for any general file transfer from the master to the minions.

##### 31.13.1 File Server Backends

In Salt 0.12.0, the modular filesaver was introduced. This feature added the ability for the Salt Master to integrate different file server backends. File server backends allow the Salt file server to act as a transparent bridge to external resources. A good example of this is the git backend, which allows Salt to serve files sourced from one or more git repositories, but there are several others as well. Click here for a full list of Salt's fileserver backends.
Enabling a Fileserver Backend

Fileserver backends can be enabled with the `fileserver_backend` option.

```yaml
fileserver_backend:
  - git
```

See the documentation for each backend to find the correct value to add to `fileserver_backend` in order to enable them.

Using Multiple Backends

If `fileserver_backend` is not defined in the Master config file, Salt will use the `roots` backend, but the `fileserver_backend` option supports multiple backends. When more than one backend is in use, the files from the enabled backends are merged into a single virtual filesystem. When a file is requested, the backends will be searched in order for that file, and the first backend to match will be the one which returns the file.

```yaml
fileserver_backend:
  - roots
  - git
```

With this configuration, the environments and files defined in the `file_roots` parameter will be searched first, and if the file is not found then the git repositories defined in `gitfs_remotes` will be searched.

Environments

Just as the order of the values in `fileserver_backend` matters, so too does the order in which different sources are defined within a fileserver environment. For example, given the below `file_roots` configuration, if both `/srv/salt/dev/foo.txt` and `/srv/salt/prod/foo.txt` exist on the Master, then `salt://foo.txt` would point to `/srv/salt/dev/foo.txt` in the `dev` environment, but it would point to `/srv/salt/prod/foo.txt` in the `base` environment.

```yaml
file_roots:
  base:
    - /srv/salt/prod
  qa:
    - /srv/salt/qa
    - /srv/salt/prod
  dev:
    - /srv/salt/dev
    - /srv/salt/qa
    - /srv/salt/prod
```

Similarly, when using the `git` backend, if both repositories defined below have a `hotfix23` branch/tag, and both of them also contain the file `bar.txt` in the root of the repository at that branch/tag, then `salt://bar.txt` in the `hotfix23` environment would be served from the first repository.

```yaml
gitfs_remotes:
  - https://mydomain.tld/repos/first.git
  - https://mydomain.tld/repos/second.git
```

Note: Environments map differently based on the fileserver backend. For instance, the mappings are explicitly defined in `roots` backend, while in the VCS backends (`git, hg, svn`) the environments are created from branches/tags/bookmarks/etc. For the `minion` backend, the files are all in a single environment, which is specified by the `minionfs_env` option.
See the documentation for each backend for a more detailed explanation of how environments are mapped.

### 31.13.2 Dynamic Module Distribution

New in version 0.9.5.

Salt Python modules can be distributed automatically via the Salt file server. Under the root of any environment defined via the `file_roots` option on the master server directories corresponding to the type of module can be used.

The directories are prepended with an underscore:

1. `_modules`
2. `_grains`
3. `_renderers`
4. `_returners`
5. `_states`

The contents of these directories need to be synced over to the minions after Python modules have been created in them. There are a number of ways to sync the modules.

**Sync Via States**

The minion configuration contains an option `autoload_dynamic_modules` which defaults to True. This option makes the state system refresh all dynamic modules when states are run. To disable this behavior set `autoload_dynamic_modules` to False in the minion config.

When dynamic modules are autoloaded via states, modules only pertinent to the environments matched in the master's top file are downloaded.

This is important to remember, because modules can be manually loaded from any specific environment that environment specific modules will be loaded when a state run is executed.

**Sync Via the saltutil Module**

The saltutil module has a number of functions that can be used to sync all or specific dynamic modules. The saltutil module function `saltutil.sync_all` will sync all module types over to a minion. For more information see: `salt.modules.saltutil`

### 31.13.3 File Server Configuration

The Salt file server is a high performance file server written in ZeroMQ. It manages large files quickly and with little overhead, and has been optimized to handle small files in an extremely efficient manner.

The Salt file server is an environment aware file server. This means that files can be allocated within many root directories and accessed by specifying both the file path and the environment to search. The individual environments can span across multiple directory roots to create overlays and to allow for files to be organized in many flexible ways.
Environments

The Salt file server defaults to the mandatory base environment. This environment **MUST** be defined and is used to download files when no environment is specified.

Environments allow for files and sls data to be logically separated, but environments are not isolated from each other. This allows for logical isolation of environments by the engineer using Salt, but also allows for information to be used in multiple environments.

Directory Overlay

The environment setting is a list of directories to publish files from. These directories are searched in order to find the specified file and the first file found is returned.

This means that directory data is prioritized based on the order in which they are listed. In the case of this file_roots configuration:

```yaml
file_roots:
  base:
    - /srv/salt/base
    - /srv/salt/failover
```

If a file's URI is salt://httpd/httpd.conf, it will first search for the file at /srv/salt/base/httpd/httpd.conf. If the file is found there it will be returned. If the file is not found there, then /srv/salt/failover/httpd/httpd.conf will be used for the source.

This allows for directories to be overlaid and prioritized based on the order they are defined in the configuration.

It is also possible to have file_roots which supports multiple environments:

```yaml
file_roots:
  base:
    - /srv/salt/base
  dev:
    - /srv/salt/dev
    - /srv/salt/base
  prod:
    - /srv/salt/prod
    - /srv/salt/base
```

This example ensures that each environment will check the associated environment directory for files first. If a file is not found in the appropriate directory, the system will default to using the base directory.

Local File Server

New in version 0.9.8.

The file server can be rerouted to run from the minion. This is primarily to enable running Salt states without a Salt master. To use the local file server interface, copy the file server data to the minion and set the file_roots option on the minion to point to the directories copied from the master. Once the minion file_roots option has been set, change the file_client option to local to make sure that the local file server interface is used.

31.13.4 The cp Module

The cp module is the home of minion side file server operations. The cp module is used by the Salt state system, salt-cp, and can be used to distribute files presented by the Salt file server.
Escaping Special Characters

The `salt://` url format can potentially contain a query string, for example `salt://dir/file.txt?saltenv=base`. You can prevent the fileclient/fileserver from interpreting ? as the initial token of a query string by referencing the file with `salt://|` rather than `salt:///`.

```
/etc/marathon/conf/?checkpoint:
file.managed:
  - source: salt://|hw/config/?checkpoint
  - makedirs: True
```

Environments

Since the file server is made to work with the Salt state system, it supports environments. The environments are defined in the master config file and when referencing an environment the file specified will be based on the root directory of the environment.

get_file

The `cp.get_file` function can be used on the minion to download a file from the master, the syntax looks like this:

```bash
# salt '*' cp.get_file salt://vimrc /etc/vimrc
```

This will instruct all Salt minions to download the vimrc file and copy it to `/etc/vimrc`

Template rendering can be enabled on both the source and destination file names like so:

```bash
# salt '*' cp.get_file "salt://{{grains.os}}/vimrc" /etc/vimrc template=jinja
```

This example would instruct all Salt minions to download the vimrc from a directory with the same name as their OS grain and copy it to `/etc/vimrc`

For larger files, the `cp.get_file` module also supports gzip compression. Because gzip is CPU-intensive, this should only be used in scenarios where the compression ratio is very high (e.g. pretty-printed JSON or YAML files).

To use compression, use the `gzip` named argument. Valid values are integers from 1 to 9, where 1 is the lightest compression and 9 the heaviest. In other words, 1 uses the least CPU on the master (and minion), while 9 uses the most.

```bash
# salt '*' cp.get_file salt://vimrc /etc/vimrc gzip=5
```

Finally, note that by default `cp.get_file` does *not* create new destination directories if they do not exist. To change this, use the `makedirs` argument:

```bash
# salt '*' cp.get_file salt://vimrc /etc/vim/vimrc makedirs=True
```

In this example, `/etc/vim/` would be created if it didn’t already exist.

get_dir

The `cp.get_dir` function can be used on the minion to download an entire directory from the master. The syntax is very similar to `get_file`:

```bash
# salt '*' cp.get_dir salt://etc/apache2 /etc
```

cp.get_dir supports template rendering and gzip compression arguments just like get_file:
File Server Client API

A client API is available which allows for modules and applications to be written which make use of the Salt file server.

The file server uses the same authentication and encryption used by the rest of the Salt system for network communication.

FileClient Class

The FileClient class is used to set up the communication from the minion to the master. When creating a FileClient object the minion configuration needs to be passed in. When using the FileClient from within a minion module the built in __opts__ data can be passed:

```python
import salt.minion

def get_file(path, dest, env='base'):
    '''
    Used to get a single file from the Salt master
    CLI Example:
salt '*' cp.get_file salt://vimrc /etc/vimrc
    '''
    # Create the FileClient object
    client = salt.minion.FileClient(__opts__)
    # Call get_file
    return client.get_file(path, dest, False, env)
```

Using the FileClient class outside of a minion module where the __opts__ data is not available, it needs to be generated:

```python
import salt.minion
import salt.config

def get_file(path, dest, env='base'):
    '''
    Used to get a single file from the Salt master
    '''
    # Get the configuration data
    opts = salt.config.minion_config('/etc/salt/minion')
    # Create the FileClient object
    client = salt.minion.FileClient(opts)
    # Call get_file
    return client.get_file(path, dest, False, env)
```

Full list of builtin fileserver modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>azurefs</td>
<td>The backend for serving files from the Azure blob storage service.</td>
</tr>
<tr>
<td>gitfs</td>
<td>Git Fileserver Backend</td>
</tr>
</tbody>
</table>

Continued on next page
Table 31.4 -- continued from previous page

<table>
<thead>
<tr>
<th>Backend</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>hgfs</td>
<td>Mercurial Fileserver Backend</td>
</tr>
<tr>
<td>minionfs</td>
<td>Fileserver backend which serves files pushed to the Master</td>
</tr>
<tr>
<td>roots</td>
<td>The default file server backend</td>
</tr>
<tr>
<td>s3fs</td>
<td>Amazon S3 Fileserver Backend</td>
</tr>
<tr>
<td>svnfs</td>
<td>Subversion Fileserver Backend</td>
</tr>
</tbody>
</table>

31.14.1 salt.fileserver.azurefs

The backend for serving files from the Azure blob storage service.

To enable, add `azurefs` to the `fileserver_backend` option in the Master config file.

```python
fileserver_backend:
  - azurefs
```

Each environment is configured as a storage container. The name of the container must match the name of the environment. The `storage_account` is the name of the storage account inside Azure where the container lives, and the `storage_key` is the access key used for that storage account:

```python
azurefs_envs:
  base:
    storage_account: my_storage
    storage_key: frehgfsw34fwGegG07fwsfw343tGFDSDGDFGD==
```

With this configuration, multiple storage accounts can be used with a single salt infrastructure.

- `salt.fileserver.azurefs.dir_list(load)`
  Return a list of all directories on the master
- `salt.fileserver.azurefs.envs()`
  Treat each container as an environment
- `salt.fileserver.azurefs.file_hash(load, find)`
  Return a file hash, the hash type is set in the master config file
- `salt.fileserver.azurefs.file_list(load)`
  Return a list of all files on the file server in a specified environment
- `salt.fileserver.azurefs.find_file(path, saltenv='base', env=None, **kwargs)`
  Search the environment for the relative path
- `salt.fileserver.azurefs.serve_file(load, find)`
  Return a chunk from a file based on the data received
- `salt.fileserver.azurefs.update()`
  When we are asked to update (regular interval) lets reap the cache

31.14.2 salt.fileserver.gitfs

Git Fileserver Backend

With this backend, branches and tags in a remote git repository are exposed to salt as different environments.

To enable, add `git` to the `fileserver_backend` option in the Master config file.

```python
fileserver_backend:
  - git
```
As of Salt 2014.7.0, the Git fileserver backend supports `GitPython`, `pygit2`, and `dulwich` to provide the Python interface to git. If more than one of these are present, the order of preference for which one will be chosen is the same as the order in which they were listed: `pygit2`, `GitPython`, `dulwich` (keep in mind, this order is subject to change).

An optional master config parameter (`gitfs_provider`) can be used to specify which provider should be used. More detailed information on how to use `gitfs` can be found in the `Gitfs Walkthrough`.

**Note:** Minimum requirements
To use `GitPython` for `gitfs` requires a minimum `GitPython` version of 0.3.0, as well as the `git` CLI utility. Instructions for installing `GitPython` can be found [here](#).

To use `pygit2` for `gitfs` requires a minimum `pygit2` version of 0.20.3. `pygit2` 0.20.3 requires `libgit2` 0.20.0. `pygit2` and `libgit2` are developed alongside one another, so it is recommended to keep them both at the same major release to avoid unexpected behavior. For example, `pygit2` 0.21.x requires `libgit2` 0.21.x, `pygit2` 0.22.x will require `libgit2` 0.22.x, etc.

To find stale refs, `pygit2` additionally requires the `git` CLI utility to be installed.

```python
salt.fileserver.gitfs.clear_cache()
    Completely clear gitfs cache

clear_lock = lambda remote=None: salt.fileserver.gitfs.clear_lock(remote=remote)
    Clear update.lk

clear_cache = lambda load: salt.fileserver.gitfs.clear_cache(load=load)
    Return a list of all directories on the master

dir_list = lambda load: salt.fileserver.gitfs.dir_list(load=load)
    Return a list of refs that can be used as environments

file_hash = lambda load, fnd: salt.fileserver.gitfs.file_hash(load, fnd)
    Return a file hash, the hash type is set in the master config file

file_list = lambda load: salt.fileserver.gitfs.file_list(load=load)
    Return a list of all files on the file server in a specified environment (specified as a key within the load dict).

file_list_emptydirs = lambda load: salt.fileserver.gitfs.file_list_emptydirs(load)
    Return a list of all empty directories on the master

find_file = lambda path, tgt_env='base', **kwargs: salt.fileserver.gitfs.find_file(path, tgt_env=tgt_env, **kwargs)
    Find the first file to match the path and ref, read the file out of git and send the path to the newly cached file

init = lambda: salt.fileserver.gitfs.init()
    Initialize remotes. This is only used by the master’s pre-flight checks, and is not invoked by GitFS.

lock = lambda remote=None: salt.fileserver.gitfs.lock(remote=remote)
    Place an update.lk

    remote can either be a dictionary containing repo configuration information, or a pattern. If the latter, then remotes for which the URL matches the pattern will be locked.

serve_file = lambda load, fnd: salt.fileserver.gitfs.serve_file(load, fnd)
    Return a chunk from a file based on the data received

symlink_list = lambda load: salt.fileserver.gitfs.symlink_list(load)
    Return a dict of all symlinks based on a given path in the repo

update = lambda: salt.fileserver.gitfs.update()
    Execute a git fetch on all of the repos
```
31.14.3 salt.fileserver.hgfs

Mercurial Fileserver Backend

To enable, add hg to the `fileserver_backend` option in the Master config file.

```yaml
cfg.fileserver_backend:
    - hg
```

After enabling this backend, branches, bookmarks, and tags in a remote mercurial repository are exposed to salt as different environments. This feature is managed by the `fileserver_backend` option in the salt master config file.

This fileserver has an additional option `hgfs_branch_method` that will set the desired branch method. Possible values are: branches, bookmarks, or mixed. If using branches or mixed, the default branch will be mapped to base.

Changed in version 2014.1.0: The `hgfs_base` master config parameter was added, allowing for a branch other than default to be used for the base environment, and allowing for a base environment to be specified when using an `hgfs_branch_method` of bookmarks.

```plaintext
depends
  - mercurial
  - python bindings for mercurial (python-hglib)
```

salt.fileserver.hgfs.clear_cache()
Complete clear hgfs cache

salt.fileserver.hgfs.clear_lock(remote=None)
Clear update.lk

remote can either be a dictionary containing repo configuration information, or a pattern. If the latter, then remotes for which the URL matches the pattern will be locked.

salt.fileserver.hgfs.dir_list(load)
Return a list of all directories on the master

salt.fileserver.hgfs.envs(ignore_cache=False)
Return a list of refs that can be used as environments

salt.fileserver.hgfs.file_hash(load, find)
Return a file hash, the hash type is set in the master config file

salt.fileserver.hgfs.file_list(load)
Return a list of all files on the file server in a specified environment

salt.fileserver.hgfs.file_list_emptydirs(load)
Return a list of all empty directories on the master

salt.fileserver.hgfs.find_file(path, tgt_env='base', **kwargs)
Find the first file to match the path and ref, read the file out of hg and send the path to the newly cached file

salt.fileserver.hgfs.init()
Return a list of hglib objects for the various hgfs remotes

salt.fileserver.hgfs.lock(remote=None)
Place an update.lk

remote can either be a dictionary containing repo configuration information, or a pattern. If the latter, then remotes for which the URL matches the pattern will be locked.
salt.fileserver.hgfs.\texttt{serve\_file}(load,fnd)
\hspace{1em}Return a chunk from a file based on the data received

salt.fileserver.hgfs.\texttt{update}()
\hspace{1em}Execute an hg pull on all of the repos

### 31.14.4 salt.fileserver.minionfs

Fileserver backend which serves files pushed to the Master

The \texttt{cp.push} function allows Minions to push files up to the Master. Using this backend, these pushed files are exposed to other Minions via the Salt fileserver.

To enable minionfs, \texttt{file_recv} needs to be set to \texttt{True} in the master config file (otherwise \texttt{cp.push} will not be allowed to push files to the Master), and \texttt{minion} must be added to the \texttt{fileservers_backends} list.

```python
fileserver_backend:
   - minion
```

Other minionfs settings include: \texttt{minionfs_whitelist}, \texttt{minionfs_blacklist}, \texttt{minionfs_mountpoint}, and \texttt{minionfs_env}.

See also:

\textit{MinionFS Backend Walkthrough}

salt.fileserver.minionfs.\texttt{dir\_list}(load)
\hspace{1em}Return a list of all directories on the master

\textit{CLI Example:}

```bash
$ salt 'source-minion' cp.push /absolute/path/file  # Push the file to the master
$ salt 'destination-minion' cp.list_master_dirs
destination-minion:
  - source-minion/absolute
  - source-minion/absolute/path
```

salt.fileserver.minionfs.\texttt{envs}()
\hspace{1em}Returns the one environment specified for minionfs in the master configuration.

salt.fileserver.minionfs.\texttt{file\_hash}(load,fnd)
\hspace{1em}Return a file hash, the hash type is set in the master config file

salt.fileserver.minionfs.\texttt{file\_list}(load)
\hspace{1em}Return a list of all files on the file server in a specified environment

salt.fileserver.minionfs.\texttt{find\_file}(path,tgt_env='base',**kwargs)
\hspace{1em}Search the environment for the relative path

salt.fileserver.minionfs.\texttt{serve\_file}(load,fnd)
\hspace{1em}Return a chunk from a file based on the data received

\textit{CLI Example:}

```bash
# Push the file to the master
$ salt 'source-minion' cp.push /path/to/the/file
$ salt 'destination-minion' cp.get_file salt://source-minion/path/to/the/file /destination/file
```

salt.fileserver.minionfs.\texttt{update}()
\hspace{1em}When we are asked to update (regular interval) let's reap the cache

#### 31.14. Full list of builtin fileserver modules

---

619
31.14.5 salt.fileserver.roots

The default file server backend

This fileserver backend serves files from the Master's local filesystem. If `fileserver_backend` is not defined in the Master config file, then this backend is enabled by default. If it is defined then `roots` must be in the `fileserver_backend` list to enable this backend.

```yaml
fileserver_backend:
  - roots
```

Fileserver environments are defined using the `file_roots` configuration option.

```python
salt.fileserver.roots.dir_list(load)
Return a list of all directories on the master

salt.fileserver.roots.envs()
Return the file server environments

salt.fileserver.roots.file_hash(load, fnd)
Return a file hash, the hash type is set in the master config file

salt.fileserver.roots.file_list(load)
Return a list of all files on the file server in a specified environment

salt.fileserver.roots.file_list_emptydirs(load)
Return a list of all empty directories on the master

salt.fileserver.roots.find_file(path, saltenv='base', env=None, **kwargs)
Search the environment for the relative path

salt.fileserver.roots.serve_file(load, fnd)
Return a chunk from a file based on the data received

salt.fileserver.roots.symlink_list(load)
Return a dict of all symlinks based on a given path on the Master

salt.fileserver.roots.update()
When we are asked to update (regular interval) lets reap the cache
```

31.14.6 salt.fileserver.s3fs

Amazon S3 Fileserver Backend

This backend exposes directories in S3 buckets as Salt environments. To enable this backend, add `s3fs` to the `fileserver_backend` option in the Master config file.

```yaml
fileserver_backend:
  - s3fs
```

S3 credentials must also be set in the master config file:

```yaml
s3.keyid: GKTADJGHEIQSXMKKRBJ08H
s3.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

Alternatively, if on EC2 these credentials can be automatically loaded from instance metadata.

This fileserver supports two modes of operation for the buckets:

1. A single bucket per environment
s3.buckets:
    production:
    - bucket1
    - bucket2
    staging:
    - bucket3
    - bucket4

2. Multiple environments per bucket

s3.buckets:
  - bucket1
  - bucket2
  - bucket3
  - bucket4

Note that bucket names must be all lowercase both in the AWS console and in Salt, otherwise you may encounter SignatureDoesNotMatch errors.

A multiple-environment bucket must adhere to the following root directory structure:

```
s3://<bucket name>/<environment>/<files>
```

Note: This files server back-end requires the use of the MD5 hashing algorithm. MD5 may not be compliant with all security policies.

```
salt.fileserver.s3fs.dir_list(load)
    Return a list of all directories on the master
salt.fileserver.s3fs.envs()
    Return a list of directories within the bucket that can be used as environments.

salt.fileserver.s3fs.file_hash(load, fnd)
    Return an MD5 file hash

salt.fileserver.s3fs.file_list(load)
    Return a list of all files on the file server in a specified environment

salt.fileserver.s3fs.file_list_emptydirs(load)
    Return a list of all empty directories on the master

salt.fileserver.s3fs.find_file(path, saltenv='base', env=None, **kwargs)
    Look through the buckets cache file for a match. If the field is found, it is retrieved from S3 only if its cached version is missing, or if the MD5 does not match.

salt.fileserver.s3fs.serve_file(load, fnd)
    Return a chunk from a file based on the data received

salt.fileserver.s3fs.update()
    Update the cache file for the bucket.

31.14.7 salt.fileserver.svnfs

Subversion Files server Backend

After enabling this backend, branches, and tags in a remote subversion repository are exposed to salt as different environments. To enable this backend, add svn to the fileserver_backend option in the Master config file.
This backend assumes a standard svn layout with directories for branches, tags, and trunk, at the repository root.

**depends**
- subversion
- pysvn

Changed in version 2014.7.0: The paths to the trunk, branches, and tags have been made configurable, via the config options `svnfs_trunk`, `svnfs_branches`, and `svnfs_tags`. `svnfs_mountpoint` was also added. Finally, support for per-remote configuration parameters was added. See the documentation for more information.

```python
salt.fileserver.svnfs.clear_cache()
```  
Completely clear svnfs cache

```python
salt.fileserver.svnfs.clear_lock(remote=None)
```  
Clear update.lk

remote can either be a dictionary containing repo configuration information, or a pattern. If the latter, then remotes for which the URL matches the pattern will be locked.

```python
salt.fileserver.svnfs.dir_list(load)
```  
Return a list of all directories on the master

```python
salt.fileserver.svnfs.envs(ignore_cache=False)
```  
Return a list of refs that can be used as environments

```python
salt.fileserver.svnfs.file_hash(load, find)
```  
Return a file hash, the hash type is set in the master config file

```python
salt.fileserver.svnfs.file_list(load)
```  
Return a list of all files on the file server in a specified environment

```python
salt.fileserver.svnfs.file_list_emptydirs(load)
```  
Return a list of all empty directories on the master

```python
salt.fileserver.svnfs.find_file(path, tgt_env='base', **kwargs)
```  
Find the first file to match the path and ref. This operates similarly to the roots file server but with assumptions of the directory structure based on svn standard practices.

```python
salt.fileserver.svnfs.init()
```  
Return the list of svn remotes and their configuration information

```python
salt.fileserver.svnfs.lock(remote=None)
```  
Place an update.lk

remote can either be a dictionary containing repo configuration information, or a pattern. If the latter, then remotes for which the URL matches the pattern will be locked.

```python
salt.fileserver.svnfs.serve_file(load, find)
```  
Return a chunk from a file based on the data received

```python
salt.fileserver.svnfs.update()
```  
Execute an svn update on all of the repos
31.15 Salt code and internals

Reference documentation on Salt’s internal code.

31.15.1 Contents

salt.aggregation

salt.utils.aggregation

This library makes it possible to introspect dataset and aggregate nodes when it is instructed.

---

**Note:** The following examples with be expressed in YAML for convenience’s sake:

- `!aggr-scalar` will refer to Scalar python function
- `!aggr-map` will refer to Map python object
- `!aggr-seq` will refer for Sequence python object

---

### How to instructs merging

This yaml document has duplicate keys:

```yaml
foo: !aggr-scalar first
foo: !aggr-scalar second
bar: !aggr-map {first: foo}
bar: !aggr-map {second: bar}
baz: !aggr-scalar 42
```

but tagged values instruct Salt that overlapping values they can be merged together:

```yaml
foo: !aggr-seq [first, second]
bar: !aggr-map {first: foo, second: bar}
baz: !aggr-seq [42]
```

### Default merge strategy is keep untouched

For example, this yaml document still has duplicate keys, but does not instruct aggregation:

```yaml
foo: first
foo: second
bar: {first: foo}
bar: {second: bar}
baz: 42
```

So the late found values prevail:

```yaml
foo: second
bar: {second: bar}
baz: 42
```

### Limitations

Aggregation is permitted between tagged objects that share the same type. If not, the default merge strategy prevails.

For example, these examples:
foo: {first: value}
foo: !aggr-map {second: value}

bar: !aggr-map {first: value}
bar: 42

baz: !aggr-seq [42]
baz: [fail]

qux: 42
qux: !aggr-scalar fail

are interpreted like this:

foo: !aggr-map {second: value}
bar: 42
baz: [fail]
qux: !aggr-seq [fail]

Introspection  TODO: write this part

salt.utils.aggregation.aggregate(obj_a, obj_b, level=False, map_class=<class 'salt.utils.aggregation.Map'>, sequence_class=<class 'salt.utils.aggregation.Sequence'>)

Merge obj_b into obj_a.

>>> aggregate('first', 'second', True) == ['first', 'second']
True

class salt.utils.aggregation.Aggregate
Aggregation base.

class salt.utils.aggregation.Map(*args, **kws)
Map aggregation.

salt.utils.aggregation.Scalar(obj)
Shortcut for Sequence creation

>>> Scalar('foo') == Sequence(['foo'])
True

class salt.utils.aggregation.Sequence
Sequence aggregation.

Exceptions

Salt-specific exceptions should be thrown as often as possible so the various interfaces to Salt (CLI, API, etc) can handle those errors appropriately and display error messages appropriately.
salt.exceptions

This module is a central location for all salt exceptions

*exception salt.exceptions.AuthenticationError*(message='')
  If sha256 signature fails during decryption

*exception salt.exceptions.AuthorizationError*(message='')
  Thrown when runner or wheel execution fails due to permissions

*exception salt.exceptions.CommandExecutionError*(message='')
  Used when a module runs a command which returns an error and wants to show the user the output gracefully instead of dying

*exception salt.exceptions.CommandNotFoundError*(message='')
  Used in modules or grains when a required binary is not available

*exception salt.exceptions.EauthAuthenticationError*(message='')
  Thrown when eauth authentication fails

*exception salt.exceptions.FileserverConfigError*(message='')
  Used when invalid fileserver settings are detected

*exception salt.exceptions.LoadError*(message='')
  Problems loading the right renderer

*exception salt.exceptions.MasterExit*
  Rise when the master exits

*exception salt.exceptions.MinionError*(message='')
  Minion problems reading uris such as salt:// or http://

*exception salt.exceptions.NotImplemented*(message='')
  Used when a module runs a command which returns an error and wants to show the user the output gracefully instead of dying

*exception salt.exceptions.PkgParseError*(message='')
  Used when of the pkg modules cannot correctly parse the output from the CLI tool (pacman, yum, apt, aptitude, etc)

*exception salt.exceptions.PublishError*(message='')
  Problems encountered when trying to publish a command

*exception salt.exceptions.SaltCacheError*(message='')
  Thrown when a problem was encountered trying to read or write from the salt cache

*exception salt.exceptions.SaltClientError*(message='')
  Problem reading the master root key

*exception salt.exceptions.SaltClientTimeout*(msg, jid=None, *args, **kwargs)*
  Thrown when a job sent through one of the Client interfaces times out
  Takes the jid as a parameter

*exception salt.exceptions.SaltCloudConfigError*(message='')
  Raised when a configuration setting is not found and should exist.

*exception salt.exceptions.SaltCloudException*(message='')
  Generic Salt Cloud Exception

*exception salt.exceptions.SaltCloudExecutionFailure*(message='')
  Raised when too much failures have occurred while querying/waiting for data.
exception salt.exceptions.SaltCloudExecutionTimeout(message='')
    Raised when too much time has passed while querying/waiting for data.

exception salt.exceptions.SaltCloudNotFound(message='')
    Raised when some cloud provider function cannot find what's being searched.

exception salt.exceptions.SaltCloudPasswordError(message='')
    Raise when virtual terminal password input failed

exception salt.exceptions.SaltCloudSystemExit(message, exit_code=1)
    This exception is raised when the execution should be stopped.

exception salt.exceptions.SaltDaemonNotRunning(message='')
    Throw when a running master/minion/syndic is not running but is needed to perform the requested operation
    (e.g., eauth).

exception salt.exceptions.SaltException(message='')
    Base exception class; all Salt-specific exceptions should subclass this

    pack()
    Pack this exception into a serializable dictionary that is safe for transport via msgpack

exception salt.exceptions.SaltInvocationError(message='')
    Used when the wrong number of arguments are sent to modules or invalid arguments are specified on the
    command line

exception salt.exceptions.SaltMasterError(message='')
    Problem reading the master root key

exception salt.exceptions.SaltNoMinionsFound(message='')
    An attempt to retrieve a list of minions failed

exception salt.exceptions.SaltRenderError(message, line_num=None, buf='', marker='^=*=*=*=*=*=*=*=*=*=*=^=', trace=None)
    Used when a renderer needs to raise an explicit error. If a line number and buffer string are passed, get_context
    will be invoked to get the location of the error.

exception salt.exceptions.SaltReqTimeoutError(message='')
    Thrown when a salt master request call fails to return within the timeout

exception salt.exceptions.SaltRunnerError(message='')
    Problem in runner

exception salt.exceptions.SaltSyndicMasterError(message='')
    Problem while proxying a request in the syndication master

exception salt.exceptions.SaltSystemExit(code=0, msg=None)
    This exception is raised when an unsolvable problem is found. There's nothing else to do, salt should just exit.

exception salt.exceptions.SaltWheelError(message='')
    Problem in wheel

exception salt.exceptions.TimedProcTimeoutError(message='')
    Thrown when a timed subprocess does not terminate within the timeout, or if the specified timeout is not an
    int or a float

exception salt.exceptions.TokenAuthenticationError(message='')
    Thrown when token authentication fails

Salt opts dictionary

It is very common in the Salt codebase to see opts referred to in a number of contexts.
For example, it can be seen as __opts__ in certain cases, or simply as opts as an argument to a function in others.

Simply put, this data structure is a dictionary of Salt's runtime configuration information that's passed around in order for functions to know how Salt is configured.

When writing Python code to use specific parts of Salt, it may become necessary to initialize a copy of opts from scratch in order to have it available for a given function.

To do so, use the utility functions available in salt.config.

As an example, here is how one might generate and print an options dictionary for a minion instance:

```python
import salt.config
opts = salt.config.minion_config('/etc/salt/minion')
print(opts)
```

To generate and display opts for a master, the process is similar:

```python
import salt.config
opts = salt.config.master_config('/etc/salt/master')
print(opts)
```

salt.exceptions

This module is a central location for all salt exceptions

exception salt.exceptions.AuthenticationError(message=''
    If sha256 signature fails during decryption
exception salt.exceptions.AuthorizationError(message=''
    Thrown when runner or wheel execution fails due to permissions
exception salt.exceptions.CommandExecutionError(message=''
    Used when a module runs a command which returns an error and wants to show the user the output gracefully instead of dying
exception salt.exceptions.CommandNotFoundError(message=''
    Used in modules or grains when a required binary is not available
exception salt.exceptions.EauthAuthenticationError(message=''
    Thrown when eauth authentication fails
exception salt.exceptions.FileserverConfigError(message=''
    Used when invalid fileserver settings are detected
exception salt.exceptions.LoaderError(message=''
    Problems loading the right renderer
exception salt.exceptions.MasterExit
    Rise when the master exits
exception salt.exceptions.MinionError(message=''
    Minion problems reading uris such as salt:// or http://
exception salt.exceptions.NotImplemented(message=''
    Used when a module runs a command which returns an error and wants to show the user the output gracefully instead of dying
exception salt.exceptions.PkgParseError(message=''
    Used when of the pkg modules cannot correctly parse the output from the CLI tool (pacman, yum, apt, aptitude, etc)
exception salt.exceptions.PublishError(message='')
    Problems encountered when trying to publish a command

exception salt.exceptions.SaltCacheError(message='')
    Thrown when a problem was encountered trying to read or write from the salt cache

exception salt.exceptions.SaltClientError(message='')
    Problem reading the master root key

exception salt.exceptions.SaltClientTimeout(msg, jid=None, *args, **kwargs)
    Thrown when a job sent through one of the Client interfaces times out
    Takes the jid as a parameter

exception salt.exceptions.SaltCloudConfigError(message='')
    Raised when a configuration setting is not found and should exist.

exception salt.exceptions.SaltCloudException(message='')
    Generic Salt Cloud Exception

exception salt.exceptions.SaltCloudExecutionFailure(message='')
    Raised when too much failures have occurred while querying/waiting for data.

exception salt.exceptions.SaltCloudExecutionTimeout(message='')
    Raised when too much time has passed while querying/waiting for data.

exception salt.exceptions.SaltCloudNotFound(message='')
    Raised when some cloud provider function cannot find what's being searched.

exception salt.exceptions.SaltCloudPasswordError(message='')
    Raise when virtual terminal password input failed

exception salt.exceptions.SaltCloudSystemExit(message, exit_code=1)
    This exception is raised when the execution should be stopped.

exception salt.exceptions.SaltDaemonNotRunning(message='')
    Throw when a running master/minion/syndic is not running but is needed to perform the requested operation
    (e.g., eauth).

exception salt.exceptions.SaltException(message='')
    Base exception class; all Salt-specific exceptions should subclass this

pack()
    Pack this exception into a serializable dictionary that is safe for transport via msgpack

exception salt.exceptions.SaltInvocationError(message='')
    Used when the wrong number of arguments are sent to modules or invalid arguments are specified on the
    command line

exception salt.exceptions.SaltMasterError(message='')
    Problem reading the master root key

exception salt.exceptions.SaltNoMinionsFound(message='')
    An attempt to retrieve a list of minions failed

exception salt.exceptions.SaltRenderError(message, line_num=None, buf='', marker='<----------------------', trace=None)
    Used when a renderer needs to raise an explicit error. If a line number and buffer string are passed, get_context
    will be invoked to get the location of the error.

exception salt.exceptions.SaltReqTimeoutError(message='')
    Thrown when a salt master request call fails to return within the timeout
```python
definitions:
- SaltDocumentation:
  - Release:
    - 2015.8.0

exceptions:
- SaltRunnerError
  - salt.exceptions
  - Problem in runner
- SaltSyndicMasterError
  - salt.exceptions
  - Problem while proxying a request in the syndication master
- SaltSystemExit
  - salt.exceptions
  - This exception is raised when an unsolvable problem is found. There’s nothing else to do, salt should just exit.
- SaltWheelError
  - salt.exceptions
  - Problem in wheel
- TimedProcTimeoutError
  - salt.exceptions
  - Thrown when a timed subprocess does not terminate within the timeout, or if the specified timeout is not an int or a float
- TokenAuthenticationError
  - salt.exceptions
  - Thrown when token authentication fails

31.16 Full list of builtin execution modules

Virtual modules

31.16.1 salt.modules.pkg

pkg is a virtual module that is fulfilled by one of the following modules:
- salt.modules.aptpkg
- salt.modules.brew
- salt.modules.ebuild
- salt.modules.freebsdpkg
- salt.modules.openbsdpkg
- salt.modules.pacman
- salt.modules.pkgin
- salt.modules.pkgng
- salt.modules.pkgutil
- salt.modules.solarispkg
- salt.modules.win_pkg
- salt.modules.yumpkg
- salt.modules.zypper
```

<table>
<thead>
<tr>
<th>aliases</th>
<th>Manage the information in the aliases file</th>
</tr>
</thead>
<tbody>
<tr>
<td>alternatives</td>
<td>Support for Alternatives system</td>
</tr>
<tr>
<td>apache</td>
<td>Support for Apache</td>
</tr>
<tr>
<td>aptpkg</td>
<td>Support for APT (Advanced Packaging Tool)</td>
</tr>
<tr>
<td>archive</td>
<td>A module to wrap (non-Windows) archive calls</td>
</tr>
<tr>
<td>Module</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>artifactory</td>
<td>Module for fetching artifacts from Artifactory</td>
</tr>
<tr>
<td>at</td>
<td>Wrapper module for at(1)</td>
</tr>
<tr>
<td>augeas_cfg</td>
<td>Manages configuration files via augeas</td>
</tr>
<tr>
<td>aws_sqs</td>
<td>Support for the Amazon Simple Queue Service.</td>
</tr>
<tr>
<td>bamboohr</td>
<td>Support for BambooHR</td>
</tr>
<tr>
<td>beacons</td>
<td>Module for managing the Salt beacons on a minion</td>
</tr>
<tr>
<td>bigip</td>
<td>An execution module which can manipulate an f5 bigip via iControl REST</td>
</tr>
<tr>
<td>blockdev</td>
<td>Module for managing block devices</td>
</tr>
<tr>
<td>bluez</td>
<td>Support for Bluetooth (using BlueZ in Linux).</td>
</tr>
<tr>
<td>boto_asg</td>
<td>Connection module for Amazon Autoscale Groups</td>
</tr>
<tr>
<td>boto_cfn</td>
<td>Connection module for Amazon Cloud Formation</td>
</tr>
<tr>
<td>boto_cloudwatch</td>
<td>Connection module for Amazon CloudWatch</td>
</tr>
<tr>
<td>boto_dynamodb</td>
<td>Connection module for Amazon DynamoDB</td>
</tr>
<tr>
<td>boto_ec2</td>
<td>Connection module for Amazon EC2</td>
</tr>
<tr>
<td>boto_elasticache</td>
<td>Connection module for Amazon Elasticache</td>
</tr>
<tr>
<td>boto_elb</td>
<td>Connection module for Amazon ELB</td>
</tr>
<tr>
<td>boto_iam</td>
<td>Connection module for Amazon IAM</td>
</tr>
<tr>
<td>boto_kms</td>
<td>Connection module for Amazon KMS</td>
</tr>
<tr>
<td>boto_rds</td>
<td>Connection module for Amazon RDS</td>
</tr>
<tr>
<td>boto_route53</td>
<td>Connection module for Amazon Route53</td>
</tr>
<tr>
<td>boto_ssecgroup</td>
<td>Connection module for Amazon Security Groups</td>
</tr>
<tr>
<td>boto_sns</td>
<td>Connection module for Amazon SNS</td>
</tr>
<tr>
<td>boto_sqs</td>
<td>Connection module for Amazon SQS</td>
</tr>
<tr>
<td>boto_vpc</td>
<td>Connection module for Amazon VPC</td>
</tr>
<tr>
<td>bower</td>
<td>Manage and query Bower packages</td>
</tr>
<tr>
<td>brew</td>
<td>Homebrew for Mac OS X</td>
</tr>
<tr>
<td>bridge</td>
<td>Module for gathering and managing bridging information</td>
</tr>
<tr>
<td>bsd_shadow</td>
<td>Manage the password database on BSD systems</td>
</tr>
<tr>
<td>btrfs</td>
<td>Module for managing BTRFS file systems.</td>
</tr>
<tr>
<td>cabal</td>
<td>Manage and query Cabal packages</td>
</tr>
<tr>
<td>cassandra</td>
<td>Cassandra NoSQL Database Module</td>
</tr>
<tr>
<td>cassandra_cql</td>
<td>Cassandra Database Module</td>
</tr>
<tr>
<td>chef</td>
<td>Execute chef in server or solo mode</td>
</tr>
<tr>
<td>chocolatey</td>
<td>A dead simple module wrapping calls to the Chocolatey package manager</td>
</tr>
<tr>
<td>cloud</td>
<td>Salt-specific interface for calling Salt Cloud directly</td>
</tr>
<tr>
<td>cmdmod</td>
<td>A module for shelling out.</td>
</tr>
<tr>
<td>composer</td>
<td>Use composer to install PHP dependencies for a directory</td>
</tr>
<tr>
<td>config</td>
<td>Return config information</td>
</tr>
<tr>
<td>consul</td>
<td>Interact with Consul</td>
</tr>
<tr>
<td>container_resource</td>
<td>Common resources for LXC and systemd-nspawn containers</td>
</tr>
<tr>
<td>cp</td>
<td>Minion side functions for salt-cp</td>
</tr>
<tr>
<td>cpan</td>
<td>Manage Perl modules using CPAN</td>
</tr>
<tr>
<td>cron</td>
<td>Work with cron</td>
</tr>
<tr>
<td>cyg</td>
<td>Manage cygwin packages.</td>
</tr>
<tr>
<td>daemontools</td>
<td>daemontools service module. This module will create daemontools type</td>
</tr>
<tr>
<td>darwin_pkgrutil</td>
<td>Installer support for OS X.</td>
</tr>
<tr>
<td>darwin_sysctl</td>
<td>Module for viewing and modifying sysctl parameters</td>
</tr>
<tr>
<td>data</td>
<td>Manage a local persistent data structure that can hold any arbitrary data</td>
</tr>
<tr>
<td>ddns</td>
<td>Support for RFC 2136 dynamic DNS updates.</td>
</tr>
</tbody>
</table>
### Table 31.6 -- continued from previous page

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>deb_apache</strong></td>
<td>Support for Apache</td>
</tr>
<tr>
<td><strong>deb_postgres</strong></td>
<td>Module to provide Postgres compatibility to salt for debian family specific tools.</td>
</tr>
<tr>
<td><strong>debconfmod</strong></td>
<td>Support for Deconf</td>
</tr>
<tr>
<td><strong>debian_ip</strong></td>
<td>The networking module for Debian based distros</td>
</tr>
<tr>
<td><strong>debian_service</strong></td>
<td>Service support for Debian systems (uses update-rc.d and /sbin/service)</td>
</tr>
<tr>
<td><strong>defaults</strong></td>
<td></td>
</tr>
<tr>
<td><strong>devmap</strong></td>
<td>Device-Mapper module</td>
</tr>
<tr>
<td><strong>dig</strong></td>
<td>Compendium of generic DNS utilities.</td>
</tr>
<tr>
<td><strong>disk</strong></td>
<td>Module for gathering disk information</td>
</tr>
<tr>
<td><strong>djangomod</strong></td>
<td>Manage Django sites</td>
</tr>
<tr>
<td><strong>dnsmasq</strong></td>
<td>Module for managing dnsmasq</td>
</tr>
<tr>
<td><strong>dnsutil</strong></td>
<td>Compendium of generic DNS utilities</td>
</tr>
<tr>
<td><strong>dockerio</strong></td>
<td>Management of Docker Containers</td>
</tr>
<tr>
<td><strong>dockerng</strong></td>
<td>Management of Docker Containers</td>
</tr>
<tr>
<td><strong>dpkg</strong></td>
<td>Support for DEB packages</td>
</tr>
<tr>
<td><strong>drac</strong></td>
<td>Manage Dell DRAC</td>
</tr>
<tr>
<td><strong>drbd</strong></td>
<td>DRBD administration module</td>
</tr>
<tr>
<td><strong>ebuild</strong></td>
<td>Support for Portage</td>
</tr>
<tr>
<td><strong>eix</strong></td>
<td>Support for Eix</td>
</tr>
<tr>
<td><strong>elasticsearch</strong></td>
<td>Elasticsearch - A distributed RESTful search and analytics server</td>
</tr>
<tr>
<td><strong>environ</strong></td>
<td>Support for getting and setting the environment variables of the current salt process.</td>
</tr>
<tr>
<td><strong>eselect</strong></td>
<td>Support foreselect, Gentoo's configuration and management tool.</td>
</tr>
<tr>
<td><strong>etcd_mod</strong></td>
<td>Execution module to work with etcd</td>
</tr>
<tr>
<td><strong>event</strong></td>
<td>Use the Salt Event System to fire events from the master to the minion and vice-versa.</td>
</tr>
<tr>
<td><strong>extfs</strong></td>
<td>Module for managing ext2/3/4 file systems</td>
</tr>
<tr>
<td><strong>file</strong></td>
<td>Manage information about regular files, directories,</td>
</tr>
<tr>
<td><strong>firewalld</strong></td>
<td>Support for firewalld</td>
</tr>
<tr>
<td><strong>freebsd_sysctl</strong></td>
<td>Module for viewing and modifying sysctl parameters</td>
</tr>
<tr>
<td><strong>freebsdjail</strong></td>
<td>The jail module for FreeBSD</td>
</tr>
<tr>
<td><strong>freebsdmod</strong></td>
<td>Module to manage FreeBSD kernel modules</td>
</tr>
<tr>
<td><strong>freebsdpkg</strong></td>
<td>Remote package support using pkg_add(1)</td>
</tr>
<tr>
<td><strong>freebsdports</strong></td>
<td>Install software from the FreeBSD ports(7) system</td>
</tr>
<tr>
<td><strong>freebsdservice</strong></td>
<td>The service module for FreeBSD</td>
</tr>
<tr>
<td><strong>gem</strong></td>
<td>Manage ruby gems.</td>
</tr>
<tr>
<td><strong>genesis</strong></td>
<td>Module for managing container and VM images</td>
</tr>
<tr>
<td><strong>gentoo_service</strong></td>
<td>Top level package command wrapper, used to translate the os detected by grains</td>
</tr>
<tr>
<td><strong>gentoolkitmod</strong></td>
<td>Support for Gentoolkit</td>
</tr>
<tr>
<td><strong>git</strong></td>
<td>Support for the Git SCM</td>
</tr>
<tr>
<td><strong>glance</strong></td>
<td>Module for handling openstack glance calls</td>
</tr>
<tr>
<td><strong>glusterfs</strong></td>
<td>Manage a glusterfs pool</td>
</tr>
<tr>
<td><strong>gnomedesktop</strong></td>
<td>GNOME implementations</td>
</tr>
<tr>
<td><strong>gpg</strong></td>
<td>Manage a GPG keychains, add keys, create keys, retrieve keys from keyservers.</td>
</tr>
<tr>
<td><strong>grains</strong></td>
<td>Return/control aspects of the grains data</td>
</tr>
<tr>
<td><strong>groupadd</strong></td>
<td>Manage groups on Linux, OpenBSD and NetBSD</td>
</tr>
<tr>
<td><strong>grub_legacy</strong></td>
<td>Support for GRUB Legacy</td>
</tr>
<tr>
<td><strong>guestfs</strong></td>
<td>Interact with virtual machine images via libguestfs</td>
</tr>
<tr>
<td><strong>hadoop</strong></td>
<td>Support for hadoop</td>
</tr>
<tr>
<td><strong>haproxyconn</strong></td>
<td>Support for haproxy</td>
</tr>
<tr>
<td><strong>hashutil</strong></td>
<td>A collection of hashing and encoding functions</td>
</tr>
<tr>
<td><strong>hg</strong></td>
<td>Support for the Mercurial SCM</td>
</tr>
<tr>
<td>Module</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>hipchat</td>
<td>Module for sending messages to hipchat.</td>
</tr>
<tr>
<td>hosts</td>
<td>Manage the information in the hosts file.</td>
</tr>
<tr>
<td>htpasswd</td>
<td>Support for htpasswd command.</td>
</tr>
<tr>
<td>http</td>
<td>Module for making various web calls.</td>
</tr>
<tr>
<td>ifttt</td>
<td>Support for IFTTT.</td>
</tr>
<tr>
<td>ilo</td>
<td>Manage HP ILO.</td>
</tr>
<tr>
<td>img</td>
<td>Virtual machine image management tools.</td>
</tr>
<tr>
<td>incron</td>
<td>Work with incron.</td>
</tr>
<tr>
<td>influx</td>
<td>InfluxDB - A distributed time series database.</td>
</tr>
<tr>
<td>ini_manage</td>
<td>Edit ini files.</td>
</tr>
<tr>
<td>introspect</td>
<td>Functions to perform introspection on a minion, and return data in a format.</td>
</tr>
<tr>
<td>ipmi</td>
<td>Support IPMI commands over LAN.</td>
</tr>
<tr>
<td>ipset</td>
<td>Support for ipset.</td>
</tr>
<tr>
<td>iptables</td>
<td>Support for iptables.</td>
</tr>
<tr>
<td>jboss7</td>
<td>Module for managing JBoss AS 7 through the CLI interface.</td>
</tr>
<tr>
<td>jboss7_cli</td>
<td>Module for low-level interaction with JBossAS7 through CLI.</td>
</tr>
<tr>
<td>junos</td>
<td>Module for interfacing to Junos devices.</td>
</tr>
<tr>
<td>kerberos</td>
<td>Manage Kerberos KDC.</td>
</tr>
<tr>
<td>key</td>
<td>Functions to view the minion's public key information.</td>
</tr>
<tr>
<td>keyboard</td>
<td>Module for managing keyboards on supported POSIX-like systems using systemd, or such as Redhat, Debian, and Gentoo.</td>
</tr>
<tr>
<td>keystone</td>
<td>Module for handling openstack keystone calls.</td>
</tr>
<tr>
<td>kmod</td>
<td>Module to manage Linux kernel modules.</td>
</tr>
<tr>
<td>launchctl</td>
<td>Module for the management of MacOS systems that use launchd/launchctl.</td>
</tr>
<tr>
<td>layman</td>
<td>Support for Layman.</td>
</tr>
<tr>
<td>ldapmod</td>
<td>Salt interface to LDAP commands.</td>
</tr>
<tr>
<td>linux_acl</td>
<td>Support for Linux File Access Control Lists.</td>
</tr>
<tr>
<td>linux_lvm</td>
<td>Support for Linux LVM2.</td>
</tr>
<tr>
<td>linux_sysctl</td>
<td>Module for viewing and modifying sysctl parameters.</td>
</tr>
<tr>
<td>localemod</td>
<td>Module for managing locales on POSIX-like systems.</td>
</tr>
<tr>
<td>locate</td>
<td>Module for using the locate utilities.</td>
</tr>
<tr>
<td>logadm</td>
<td>Module for managing Solaris logadm based log rotations.</td>
</tr>
<tr>
<td>logrotate</td>
<td>Module for managing logrotate.</td>
</tr>
<tr>
<td>lvs</td>
<td>Support for LVS (Linux Virtual Server).</td>
</tr>
<tr>
<td>lxc</td>
<td>Control Linux Containers via Salt.</td>
</tr>
<tr>
<td>mac_group</td>
<td>Manage groups on Mac OS 10.7+.</td>
</tr>
<tr>
<td>mac_user</td>
<td>Manage users on Mac OS 10.7+.</td>
</tr>
<tr>
<td>macports</td>
<td>Support for MacPorts under Mac OSX.</td>
</tr>
<tr>
<td>makeconf</td>
<td>Support for modifying make.conf under Gentoo.</td>
</tr>
<tr>
<td>match</td>
<td>The match module allows for match routines to be run and determine target specs.</td>
</tr>
<tr>
<td>mdadm</td>
<td>Salt module to manage RAID arrays with mdadm.</td>
</tr>
<tr>
<td>memcached</td>
<td>Module for Management of Memcached Keys.</td>
</tr>
<tr>
<td>mine</td>
<td>The function cache system allows for data to be stored on the master so it can be easily read by other minions.</td>
</tr>
<tr>
<td>mod_random</td>
<td>New in version 2014.7.0.</td>
</tr>
<tr>
<td>modjk</td>
<td>Control Modjk via the Apache Tomcat `&quot;Status&quot; worker.</td>
</tr>
<tr>
<td>mongodb</td>
<td>Module to provide MongoDB functionality to Salt.</td>
</tr>
<tr>
<td>monit</td>
<td>Monit service module.</td>
</tr>
<tr>
<td>moosefs</td>
<td>Module for gathering and managing information about MooseFS.</td>
</tr>
<tr>
<td>mount</td>
<td>Salt module to manage unix mounts and the fstab file.</td>
</tr>
<tr>
<td>mssql</td>
<td>Module to provide MS SQL Server compatibility to salt.</td>
</tr>
<tr>
<td>munin</td>
<td>Run munin plugins/checks from salt and format the output as data.</td>
</tr>
</tbody>
</table>
Table 31.6 -- continued from previous page

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>mysql</td>
<td>Module to provide MySQL compatibility to salt.</td>
</tr>
<tr>
<td>nacl</td>
<td>This module helps include encrypted passwords</td>
</tr>
<tr>
<td></td>
<td>in pillars, grains and salt state files.</td>
</tr>
<tr>
<td>nagios</td>
<td>Run nagios plugins/checks from salt and get</td>
</tr>
<tr>
<td></td>
<td>the return as data.</td>
</tr>
<tr>
<td>nagios_rpc</td>
<td>Check Host &amp; Service status from Nagios via</td>
</tr>
<tr>
<td></td>
<td>JSON RPC.</td>
</tr>
<tr>
<td>netbsd_sysctl</td>
<td>Module for viewing and modifying sysctl</td>
</tr>
<tr>
<td></td>
<td>parameters.</td>
</tr>
<tr>
<td>netbsdservice</td>
<td>The service module for NetBSD.</td>
</tr>
<tr>
<td>network</td>
<td>Module for gathering and managing network</td>
</tr>
<tr>
<td></td>
<td>information.</td>
</tr>
<tr>
<td>neutron</td>
<td>Module for handling OpenStack Neutron calls.</td>
</tr>
<tr>
<td>nfs3</td>
<td>Module for managing NFS version 3.</td>
</tr>
<tr>
<td>nftables</td>
<td>Support for nftables.</td>
</tr>
<tr>
<td>nginx</td>
<td>Support for nginx.</td>
</tr>
<tr>
<td>node</td>
<td>Module for full system inspection.</td>
</tr>
<tr>
<td>nova</td>
<td>Module for handling OpenStack Nova calls.</td>
</tr>
<tr>
<td>npm</td>
<td>Manage and query NPM packages.</td>
</tr>
<tr>
<td>nspawn</td>
<td>Manage nspawn containers.</td>
</tr>
<tr>
<td>omap1</td>
<td>This module interacts with an ISC DHCP Server</td>
</tr>
<tr>
<td></td>
<td>via OMAPI.</td>
</tr>
<tr>
<td>openbsd_sysctl</td>
<td>Module for viewing and modifying OpenBSD</td>
</tr>
<tr>
<td></td>
<td>sysctl parameters.</td>
</tr>
<tr>
<td>openbsd_pkg</td>
<td>Package support for OpenBSD.</td>
</tr>
<tr>
<td>openbsdrcctld</td>
<td>The rcctld service module for OpenBSD.</td>
</tr>
<tr>
<td>openbsd_svc</td>
<td>The service module for OpenBSD.</td>
</tr>
<tr>
<td>openstack_config</td>
<td>Modify, retrieve, or delete values from</td>
</tr>
<tr>
<td></td>
<td>OpenStack configuration files.</td>
</tr>
<tr>
<td>oracle</td>
<td>Oracle Database connection module.</td>
</tr>
<tr>
<td>osxdesktop</td>
<td>Mac OS X implementations of various commands in</td>
</tr>
<tr>
<td></td>
<td>the <code>desktop</code> interface.</td>
</tr>
<tr>
<td>pacman</td>
<td>A module to wrap pacman calls, since Arch is</td>
</tr>
<tr>
<td></td>
<td>the best.</td>
</tr>
<tr>
<td>pagerduty</td>
<td>Module for Firing Events via PagerDuty.</td>
</tr>
<tr>
<td>pagerduty_util</td>
<td>Module for managing PagerDuty resource.</td>
</tr>
<tr>
<td>pam</td>
<td>Support for pam.</td>
</tr>
<tr>
<td>parted</td>
<td>Module for managing partitions on POSIX-like</td>
</tr>
<tr>
<td></td>
<td>systems.</td>
</tr>
<tr>
<td>pecl</td>
<td>Manage PHP pecl extensions.</td>
</tr>
<tr>
<td>pillar</td>
<td>Extract the pillar data for this minion</td>
</tr>
<tr>
<td>pip</td>
<td>Install Python packages with pip to either the</td>
</tr>
<tr>
<td></td>
<td>system or a virtualenv.</td>
</tr>
<tr>
<td>pkg_resource</td>
<td>Resources needed by pkg providers.</td>
</tr>
<tr>
<td>pkginit</td>
<td>Package support for pkginit based systems,</td>
</tr>
<tr>
<td></td>
<td>inspired from freebsdpkg module.</td>
</tr>
<tr>
<td>pkgng</td>
<td>Support for pkgng, the new package manager for</td>
</tr>
<tr>
<td></td>
<td>FreeBSD.</td>
</tr>
<tr>
<td>pkgutil</td>
<td>Pkgutil support for Solaris.</td>
</tr>
<tr>
<td>portage_config</td>
<td>Configure portage(5)</td>
</tr>
<tr>
<td>postfix</td>
<td>Support for Postfix.</td>
</tr>
<tr>
<td>postgres</td>
<td>Module to provide Postgres compatibility to</td>
</tr>
<tr>
<td></td>
<td>salt.</td>
</tr>
<tr>
<td>poudriere</td>
<td>Support for poudriere</td>
</tr>
<tr>
<td>powerpath</td>
<td>powerpath support.</td>
</tr>
<tr>
<td>ps</td>
<td>Publish a command from a minion to a target.</td>
</tr>
<tr>
<td>puppet</td>
<td>Execute puppet routines.</td>
</tr>
<tr>
<td>pushover_notify</td>
<td>Module for sending messages to Pushover</td>
</tr>
<tr>
<td></td>
<td>(<a href="https://www.pushover.net">https://www.pushover.net</a>).</td>
</tr>
<tr>
<td>pw_group</td>
<td>Manage groups on FreeBSD.</td>
</tr>
<tr>
<td>pw_user</td>
<td>Manage users with the useradd command.</td>
</tr>
<tr>
<td>pyenv</td>
<td>Manage python installations with pyenv.</td>
</tr>
<tr>
<td>qemu_img</td>
<td>Qemu-img Command Wrapper.</td>
</tr>
</tbody>
</table>
Table 31.6 -- continued from previous page

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>qemu_nbd</td>
<td>Qemu Command Wrapper</td>
</tr>
<tr>
<td>quota</td>
<td>Module for managing quotas on POSIX-like systems.</td>
</tr>
<tr>
<td>rabbitmq</td>
<td>Module to provide RabbitMQ compatibility to Salt.</td>
</tr>
<tr>
<td>raet_publish</td>
<td>Publish a command from a minion to a target</td>
</tr>
<tr>
<td>rallydev</td>
<td>Support for RallyDev</td>
</tr>
<tr>
<td>random_org</td>
<td>Module for retrieving random information from Random.org</td>
</tr>
<tr>
<td>rbenv</td>
<td>Manage ruby installations with rbenv.</td>
</tr>
<tr>
<td>rdp</td>
<td>Manage RDP Service on Windows servers</td>
</tr>
<tr>
<td>redismod</td>
<td>Module to provide redis functionality to Salt</td>
</tr>
<tr>
<td>reg</td>
<td></td>
</tr>
<tr>
<td>rest_package</td>
<td>Service support for the REST example</td>
</tr>
<tr>
<td>rest_sample</td>
<td>Module for interfacing to the REST example</td>
</tr>
<tr>
<td>rest_service</td>
<td>Service support for the REST example</td>
</tr>
<tr>
<td>ret</td>
<td>Module to integrate with the returner system and retrieve data sent to a salt returner</td>
</tr>
<tr>
<td>rh_ip</td>
<td>The networking module for RHEL/Fedora based distros</td>
</tr>
<tr>
<td>rh_service</td>
<td>Service support for RHEL-based systems, including support for both upstart and sysvinit</td>
</tr>
<tr>
<td>riak</td>
<td>Riak Salt Module</td>
</tr>
<tr>
<td>rpm</td>
<td>Support for rpm</td>
</tr>
<tr>
<td>rpmbuild</td>
<td>RPM Package builder system</td>
</tr>
<tr>
<td>rsync</td>
<td>Wrapper for rsync</td>
</tr>
<tr>
<td>runit</td>
<td>runit service module</td>
</tr>
<tr>
<td>rvm</td>
<td>Manage ruby installations and gemsets with RVM, the Ruby Version Manager.</td>
</tr>
<tr>
<td>s3</td>
<td>Connection module for Amazon S3</td>
</tr>
<tr>
<td>saltcloudmod</td>
<td>Control a salt cloud system</td>
</tr>
<tr>
<td>saltutil</td>
<td>The Saltutil module is used to manage the state of the salt minion itself.</td>
</tr>
<tr>
<td>schedule</td>
<td>Module for managing the Salt schedule on a minion</td>
</tr>
<tr>
<td>scsi</td>
<td>SCSI administration module</td>
</tr>
<tr>
<td>sdb</td>
<td>Module for Manipulating Data via the Salt DB API</td>
</tr>
<tr>
<td>seed</td>
<td>Virtual machine image management tools</td>
</tr>
<tr>
<td>selinux</td>
<td>Execute calls on selinux</td>
</tr>
<tr>
<td>sensors</td>
<td>Read lm-sensors</td>
</tr>
<tr>
<td>serverdensity_device</td>
<td>Wrapper around Server Density API</td>
</tr>
<tr>
<td>service</td>
<td>The default service module, if not otherwise specified salt will fall back</td>
</tr>
<tr>
<td>shadow</td>
<td>Manage the shadow file</td>
</tr>
<tr>
<td>slack_notify</td>
<td>Module for sending messages to Slack</td>
</tr>
<tr>
<td>smartos_imgadm</td>
<td>Module for running imgadm command on SmartOS</td>
</tr>
<tr>
<td>smartos_vmadm</td>
<td>Module for running vmadm command on SmartOS</td>
</tr>
<tr>
<td>smbios</td>
<td>Interface to SMBIOS/DMI</td>
</tr>
<tr>
<td>smtp</td>
<td>Service support for Solaris 10 and 11, should work with other systems that use SMF also.</td>
</tr>
<tr>
<td>softwareupdate</td>
<td>Module for Sending Messages via SMTP</td>
</tr>
<tr>
<td>solaris_group</td>
<td>Support for the softwareupdate command on MacOS.</td>
</tr>
<tr>
<td>solaris_shadow</td>
<td>Manage groups on Solaris</td>
</tr>
<tr>
<td>solaris_user</td>
<td>Manage the password database on Solaris systems.</td>
</tr>
<tr>
<td>solarisips</td>
<td>Manage users with the useradd command</td>
</tr>
<tr>
<td>solarispkg</td>
<td>IPS pkg support for Solaris</td>
</tr>
<tr>
<td>solr</td>
<td>Package support for Solaris</td>
</tr>
<tr>
<td>splunk_search</td>
<td>Apache Solr Salt Module</td>
</tr>
<tr>
<td>sqlite3</td>
<td>Support for SQLite3</td>
</tr>
<tr>
<td>Module</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ssh</td>
<td>Manage client ssh components</td>
</tr>
<tr>
<td>state</td>
<td>Control the state system on the minion.</td>
</tr>
<tr>
<td>status</td>
<td>Module for returning various status data about a minion.</td>
</tr>
<tr>
<td>stormpath</td>
<td>Support for Stormpath</td>
</tr>
<tr>
<td>sudo</td>
<td>Allow for the calling of execution modules via sudo.</td>
</tr>
<tr>
<td>supervisord</td>
<td>Provide the service module for system supervisord or supervisord in a</td>
</tr>
<tr>
<td>svn</td>
<td>Subversion SCM</td>
</tr>
<tr>
<td>swift</td>
<td>Module for handling OpenStack Swift calls</td>
</tr>
<tr>
<td>sysbench</td>
<td>The <code>sysbench</code> module is used to analyze the performance of the minions, right from the master! It measures various system parameters such as CPU, Memory, File I/O, Threads, and Mutex.</td>
</tr>
<tr>
<td>syslog_ng</td>
<td>Module for getting information about syslog-ng</td>
</tr>
<tr>
<td>sysmod</td>
<td>The sys module provides information about the available functions on the minion</td>
</tr>
<tr>
<td>sysrc</td>
<td>sysrc module for FreeBSD</td>
</tr>
<tr>
<td>system</td>
<td>Support for reboot, shutdown, etc</td>
</tr>
<tr>
<td>system_profiler</td>
<td>System Profiler Module</td>
</tr>
<tr>
<td>systemd</td>
<td>Provide the service module for systemd</td>
</tr>
<tr>
<td>temp</td>
<td>Simple module for creating temporary directories and files</td>
</tr>
<tr>
<td>test</td>
<td>Module for running arbitrary tests</td>
</tr>
<tr>
<td>test_virtual</td>
<td>Module for running arbitrary tests with a <strong>virtual</strong> function</td>
</tr>
<tr>
<td>timezone</td>
<td>Module for managing timezone on POSIX-like systems.</td>
</tr>
<tr>
<td>tls</td>
<td>A salt module for SSL/TLS</td>
</tr>
<tr>
<td>tomcat</td>
<td>Support for Tomcat</td>
</tr>
<tr>
<td>trafficserver</td>
<td>Apache Traffic Server execution module.</td>
</tr>
<tr>
<td>tuned</td>
<td>Interface to Red Hat tuned-adm module</td>
</tr>
<tr>
<td>twilio_notify</td>
<td>Module for notifications via Twilio</td>
</tr>
<tr>
<td>udev</td>
<td>Manage and query udev info</td>
</tr>
<tr>
<td>upstart</td>
<td>Module for the management of upstart systems</td>
</tr>
<tr>
<td>uptime</td>
<td>Wrapper around uptime API</td>
</tr>
<tr>
<td>useradd</td>
<td>Manage users with the useradd command</td>
</tr>
<tr>
<td>varnish</td>
<td>Support for Varnish</td>
</tr>
<tr>
<td>vbox_guest</td>
<td>VirtualBox Guest Additions installer</td>
</tr>
<tr>
<td>victorops</td>
<td>Support for VictorOps</td>
</tr>
<tr>
<td>virt</td>
<td>Work with virtual machines managed by libvirt</td>
</tr>
<tr>
<td>virtualenv_mod</td>
<td>Create virtualenv environments</td>
</tr>
<tr>
<td>win_autoruns</td>
<td>Module for listing programs that automatically run on startup</td>
</tr>
<tr>
<td>win_dacl</td>
<td>Manage DACLs on Windows</td>
</tr>
<tr>
<td>win_disk</td>
<td>Module for gathering disk information on Windows</td>
</tr>
<tr>
<td>win_dns_client</td>
<td>Module for configuring DNS Client on Windows systems</td>
</tr>
<tr>
<td>win_file</td>
<td>Manage information about files on the minion, set/read user, group</td>
</tr>
<tr>
<td>win_firewall</td>
<td>Module for configuring Windows Firewall</td>
</tr>
<tr>
<td>win_groupadd</td>
<td>Manage groups on Windows</td>
</tr>
<tr>
<td>win_ip</td>
<td>The networking module for Windows based systems</td>
</tr>
<tr>
<td>win_network</td>
<td>Module for gathering and managing network information</td>
</tr>
<tr>
<td>win_ntp</td>
<td>Management of NTP servers on Windows</td>
</tr>
<tr>
<td>win_path</td>
<td>Manage the Windows System PATH</td>
</tr>
<tr>
<td>win_pkg</td>
<td>A module to manage software on Windows</td>
</tr>
<tr>
<td>win_powercfg</td>
<td>This module allows you to control the power settings of a windows minion via powercfg.</td>
</tr>
<tr>
<td>win_repo</td>
<td>Module to manage Windows software repo on a Standalone Minion</td>
</tr>
<tr>
<td>win_servermanager</td>
<td>Manage Windows features via the ServerManager powershell module</td>
</tr>
<tr>
<td>win_service</td>
<td>Windows Service module</td>
</tr>
</tbody>
</table>

31.16. Full list of built-in execution modules
### Table 31.6 -- continued from previous page

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>win_shadow</td>
<td>Manage the shadow file</td>
</tr>
<tr>
<td>win_status</td>
<td>Module for returning various status data about a minion.</td>
</tr>
<tr>
<td>win_system</td>
<td>Module for managing windows systems.</td>
</tr>
<tr>
<td>win_timezone</td>
<td>Module for managing timezone on Windows systems.</td>
</tr>
<tr>
<td>win_update</td>
<td>Module for running windows updates.</td>
</tr>
<tr>
<td>win_useradd</td>
<td>Module for managing Windows Users</td>
</tr>
<tr>
<td>win_wua</td>
<td>Module for managing Windows Updates using the Windows Update Agent.</td>
</tr>
<tr>
<td>x509</td>
<td>Manage X509 certificates</td>
</tr>
<tr>
<td>xapi</td>
<td>This module (mostly) uses the XenAPI to manage Xen virtual machines.</td>
</tr>
<tr>
<td>xfs</td>
<td>Module for managing XFS file systems.</td>
</tr>
<tr>
<td>xmpp</td>
<td>Module for Sending Messages via XMPP (a.k.a.</td>
</tr>
<tr>
<td>yumpkg</td>
<td>Support for YUM</td>
</tr>
<tr>
<td>zcbuildout</td>
<td>Management of zc.buildout</td>
</tr>
<tr>
<td>zfs</td>
<td>Salt interface to ZFS commands</td>
</tr>
<tr>
<td>zk_concurrency</td>
<td>Concurrency controls in zookeeper</td>
</tr>
<tr>
<td>znc</td>
<td>znc - An advanced IRC bouncer</td>
</tr>
<tr>
<td>zpool</td>
<td>Module for running ZFS zpool command</td>
</tr>
<tr>
<td>zypper</td>
<td>Package support for openSUSE via the zypper package manager</td>
</tr>
</tbody>
</table>

#### 31.16.2 salt.modules.aliases

Manage the information in the aliases file

**salt.modules.aliases.get_target(alias)**
Return the target associated with an alias

CLI Example:
```
salt '*' aliases.get_target alias
```

**salt.modules.aliases.has_target(alias, target)**
Return true if the alias/target is set

CLI Example:
```
salt '*' aliases.has_target alias target
```

**salt.modules.aliases.list_aliases()**
Return the aliases found in the aliases file in this format:

```json
{'alias': 'target'}
```

CLI Example:
```
salt '*' aliases.list_aliases
```

**salt.modules.aliases.rm_alias(alias)**
Remove an entry from the aliases file

CLI Example:
```
salt '*' aliases.rm_alias alias
```

**salt.modules.aliases.set_target(alias, target)**
Set the entry in the aliases file for the given alias, this will overwrite any previous entry for the given alias or create a new one if it does not exist.
31.16.3 salt.modules.alternatives

Support for Alternatives system

codeauthor Radek Rada <radek.rada@gmail.com>

salt.modules.alternatives.auto(name)
Trigger alternatives to set the path for <name> as specified by priority.

CLI Example:

    salt '*' alternatives.auto name

salt.modules.alternatives.check_installed(name, path)
Check if the current highest-priority match for a given alternatives link is set to the desired path

CLI Example:

    salt '*' alternatives.check_installed name path

salt.modules.alternatives.display(name)
Display alternatives settings for defined command name

CLI Example:

    salt '*' alternatives.display editor

salt.modules.alternatives.install(name, link, path, priority)
Install symbolic links determining default commands

CLI Example:

    salt '*' alternatives.install editor /usr/bin/editor /usr/bin/emacs23 50

salt.modules.alternatives.remove(name, path)
Remove symbolic links determining the default commands.

CLI Example:

    salt '*' alternatives.remove name path

salt.modules.alternatives.set(name, path)
Manually set the alternative <path> for <name>.

CLI Example:

    salt '*' alternatives.set name path

salt.modules.alternatives.show_current(name)
Display the current highest-priority alternative for a given alternatives link

CLI Example:

    salt '*' alternatives.show_current editor
31.16.4 salt.modules.apache

Support for Apache

Note: The functions in here are generic functions designed to work with all implementations of Apache. Debian-specific functions have been moved into deb_apache.py, but will still load under the apache namespace when a Debian-based system is detected.

salt.modules.apache.config(name, config, edit=True)
Create VirtualHost configuration files

- name: File for the virtual host
- config: VirtualHost configurations

Note: This function is not meant to be used from the command line. Config is meant to be an ordered dict of all of the apache configs.

CLI Example:

```
salt '*' apache.config /etc/httpd/conf.d/ports.conf config="[{'Listen': '22'}]"
```

salt.modules.apache.directives()
Return list of directives together with expected arguments and places where the directive is valid (apachectl -L)

CLI Example:

```
salt '*' apache.directives
```

salt.modules.apache.fullversion()
Return server version (apachectl -V)

CLI Example:

```
salt '*' apache.fullversion
```

salt.modules.apache.modules()
Return list of static and shared modules (apachectl -M)

CLI Example:

```
salt '*' apache.modules
```

salt.modules.apache.server_status(profile='default')
Get Information from the Apache server-status handler

Note: The server-status handler is disabled by default. In order for this function to work it needs to be enabled. See [http://httpd.apache.org/docs/2.2/mod/mod_status.html](http://httpd.apache.org/docs/2.2/mod/mod_status.html)

The following configuration needs to exists in pillar/grains. Each entry nested in apache.server-status is a profile of a vhost/server. This would give support for multiple apache servers/vhosts.

```
apache.server-status:
    default:
        url: http://localhost/server-status
        user: someuser
        pass: password
```
realm: 'authentication realm for digest passwords'
        timeout: 5

CLI Examples:
salt '*' apache.server_status
salt '*' apache.server_status other-profile

salt.modules.apache.servermods()
        Return list of modules compiled into the server (apachectl -l)
        CLI Example:
salt '*' apache.servermods

salt.modules.apache.signal(signal=None)
        Signals httpd to start, restart, or stop.
        CLI Example:
salt '*' apache.signal restart

salt.modules.apache.useradd(pwfile, user, password, opts='')
        Add HTTP user using the htpasswd command. If the htpasswd file does not exist, it will be created. Valid options that can be passed are:
        n  Don't update file; display results on stdout.
        m  Force MD5 encryption of the password (default).
        d  Force CRYPT encryption of the password.
        p  Do not encrypt the password (plaintext).
        s  Force SHA encryption of the password.
        CLI Examples:
salt '*' apache.useradd /etc/httpd/htpasswd larry badpassword
salt '*' apache.useradd /etc/httpd/htpasswd larry badpass opts=ns

salt.modules.apache.userdel(pwfile, user)
        Delete HTTP user from the specified htpasswd file.
        CLI Example:
salt '*' apache.userdel /etc/httpd/htpasswd larry

salt.modules.apache.version()
        Return server version (apachectl -v)
        CLI Example:
salt '*' apache.version

salt.modules.apache.vhosts()
        Show the settings as parsed from the config file (currently only shows the virtualhost settings) (apachectl -S). Because each additional virtual host adds to the execution time, this command may require a long timeout be specified by using -t 10.
        CLI Example:
salt -t 10 '*' apache.vhosts
31.16.5 salt.modules.aptpkg

Support for APT (Advanced Packaging Tool)

Note: For virtual package support, either the python-apt or dctrl-tools package must be installed. For repository management, the python-apt package must be installed.

salt.modules.aptpkg.autoremove(list_only=False, purge=False)

New in version 2015.5.0.

Remove packages not required by another package using apt-get autoremove.

list_only [False] Only retrieve the list of packages to be auto-removed, do not actually perform the auto-removal.

purge [False] Also remove package config data when autoremoving packages.

New in version 2015.8.0.

CLI Example:

```
salt '*' pkg.autoremove
salt '*' pkg.autoremove list_only=True
salt '*' pkg.autoremove purge=True
```

salt.modules.aptpkg.del_repo(repo, **kwargs)

Delete a repo from the sources.list / sources.list.d

If the .list file is in the sources.list.d directory and the file that the repo exists in does not contain any other repo configuration, the file itself will be deleted.

The repo passed in must be a fully formed repository definition string.

CLI Examples:

```
salt '*' pkg.del_repo "myrepo definition"
```

salt.modules.aptpkg.del_repo_key(name=None, **kwargs)

New in version 2015.8.0.

Remove a repo key using apt-key del

name Repo from which to remove the key. Unnecessary if keyid is passed.

keyid The KeyID of the GPG key to remove

keyid_ppa [False] If set to True, the repo's GPG key ID will be looked up from ppa.launchpad.net and removed.

Note: Setting this option to True requires that the name param also be passed.

CLI Examples:

```
salt '*' pkg.del_repo_key keyid=0123ABCD
salt '*' pkg.del_repo_key name='ppa:foo/bar' keyid_ppa=True
```

salt.modules.aptpkg.expand_repo_def(repokwargs)

Take a repository definition and expand it to the full pkg repository dict that can be used for comparison. This is a helper function to make the Debian/Ubuntu apt sources sane for comparison in the pkgrepo states.

There is no use to calling this function via the CLI.
salt.modules.aptpkg.file_dict("packages")
List the files that belong to a package, grouped by package. Not specifying any packages will return a list of _every_ file on the system's package database (not generally recommended).

CLI Examples:

```
salt '*' pkg.file_list httpd
salt '*' pkg.file_list httpd postfix
salt '*' pkg.file_list
```

salt.modules.aptpkg.file_list("packages")
List the files that belong to a package. Not specifying any packages will return a list of _every_ file on the system's package database (not generally recommended).

CLI Examples:

```
salt '*' pkg.file_list httpd
salt '*' pkg.file_list httpd postfix
salt '*' pkg.file_list
```

salt.modules.aptpkg.get_repo(repo, **kwargs)
Display a repo from the sources.list / sources.list.d

The repo passed in needs to be a complete repo entry.

CLI Examples:

```
salt '*' pkg.get_repo "myrepo definition"
```

salt.modules.aptpkg.get_selections(pattern=None, state=None)
View package state from the dpkg database.

Returns a dict of dicts containing the state, and package names:

```
{'<host>': {'<state>': ['pkg1', ...
   ],
   ...}
```

CLI Example:

```
salt '*' pkg.get_selections
salt '*' pkg.get_selections 'python-*'
salt '*' pkg.get_selections state=hold
salt '*' pkg.get_selections 'openssh*' state=hold
```

salt.modules.aptpkg.hold(name=None, pkgs=None, sources=None, **kwargs)
New in version 2014.7.0.

Set package in `hold` state, meaning it will not be upgraded.

name  The name of the package, e.g., `tmux`

CLI Example:

```
salt '*' pkg.hold <package name>
```

pkgs  A list of packages to hold. Must be passed as a python list.

CLI Example:
salt '*' pkg.hold pkgs='["foo", "bar"]'

```
salt.modules.aptpkg.info_installed('names')
```

Return the information of the named package(s), installed on the system.

CLI example:
```
salt '*' pkg.info_installed <package1>
salt '*' pkg.info_installed <package1> <package2> <package3> ...
```

```
salt.modules.aptpkg.install(name=None, refresh=False, fromrepo=None, skip_verify=False, debconf=None, pkgs=None, sources=None, reinstall=False, **kwargs)
```

Install the passed package, add refresh=True to update the dpkg database.

- **name**: The name of the package to be installed. Note that this parameter is ignored if either ``pkgs`` or ``sources`` is passed. Additionally, please note that this option can only be used to install packages from a software repository. To install a package file manually, use the ``sources`` option.

  32-bit packages can be installed on 64-bit systems by appending the architecture designation (i386, etc.) to the end of the package name.

  CLI Example:
```
salt '*' pkg.install <package name>
```

- **refresh**: Whether or not to refresh the package database before installing.

- **fromrepo**: Specify a package repository to install from (e.g., apt-get -t unstable install somepackage)

- **skip_verify**: Skip the GPG verification check (e.g., --allow-unauthenticated, or --force-bad-verify for install from package file).

- **debconf**: Provide the path to a debconf answers file, processed before installation.

- **version**: Install a specific version of the package, e.g. 1.2.3-0ubuntu0. Ignored if ``pkgs`` or ``sources`` is passed.

- **reinstall** [False] Specifying reinstall=True will use apt-get install --reinstall rather than simply apt-get install for requested packages that are already installed.

  If a version is specified with the requested package, then apt-get install --reinstall will only be used if the installed version matches the requested version.

  New in version 2015.8.0.

Multiple Package Installation Options:

- **pkgs**: A list of packages to install from a software repository. Must be passed as a python list.

  CLI Example:
```
salt '*' pkg.install pkgs='["foo", "bar"]'
salt '*' pkg.install pkgs='["foo", {"bar": "1.2.3-0ubuntu0"}]'
```

- **sources**: A list of DEB packages to install. Must be passed as a list of dicts, with the keys being package names, and the values being the source URI or local path to the package. Dependencies are automatically resolved and marked as auto-installed.
Salt Documentation, Release 2015.8.0

32-bit packages can be installed on 64-bit systems by appending the architecture designation
(:i386, etc.) to the end of the package name.
Changed in version 2014.7.0.
CLI Example:
salt '*' pkg.install sources='[{"foo": "salt://foo.deb"},{"bar": "salt://bar.deb"}]'

force_yes Passes --force-yes to the apt-get command. Don't use this unless you know what
you're doing.
New in version 0.17.4.
install_recommends Whether to install the packages marked as recommended. Default is True.
New in version 2015.5.0.
only_upgrade Only upgrade the packages, if they are already installed. Default is False.
New in version 2015.5.0.
force_conf_new
Always install the new version of any configuration files.
New in version 2015.8.0.
Returns a dict containing the new package names and versions:
{'<package>': {'old': '<old-version>',
'new': '<new-version>'}}

salt.modules.aptpkg.latest_version(*names, **kwargs)
Return the latest version of the named package available for upgrade or installation. If more than one package
name is specified, a dict of name/version pairs is returned.
If the latest version of a given package is already installed, an empty string will be returned for that package.
A specific repo can be requested using the fromrepo keyword argument.
CLI Example:
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package name> fromrepo=unstable
salt '*' pkg.latest_version <package1> <package2> <package3> ...

salt.modules.aptpkg.list_pkgs(versions_as_list=False,
**kwargs)
List the packages currently installed in a dict:

removed=False,

purge_desired=False,

{'<package_name>': '<version>'}

removed If True, then only packages which have been removed (but not purged) will be returned.
purge_desired If True, then only packages which have been marked to be purged, but can't be purged due
to their status as dependencies for other installed packages, will be returned. Note that these packages
will appear in installed
Changed in version 2014.1.1: Packages in this state now correctly show up in the output of this function.

31.16. Full list of builtin execution modules

643


Note: External dependencies

Virtual package resolution requires the `dctrl-tools` package to be installed. Virtual packages will show a version of 1.

CLI Example:
```python
salt '*' pkg.list_pkgs
salt '*' pkg.list_pkgs versions_as_list=True
```

```
salt.modules.aptpkg.list_repos()

Lists all repos in the sources.list (and sources.lists.d) files

CLI Example:
```python
salt '*' pkg.list_repos
salt '*' pkg.list_repos disabled=True
```

```
salt.modules.aptpkg.list_upgrades(refresh=True, dist_upgrade=True)

List all available package upgrades.

- `refresh` Whether to refresh the package database before listing upgrades. Default: True.
- `dist_upgrade` Whether to list the upgrades using dist-upgrade vs upgrade. Default is to use dist-upgrade.

CLI Example:
```python
salt '*' pkg.list_upgrades
```

```
salt.modules.aptpkg.mod_repo(repo, saltenv='base', **kwargs)

Modify one or more values for a repo. If the repo does not exist, it will be created, so long as the definition is well formed. For Ubuntu the `ppa:<project>/repo` format is acceptable. `ppa:` format can only be used to create a new repository.

The following options are available to modify a repo definition:

- `comps` (a comma separated list of components for the repo, e.g. "main")
- `file` (a file name to be used)
- `keyserver` (keyserver to get gpg key from)
- `keyid` (key id to load with the keyserver argument)
- `key_url` (URL to a gpg key to add to the apt gpg keyring)
- `consolidate` (if true, will attempt to de-dup and consolidate sources)

* Note: Due to the way keys are stored for apt, there is a known issue where the key wont be updated unless another change is made at the same time. Keys should be properly added on initial configuration.

CLI Examples:
```python
salt '*' pkg.mod_repo 'myrepo definition' uri=http://new/uri
salt '*' pkg.mod_repo 'myrepo definition' comps=main,universe
```

```
salt.modules.aptpkg.owner('paths')

New in version 2014.7.0.

Return the name of the package that owns the file. Multiple file paths can be passed. Like `pkg.version`, if a single path is passed, a string will be returned, and if multiple paths are passed, a dictionary of file/package name pairs will be returned.
If the file is not owned by a package, or is not present on the minion, then an empty string will be returned for that path.

CLI Example:

```
salt '*' pkg.owner /usr/bin/apachectl
salt '*' pkg.owner /usr/bin/apachectl /usr/bin/basename
```

**salt.modules.aptpkg.purge**(name=``None``, pkgs=``None``, **kwargs)

Remove packages via `apt-get purge` along with all configuration files.

- **name**: The name of the package to be deleted.
- **pkgs**: A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

```
salt '*' pkg.purge <package name>
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs=['"foo", "bar"]'
```

**salt.modules.aptpkg.refresh_db()**

Updates the APT database to latest packages based upon repositories

Returns a dict, with the keys being package databases and the values being the result of the update attempt. Values can be one of the following:

- **True**: Database updated successfully
- **False**: Problem updating database
- **None**: Database already up-to-date

CLI Example:

```
salt '*' pkg.refresh_db
```

**salt.modules.aptpkg.remove**(name=``None``, pkgs=``None``, **kwargs)

Remove packages using `apt-get remove`.

- **name**: The name of the package to be deleted.
- **pkgs**: A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

```
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs=['"foo", "bar"]'
```
salt.modules.aptpkg.set_selections(path=None, selection=None, clear=False, saltenv='base')
Change package state in the dpkg database.

The state can be any one of, documented in `dpkg(1):

- install
- hold
- deinstall
- purge

This command is commonly used to mark specific packages to be held from being upgraded, that is, to be kept at a certain version. When a state is changed to anything but being held, then it is typically followed by `apt-get -u dselect-upgrade`.

Note: Be careful with the clear argument, since it will start with setting all packages to deinstall state.

Returns a dict of dicts containing the package names, and the new and old versions:

```python
{'<host>':
 {'<package>': {'new': '<new-state>',
                'old': '<old-state>'}}
}
```

CLI Example:

```bash
salt '*' pkg.set_selections selection="{"install": ["netcat"]}"  
salt '*' pkg.set_selections selection="{"hold": ["openssh-server", "openssh-client"]}"  
salt '*' pkg.set_selections salt://path/to/file  
salt '*' pkg.set_selections salt://path/to/file clear=True
```

salt.modules.aptpkg.unhold(name=None, pkgs=None, sources=None, **kwargs)
New in version 2014.7.0.

Set package current in `hold` state to install state, meaning it will be upgraded.

- name   The name of the package, e.g., `tmux`

CLI Example:

```bash
salt '*' pkg.unhold <package name>
```

- pkgs   A list of packages to hold. Must be passed as a python list.

CLI Example:

```bash
salt '*' pkg.unhold pkgs='["foo", "bar"]'
```

salt.modules.aptpkg.upgrade(refresh=True, dist_upgrade=False, **kwargs)

Upgrades all packages via `apt-get dist-upgrade`

Returns a dict containing the changes.

```python
{`<package>`: {`old`: `<old-version>`, `new`: `<new-version>`}}
```

- dist_upgrade   Whether to perform the upgrade using dist-upgrade vs upgrade. Default is to use upgrade.

New in version 2014.7.0.
force_conf_new

Always install the new version of any configuration files.
New in version 2015.8.0.

CLI Example:

```
salt '*' pkg.upgrade
```

salt.modules.aptpkg.upgrade_available(name)

Check whether or not an upgrade is available for a given package

CLI Example:

```
salt '*' pkg.upgrade_available <package name>
```

salt.modules.aptpkg.version('names', **kwargs)

Returns a string representing the package version or an empty string if not installed. If more than one package name is specified, a dict of name/version pairs is returned.

CLI Example:

```
salt '*' pkg.version <package name>
salt '*' pkg.version <package1> <package2> <package3> ...
```

salt.modules.aptpkg.version_cmp(pkg1, pkg2)

Do a cmp-style comparison on two packages. Return -1 if pkg1 < pkg2, 0 if pkg1 == pkg2, and 1 if pkg1 > pkg2. Return None if there was a problem making the comparison.

CLI Example:

```
salt '*' pkg.version_cmp '0.2.4-@ubuntu1' '0.2.4.1-@ubuntu1'
```

31.16.6 salt.modules.archive

A module to wrap (non-Windows) archive calls

New in version 2014.1.0.

salt.modules.archive.cmd_unzip(zip_file, dest, excludes=None, template=None, options=None, runas=None)

New in version 2015.5.0: In versions 2014.7.x and earlier, this function was known as archive.unzip.

Uses the unzip command to unpack zip files. This command is part of the Info-ZIP suite of tools, and is typically packaged as simply unzip.

zip_file  Path of zip file to be unpacked
dest  The destination directory into which the file should be unpacked
excludes  [None] Comma-separated list of files not to unpack. Can also be passed in a Python list.
template  [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:
```
salt '*' archive.cmd_unzip template=jinja /tmp/zipfile.zip /tmp/{{grains.id}}/ excludes=file
```
options  [None] Additional command-line options to pass to the unzip binary.

Changed in version 2015.8.0: The mandatory -prefixing has been removed. An options string beginning with a `--long-option`, would have uncharacteristically needed its first - removed under the former scheme.
runas [None] Unpack the zip file as the specified user. Defaults to the user under which the minion is running.

New in version 2015.5.0.

CLI Example:
```bash
salt '*' archive.cmd_unzip /tmp/zipfile.zip /home/strongbad/ excludes=file_1,file_2
```

salt.modules.archive.cmd_zip(zip_file, sources, template=None, cwd=None, runas=None)
New in version 2015.5.0: In versions 2014.7.x and earlier, this function was known as archive.zip.

Uses the zip command to create zip files. This command is part of the Info-ZIP suite of tools, and is typically packaged as simply zip.

**zip_file** Path of zip file to be created

**sources** Comma-separated list of sources to include in the zip file. Sources can also be passed in a Python list.

**template** [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:
```bash
salt '*' archive.cmd_zip template=jinja /tmp/zipfile.zip /tmp/sourcefile1,/tmp/{{grains.id}}.txt
```

**cwd** [None] Use this argument along with relative paths in sources to create zip files which do not contain the leading directories. If not specified, the zip file will be created as if the cwd was ``, and creating a zip file of `/foo/bar/baz.txt` will contain the parent directories foo and bar. To create a zip file containing just `baz.txt`, the following command would be used:
```bash
salt '*' archive.cmd_zip /tmp/zipfile.zip baz.txt cwd=/foo/bar
```

New in version 2014.7.1.

**runas** [None] Create the zip file as the specified user. Defaults to the user under which the minion is running.

New in version 2015.5.0.

CLI Example:
```bash
salt '*' archive.cmd_zip /tmp/sourcefile1,/tmp/sourcefile2
```

salt.modules.archive.gunzip(gzipfile, template=None, runas=None)
Uses the gunzip command to unpack gzip files

**template** [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:
```bash
salt '*' archive.gunzip template=jinja /tmp/{{grains.id}}.txt.gz
```

CLI Example:
```bash
# Create /tmp/sourcefile.txt
salt '*' archive.gunzip /tmp/sourcefile.txt.gz
```

salt.modules.archive.gzip(sourcefile, template=None, runas=None)
Uses the gzip command to create gzip files

**template** [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:
```bash
salt '*' archive.gzip template=jinja /tmp/{{grains.id}}.txt
```

CLI Example:
# Create /tmp/sourcefile.txt.gz
salt '*' archive.gzip /tmp/sourcefile.txt

salt.modules.archive.rar(rarfile, sources, template=None, cwd=None, runas=None)
Uses `rar` for Linux to create rar files

- **rarfile**  Path of rar file to be created
- **sources**  Comma-separated list of sources to include in the rar file. Sources can also be passed in a Python list.
- **cwd**  [None] Run the `rar` command from the specified directory. Use this argument along with relative file paths to create rar files which do not contain the leading directories. If not specified, this will default to the home directory of the user under which the salt minion process is running.

  New in version 2014.7.1.
- **template**  [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:

```bash
salt '*' archive.rar template=jinja /tmp/rarfile.rar /tmp/sourcefile1,/tmp/sourcefile2
```

CLI Example:

```bash
salt '*' archive.rar /tmp/rarfile.rar /tmp/sourcefile1,/tmp/sourcefile2
```

salt.modules.archive.tar(options, tarfile, sources=None, dest=None, cwd=None, template=None, runas=None)

**Note:** This function has changed for version 0.17.0. In prior versions, the `cwd` and `template` arguments must be specified, with the source directories/files coming as a space-separated list at the end of the command. Beginning with 0.17.0, `sources` must be a comma-separated list, and the `cwd` and `template` arguments are optional.

Uses the tar command to pack, unpack, etc. tar files

- **options**  Options to pass to the tar command

  Changed in version 2015.8.0: The mandatory `-prefixing has been removed. An options string beginning with a `--long-option`, would have uncharacteristically needed its first `- removed under the former scheme. Also, tar will parse its options differently if short options are used with or without a preceding `-`, so it is better to not confuse the user into thinking they’re using the non-- format, when really they are using the with-- format.

- **tarfile**  The filename of the tar archive to pack/unpack
- **sources**  Comma delimited list of files to **pack** into the tarfile. Can also be passed as a Python list.
- **dest**  The destination directory into which to **unpack** the tarfile
- **cwd**  [None] The directory in which the tar command should be executed. If not specified, will default to the home directory of the user under which the salt minion process is running.
- **template**  [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:

```bash
salt '*' archive.tar -cjvf /tmp/salt.tar.bz2 {{grains.saltpath}} template=jinja
```

CLI Examples:
# Create a tarfile
salt '*' archive.tar -cjvf /tmp/tarfile.tar.bz2 /tmp/file_1,/tmp/file_2

# Unpack a tarfile
salt '*' archive.tar xf foo.tar dest=/target/directory

salt.modules.archive.unrar (rarfile, dest, excludes=None, template=None, runas=None)

Uses `rar` for Linux to unpack rar files

- **rarfile** Name of rar file to be unpacked
- **dest** The destination directory into which to unpack the rar file
- **template** [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:

```
salt '*' archive.unrar template=jinja /tmp/rarfile.rar /tmp/{{grains.id}}/ excludes=file_1,file_2
```

CLI Example:

```
salt '*' archive.unrar /tmp/rarfile.rar /home/strongbad/ excludes=file_1,file_2
```

salt.modules.archive.unzip (zip_file, dest, excludes=None, template=None, runas=None)

Uses the `zipfile` Python module to unpack zip files

Changed in version 2015.5.0: This function was rewritten to use Python's native zip file support. The old functionality has been preserved in the new function `archive.cmd_unzip`. For versions 2014.7.x and earlier, see the `archive.cmd_zip` documentation.

- **zip_file** Path of zip file to be unpacked
- **dest** The destination directory into which the file should be unpacked
- **excludes** [None] Comma-separated list of files not to unpack. Can also be passed in a Python list.
- **template** [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:

```
salt '*' archive.unzip template=jinja /tmp/zipfile.zip /tmp/{{grains.id}}/ excludes=file_1,file_2
```

CLI Example:

```
salt '*' archive.unzip /tmp/zipfile.zip /home/strongbad/ excludes=file_1,file_2
```

salt.modules.archive.zip (zip_file, sources, template=None, cwd=None, runas=None)

Uses the `zipfile` Python module to create zip files

Changed in version 2015.5.0: This function was rewritten to use Python's native zip file support. The old functionality has been preserved in the new function `archive.cmd_zip`. For versions 2014.7.x and earlier, see the `archive.cmd_zip` documentation.

- **zip_file** Path of zip file to be created
- **sources** Comma-separated list of sources to include in the zip file. Sources can also be passed in a Python list.
- **template** [None] Can be set to `jinja` or another supported template engine to render the command arguments before execution:

```
salt '*' archive.zip template=jinja /tmp/zipfile.zip /tmp/sourcefile1,/tmp/{{grains.id}}.txt
```

CLI Example:

```
**cwd** [None] Use this argument along with relative paths in sources to create zip files which do not contain the leading directories. If not specified, the zip file will be created as if the cwd was /, and creating a zip file of /foo/bar/baz.txt will contain the parent directories foo and bar. To create a zip file containing just baz.txt, the following command would be used:

```bash
salt '*' archive.zip /tmp/baz.zip baz.txt cwd=/foo/bar
```

**runas** [None] Create the zip file as the specified user. Defaults to the user under which the minion is running.

CLI Example:

```bash
salt '*' archive.zip /tmp/zipfile.zip /tmp/sourcefile1,/tmp/sourcefile2
```

### 31.16.7 `salt.modules.artifactory`

Module for fetching artifacts from Artifactory

**exception** `salt.modules.artifactory.ArtifactError(value)`

```python
salt.modules.artifactory.get_latest_snapshot(artifact_url, repository, group_id, artifact_id, packaging, target_dir='/tmp', target_file=None, classifier=None, username=None, password=None)
```

Gets latest snapshot of the given artifact

- **artifact_url** URL of artifactory instance
- **repository** Snapshot repository in artifactory to retrieve artifact from, for example: libs-snapshots
- **group_id** Group Id of the artifact
- **artifact_id** Artifact Id of the artifact
- **packaging** Packaging type (jar,war,ear,etc)
- **target_dir** Target directory to download artifact to (default: /tmp)
- **target_file** Target file to download artifact to (by default it is target_dir/artifact_id-snapshot_version.packaging)
- **classifier** Artifact classifier name (ex: sources,javadoc,etc). Optional parameter.
- **username** Artifactory username. Optional parameter.
- **password** Artifactory password. Optional parameter.

```python
salt.modules.artifactory.get_release(artifact_url, repository, group_id, artifact_id, packaging, version, target_dir='/tmp', target_file=None, classifier=None, username=None, password=None)
```

Gets the specified release of the artifact

- **artifact_url** URL of artifactory instance
- **repository** Release repository in artifactory to retrieve artifact from, for example: libs-releases
- **group_id** Group Id of the artifact
- **artifact_id** Artifact Id of the artifact
- **packaging** Packaging type (jar,war,ear,etc)
- **version** Version of the artifact
- **target_dir** Target directory to download artifact to (default: /tmp)
target_file  Target file to download artifact to (by default it is target_dir/artifact_id-version.packaging)
classifier   Artifact classifier name (ex: sources,javadoc,etc). Optional parameter.
username     Artifactory username. Optional parameter.
password     Artifactory password. Optional parameter.

```
salt.modules.artifactory.get_snapshot(artifactory_url, repository, group_id, artifact_id, packaging, version, snapshot_version=None, target_dir='/tmp', target_file=None, classifier=None, username=None, password=None)
```

Gets snapshot of the desired version of the artifact

artifactory_url  URL of artifactory instance
repository   Snapshot repository in artifactory to retrieve artifact from, for example: libs-snapshots
group_id     Group Id of the artifact
artifact_id  Artifact Id of the artifact
packaging    Packaging type (jar,war,ear,etc)
version     Version of the artifact
target_dir  Target directory to download artifact to (default: /tmp)
target_file Target file to download artifact to (by default it is target_dir/artifact_id-
snapshot_version.packaging)

classifier   Artifact classifier name (ex: sources,javadoc,etc). Optional parameter.
username     Artifactory username. Optional parameter.
password     Artifactory password. Optional parameter.

31.16.8  salt.modules.at

Wrapper module for at(1)

Also, a `tag' feature has been added to more easily tag jobs.

```
salt.modules.at.at(*args, **kwargs)
```

Add a job to the queue.

The `timespec' follows the format documented in the at(1) manpage.

CLI Example:

```
salt '*' at.at <timespec> <cmd> [tag=<tag>] [runas=<user>]
salt '*' at.at 12:05am '/sbin/reboot' tag=reboot
salt '*' at.at '3:05am +3 days' 'bin/myscript' tag=nightly runas=jim
```

```
salt.modules.at.atc(jobid)
```

Print the at(1) script that will run for the passed job id. This is mostly for debugging so the output will just be text.

CLI Example:

```
salt '*' at.atc <jobid>
```
salt.modules.at.atq(tag=None)
    List all queued and running jobs or only those with an optional `tag`.
    
    CLI Example:
    
    ```
    salt '*' at.atq
    salt '*' at.atq [tag]
    salt '*' at.atq [job number]
    ```

salt.modules.at.atrm(*args)
    Remove jobs from the queue.
    
    CLI Example:
    
    ```
    salt '*' at.atrm <jobid> <jobid> .. <jobid>
    salt '*' at.atrm all
    salt '*' at.atrm all [tag]
    ```

salt.modules.at.jobcheck(**kwargs)
    Check the job from queue. The kwargs dict include `hour minute day month year tag runas`. Other parameters will be ignored.
    
    CLI Example:
    
    ```
    salt '*' at.jobcheck runas=jam day=13
    salt '*' at.jobcheck day=13 month=12 year=13 tag=rose
    ```

### 31.16.9 salt.modules.augeas_cfg

Manages configuration files via augeas

This module requires the augeas Python module.

**Warning**: Minimal installations of Debian and Ubuntu have been seen to have packaging bugs with python-augeas, causing the augeas module to fail to import. If the minion has the augeas module installed, but the functions in this execution module fail to run due to being unavailable, first restart the salt-minion service. If the problem persists past that, the following command can be run from the master to determine what is causing the import to fail:

```
salt minion-id cmd.run 'python -c "from augeas import Augeas"'
```

For affected Debian/Ubuntu hosts, installing libpython2.7 has been known to resolve the issue.

salt.modules.augeas_cfg.execute(context=None, lens=None, commands=())
    Execute Augeas commands
    
    New in version 2014.7.0.
    
    CLI Example:
    
    ```
    salt '*' augeas.execute /files/etc/redis/redis.conf commands='["set bind 0.0.0.0", "set maxmemory 1G"]'
    ```

salt.modules.augeas_cfg.get(path, value='')
    Get a value for a specific augeas path
    
    CLI Example:
    
    ```
    salt '*' augeas.get /files/etc/hosts/1/ ipaddr
    ```
salt.modules.augeas_cfg.ls(path)
List the direct children of a node

CLI Example:
salt '*' augeas.ls /files/etc/passwd

salt.modules.augeas_cfg.match(path, value='``

Get matches for path expression

CLI Example:
salt '*' augeas.match /files/etc/services/service-name ssh

salt.modules.augeas_cfg.remove(path)
Get matches for path expression

CLI Example:
salt '*' augeas.remove /files/etc/sysctl.conf/net.ipv4.conf.all.log_martians

salt.modules.augeas_cfg.setvalue('args)
Set a value for a specific augeas path

CLI Example:
salt '*' augeas.setvalue /files/etc/hosts/1/canonical localhost

This will set the first entry in /etc/hosts to localhost

CLI Example:
salt '*' augeas.setvalue /files/etc/hosts/01/ipaddr 192.168.1.1 \\
/files/etc/hosts/01/canonical test

Adds a new host to /etc/hosts the ip address 192.168.1.1 and hostname test

CLI Example:
salt '*' augeas.setvalue prefix=/files/etc/sudoers/ \\
    "spec[user = '%wheel']/user" "%wheel" \\
    "spec[user = '%wheel']/host_group/host" 'ALL' \\
    "spec[user = '%wheel']/host_group/command[1]" 'ALL' \\
    "spec[user = '%wheel']/host_group/command[1]/tag" 'PASSWD' \\
    "spec[user = '%wheel']/host_group/command[2]" '/usr/bin/apt-get' \\
    "spec[user = '%wheel']/host_group/command[2]/tag" NOPASSWD

Ensures that the following line is present in /etc/sudoers:

%wheel ALL = PASSWD : ALL , NOPASSWD : /usr/bin/apt-get , /usr/bin/aptitude

salt.modules.augeas_cfg.tree(path)
Returns recursively the complete tree of a node

CLI Example:
salt '*' augeas.tree /files/etc/

31.16.10 salt.modules.aws_sqs
Support for the Amazon Simple Queue Service.
salt.modules.aws_sqs.create_queue(name, region, opts=None, user=None)

Creates a queue with the correct name.

- **name**: Name of the SQS queue to create
- **region**: Region to create the SQS queue in
- **opts**: [None] Any additional options to add to the command line
- **user**: [None] Run hg as a user other than what the minion runs as

salt.modules.aws_sqs.delete_message(queue, region, receipthandle, opts=None, user=None)

Delete one or more messages from a queue in a region

- **queue**: The name of the queue to delete messages from
- **region**: Region where SQS queues exists
- **receipthandle**: The ReceiptHandle of the message to delete. The ReceiptHandle is obtained in the return from `receive_message`
- **opts**: [None] Any additional options to add to the command line
- **user**: [None] Run as a user other than what the minion runs as

CLI Example:
```
salt '*' aws_sqs.delete_message <sqs queue> <region> receipthandle='<sqs ReceiptHandle>'
```

New in version 2014.7.0.

salt.modules.aws_sqs.delete_queue(name, region, opts=None, user=None)

Deletes a queue in the region.

- **name**: Name of the SQS queue to deletes
- **region**: Name of the region to delete the queue from
- **opts**: [None] Any additional options to add to the command line
- **user**: [None] Run hg as a user other than what the minion runs as

salt.modules.aws_sqs.list_queues(region, opts=None, user=None)

List the queues in the selected region.

- **region**: Region to list SQS queues for
- **opts**: [None] Any additional options to add to the command line
- **user**: [None] Run hg as a user other than what the minion runs as

salt.modules.aws_sqs.queue_exists(name, region, opts=None, user=None)

Returns True or False on whether the queue exists in the region

- **name**: Name of the SQS queue to search for
- **region**: Name of the region to search for the queue in
- **opts**: [None] Any additional options to add to the command line
- **user**: [None] Run hg as a user other than what the minion runs as

salt.modules.aws_sqs.receive_message(queue, region, num=1, opts=None, user=None)

Receive one or more messages from a queue in a region

- **queue**: The name of the queue to receive messages from
- **region**: Region where SQS queues exists
num [1] The max number of messages to receive

opts [None] Any additional options to add to the command line

user [None] Run as a user other than what the minion runs as

CLI Example:

```
salt '*' aws_sqs.receive_message <sqs queue> <region>
salt '*' aws_sqs.receive_message <sqs queue> <region> num=10
```

New in version 2014.7.0.

### 31.16.11 salt.modules.bamboohr

Support for BambooHR

New in version 2015.8.0.

Requires a subdomain and an apikey in /etc/salt/minion:

salt.modules.bamboohr.list_employees(order_by='id')

Show all employees for this company.

CLI Example:

```
salt myminion bamboohr.list_employees
```

By default, the return data will be keyed by ID. However, it can be ordered by any other field. Keep in mind that if the field that is chosen contains duplicate values (i.e., location is used, for a company which only has one location), then each duplicate value will be overwritten by the previous. Therefore, it is advisable to only sort by fields that are guaranteed to be unique.

CLI Examples:

```
salt myminion bamboohr.list_employees order_by=id salt myminion bamboohr.list_employees order_by=displayName
```

salt.modules.bamboohr.list_meta_fields()

Show all meta data fields for this company.

CLI Example:

```
salt myminion bamboohr.list_meta_fields
```

salt.modules.bamboohr.list_users(order_by='id')

Show all users for this company.

CLI Example:

```
salt myminion bamboohr.list_users
```

By default, the return data will be keyed by ID. However, it can be ordered by any other field. Keep in mind that if the field that is chosen contains duplicate values (i.e., location is used, for a company which only has one location), then each duplicate value will be overwritten by the previous. Therefore, it is advisable to only sort by fields that are guaranteed to be unique.

CLI Examples:

```
salt myminion bamboohr.list_users order_by=id salt myminion bamboohr.list_users order_by=email
```
salt.modules.bamboohr.show_employee(emp_id, fields=None)

Show all employees for this company.

CLI Example:
    salt myminion bamboohr.show_employee 1138

By default, the fields normally returned from bamboohr.list_employees are returned. These fields are:

- canUploadPhoto
- department
- displayName
- firstName
- id
- jobTitle
- lastName
- location
- mobilePhone
- nickname
- photoUploaded
- photoUrl
- workEmail
- workPhone
- workPhoneExtension

If needed, a different set of fields may be specified, separated by commas:

CLI Example:
    salt myminion bamboohr.show_employee 1138 displayName, dateOfBirth

A list of available fields can be found at http://www.bamboohr.com/api/documentation/employees.php

salt.modules.bamboohr.update_employee(emp_id, key=None, value=None, items=None)

Update one or more items for this employee. Specifying an empty value will clear it for that employee.

CLI Examples:
    salt myminion bamboohr.update_employee 1138 nickname Curly
    salt myminion bamboohr.update_employee 1138 nickname
    salt myminion bamboohr.update_employee 1138 items={"nickname": "Curly"}
    salt myminion bamboohr.update_employee 1138 items={"nickname": ""}

31.16.12 salt.modules.beacons

Module for managing the Salt beacons on a minion

New in version 2015.8.0.

salt.modules.beacons.add(name, beacon_data, **kwargs)

Add a beacon on the minion

Parameters
• **name** -- Name of the beacon to configure

• **beacon_data** -- Dictionary or list containing configuration for beacon.

Returns Boolean and status message on success or failure of add.

CLI Example:

```bash
salt '*' beacons.add ps "{'salt-master': 'stopped', 'apache2': 'stopped'}"
```

Function: salt.modules.beacons.delete

Delete a beacon item

Parameters

- **name** -- Name of the beacon to delete

Returns Boolean and status message on success or failure of delete.

CLI Example:

```bash
salt '*' beacons.delete ps
salt '*' beacons.delete load
```

Function: salt.modules.beacons.disable

Disable all beacons job on the minion

Returns Boolean and status message on success or failure of disable.

CLI Example:

```bash
salt '*' beacons.disable
```

Function: salt.modules.beacons.disable_beacon

Disable beacon on the minion

- **Name** Name of the beacon to enable.

Returns Boolean and status message on success or failure of disable.

CLI Example:

```bash
salt '*' beacons.disable_beacon ps
```

Function: salt.modules.beacons.enable

Enable all beacons on the minion

Returns Boolean and status message on success or failure of enable.

CLI Example:

```bash
salt '*' beacons.enable
```

Function: salt.modules.beacons.enable_beacon

Enable beacon on the minion

- **Name** Name of the beacon to enable.

Returns Boolean and status message on success or failure of enable.

CLI Example:

```bash
salt '*' beacons.enable_beacon ps
```

Function: salt.modules.beacons.list

List the beacons currently configured on the minion
Parameters `return_yaml` -- Whether to return YAML formatted output, default True

Returns List of currently configured Beacons.

CLI Example:
```
salt '*' beacons.list
```

```
salt.modules.beacons.modify(name, beacon_data, **kwargs)
Modify an existing beacon

Parameters

- `name` -- Name of the beacon to configure
- `beacon_data` -- Dictionary or list containing updated configuration for beacon.

Returns Boolean and status message on success or failure of modify.

CLI Example:
```
salt '*' beacon.modify ps "{'salt-master': 'stopped', 'apache2': 'stopped'}"
```

```
salt.modules.beacons.save()
Save all beacons on the minion

Returns Boolean and status message on success or failure of save.

CLI Example:
```
salt '*' beacons.save
```

### 31.16.13 salt.modules.bigip

An execution module which can manipulate an f5 bigip via iControl REST

```
maturity  develop
platform  f5_bigip_11.6
```

```
salt.modules.bigip.add_pool_member(hostname, username, password, name, member)
A function to connect to a bigip device and add a new member to an existing pool.

- `hostname` The host/address of the bigip device
- `username` The iControl REST username
- `password` The iControl REST password
- `name` The name of the pool to modify
- `member` The name of the member to add i.e. 10.1.1.2:80

CLI Example:
```
salt '*' bigip.add_pool_members bigip admin admin my-pool 10.2.2.1:80
```

```
salt.modules.bigip.commit_transaction(hostname, username, password, label)
A function to connect to a bigip device and commit an existing transaction.

Parameters:
- `hostname`: The host/address of the bigip device
- `username`: The iControl REST username
- `password`: The iControl REST password
- `label`: the label of this transaction stored within the grain: bigip_f5_trans:<label>

CLI Example:
```
```
salt`*'bigip.commit_transaction bigip admin admin my_transaction

salt.modules.bigip.create_monitor(hostname, username, password, monitor_type, name, **kwargs)

A function to connect to a bigip device and create a monitor.

**Parameters:**
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- monitor_type: The type of monitor to create
- name: The name of the monitor to create

**Keyword Args:** [arg=val]...
Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

**CLI Example:**
salt`*'bigip.create_monitor bigip admin admin http my-http-monitor timeout=10 interval=5

salt.modules.bigip.create_node(hostname, username, password, name, address, trans_label=None)

A function to connect to a bigip device and create a node.

**Parameters:**
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the node
- address: The address of the node
- trans_label: The label of the transaction stored within the grain: bigip_f5_trans:<label>

**CLI Example:**
salt `*' bigip.create_node bigip admin admin 10.1.1.2

salt.modules.bigip.create_pool(hostname, username, password, name, members=None, allow_nat=None, allow_snat=None, description=None, gateway_failsafe_device=None, ignore_persisted_weight=None, ip_tos_to_client=None, ip_tos_to_server=None, link_qos_to_client=None, link_qos_to_server=None, load_balancing_mode=None, min_active_members=None, min_up_members=None, min_up_members_action=None, min_up_members_checking=None, monitor=None, profiles=None, queue_depth_limit=None, queue_on_connection_limit=None, queue_time_limit=None, reselect_tries=None, service_down_action=None, slow_ramp_time=None)

A function to connect to a bigip device and create a pool.

**Parameters:**
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the pool to create.
- members: List of comma delimited pool members to add to the pool.

i.e. 10.1.1.1:80,10.1.1.2:80,10.1.1.3:80

- allow_nat: [yes | no]
- allow_snat: [yes | no]
- description: [string]
- gateway_failsafe_device: [string]
- ignore_persisted_weight: [enabled | disabled]
- ip_tos_to_client: [pass-through | [integer]]
- ip_tos_to_server: [pass-through | [integer]]
- link_qos_to_client: [pass-through | [integer]]
- link_qos_to_server: [pass-through | [integer]]
- load_balancing_mode: [dynamic-ratio-member | dynamic-ratio-node | fast-end-app-response | fast-end-node | least-connections-members | least-connections-node | least-sessions | observed-member | observed-node | predictive-member | predictive-node | ratio-least-connections-member | ratio-least-connections-node | ratio-member | ratio-node | ratio-session | round-robin | weighted-least-connections-member | weighted-least-connections-node]

- min_active_members: [integer]
- min_up_members: [integer]
- min_up_members_action: [failover | reboot | restart-all]
- min_up_members_checking: [enabled | disabled]
- monitor: [name]
- profiles: [none | profile_name]
- queue_depth_limit: [integer]
- queue_on_connection_limit: [enabled | disabled]
queue_time_limit: [integer] reselect_tries: [integer] service_down_action: [drop | none | reselect | reset]
slow_ramp_time: [integer]

CLI Example:
salt '*' bigip.create_pool bigip admin admin my-pool 10.1.1.1:80,10.1.1.2:80,10.1.1.3:80 monitor=http

salt.modules.bigip.create_profile(hostname, username, password, profile_type, name, **kwargs)
A function to connect to a bigip device and create a profile.

Parameters:
hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password profile_type: The type of profile to create name: The name of the profile to create

Keyword Args: [arg=val] ... [arg=key1=val1,key2=val2] ... Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

Creating Complex Args: Profiles can get pretty complicated in terms of the amount of possible config options. Use the following shorthand to create complex arguments such as lists, dictionaries, and lists of dictionaries. An option is also provided to pass raw json as well.

lists [i,i,i]: param='item1,item2,item3'
Dictionary [k:v,k,v,k,v]: param='key-1:val-1,key-2:val2,key-3:val-3'
List of Dictionaries [k:v,k,v,k,v]: param='key-1:val-1,key-2:val-2|key-1:val-1,key-2:val-2|key-1:val-1,key-2:val-2'
JSON: '[j ... ]j': cert-key-chain='j{``default'': {``cert'': ``default.crt'',``chain'': ``default.crt'',``key'': ``default.key''}}j'

Escaping Delimiters: Use , or : or | to escape characters which shouldn't be treated as delimiters i.e. ciphers='DEFAULT:!SSLv3'

CLI Examples:
salt '*' bigip.create_profile bigip admin admin http my-http-profile defaultsFrom='/Common/http' salt '*' bigip.create_profile bigip admin admin http my-http-profile defaultsFrom='/Common/http' n enforcement=maxHeaderCount:3200,maxRequests:10

salt.modules.bigip.create_virtual(hostname, username, password, name, destination, pool=None, address_status=None, auto_lasthop=None, bwc_policy=None, cmp_enabled=None, connection_limit=None, dhcp_relay=None, description=None, fallback_persistence=None, flow_eviction_policy=None, gtm_score=None, ip_forward=None, ip_protocol=None, internal=None, twelve_forward=None, last_hop_pool=None, mask=None, mirror=None, nat64=None, persist=None, profiles=None, policies=None, rate_class=None, rate_limit=None, rate_limit_mode=None, rate_limit_dst=None, rate_limit_src=None, rules=None, related_rules=None, reject=None, source=None, source_address_translation=None, source_port=None, state=None, traffic_classes=None, translate_address=None, translate_port=None, vlans=None)
A function to connect to a bigip device and create a virtual server.

Parameters:
hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the virtual to create destination: [ [virtual_address_name:port] | [ipv4:port] | [ipv6:port] ]
pool: [ [pool_name] | none] address_status: [yes | no] auto_lasthop: [default | enabled | disabled ]
flow_eviction_policy: [none | [eviction policy name] ] gtm_score: [integer] ip_forward: [yes | no]
policies: [none | default | policy1,policy2,policy3 ... ] rate_class: [name] rate_limit: [integer] rate_limit-mode: [destination | object | object-destination | source | source-destination]
translate_address: [enabled | disabled] translate_port: [enabled | disabled] vlans: [none | default | [enabled|disabled]:vlan1,vlan2,vlan3 ... ]

CLI Examples:
salt '*' bigip.create_virtual bigip admin admin my-virtual-3 26.2.2.5:80 n pool=my-http-pool-http
 profiles=http,tc n
salt '*' bigip.create_virtual bigip admin admin my-virtual-3 43.2.2.5:80 n pool=test-http-pool-
http_profiles=http,websecurity persist=cookie,hash n policies=asm_auto_l7_policy_http
virtual n rules=sys_APM_ExchangeSupport_helper.Sys_HTTP_redirect n related_rules=sys_APM_acts
ivesyncnc Sys_APM_ExchangeSupport_helper n source_address_translation=snat:my-snat-pool n translate_address=enabled translate_port=enabled n traffic_classes=my-class,other-class n vlans=enabled:external,internal

salt.modules.bigip.delete_monitor( hostname, username, password, monitor_type, name )
A function to connect to a bigip device and delete an existing monitor.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password monitor_type: The type of monitor to delete name: The name of the monitor to delete

CLI Example:
salt '*' bigip.delete_monitor bigip admin admin http my-http-monitor

salt.modules.bigip.delete_node( hostname, username, password, name, trans_label=None )
A function to connect to a bigip device and delete a specific node.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the node which will be deleted.
trans_label: The label of the transaction stored within the grain: bigip_5_trans:<label>

CLI Example:
salt '*' bigip.delete_node bigip admin admin my-node

salt.modules.bigip.delete_pool( hostname, username, password, name )
A function to connect to a bigip device and delete a specific pool.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the pool which will be deleted

CLI Example:
salt '*' bigip.delete_pool bigip admin admin my-pool

662 Chapter 31. Reference
salt.modules.bigip.delete_pool_member(hostname, username, password, name, member)
A function to connect to a bigip device and delete a specific pool.

Parameters:
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the pool to modify
- member: The name of the pool member to delete

CLI Example:
salt '*' bigip.delete_node bigip admin admin my-pool 10.2.2.2:80

salt.modules.bigip.delete_profile(hostname, username, password, profile_type, name)
A function to connect to a bigip device and delete an existing profile.

Parameters:
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- profile_type: The type of profile to delete
- name: The name of the profile to delete

CLI Example:
salt '*' bigip.delete_profile bigip admin admin http my-http-profile

salt.modules.bigip.delete_transaction(hostname, username, password, label)
A function to connect to a bigip device and delete an existing transaction.

Parameters:
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- label: The label of this transaction stored within the grain: bigip_f5_trans:<label>

CLI Example:
salt '*' bigip.delete_transaction bigip admin admin my_transaction

salt.modules.bigip.delete_virtual(hostname, username, password, name)
A function to connect to a bigip device and delete a specific virtual.

Parameters:
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the virtual to delete

CLI Example:
salt '*' bigip.delete_virtual bigip admin admin my-virtual

salt.modules.bigip.list_monitor(hostname, username, password, monitor_type, name=None)
A function to connect to a bigip device and list an existing monitor. If no name is provided then all monitors of the specified type will be listed.

Parameters:
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- monitor_type: The type of monitor(s) to list
- name: The name of the monitor to list

CLI Example:
salt '*' bigip.list_monitor bigip admin admin http my-http-monitor

salt.modules.bigip.list_node(hostname, username, password, name=None, trans_label=None)
A function to connect to a bigip device and list all nodes or a specific node.

Parameters:
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the node to list. If no name is specified then all nodes will be listed.
- trans_label: The label of the transaction stored within the grain: bigip_f5_trans:<label>
CLI Example:

salt '*' bigip.list_node bigip admin admin my-node

salt.modules.bigip.list_pool(hostname, username, password, name=None)
A function to connect to a bigip device and list all pools or a specific pool.

Parameters:
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
name: The name of the pool to list. If no name is specified then all pools will be listed.

CLI Example:

salt '*' bigip.list_pool bigip admin admin my-pool

salt.modules.bigip.list_profile(hostname, username, password, profile_type, name=None)
A function to connect to a bigip device and list an existing profile. If no name is provided than all profiles of the specified type will be listed.

Parameters:
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
profile_type: The type of profile(s) to list
name: The name of the profile to list

CLI Example:

salt '*' bigip.list_profile bigip admin admin http my-http-profile

salt.modules.bigip.list_transaction(hostname, username, password, label)
A function to connect to a bigip device and list an existing transaction.

Parameters:
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
label: the label of this transaction stored within the grain: bigip_f5_trans:<label>

CLI Example:

salt '*' bigip.list_transaction bigip admin admin my_transaction

salt.modules.bigip.list_virtual(hostname, username, password, name=None)
A function to connect to a bigip device and list all virtuals or a specific virtual.

Parameters:
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
name: The name of the virtual to list. If no name is specified then all virtuals will be listed.

CLI Example:

salt '*' bigip.list_virtual bigip admin admin my-virtual

salt.modules.bigip.modify_monitor(hostname, username, password, monitor_type, name, **kwargs)
A function to connect to a bigip device and modify an existing monitor.

Parameters:
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
monitor_type: The type of monitor to modify
name: The name of the monitor to modify

Keyword Args: [ arg=val ] ... Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

CLI Example:
A function to connect to a bigip device and modify an existing node.

**Parameters:**
- **hostname:** The host/address of the bigip device
- **username:** The iControl REST username
- **password:** The iControl REST password
- **name:** The name of the node to modify
- **connection_limit:** [integer]
- **description:** [string]
- **dynamic_ratio:** [integer]
- **logging:** [enabled | disabled]
- **monitor:** [[name] | none | default]
- **rate_limit:** [integer]
- **ratio:** [integer]
- **session:** [user-enabled | user-disabled]
- **state:** [user-down | user-up]
- **trans_label:** The label of the transaction stored within the grain:

```
bigip_f5_trans:<label>
```

**CLI Example:**

```
salt '*' bigip.modify_node bigip admin admin http my-http-monitor timeout=16 interval=6
```

```python
salt.modules.bigip.modify_node(
    hostname, username, password, name, connection_limit=None,
    description=None, dynamic_ratio=None, logging=None,
    monitor=None, rate_limit=None, ratio=None, session=None,
    state=None, trans_label=None)
```

A function to connect to a bigip device and modify an existing pool.

**Parameters:**
- **hostname:** The host/address of the bigip device
- **username:** The iControl REST username
- **password:** The iControl REST password
- **name:** The name of the pool to modify
- **allow_nat:** [yes | no]
- **allow_snat:** [yes | no]
- **description:** [string]
- **gateway_failsafe_device:** [string]
- **ignore_persisted_weight:** [yes | no]
- **ip_tos_to_client:** [pass-through | [integer]]
- **ip_tos_to_server:** [pass-through | [integer]]
- **link_qos_to_client:** [pass-through | [integer]]
- **link_qos_to_server:** [pass-through | [integer]]
- **load_balancing_mode:** [dynamic-ratio-member | dynamic-ratio-node]
- **fastest-app-response:**
- **fastest-node:**
- **least-connections-members:**
- **least-connections-node:**
- **least-sessions:**
- **observed-member:**
- **observed-node:**
- **predictive-member:**
- **predictive-node:**
- **ratio-least-connections-member:**
- **ratio-least-connections-node:**
- **ratio-member:**
- **ratio-node:**
- **ratio-session:**
- **round-robin:**
- **weighted-least-connections-member:**
- **weighted-least-connections-node:**
- **min_active_members:** [integer]
- **min_up_members:** [integer]
- **min_up_members_action:** [failover | reboot | restart-all]
- **min_up_members_checking:** [enabled | disabled]
- **monitor:** [name]
- **profiles:** [none | profile_name]
- **queue_on_connection_limit:** [enabled | disabled]
- **queue_depth_limit:** [integer]
- **queue_time_limit:** [integer]
- **reselect_tries:** [integer]
- **service_down_action:** [drop | none | reselect | reset]
- **slow_ramp_time:** [integer]

**CLI Example:**

```
salt '*' bigip.modify_pool bigip admin admin my-pool 10.1.1.1:80,10.1.1.2:80,10.1.1.3:80 min_active_members=1
```

31.16. Full list of builtin execution modules 665
salt.modules.bigip.modify_pool_member(hostname, username, password, name, member, connection_limit=None, description=None, dynamic_ratio=None, inherit_profile=None, logging=None, monitor=None, priority_group=None, profiles=None, rate_limit=None, ratio=None, session=None, state=None)

A function to connect to a bigip device and modify an existing member of a pool.

Parameters:
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
name: The name of the pool to modify
member: The name of the member to modify
i.e. 10.1.1.2:80

collection_limit: [integer]
description: [string]
dynamic_ratio: [integer]
inherit_profile: [enabled | disabled]
logging: [enabled | disabled]
monitor: [name]
priority_group: [integer]
profiles: [none | profile_name]
ratio: [integer]
state: [user-up | user-down]

CLI Example: salt '*' bigip.modify_pool_member bigip admin admin my-pool 10.2.2.1:80 state=use-down
session=user-disabled

salt.modules.bigip.modify_profile(hostname, username, password, profile_type, name, **kwargs)

A function to connect to a bigip device and create a profile.

Parameters:
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
profile_type: The type of profile to modify
name: The name of the profile to modify

Keyword Args: [arg=val] ... [arg-key1:val1,key2:val2] ... Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

Creating Complex Args: Profiles can get pretty complicated in terms of the amount of possible config options. Use the following shorthand to create complex arguments such as lists, dictionaries, and lists of dictionaries. An option is also provided to pass raw json as well.

lists [i,i,i]: param='item1,item2,item3'
Dictionary [k,v,k,v,k,v]: param='key-1:val-1,key-2:val2,key-3:val3'
List of Dictionaries [k,v,k,v,k,v,k,v]: param='key-1:val-1,key-2:val2,key-3:val3'
JSON: '[j[...]]j': cert-key-chain='[j[``default'': {``cert'': ``default.crt'',``chain'': ``default.crt'',``key'': ``default.key''}]j'

Escaping Delimiters: Use , or : or | to escape characters which shouldn't be treated as delimiters i.e. ciphers='DEFAULT:!SSLv3'

CLI Examples:
salt '*' bigip.modify_profile bigip admin http my-http-profile defaultsFrom='/Common/http' salt '*' bigip.modify_profile bigip admin http my-http-profile defaultsFrom='/Common/http' n enforement=maxHeaderCount:3200,maxRequests:10
salt '*' bigip.modify_profile bigip admin client-ssl my-client-ssl-1 retainCertificate=false n ciphers='DEFAULT:!SSLv3' cert_key_chain='[j[``default'': {``cert'': ``default.crt'',``chain'': ``default.crt'',``key'': ``default.key''}]j]'
**salt.modules.bigip.modify_virtual** *(hostname, username, password, name, destination=None, pool=None, address_status=None, auto_lasthop=None, bwc_policy=None, cmp_enabled=None, connection_limit=None, dhcp_relay=None, description=None, fallback_persistence=None, flow_eviction_policy=None, gtm_score=None, ip_forward=None, ip_protocol=None, internal=None, twelve_forward=None, last_hop_pool=None, mask=None, mirror=None, nat64=None, persist=None, profiles=None, policies=None, rate_class=None, rate_limit=None, rate_limit_mode=None, rate_limit_dst=None, rate_limit_src=None, rules=None, related_rules=None, reject=None, source=None, source_address_translation=None, source_port=None, state=None, traffic_classes=None, translate_address=None, translate_port=None, vlans=None)*

A function to connect to a bigip device and modify an existing virtual server.

**Parameters:**
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
name: The name of the virtual to modify

destination: [ [virtual_address_name:port] | [ipv4:port] | [ipv6:port] ]
pool: [ [pool_name] | none ]
address_status: [ yes | no ]
auto_lasthop: [ default | enabled | disabled ]
bwc_policy: [ none | string ]
cmp_enabled: [ yes | no ]
dhcp_relay: [ yes | no ]
connection_limit: [ integer ]
description: [ string ]
state: [ disabled | enabled ]
fallback_persistence: [ none | [ profile name ] ]
flow_eviction_policy: [ none | [ eviction policy name ] ]
gtm_score: [ integer ]
ip_forward: [ yes | no ]
ip_protocol: [ any | protocol ]
internal: [ yes | no ]
twelve_forward: [12-forward]: [ yes | no ]
last_hop_pool: [ [pool_name] | none ]
mask: [ [ipv4] | [ipv6] ]
mirror: [ [ disabled | enabled | none ] ]
nat64: [ enabled | disabled ]
persist: [ none | [ profile1,profile2,profile3 ... ] ]
profiles: [ none | default | profile1,profile2,profile3 ... ]
policies: [ none | default | policy1,policy2,policy3 ... ]
rate_class: [ name ]
rate_limit: [ integer ]
rate_limit_mode: [ destination | object | object-destination | object-source | object-source-destination | source | source-destination ]
rate_limit_dst: [ integer ]
rate_limit_src: [ integer ]
rules: [ none | [ rule_one,rule_two ... ] ]
related_rules: [ none | [ rule_one,rule_two ... ] ]
reject: [ yes | no ]
source: [ [ipv4[/prefixlen]] | [ipv6[/prefixlen]] ]
source_address_translation: [ [snat:pool_name] | lsn | automap ]
source_port: [ change | preserve | preserve-strict ]
state: [ enabled | disable ]
traffic_classes: [ none | default | class_one,class_two ... ]
translate_address: [ enabled | disabled ]
translate_port: [ enabled | disabled ]
vlans: [ none | default | [ enabled | disabled ]:vlan1,vlan2,vlan3 ... ]

**CLI Example:**
salt '*' bigip.modify_virtual bigip admin admin my-virtual source_address_translation=none salt '*' bigip.modify_virtual bigip admin admin my-virtual_rules=my-rule,my-other-rule

**salt.modules.bigip.replace_pool_members** *(hostname, username, password, name, members)*

A function to connect to a bigip device and replace members of an existing pool with new members.

**Parameters:**
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
name: The name of the pool to modify members: List of comma delimited pool members to replace existing members with.

e.g. 10.2.2.1:80,10.2.2.2:80,10.2.2.3:80

**CLI Example:**
salt '*' bigip.replace_pool_members bigip admin admin my-pool 10.2.2.1:80,10.2.2.2:80,10.2.2.3:80

**salt.modules.bigip.start_transaction** *(hostname, username, password, label)*

A function to connect to a bigip device and start a new transaction.

**Parameters:**
hostname: The host/address of the bigip device
username: The iControl REST username
password: The iControl REST password
label: The name / alias for this transaction

The actual transaction
id will be stored within a grain called bigip_f5_trans:

CLI Example:

```
salt '*' bigip.start_transaction bigip admin admin my_transaction
```

### 31.16.14 `salt.modules.blockdev`

Module for managing block devices

New in version 2014.7.0.

- `salt.modules.blockdev.dump(device, args=None)`
  - Return all contents of dumpt2fs for a specified device
    - CLI Example: `salt '*' extfs.dump /dev/sda1`

- `salt.modules.blockdev.resize2fs(device)`
  - Resizes the filesystem.
    - CLI Example: `salt '*' blockdev.resize2fs /dev/sda1`

- `salt.modules.blockdev.tune(device, **kwargs)`
  - Set attributes for the specified device
    - CLI Example:
      ```
salt '*' blockdev.tune /dev/sda1 read-ahead=1024 read-write=True
      ```
  
  Valid options are: read-ahead, filesystem-read-ahead, read-only, read-write.

  See the blockdev(8) manpage for a more complete description of these options.

- `salt.modules.blockdev.wipe(device)`
  - Remove the filesystem information
    - CLI Example:
      ```
salt '*' blockdev.wipe /dev/sda1
      ```

### 31.16.15 `salt.modules.bluez`

Support for Bluetooth (using BlueZ in Linux).

The following packages are required packages for this module:

- bluez >= 5.7 bluez-libs >= 5.7 bluez-libs-libs >= 5.7 pybluez >= 0.18

- `salt.modules.bluez.address()`
  - Get the many addresses of the Bluetooth adapter
    - CLI Example:
      ```
salt '*' bluetooth.address
      ```

- `salt.modules.bluez.block(bdaddr)`
  - Block a specific bluetooth device by BD Address
    - CLI Example:

salt.modules.bluez.discoverable(dev)
   Enable this bluetooth device to be discoverable.
   CLI Example:
   salt '*' bluetooth.discoverable hci0

salt.modules.bluez.noscan(dev)
   Turn off scanning modes on this device.
   CLI Example:
   salt '*' bluetooth.noscan hci0

salt.modules.bluez.pair(address, key)
   Pair the bluetooth adapter with a device
   CLI Example:
   salt '*' bluetooth.pair DE:AD:BE:EF:CA:FE 1234

Where DE:AD:BE:EF:CA:FE is the address of the device to pair with, and 1234 is the passphrase.

TODO: This function is currently broken, as the bluez-simple-agent program no longer ships with BlueZ >= 5.0. It needs to be refactored.

salt.modules.bluez.power(dev, mode)
   Power a bluetooth device on or off
   CLI Examples:
   salt '*' bluetooth.power hci0 on
   salt '*' bluetooth.power hci0 off

salt.modules.bluez.scan()
   Scan for bluetooth devices in the area
   CLI Example:
   salt '*' bluetooth.scan

salt.modules.bluez.start()
   Start the bluetooth service.
   CLI Example:
   salt '*' bluetooth.start

salt.modules.bluez.stop()
   Stop the bluetooth service.
   CLI Example:
   salt '*' bluetooth.stop

salt.modules.bluez.unblock(bdaddr)
   Unblock a specific bluetooth device by BD Address
   CLI Example:
salt '*

salt.modules.bluez.unpair(address)
Unpair the bluetooth adapter from a device
CLI Example:
salt '*

Where DE:AD:BE:EF:CA:FE is the address of the device to unpair.
TODO: This function is currently broken, as the bluez-simple-agent program no longer ships with BlueZ >=
5.0. It needs to be refactored.

salt.modules.bluez.version()
Return Bluez version from bluetoothd -v
CLI Example:
salt '*
bluetoothd.version

31.16.16 salt.modules.boto_asg
Connection module for Amazon Autoscale Groups
New in version 2014.7.0.

configuration This module accepts explicit autoscale credentials but can also utilize IAM roles assigned
to the instance trough Instance Profiles. Dynamic credentials are then automatically obtained from
AWS API and no further configuration is necessary. More Information available at:

If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

asg.keyid: GKTADJGHEIQSXMKKRBJ08H
asg.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs

A region may also be specified in the configuration:
asg.region: us-east-1

If a region is not specified, the default is us-east-1.
It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a
string to pull from pillars or minion config:

myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1

depends boto
salt.modules.boto_asg.create(name, launch_config_name, availability_zones, min_size, max_size, desired_capacity=None, load_balancers=None, default_cooldown=None, health_check_type=None, health_check_period=None, placement_group=None, vpc_zone_identifier=None, tags=None, termination_policies=None, suspended_processes=None, scaling_policies=None, region=None, notification_arn=None, notification_types=None, key=None, keyid=None, profile=None)

Create an autoscale group.

CLI example:
```
salt myminion boto_asg.create myasg mylc ['"us-east-1a", "us-east-1e"'] 1 10 load_balancers='["myelb", "myelb2"]'
```

salt.modules.boto_asg.create_launch_configuration(name, image_id, key_name=None, security_groups=None, user_data=None, instance_type='m1.small', kernel_id=None, ramdisk_id=None, block_device_mappings=None, instance_monitoring=False, spot_price=None, instance_profile_name=None, ebs_optimized=False, associate_public_ip_address=None, volume_type=None, delete_on_termination=True, iops=None, use_block_device_types=False, region=None, key=None, keyid=None, profile=None)

Create a launch configuration.

CLI example:
```
salt myminion boto_asg.create_launch_configuration mylc image_id=ami-0b9c9f62 key_name='mykey' security_groups='["mygroup"]' instance_type='c3.2xlarge'
```

salt.modules.boto_asg.delete(name, force=False, region=None, key=None, keyid=None, profile=None)

Delete an autoscale group.

CLI example:
```
salt myminion boto_asg.delete myasg region=us-east-1
```

salt.modules.boto_asg.delete_launch_configuration(name, region=None, key=None, keyid=None, profile=None)

Delete a launch configuration.

CLI example:
```
salt myminion boto_asg.delete_launch_configuration mylc
```

salt.modules.boto_asg.exists(name, region=None, key=None, keyid=None, profile=None)

Check to see if an autoscale group exists.

CLI example:
salt myminion boto_asg.exists myasg region=us-east-1

salt.modules.boto_asg.get_cloud_init_mime(cloud_init)
Get a mime multipart encoded string from a cloud-init dict. Currently supports scripts and cloud-config.
CLI Example:
salt myminion boto.get_cloud_init_mime <cloud init>

salt.modules.boto_asg.get_config(name, region=None, key=None, keyid=None, profile=None)
Get the configuration for an autoscale group.
CLI example:
salt myminion boto_asg.get_config myasg region=us-east-1

salt.modules.boto_asg.get_instances(name, lifecycle_state='InService', health_status='Healthy', attribute='private_ip_address', region=None, key=None, keyid=None, profile=None)
return attribute of all instances in the named autoscale group.
CLI example:
salt-call boto_asg.get_instances my_autoscale_group_name

salt.modules.boto_asg.get_scaling_policy_arn(as_group, scaling_policy_name, region=None, key=None, keyid=None, profile=None)
Return the arn for a scaling policy in a specific autoscale group or None if not found. Mainly used as a helper method for boto_cloudwatch_alarm, for linking alarms to scaling policies.
CLI Example:
salt '*' boto_asg.get_scaling_policy_arn mygroup mypolicy

salt.modules.boto_asg.launch_configuration_exists(name, region=None, key=None, keyid=None, profile=None)
Check for a launch configuration's existence.
CLI example:
salt myminion boto_asg.launch_configuration_exists mylc

salt.modules.boto_asg.update(name, launch_config_name, availability_zones, min_size, max_size, desired_capacity=None, load_balancers=None, default_cooldown=None, health_check_type=None, health_check_period=None, placement_group=None, vpc_zone_identifier=None, tags=None, termination_policies=None, suspended_processes=None, scaling_policies=None, notification_arn=None, notification_types=None, region=None, key=None, keyid=None, profile=None)
Update an autoscale group.
CLI example:
salt myminion boto_asg.update myasg mylc '["us-east-1a", "us-east-1e"]' 1 10 load_balancers='["myelb", "myelb2"]'
31.16.17 salt.modules.boto_cfn

Connection module for Amazon Cloud Formation

New in version 2015.5.0.

configuration This module accepts explicit AWS credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

| cfn.keyid: GKTADJGHEIQSXMKKRBJ08H |
| cfn.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs |

A region may also be specified in the configuration:

| cfn.region: us-east-1 |

depends boto

salt.modules.boto_cfn.create(name, template_body=None, template_url=None, parameters=None, notification_arns=None, disable_rollback=None, timeout_in_minutes=None, capabilities=None, tags=None, on_failure=None, stack_policy_body=None, stack_policy_url=None, region=None, key=None, keyid=None, profile=None)

Create a CFN stack.

CLI example to create a stack:

salt myminion boto_cfn.create mystack template_url='https://s3.amazonaws.com/bucket/template.cft' region=us-east-1

salt.modules.boto_cfn.delete(name, region=None, key=None, keyid=None, profile=None)

Delete a CFN stack.

CLI example to delete a stack:

salt myminion boto_cfn.delete mystack region=us-east-1

salt.modules.boto_cfn.describe(name, region=None, key=None, keyid=None, profile=None)

Describe a stack.

New in version 2015.8.0.

CLI example:

salt myminion boto_cfn.describe mystack region=us-east-1

salt.modules.boto_cfn.exists(name, region=None, key=None, keyid=None, profile=None)

Check to see if a stack exists.

CLI example:

salt myminion boto_cfn.exists mystack region=us-east-1

salt.modules.boto_cfn.get_template(name, region=None, key=None, keyid=None, profile=None)

Check to see if attributes are set on a CFN stack.

CLI example:
salt myminion boto_cfn.get_template mystack

salt.modules.boto_cfn.update_stack(name, template_body=None, template_url=None, parameters=None, notification_arns=None, disable_rollback=False, timeout_in_minutes=None, capabilities=None, tags=None, use_previous_template=None, stack_policy_during_update_body=None, stack_policy_during_update_url=None, stack_policy_body=None, stack_policy_url=None, region=None, key=None, keyid=None, profile=None)

Update a CFN stack.
New in version 2015.8.0.
CLI example to update a stack:
salt myminion boto_cfn.update_stack mystack template_url='https://s3.amazonaws.com/bucket/template.cft' region=us-east-1

salt.modules.boto_cfn.validate_template(template_body=None, template_url=None, region=None, key=None, keyid=None, profile=None)

Validate cloudformation template
New in version 2015.8.0.
CLI example:
salt myminion boto_cfn.validate_template mystack-template

31.16.18 salt.modules.boto_cloudwatch

Connection module for Amazon CloudWatch
New in version 2014.7.0.
configuration This module accepts explicit credentials but can also utilize IAM roles assigned to the instance trough Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:

If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:
cloudwatch.keyid: GKTADJGHEIQSXMKKRBJ08H
cloudwatch.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs

A region may also be specified in the configuration:
cloudwatch.region: us-east-1

If a region is not specified, the default is us-east-1.
It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

myprofile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
    region: us-east-1
depends boto

```
salt.modules.boto_cloudwatch.convert_to_arn(arns, region=None, key=None, keyid=None, profile=None)
```

Convert a list of strings into actual arns. Converts convenience names such as `scaling_policy:`...

CLI Example:
```
salt '*' convert_to_arn 'scaling_policy:'
```

```
salt.modules.boto_cloudwatch.create_or_update_alarm(connection=None, name=None, metric=None, namespace=None, statistic=None, comparison=None, threshold=None, period=None, evaluation_periods=None, unit=None, description='`, dimensions=None, alarm_actions=None, insufficient_data_actions=None, ok_actions=None, region=None, key=None, keyid=None, profile=None)
```

Create or update a cloudwatch alarm.


Dimensions must be a dict. If the value of Dimensions is a string, it will be json decoded to produce a dict. `alarm_actions`, `insufficient_data_actions`, and `ok_actions` must be lists of string. If the passed-in value is a string, it will be split on “,” to produce a list. The strings themselves for `alarm_actions`, `insufficient_data_actions`, and `ok_actions` must be Amazon resource names (ARN's); however, this method also supports an arn lookup notation, as follows:

```
arn:aws:.... ARN as per [http://docs.aws.amazon.com/general/latest/gr/aws-arns-and-namespaces.html](http://docs.aws.amazon.com/general/latest/gr/aws-arns-and-namespaces.html) scaling_policy::<as_name>:<scaling_policy_name> The named autoscale group scaling policy, for the named group (e.g. scaling_policy:my-asg:ScaleDown)
```

This is convenient for setting up autoscaling as follows. First specify a `boto_asg.present` state for an ASG with scaling_policies, and then set up `boto_cloudwatch_alarm.present` states which have `alarm_actions` that reference the `scaling_policy`.

CLI example:
```
salt myminion boto_cloudwatch.create_alarm name=myalarm ... region=us-east-1
```

```
salt.modules.boto_cloudwatch.delete_alarm(name, region=None, key=None, keyid=None, profile=None)
```

Delete a cloudwatch alarm

CLI example to delete a queue:
```
salt myminion boto_cloudwatch.delete_alarm myalarm region=us-east-1
```

```
salt.modules.boto_cloudwatch.get_alarm(name, region=None, key=None, keyid=None, profile=None)
```

Get alarm details. Also can be used to check to see if an alarm exists.

CLI example:
```
salt myminion boto_cloudwatch.get_alarm myalarm region=us-east-1
```
salt.modules.boto_cloudwatch.get_all_alarms(region=None, prefix=None, key=None, keyid=None, profile=None)

Get all alarm details. Produces results that can be used to create an sls file.

If prefix parameter is given, alarm names in the output will be prepended with the prefix; alarms that have the prefix will be skipped. This can be used to convert existing alarms to be managed by salt, as follows:

1. Make a "backup" of all existing alarms
   $ salt-call boto_cloudwatch.get_all_alarms --out=txt | sed "s/local: //" > legacy_alarms.sls

2. Get all alarms with new prefixed names
   $ salt-call boto_cloudwatch.get_all_alarms `prefix="**MANAGED BY SALT**"` --out=txt | sed "s/local: //" > managed_alarms.sls

3. Insert the managed alarms into cloudwatch
   $ salt-call state.template managed_alarms.sls

4. Manually verify that the new alarms look right

5. Delete the original alarms
   $ sed s/present/absent/ legacy_alarms.sls > remove_legacy_alarms.sls
   $ salt-call state.template remove_legacy_alarms.sls

6. Get all alarms again, verify no changes
   $ salt-call boto_cloudwatch.get_all_alarms --out=txt | sed "s/local: //" > final_alarms.sls
   $ diff final_alarms.sls managed_alarms.sls

CLI example:

```
salt myminion boto_cloudwatch.get_all_alarms region=us-east-1 --out=txt
```

31.16.19 salt.modules.boto_dynamodb

Connection module for Amazon DynamoDB

New in version 2015.5.0.

configuration

This module accepts explicit DynamoDB credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```
keyid: GKTADJGHEIQXSXMKRRBJJ08H
key: askdjghsdfjkghWupUjasdflkSdkflgjjsdfjajkgghs
```

A region may also be specified in the configuration:

```
region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```
.. code-block:: yaml

  myprofile: keyid: GKTADJGHEIQXSXMKRRBJJ08H key: askdjghsdfjkghWupUjasdflkSdkflgjjsdfjajkgghs region: us-east-1
```

depends boto
salt.modules.boto_dynamodb.create_table(table_name, region=None, key=None, keyid=None, profile=None, read_capacity_units=None, write_capacity_units=None, hash_key=None, hash_key_data_type=None, range_key=None, range_key_data_type=None, local_indexes=None, global_indexes=None)

Creates a DynamoDB table.

CLI Example:

```
salt myminion boto_dynamodb.create_table table_name / region=us-east-1 / hash_key=id / hash_key_data_type=N / range_key=created_at / range_key_data_type=N / read_capacity_units=1 / write_capacity_units=1
```

salt.modules.boto_dynamodb.delete(table_name, region=None, key=None, keyid=None, profile=None)

Delete a DynamoDB table.

CLI Example:

```
salt myminion boto_dynamodb.delete table_name region=us-east-1
```

salt.modules.boto_dynamodb.exists(table_name, region=None, key=None, keyid=None, profile=None)

Check to see if a table exists.

CLI Example:

```
salt myminion boto_dynamodb.exists table_name region=us-east-1
```

**31.16.20 salt.modules.boto_ec2**

Connection module for Amazon EC2

New in version 2015.8.0.

**configuration** This module accepts explicit EC2 credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```
ec2.keyid: GKTADJGHEIQSXMKKRBJ08H
e2.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

A region may also be specified in the configuration:

```
ec2.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:
Salt Documentation, Release 2015.8.0

```python
myprofile:
keyid: GKTADJGHEIQSXMKKRBJ08H
key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
region: us-east-1
```

```python
depends boto

salt.modules.boto_ec2.create_key(key_name, save_path, region=None, key=None, keyid=None, profile=None)

Creates a key and saves it to a given path. Returns the private key.

CLI Example:

```
salt myminion boto_ec2.create_key /root/
```

salt.modules.boto_ec2.delete_key(key_name, region=None, key=None, keyid=None, profile=None)

Deletes a key. Always returns True

CLI Example:

```
salt myminion boto_ec2.delete_key mykey
```

salt.modules.boto_ec2.exists(instance_id=None, name=None, tags=None, region=None, key=None, keyid=None, profile=None)

Given a instance id, check to see if the given instance id exists.

Returns True if the given an instance with the given id, name, or tags exists; otherwise, False is returned.

CLI Example:

```
salt myminion boto_ec2.exists myinstance
```

salt.modules.boto_ec2.find_instances(instance_id=None, name=None, tags=None, region=None, key=None, keyid=None, profile=None, return_objs=False)

Given instance properties, find and return matching instance ids

CLI Examples:

```
salt myminion boto_ec2.find_instances # Lists all instances
salt myminion boto_ec2.find_instances name=myinstance
salt myminion boto_ec2.find_instances tags='{"mytag": "value"}'
```

salt.modules.boto_ec2.get_attribute(attribute, instance_name=None, instance_id=None, region=None, key=None, keyid=None, profile=None)

Get an EC2 instance attribute.

CLI Example:

```
salt myminion boto_ec2.get_attribute name=my_instance attribute=sourceDestCheck
```

Available attributes:

- instanceType
- kernel
- ramdisk
- userData
- disableApiTermination
```
- `instanceInitiatedShutdownBehavior`
- `rootDeviceName`
- `blockDeviceMapping`
- `productCodes`
- `sourceDestCheck`
- `groupSet`
- `ebsOptimized`
- `sriovNetSupport`

```python
salt.modules.boto_ec2.get_id(name=None, tags=None, region=None, key=None, keyid=None, profile=None)
```

Given instance properties, return the instance id if it exists.

CLI Example:
```
salt myminion boto_ec2.get_id myinstance
```

```python
salt.modules.boto_ec2.get_key(key_name, region=None, key=None, keyid=None, profile=None)
```

Check to see if a key exists. Returns fingerprint and name if it does and False if it doesn't

CLI Example:
```
salt myminion boto_ec2.get_key mykey
```

```python
salt.modules.boto_ec2.get_keys(keynames=None, filters=None, region=None, key=None, keyid=None, profile=None)
```

Gets all keys or filters them by name and returns a list. `keynames` (list):: A list of the names of keypairs to retrieve. If not provided, all key pairs will be returned. `filters` (dict):: Optional filters that can be used to limit the results returned. Filters are provided in the form of a dictionary consisting of filter names as the key and filter values as the value. The set of allowable filter names/values is dependent on the request being performed. Check the EC2 API guide for details.

CLI Example:
```
salt myminion boto_ec2.get_keys
```

```python
salt.modules.boto_ec2.get_zones(region=None, key=None, keyid=None, profile=None)
```

Get a list of AZs for the configured region.

CLI Example:
```
salt myminion boto_ec2.get_zones
```

```python
salt.modules.boto_ec2.import_key(key_name, public_key_material, region=None, key=None, keyid=None, profile=None)
```

Imports the public key from an RSA key pair that you created with a third-party tool. Supported formats:
- OpenSSH public key format (e.g., the format in ~/.ssh/authorized_keys)
- Base64 encoded DER format
- SSH publickey file format as specified in RFC4716

DSA keys are not supported. Make sure your key generator is set up to create RSA keys. Supported lengths: 1024, 2048, and 4096.

CLI Example:
```
salt myminion boto_ec2.import mykey publickey
```

```python
salt.modules.boto_ec2.run(image_id, name=None, tags=None, instance_type='m1.small',
key_name=None, security_groups=None, user_data=None, placement=None, region=None, key=None, keyid=None, profile=None)
```

Create and start an EC2 instance.
Returns True if the instance was created; otherwise False.

CLI Example:

```bash
salt myminion boto_ec2.run ami-b80c2b87 name=myinstance
```

```python
salt.modules.boto_ec2.set_attribute(attribute, attribute_value, instance_name=None, instance_id=None, region=None, key=None, keyid=None, profile=None)
```

Set an EC2 instance attribute. Returns whether the operation succeeded or not.

CLI Example:

```bash
salt myminion boto_ec2.set_attribute instance_name=my_instance attribute=sourceDestCheck attribute_value=False
```

Available attributes:

- instanceType
- kernel
- ramdisk
- userData
- disableApiTermination
- instanceInitiatedShutdownBehavior
- rootDeviceName
- blockDeviceMapping
- productCodes
- sourceDestCheck
- groupSet
- ebsOptimized
- srivNetSupport

```python
salt.modules.boto_ec2.terminate(instance_id=None, name=None, region=None, key=None, keyid=None, profile=None)
```

Terminate the instance described by instance_id or name.

CLI Example:

```bash
salt myminion boto_ec2.terminate name=myinstance
salt myminion boto_ec2.terminate instance_id=i-a46b9f
```

### 31.16.21 salt.modules.boto_elasticache

Connection module for Amazon Elasticache

New in version 2014.7.0.

**configuration** This module accepts explicit elasticache credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:
If IAM roles are not used you need to specify them either in a pillar or the minion's config file:

```yaml
elasticache.keyid: GKTADJGHEIQSXMKKRBJ08H
elasticache.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

A region may also be specified in the configuration:

```yaml
elasticache.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```yaml
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1
```

depends boto

```
salt.modules.boto_elasticache.authorize_cache_security_group_ingress(name, ec2_security_group_name, ec2_security_group_owner_id, region=None, key=None, keyid=None, profile=None)

Authorize network ingress from an ec2 security group to a cache security group.

CLI example:

```bash
salt myminion boto_elasticache.authorize_cache_security_group_ingress myelasticachesg myec2sg 879879
```
```
salt.modules.boto_elasticache.create(name, num_cache_nodes=None, engine=None, cache_node_type=None, replication_group_id=None, engine_version=None, cache_parameter_group_name=None, cache_subnet_group_name=None, cache_security_group_names=None, security_group_ids=None, snapshot_arns=None, preferred_availability_zone=None, preferred_maintenance_window=None, port=None, notification_topic_arn=None, auto_minor_version_upgrade=None, wait=None, region=None, key=None, keyid=None, profile=None)

Create a cache cluster.

CLI example:

```bash
salt myminion boto_elasticache.create myelasticache 1 redis cache.t1.micro cache_security_group_names='["myelasticachesg"]'
```
salt.modules.boto_elasticache.create_cache_security_group(name, description, region=None, key=None, keyid=None, profile=None)

Create a cache security group.
CLI example:
salt myminion boto_elasticache.create_cache_security_group myelasticachesg 'My Cache Security Group'

salt.modules.boto_elasticache.create_replication_group(name, primary_cluster_id, replication_group_description, wait=None, region=None, key=None, keyid=None, profile=None)

Create replication group.
CLI example:
salt myminion boto_elasticache.create_replication_group myelasticache myprimarycluster description

salt.modules.boto_elasticache.create_subnet_group(name, description, subnet_ids, tags=None, region=None, key=None, keyid=None, profile=None)

Create an ElastiCache subnet group
CLI example to create an ElastiCache subnet group:
salt myminion boto_elasticache.create_subnet_group my-subnet-group "group description" ['subnet-12345678', 'subnet-87654321'] region=us-east-1

salt.modules.boto_elasticache.delete(name, wait=False, region=None, key=None, keyid=None, profile=None)

Delete a cache cluster.
CLI example:
salt myminion boto_elasticache.delete myelasticache

salt.modules.boto_elasticache.delete_cache_security_group(name, region=None, key=None, keyid=None, profile=None)

Delete a cache security group.
CLI example:
salt myminion boto_elasticache.delete_cache_security_group myelasticachesg 'My Cache Security Group'

salt.modules.boto_elasticache.delete_subnet_group(name, region=None, key=None, keyid=None, profile=None)

Delete an ElastiCache subnet group.
CLI example:
salt myminion boto_elasticache.delete_subnet_group my-subnet-group region=us-east-1

salt.modules.boto_elasticache.describe_replication_group(name, region=None, key=None, keyid=None, profile=None, parameter=None)

Get replication group information.
CLI example:

```python
salt myminion boto_elasticache.describe_replication_group mygroup
```

```python
salt.modules.boto_elasticache.exists(name, region=None, key=None, keyid=None, profile=None)
```

Check to see if a cache cluster exists.

CLI example:

```python
salt myminion boto_elasticache.exists myelasticache
```

```python
salt.modules.boto_elasticache.get_cache_subnet_group(name, region=None, key=None, keyid=None, profile=None)
```

Get information about a cache subnet group.

CLI example:

```python
salt myminion boto_elasticache.get_cache_subnet_group mycache_subnet_group
```

```python
salt.modules.boto_elasticache.get_config(name, region=None, key=None, keyid=None, profile=None)
```

Get the configuration for a cache cluster.

CLI example:

```python
salt myminion boto_elasticache.get_config myelasticache
```

```python
salt.modules.boto_elasticache.get_group_host(name, region=None, key=None, keyid=None, profile=None)
```

Get hostname from replication cache group

CLI example:

```python
salt myminion boto_elasticache.get_group_host myelasticachegroup
```

```python
salt.modules.boto_elasticache.get_node_host(name, region=None, key=None, keyid=None, profile=None)
```

Get hostname from cache node

CLI example:

```python
salt myminion boto_elasticache.get_node_host myelasticache
```

```python
salt.modules.boto_elasticache.group_exists(name, region=None, key=None, keyid=None, profile=None)
```

Check to see if a replication group exists.

CLI example:

```python
salt myminion boto_elasticache.group_exists myelasticache
```

```python
salt.modules.boto_elasticache.revoke_cache_security_group_ingress(name, 
ec2_security_group_name, 
ec2_security_group_owner_id, 
region=None, 
key=None, 
keyid=None, 
profile=None)
```

Revoke network ingress from an ec2 security group to a cache security group.
### 31.16.22 salt.modules.boto_elb

Connection module for Amazon ELB

New in version 2014.7.0.

**configuration** This module accepts explicit elb credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```
elb.keyid: GKTADJGHEIQSXMKKRBJ08H
elb.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

A region may also be specified in the configuration:

```
elb.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1
```

**depends** boto >= 2.33.0

salt.modules.boto_elb.**apply_security_groups**(name, security_groups, region=None, key=None, keyid=None, profile=None)

Apply security groups to ELB.

CLI example:

```
salt myminion boto_elb.apply_security_groups myelb '"["mysecgroup1"]' 
```

salt.modules.boto_elb.**attach_subnets**(name, subnets, region=None, key=None, keyid=None, profile=None)

Attach ELB to subnets.

CLI example:
salt.myminion.boto_elb.attach_subnets(myelb, "["mysubnet"]")

salt.modules.boto_elb.create(name, availability_zones=None, subnets=None, security_groups=None, scheme='internet-facing', region=None, key=None, keyid=None, profile=None)

Create an ELB

CLI example to create an ELB:

salt.myminion.boto_elb.create(myelb, "["us-east-1a", "us-east-1e"]", listeners='[[443, 80, "HTTPS", "HTTP", "arn:aws:iam::1111111:server-certificate/mycert"]]", region=us-east-1)

salt.modules.boto_elb.create_listeners(name, listeners=None, region=None, key=None, keyid=None, profile=None)

Create listeners on an ELB.

CLI example:

salt.myminion.boto_elb.create_listeners(myelb, listeners=["HTTPS", "HTTP", 443, 80, "arn:aws:iam::1111111:server-certificate/mycert"], region=us-east-1)

salt.modules.boto_elb.delete(name, region=None, key=None, keyid=None, profile=None)

Delete an ELB.

CLI example to delete an ELB:

salt.myminion.boto_elb.delete(myelb, region=us-east-1)

salt.modules.boto_elb.delete_listeners(name, ports, region=None, key=None, keyid=None, profile=None)

Delete listeners on an ELB.

CLI example:

salt.myminion.boto_elb.delete_listeners(myelb, [80, 443], region=us-east-1)

salt.modules.boto_elb.deregister_instances(name, instances, region=None, key=None, keyid=None, profile=None)

Deregister instances with an ELB. Instances is either a string instance id or a list of string instance id's.

Returns:

• True: instance(s) deregistered successfully
• False: instance(s) failed to be deregistered
• None: instance(s) not valid or not registered, no action taken

CLI example:

salt.myminion.boto_elb.deregister_instances(myelb, "[instance_id, instance_id]", region=us-east-1)

salt.modules.boto_elb.detach_subnets(name, subnets, region=None, key=None, keyid=None, profile=None)

Detach ELB from subnets.

CLI example:

salt.myminion.boto_elb.detach_subnets(myelb, "["mysubnet"]")

salt.modules.boto_elb.disable_availability_zones(name, availability_zones, region=None, key=None, keyid=None, profile=None)

Disable availability zones for ELB.
salt.modules.boto_elb.enable_availability_zones(name, availability_zones, region=None, key=None, keyid=None, profile=None)
Enable availability zones for ELB.
CLI example:
   salt myminion boto_elb.enable_availability_zones myelb ['"us-east-1a"']

salt.modules.boto_elb.exists(name, region=None, key=None, keyid=None, profile=None)
Check to see if an ELB exists.
CLI example:
   salt myminion boto_elb.exists myelb region=us-east-1

salt.modules.boto_elb.get_attributes(name, region=None, key=None, keyid=None, profile=None)
Check to see if attributes are set on an ELB.
CLI example:
   salt myminion boto_elb.get_attributes myelb

salt.modules.boto_elb.get_elb_config(name, region=None, key=None, keyid=None, profile=None)
Check to see if an ELB exists.
CLI example:
   salt myminion boto_elb.exists myelb region=us-east-1

salt.modules.boto_elb.get_health_check(name, region=None, key=None, keyid=None, profile=None)
Get the health check configured for this ELB.
CLI example:
   salt myminion boto_elb.get_health_check myelb

salt.modules.boto_elb.get_instance_health(name, region=None, key=None, keyid=None, profile=None, instances=None)
Get a list of instances and their health state
CLI example:
   salt myminion boto_elb.get_instance_health myelb
   salt myminion boto_elb.get_instance_health myelb region=us-east-1 instances="[instance_id,instance_id]"

salt.modules.boto_elb.register_instances(name, instances, region=None, key=None, keyid=None, profile=None)
Register instances with an ELB. Instances is either a string instance id or a list of string instance id's.
Returns:
   True: instance(s) registered successfully
   False: instance(s) failed to be registered
CLI example:
salt.myminion boto_elb.register_instances myelb instance_id
salt.myminion boto_elb.register_instances myelb "[instance_id,instance_id]"

salt.modules.boto_elb.set_attributes(name, attributes, region=None, key=None, keyid=None, profile=None)

Set attributes on an ELB.
CLI example to set attributes on an ELB:

salt.myminion boto_elb.set_attributes myelb '{"access_log": {"enabled": "true", "s3_bucket_name": "mylogs"}}'

salt.modules.boto_elb.set_health_check(name, health_check, region=None, key=None, keyid=None, profile=None)

Set attributes on an ELB.
CLI example to set attributes on an ELB:

salt.myminion boto_elb.set_health_check myelb '{"target": "HTTP:80/"}''

31.16.23 salt.modules.boto_iam

Connection module for Amazon IAM

New in version 2014.7.0.

classification This module accepts explicit iam credentials but can also utilize IAM roles assigned to
the instance through Instance Profiles. Dynamic credentials are then automatically obtained from
AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

iam.keyid: GKTADJGHEIQSXMKKRBJ08H
iam.key: askdjghsdfjkgHwupUjasdflkdfklgjjsdfjakjghs
iam.region: us-east-1

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a
string to pull from pillars or minion config:

myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkgHwupUjasdflkdfklgjjsdfjakjghs
  region: us-east-1

depends boto

salt.modules.boto_iam.add_user_to_group(user_name, group_name, region=None, key=None, keyid=None, profile=None)

Add user to group.
New in version 2015.8.0.
CLI Example:
salt.myminion boto_iam.add_user_to_group myuser mygroup

salt.modules.boto_iam.associate_profile_to_role(profile_name, role_name, region=None, key=None, keyid=None, profile=None)

Associate an instance profile with an IAM role.
Salt Documentation, Release 2015.8.0

CLI Example:

```python
salt myminion boto_iams.associate_profile_to_role myirole myiprofile
```

`salt.modules.boto_iams.build_policy(region=None, key=None, keyid=None, profile=None)`
Build a default assume role policy.
New in version 2015.8.0.
CLI Example:

```python
salt myminion boto_iams.build_policy
```

`salt.modules.boto_iams.create_access_key(user_name, region=None, key=None, keyid=None, profile=None)`
Create access key id for a user.
New in version 2015.8.0.
CLI Example:

```python
salt myminion boto_iams.create_access_key myuser
```

`salt.modules.boto_iams.create_group(group_name, path=None, region=None, key=None, keyid=None, profile=None)`
Create a group.
New in version 2015.8.0.
CLI Example:

```python
salt myminion boto_iams.create_group group
```

`salt.modules.boto_iams.create_instance_profile(name, region=None, key=None, keyid=None, profile=None)`
Create an instance profile.
CLI Example:

```python
salt myminion boto_iams.create_instance_profile myiprofile
```

`salt.modules.boto_iams.create_login_profile(user_name, password, region=None, key=None, keyid=None, profile=None)`
Creates a login profile for the specified user, give the user the ability to access AWS services and the AWS Management Console.
New in version 2015.8.0.
CLI Example:

```python
salt myminion boto_iams.create_login_profile user_name password
```

`salt.modules.boto_iams.create_role(name, policy_document=None, path=None, region=None, key=None, keyid=None, profile=None)`
Create an instance role.
CLI Example:

```python
salt myminion boto_iams.create_role myrole
```

`salt.modules.boto_iams.create_role_policy(role_name, policy_name, policy, region=None, key=None, keyid=None, profile=None)`
Create or modify a role policy.
CLI Example:
```
salt myminion boto_iam.create_role_policy myrole mypolicy
```}

```
salt.modules.boto_iam.create_user(
    user_name,
    path=None,
    region=None,
    key=None,
    keyid=None,
    profile=None)
```
Create a user.
New in version 2015.8.0.
CLI Example:
```
salt myminion boto_iam.create_user myuser
```

```
salt.modules.boto_iam.delete_access_key(
    access_key_id,
    user_name=None,
    region=None,
    key=None,
    keyid=None,
    profile=None)
```
Delete access key id from a user.
New in version 2015.8.0.
CLI Example:
```
salt myminion boto_iam.delete_access_key myuser
```

```
salt.modules.boto_iam.delete_group_policy(
    group_name,
    policy_name,
    region=None,
    key=None,
    keyid=None,
    profile=None)
```
Delete a group policy.
CLI Example:
```
.. code-block:: bash
    salt myminion boto_iam.delete_group_policy mygroup mypolicy
```

```
salt.modules.boto_iam.delete_instance_profile(
    name,
    region=None,
    key=None,
    keyid=None,
    profile=None)
```
Delete an instance profile.
CLI Example:
```
salt myminion boto_iam.delete_instance_profile myiprofile
```

```
salt.modules.boto_iam.delete_role(
    name,
    region=None,
    key=None,
    keyid=None,
    profile=None)
```
Delete an IAM role.
CLI Example:
```
salt myminion boto_iam.delete_role myirole
```

```
salt.modules.boto_iam.delete_role_policy(
    role_name,
    policy_name,
    region=None,
    key=None,
    keyid=None,
    profile=None)
```
Delete a role policy.
CLI Example:
```
salt myminion boto_iam.delete_role_policy myirole mypolicy
```

```
salt.modules.boto_iam.delete_server_cert(
    cert_name,
    region=None,
    key=None,
    keyid=None,
    profile=None)
```
Deletes a certificate from Amazon.
New in version 2015.8.0.

31.16. Full list of builtin execution modules
**CLI Example:**
```
salt myminion boto_iam.delete_server_cert mycert_name
```

salt.modules.boto_iam.delete_user(user_name, region=None, key=None, keyid=None, profile=None)
Delete a user.
New in version 2015.8.0.
**CLI Example:**
```
salt myminion boto_iam.delete_user myuser
```

salt.modules.boto_iam.delete_user_policy(user_name, policy_name, region=None, key=None, keyid=None, profile=None)
Delete a user policy.
**CLI Example:**
```
salt myminion boto_iam.delete_user_policy myuser mypolicy
```

salt.modules.boto_iam.describe_role(name, region=None, key=None, keyid=None, profile=None)
Get information for a role.
**CLI Example:**
```
salt myminion boto_iam.describe_role myirole
```

salt.modules.boto_iam.disassociate_profile_from_role(profile_name, role_name, region=None, key=None, keyid=None, profile=None)
Disassociate an instance profile from an IAM role.
**CLI Example:**
```
salt myminion boto_iam.disassociate_profile_from_role myirole myiprofile
```

salt.modules.boto_iam.get_account_id(region=None, key=None, keyid=None, profile=None)
Get the AWS account id associated with the used credentials.
**CLI Example:**
```
salt myminion boto_iam.get_account_id
```

salt.modules.boto_iam.get_account_policy(region=None, key=None, keyid=None, profile=None)
Get account policy for the AWS account.
New in version 2015.8.0.
**CLI Example:**
```
salt myminion boto_iam.get_account_policy
```

salt.modules.boto_iam.get_all_access_keys(user_name, marker=None, max_items=None, region=None, key=None, keyid=None, profile=None)
Get all access keys from a user.
New in version 2015.8.0.
CLI Example:
```bash
salt myminion boto_iam.get_all_access_keys myuser
```

`salt.modules.boto_iam.get_all_group_policies(group_name, region=None, key=None, keyid=None, profile=None)`
Get a list of policy names from a group.

CLI Example:
```bash
salt myminion boto_iam.get_all_group_policies mygroup
```

`salt.modules.boto_iam.get_all_user_policies(user_name, marker=None, max_items=None, region=None, key=None, keyid=None, profile=None)`
Get all user policies.
New in version 2015.8.0.

CLI Example:
```bash
salt myminion boto_iam.get_group mygroup
```

`salt.modules.boto_iam.get_group(group_name, marker=None, max_items=None, region=None, key=None, keyid=None, profile=None)`
Get group information.
New in version 2015.8.0.

CLI Example:
```bash
salt myminion boto_iam.get_group mygroup
```

`salt.modules.boto_iam.get_group_policy(group_name, policy_name, region=None, key=None, keyid=None, profile=None)`
Retrieves the specified policy document for the specified group.
New in version 2015.8.0.

CLI Example:
```bash
salt myminion boto_iam.get_group_policy mygroup policymapname
```

`salt.modules.boto_iam.get_role_policy(role_name, policy_name, region=None, key=None, keyid=None, profile=None)`
Get a role policy.

CLI Example:
```bash
salt myminion boto_iam.get_role_policy myirole mypolicy
```

`salt.modules.boto_iam.get_server_certificate(cert_name, region=None, key=None, keyid=None, profile=None)`
Returns certificate information from Amazon
New in version 2015.8.0.

CLI Example:
```bash
salt myminion boto_iam.get_server_certificate mycert_name
```

`salt.modules.boto_iam.get_user(user_name=None, region=None, key=None, keyid=None, profile=None)`
Get user information.

31.16. Full list of builtin execution modules
New in version 2015.8.0.

CLI Example:

```shell
salt myminion boto_iam.get_user myuser
```

salt.modules.boto_iam.get_user_policy

```python
(user_name, policy_name, region=None, key=None,
 keyid=None, profile=None)
```

Retrieves the specified policy document for the specified user.

New in version 2015.8.0.

CLI Example:

```shell
salt myminion boto_iam.get_user_policy myuser mypolicynname
```

salt.modules.boto_iam.instance_profile_exists

```python
(name, region=None, key=None,
 keyid=None, profile=None)
```

Check to see if an instance profile exists.

CLI Example:

```shell
salt myminion boto_iam.instance_profile_exists myiprofile
```

salt.modules.boto_iam.list_role_policies

```python
(role_name, region=None, key=None,
 keyid=None, profile=None)
```

Get a list of policy names from a role.

CLI Example:

```shell
salt myminion boto_iam.list_role_policies myirole
```

salt.modules.boto_iam.profile_associated

```python
(role_name, profile_name, region, key, keyid, pro-
 file)
```

Check to see if an instance profile is associated with an IAM role.

CLI Example:

```shell
salt myminion boto_iam.profile_associated myirole myiprofile
```

salt.modules.boto_iam.put_group_policy

```python
(group_name, policy_name, policy_json, region=None,
 key=None, keyid=None, profile=None)
```

Adds or updates the specified policy document for the specified group.

New in version 2015.8.0.

CLI Example:

```shell
salt myminion boto_iam.put_group_policy mygroup policymcname policyrules
```

salt.modules.boto_iam.put_user_policy

```python
(user_name, policy_name, policy_json, region=None,
 key=None, keyid=None, profile=None)
```

Adds or updates the specified policy document for the specified user.

New in version 2015.8.0.

CLI Example:

```shell
salt myminion boto_iam.put_user_policy myuser policymcname policyrules
```

salt.modules.boto_iam.remove_user_from_group

```python
(group_name, user_name, region=None,
 key=None, keyid=None, profile=None)
```

Remove user from group.
New in version 2015.8.0.

CLI Example:

```
salt myminion boto_iam.remove_user_from_group mygroup myuser
```

```
salt.modules.boto_iam.role_exists(name, region=None, key=None, keyid=None, profile=None)
Check to see if an IAM role exists.
```

CLI Example:

```
salt myminion boto_iam.role_exists myirole
```

```
salt.modules.boto_iam.update_account_password_policy(allow_users_to_change_password=None,
hard_expiry=None,
max_password_age=None, minimum_password_length=None,
password_reuse_prevention=None,
require_lowercase_characters=None,
require_numbers=None,
require_symbols=None, require_uppercase_characters=None,
region=None, key=None, keyid=None, profile=None)
Update the password policy for the AWS account.
New in version 2015.8.0.
```

CLI Example:

```
salt myminion boto_iam.update_account_password_policy True
```

```
salt.modules.boto_iam.update_assume_role_policy(role_name, policy_document, region=None, key=None, keyid=None, profile=None)
Update an assume role policy for a role.
New in version 2015.8.0.
```

CLI Example:

```
salt myminion boto_iam.update_assume_role_policy myrole '{"Statement":...}"
```

```
salt.modules.boto_iam.upload_server_cert(cert_name, cert_body, private_key, cert_chain=None, path=None, region=None, key=None, keyid=None, profile=None)
Upload a certificate to Amazon.
New in version 2015.8.0.
```

CLI Example:

```
salt myminion boto_iam.upload_server_cert mycert_name crt priv_key
```

Parameters

- **cert_name** -- The name for the server certificate. Do not include the path in this value.
- **cert_body** -- The contents of the public key certificate in PEM-encoded format.
- **private_key** -- The contents of the private key in PEM-encoded format.
- **cert_chain** -- The contents of the certificate chain. This is typically a concatenation of the PEM-encoded public key certificates of the chain.
- **path** -- The path for the server certificate.
- **region** -- The name of the region to connect to.
- **key** -- The key to be used in order to connect
- **keyid** -- The keyid to be used in order to connect
- **profile** -- The profile that contains a dict of region, key, keyid

**Returns** True / False

```python
salt.modules.boto_iam.user_exists_in_group(user_name, group_name, region=None, key=None, keyid=None, profile=None)
```

Check if user exists in group.

New in version 2015.8.0.

CLI Example:
```
salt myminion boto_iam.user_exists_in_group myuser mygroup
```

### 31.16.24 salt.modules.boto_kms

Connection module for Amazon KMS

New in version 2015.8.0.

**configuration** This module accepts explicit kms credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```python
kms.keyid: GKTADJGHEIQSXMKKRBJ08H
kms.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

A region may also be specified in the configuration:

```python
kms.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```python
myprofile: keyid: GKTADJGHEIQXSXMKKRBJ08H key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs region: us-east-1
```

**depends** boto

```python
salt.modules.boto_kms.create_alias(alias_name, target_key_id, region=None, key=None, keyid=None, profile=None)
```

Create a display name for a key.

CLI example:
```
salt myminion boto_kms.create_alias 'alias/mykey' key_id
```

```
salt.modules.boto_kms.create_grant(key_id, grantee_principal, retiring_principal=None, operations=None, constraints=None, grant_tokens=None, region=None, key=None, keyid=None, profile=None)
```

Adds a grant to a key to specify who can access the key and under what conditions.

CLI example:
```
salt myminion boto_kms.create_grant 'alias/mykey' 'arn:aws:iam::111111111111:role/myrole' operations=['Encrypt','Decrypt']
```

```
salt.modules.boto_kms.create_key(policy=None, description=None, key_usage=None, region=None, key=None, keyid=None, profile=None)
```

Creates a master key.

CLI example:
```
salt myminion boto_kms.create_key '{"Statement":...}' "My master key"
```

```
salt.modules.boto_kms.decrypt(ciphertext_blob, encryption_context=None, grant_tokens=None, region=None, key=None, keyid=None, profile=None)
```

Decrypt ciphertext.

CLI example:
```
salt myminion boto_kms.decrypt encrypted_ciphertext
```

```
salt.modules.boto_kms.describe_key(key_id, region=None, key=None, keyid=None, profile=None)
```

Get detailed information about a key.

CLI example:
```
salt myminion boto_kms.describe_key 'alias/mykey'
```

```
salt.modules.boto_kms.disable_key(key_id, region=None, key=None, keyid=None, profile=None)
```

Mark key as disabled.

CLI example:
```
salt myminion boto_kms.disable_key 'alias/mykey'
```

```
salt.modules.boto_kms.disable_key_rotation(key_id, region=None, key=None, keyid=None, profile=None)
```

Disable key rotation for specified key.

CLI example:
```
salt myminion boto_kms.disable_key_rotation 'alias/mykey'
```

```
salt.modules.boto_kms.enable_key(key_id, region=None, key=None, keyid=None, profile=None)
```

Mark key as enabled.

CLI example:
```
salt myminion boto_kms.enable_key 'alias/mykey'
```

```
salt.modules.boto_kms.enable_key_rotation(key_id, region=None, key=None, keyid=None, profile=None)
```

Disable key rotation for specified key.

CLI example:
salt.myminion.boto_kms.enable_key_rotation('alias/mykey')

salt.modules.boto_kms.encrypt(key_id, plaintext, encryption_context=None, grant_tokens=None, region=None, key=None, keyid=None, profile=None)

Encrypt plaintext into cipher text using specified key.

CLI example:

```bash
salt myminion boto_kms.encrypt 'alias/mykey' 'myplaindata' '{"aws:username":"myuser"}'
```

salt.modules.boto_kms.generate_data_key(key_id, encryption_context=None, number_of_bytes=None, key_spec=None, grant_tokens=None, region=None, key=None, keyid=None, profile=None)

Generate a secure data key.

CLI example:

```bash
salt myminion boto_kms.generate_data_key 'alias/mykey' number_of_bytes=1024 key_spec=AES_128
```

salt.modules.boto_kms.generate_data_key_without_plaintext(key_id, encryption_context=None, number_of_bytes=None, key_spec=None, grant_tokens=None, region=None, key=None, keyid=None, profile=None)

Generate a secure data key without a plaintext copy of the key.

CLI example:

```bash
salt myminion boto_kms.generate_data_key_without_plaintext 'alias/mykey' number_of_bytes=1024 key_spec=AES_128
```

salt.modules.boto_kms.generate_random(number_of_bytes=None, region=None, key=None, keyid=None, profile=None)

Generate a random string.

CLI example:

```bash
salt myminion boto_kms.generate_random number_of_bytes=1024
```

salt.modules.boto_kms.get_key_policy(key_id, policy_name, region=None, key=None, keyid=None, profile=None)

Get the policy for the specified key.

CLI example:

```bash
salt myminion boto_kms.get_key_policy 'alias/mykey' mypolicy
```

salt.modules.boto_kms.get_key_rotation_status(key_id, region=None, key=None, keyid=None, profile=None)

Get status of whether or not key rotation is enabled for a key.

CLI example:

```bash
salt myminion boto_kms.get_key_rotation_status 'alias/mykey'
```

salt.modules.boto_kms.key_exists(key_id, region=None, key=None, keyid=None, profile=None)

Check for the existence of a key.
CLI example:
```
salt myminion boto_kms.key_exists 'alias/mykey'
```

```python
salt.modules.boto_kms.list_grants(key_id, limit=None, marker=None, region=None, key=None, keyid=None, profile=None)
```
List grants for the specified key.

CLI example:
```
salt myminion boto_kms.list_grants 'alias/mykey'
```

```python
salt.modules.boto_kms.list_key_policies(key_id, limit=None, marker=None, region=None, key=None, keyid=None, profile=None)
```
List key policies for the specified key.

CLI example:
```
salt myminion boto_kms.list_key_policies 'alias/mykey'
```

```python
salt.modules.boto_kms.put_key_policy(key_id, policy_name, policy, region=None, key=None, keyid=None, profile=None)
```
Attach a key policy to the specified key.

CLI example:
```
salt myminion boto_kms.put_key_policy 'alias/mykey' default '{"Statement":...}'
```

```python
salt.modules.boto_kms.re_encrypt(ciphertext_blob, destination_key_id, source_encryption_context=None, destination_encryption_context=None, grant_tokens=None, region=None, key=None, keyid=None, profile=None)
```
Reencrypt encrypted data with a new master key.

CLI example:
```
salt myminion boto_kms.re_encrypt 'encrypted_data' 'alias/mynewkey' default '{"Statement":...}'
```

```python
salt.modules.boto_kms.revoke_grant(key_id, grant_id, region=None, key=None, keyid=None, profile=None)
```
Revoke a grant from a key.

CLI example:
```
salt myminion boto_kms.revoke_grant 'alias/mykey' 8u89hf-j09j...
```

```python
salt.modules.boto_kms.update_key_description(key_id, description, region=None, key=None, keyid=None, profile=None)
```
Update a key's description.

CLI example:
```
salt myminion boto_kms.update_key_description 'alias/mykey' 'My key'
```

### 31.16.25 salt.modules.boto_rds

Connection module for Amazon RDS

New in version 2015.8.0.
**configuration** This module accepts explicit rds credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```python
rds.keyid: GKTADJGHEIQSXMKKRBJ08H
rds.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

A region may also be specified in the configuration:

```python
rds.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```python
myprofile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
    region: us-east-1
```

**depends** boto

salt.modules.boto_rds.create(name, allocated_storage, storage_type, db_instance_class, engine, master_username, master_user_password, db_name=None, db_security_groups=None, vpc_security_group_ids=None, availability_zone=None, db_subnet_group_name=None, preferred_maintenance_window=None, db_parameter_group_name=None, backup_retention_period=None, preferred_backup_window=None, port=None, multi_az=None, engine_version=None, auto_minor_version_upgrade=None, license_model=None, iops=None, option_group_name=None, character_set_name=None, publicly_accessible=None, wait_status=None, tags=None, region=None, key=None, keyid=None, profile=None)

Create an RDS

CLI example to create an RDS:

```bash
salt myminion boto_rds.create myrds 10 db.t2.micro MySQL sqlusr sqlpass
```

salt.modules.boto_rds.create_option_group(name, engine_name, major_engine_version, option_group_description, tags=None, region=None, key=None, keyid=None, profile=None)

Create an RDS option group

CLI example to create an RDS option group:

```bash
salt myminion boto_rds.create_option_group my-opt-group mysql 5.6
```

salt.modules.boto_rds.create_parameter_group(name, db_parameter_group_family, description, tags=None, region=None, key=None, keyid=None, profile=None)

Create an RDS parameter group

CLI example to create an RDS parameter group:
salt.myminion boto_rds.create_parameter_group my-param-group mysql5.6

salt.modules.boto_rds.create_read_replica(name, source_name, db_instance_class=None, availability_zone=None, port=None, auto_minor_version_upgrade=None, iops=None, option_group_name=None, publicly_accessible=None, tags=None, region=None, key=None, keyid=None, profile=None)

Create an RDS read replica

CLI example to create an RDS read replica:

```
salt myminion boto_rds.create_read_replica replicaname source_name
```

salt.modules.boto_rds.create_subnet_group(name, description, subnet_ids, tags=None, region=None, key=None, keyid=None, profile=None)

Create an RDS subnet group

CLI example to create an RDS subnet group:

```
salt myminion boto_rds.create_subnet_group my-subnet-group "group description" '[subnet-12345678, subnet-87654321]' region=us-east-1
```

salt.modules.boto_rds.delete(name, skip_final_snapshot=None, final_db_snapshot_identifier=None, region=None, key=None, keyid=None, profile=None)

Delete an RDS instance.

CLI example:

```
salt myminion boto_rds.delete myrds skip_final_snapshot=True region=us-east-1
```

salt.modules.boto_rds.delete_option_group(name, region=None, key=None, keyid=None, profile=None)

Delete an RDS option group.

CLI example:

```
salt myminion boto_rds.delete_option_group my-opt-group region=us-east-1
```

salt.modules.boto_rds.delete_parameter_group(name, region=None, key=None, keyid=None, profile=None)

Delete an RDS parameter group.

CLI example:

```
salt myminion boto_rds.delete_parameter_group my-param-group region=us-east-1
```

salt.modules.boto_rds.delete_subnet_group(name, region=None, key=None, keyid=None, profile=None)

Delete an RDS subnet group.

CLI example:

```
salt myminion boto_rds.delete_subnet_group my-subnet-group region=us-east-1
```

salt.modules.boto_rds.describe(name, tags=None, region=None, key=None, keyid=None, profile=None)

Return RDS instance details.

CLI example:
salt myminion boto_rds.describe myrds

salt.modules.boto_rds.exists(name, tags=None, region=None, key=None, keyid=None, profile=None)
Check to see if an RDS exists.
CLI example:
    salt myminion boto_rds.exists myrds region=us-east-1

salt.modules.boto_rds.get_endpoint(name, tags=None, region=None, key=None, keyid=None, profile=None)
Return the endpoint of an RDS instance.
CLI example:
    salt myminion boto_rds.get_endpoint myrds

salt.modules.boto_rds.option_group_exists(name, tags=None, region=None, key=None, keyid=None, profile=None)
Check to see if an RDS option group exists.
CLI example:
    salt myminion boto_rds.option_group_exists myoptiongr region=us-east-1

salt.modules.boto_rds.parameter_group_exists(name, tags=None, region=None, key=None, keyid=None, profile=None)
Check to see if an RDS parameter group exists.
CLI example:
    salt myminion boto_rds.parameter_group_exists myparametergroup region=us-east-1

salt.modules.boto_rds.subnet_group_exists(name, tags=None, region=None, key=None, keyid=None, profile=None)
Check to see if an RDS subnet group exists.
CLI example:
    salt myminion boto_rds.subnet_group_exists my-param-group region=us-east-1

salt.modules.boto_rds.update_parameter_group(name, parameters, apply_method='pending-reboot', tags=None, region=None, key=None, keyid=None, profile=None)
Update an RDS parameter group.
CLI example:
    salt myminion boto_rds.update_parameter_group my-param-group parameters='{"back_'

31.16.26 salt.modules.boto_route53

Connection module for Amazon Route53

New in version 2014.7.0.

configuration This module accepts explicit route53 credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:
If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```python
route53.keyid: GKTADJGHEIQSXMKKRBJ08H
route53.key: askdjghsdfjkgWupUjasdflkdfklgjsdfjajkghs
```

A region may also be specified in the configuration:

```python
route53.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```python
myprofile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
    region: us-east-1
```

depends boto

`salt.modules.boto_route53.add_record(name, value, zone, record_type, identifier=None, ttl=None, region=None, key=None, keyid=None, profile=None, wait_for_sync=True, split_dns=False, private_zone=False)`

Add a record to a zone.

CLI example:

```
salt myminion boto_route53.add_record test.example.org 1.1.1.1 example.org A
```

`salt.modules.boto_route53.create_zone(zone, private=False, vpc_id=None, vpc_region=None, region=None, key=None, keyid=None, profile=None)`

Create a Route53 hosted zone.

New in version 2015.8.0.

CLI Example:

```
salt myminion boto_route53.create_zone example.org
```

`salt.modules.boto_route53.delete_record(name, zone, record_type, identifier=None, all_records=False, region=None, key=None, keyid=None, profile=None, wait_for_sync=True, split_dns=False, private_zone=False)`

Modify a record in a zone.

CLI example:

```
salt myminion boto_route53.delete_record test.example.org example.org A
```

`salt.modules.boto_route53.delete_zone(zone, region=None, key=None, keyid=None, profile=None)`

Delete a Route53 hosted zone.

New in version 2015.8.0.

CLI Example:
salt.myminion boto_route53.delete_zone example.org

salt.modules.boto_route53.get_record(name, zone, record_type, fetch_all=False, region=None, key=None, keyid=None, profile=None, split_dns=False, private_zone=False)

Get a record from a zone.
CLI example:

    salt myminion boto_route53.get_record test.example.org example.org A

salt.modules.boto_route53.update_record(name, value, zone, record_type, identifier=None, ttl=None, region=None, key=None, keyid=None, profile=None, wait_for_sync=True, split_dns=False, private_zone=False)

Modify a record in a zone.
CLI example:

    salt myminion boto_route53.modify_record test.example.org 1.1.1.1 example.org A

salt.modules.boto_route53.zone_exists(zone, region=None, key=None, keyid=None, profile=None)

Check for the existence of a Route53 hosted zone.
New in version 2015.8.0.
CLI Example:

    salt myminion boto_route53.zone_exists example.org

31.16.27 salt.modules.boto_secgroup

Connection module for Amazon Security Groups
New in version 2014.7.0.

configuration This module accepts explicit ec2 credentials but can also utilize IAM roles assigned to the instance through instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

    segroup.keyid: GKTADJGHEIQSXMKKRBJ08H
    segroup.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs

A region may also be specified in the configuration:

    segroup.region: us-east-1

If a region is not specified, the default is us-east-1.
It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1

depends boto

salt.modules.boto_secgroup.authorize(name=None, source_group_name=None, source_group_owner_id=None, ip_protocol=None, from_port=None, to_port=None, cidr_ip=None, group_id=None, source_group_group_id=None, region=None, key=None, keyid=None, profile=None, vpc_id=None, egress=False)

Add a new rule to an existing security group.

CLI example:
```
salt myminion boto_secgroup.authorize mysecgroup ip_protocol=tcp from_port=80 to_port=80 cidr_ip=\['10.0.0.0/8', '192.168.0.0/24'\]
```

salt.modules.boto_secgroup.convert_to_group_ids(groups, vpc_id, region=None, key=None, keyid=None, profile=None)

Given a list of security groups and a vpc_id, convert_to_group_ids will convert all list items in the given list to security group ids.

CLI example:
```
salt myminion boto_secgroup.convert_to_group_ids mysecgroup vpc-89yhh7h
```

salt.modules.boto_secgroup.create(name, description, vpc_id=None, region=None, key=None, keyid=None, profile=None)

Create a security group.

CLI example:
```
salt myminion boto_secgroup.create mysecgroup 'My Security Group'
```

salt.modules.boto_secgroup.delete(name=None, group_id=None, region=None, key=None, keyid=None, profile=None, vpc_id=None)

Delete a security group.

CLI example:
```
salt myminion boto_secgroup.delete mysecgroup
```

salt.modules.boto_secgroup.exists(name=None, region=None, key=None, keyid=None, profile=None, vpc_id=None, group_id=None)

Check to see if an security group exists.

CLI example:
```
salt myminion boto_secgroup.exists mysecgroup
```

salt.modules.boto_secgroup.get_config(name=None, group_id=None, region=None, key=None, keyid=None, profile=None, vpc_id=None)

Get the configuration for a security group.

CLI example:
```
salt myminion boto_secgroup.get_config mysecgroup
```

31.16. Full list of builtin execution modules
salt.modules.boto_secgroup.get_group_id(name, vpc_id=None, region=None, key=None, keyid=None, profile=None)

Get a Group ID given a Group Name or Group Name and VPC ID

CLI example:
```
salt myminion boto_secgroup.get_group_id mysecgroup
```

salt.modules.boto_secgroup.revoke(name=None, source_group_name=None, source_group_owner_id=None, ip_protocol=None, from_port=None, to_port=None, cidr_ip=None, group_id=None, source_group_group_id=None, region=None, key=None, keyid=None, profile=None, vpc_id=None, egress=False)

Remove a rule from an existing security group.

CLI example:
```
salt myminion boto_secgroup.revoke mysecgroup ip_protocol=tcp from_port=80 to_port=80 cidr_ip='10.0.0.0/8'
```

### 31.16.28 salt.modules.boto_sns

Connection module for Amazon SNS

**configuration** This module accepts explicit sns credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion’s config file:

```
sns.keyid: GKTADJGHEIQSXMKKRBJ08H
sns.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

A region may also be specified in the configuration:

```
sns.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1
```

**depends** boto

salt.modules.boto_sns.create(name, region=None, key=None, keyid=None, profile=None)

Create an SNS topic.

CLI example to create a topic:
```
salt myminion boto_sns.create mytopic region=us-east-1
```
**salt.modules.boto_sns.delete** *(name, region=None, key=None, keyid=None, profile=None)*

Delete an SNS topic.

CLI example to delete a topic:

```bash
salt myminion boto_sns.delete mytopic region=us-east-1
```

**salt.modules.boto_sns.exists** *(name, region=None, key=None, keyid=None, profile=None)*

Check to see if an SNS topic exists.

CLI example:

```bash
salt myminion boto_sns.exists mytopic region=us-east-1
```

**salt.modules.boto_sns.get_all_subscriptions_by_topic** *(name, region=None, key=None, keyid=None, profile=None)*

Get list of all subscriptions to a specific topic.

CLI example to delete a topic:

```bash
salt myminion boto_sns.get_all_subscriptions_by_topic mytopic region=us-east-1
```

**salt.modules.boto_sns.get_all_topics** *(region=None, key=None, keyid=None, profile=None)*

Returns a list of the all topics.

CLI example:

```bash
salt myminion boto_sns.get_all_topics
```

**salt.modules.boto_sns.get_arn** *(name, region=None, key=None, keyid=None, profile=None)*

Returns the full ARN for a given topic name.

CLI example:

```bash
salt myminion boto_sns.get_arn mytopic
```

**salt.modules.boto_sns.subscribe** *(topic, protocol, endpoint, region=None, key=None, keyid=None, profile=None)*

Subscribe to a Topic.

CLI example to delete a topic:

```bash
salt myminion boto_sns.subscribe mytopic https https://www.example.com/sns-endpoint region=us-east-1
```

31.16.29 **salt.modules.boto_sqs**

Connection module for Amazon SQS

New in version 2014.7.0.

**configuration** This module accepts explicit sqs credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```bash
sqs.keyid: GKTADJGHEIQSXMKKRBJ08H
sqs.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```
A region may also be specified in the configuration:

```python
sqs.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```python
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkgHupUjasdflkdfklgjsdfjajkghs
  region: us-east-1
```

**depends** boto

```python
salt.modules.boto_sqs.create(name, region=None, key=None, keyid=None, profile=None)
```

Create an SQS queue.

CLI example to create a queue:

```bash
salt myminion boto_sqs.create myqueue region=us-east-1
```

```python
salt.modules.boto_sqs.delete(name, region=None, key=None, keyid=None, profile=None)
```

Delete an SQS queue.

CLI example to delete a queue:

```bash
salt myminion boto_sqs.delete myqueue region=us-east-1
```

```python
salt.modules.boto_sqs.exists(name, region=None, key=None, keyid=None, profile=None)
```

Check to see if a queue exists.

CLI example:

```bash
salt myminion boto_sqs.exists myqueue region=us-east-1
```

```python
salt.modules.boto_sqs.get_attributes(name, region=None, key=None, keyid=None, profile=None)
```

Check to see if attributes are set on an SQS queue.

CLI example:

```bash
salt myminion boto_sqs.get_attributes myqueue
```

```python
salt.modules.boto_sqs.set_attributes(name, attributes, region=None, key=None, keyid=None, profile=None)
```

Set attributes on an SQS queue.

CLI example to set attributes on a queue:

```bash
salt myminion boto_sqs.set_attributes myqueue '{ReceiveMessageWaitTimeSeconds: 20}' region=us-east-1
```

### 31.16.30 salt.modules.boto_vpc

Connection module for Amazon VPC

New in version 2014.7.0.
**configuration**  This module accepts explicit VPC credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```yaml
vpc.keyid: GKTADJGHEIQSXMKKRBJ08H
vpc.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

A region may also be specified in the configuration:

```yaml
vpc.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```yaml
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1
```

Changed in version 2015.8.0: All methods now return a dictionary. Create and delete methods return:

```yaml
created: true
```

or

```yaml
created: false
error:
  message: error message
```

Request methods (e.g., `describe_vpc`) return:

```yaml
vpcs:
- {...}
- {...}
```

or

```yaml
error:
  message: error message
```

**depends** boto

```python
salt.modules.boto_vpc.associate_dhcp_options_to_vpc(dhcp_options_id, vpc_id=None, vpc_name=None, region=None, key=None, keyid=None, profile=None)
```

Given valid DHCP options id and a valid VPC id, associate the DHCP options record with the VPC.

Returns True if the DHCP options record were associated and returns False if the DHCP options record was not associated.

CLI Example:

```bash
salt myminion boto_vpc.associate_dhcp_options_to_vpc 'dhcp-a0bl34pp' 'vpc-6b1fe402'
```
salt.modules.boto_vpc.associate_network_acl_to_subnet(network_acl_id=None, subnet_id=None, network_acl_name=None, subnet_name=None, region=None, key=None, keyid=None, profile=None)

Given a network acl and subnet ids or names, associate a network acl to a subnet.

CLI Example:

```bash
salt myminion boto_vpc.associate_network_acl_to_subnet
  network_acl_id='acl-5fb85d36' subnet_id='subnet-6a1fe403'
```

```bash
salt myminion boto_vpc.associate_network_acl_to_subnet
  network_acl_id='myacl' subnet_id='mysubnet'
```

salt.modules.boto_vpc.associate_new_dhcp_options_to_vpc(vpc_id, domain_name=None, domain_name_servers=None, ntp_servers=None, netbios_name_servers=None, netbios_node_type=None, region=None, key=None, keyid=None, profile=None)

.. deprecated:: Boron
   This function has been deprecated in favor of boto_vpc.create_dhcp_options, which now takes vpc_id or vpc_name as kwargs.

   This function will be removed in the Salt Boron release.

   Given valid DHCP options and a valid VPC id, create and associate the DHCP options record with the VPC.

   CLI Example:

   ```bash
   salt myminion boto_vpc.associate_new_dhcp_options_to_vpc 'vpc-6b1fe402' domain_name='example.com'
   ```

salt.modules.boto_vpc.associate_new_network_acl_to_subnet(vpc_id, subnet_id, network_acl_name=None, tags=None, region=None, key=None, keyid=None, profile=None)

.. deprecated:: Boron
   This function has been deprecated in favor of boto_vpc.create_network_acl, which now takes subnet_id or subnet_name as kwargs.

   This function will be removed in the Salt Boron release.

   Given a vpc ID and a subnet ID, associates a new network act to a subnet.

   Returns a dictionary containing the network acl id and the new association id if successful. If unsuccessful, returns False.

   CLI Example:

   ```bash
   salt myminion boto_vpc.associate_new_network_acl_to_subnet 'vpc-6b1fe402' 'subnet-6a1fe403'
   ```

salt.modules.boto_vpc.associate_route_table(route_table_id=None, subnet_id=None, route_table_name=None, subnet_name=None, region=None, key=None, keyid=None, profile=None)
Given a route table and subnet name or id, associates the route table with the subnet.

CLI Example:

```bash
salt myminion boto_vpc.associate_route_table 'rtb-1f382e7d' 'subnet-6a1fe403'
```

```bash
salt myminion boto_vpc.associate_route_table route_table_name='myrtb' \ subnet_name='mysubnet'
```

```bash
salt.modules.boto_vpc.create(cidr_block, instance_tenancy=None, vpc_name=None, enable_dns_support=None, enable_dns_hostnames=None, tags=None, region=None, key=None, keyid=None, profile=None)
```

Given a valid CIDR block, create a VPC.

An optional instance_tenancy argument can be provided. If provided, the valid values are 'default' or 'dedicated'

An optional vpc_name argument can be provided.

Returns {created: true} if the VPC was created and returns {created: False} if the VPC was not created.

CLI Example:

```bash
salt myminion boto_vpc.create '10.0.0.0/24'
```

```bash
salt.modules.boto_vpc.create_customer_gateway(vpn_connection_type, ip_address, bgp_asn, customer_gateway_name=None, tags=None, region=None, key=None, keyid=None, profile=None)
```

Given a valid VPN connection type, a static IP address and a customer gateway’s Border Gateway Protocol (BGP) Autonomous System Number, create a customer gateway.

Returns the customer gateway id if the customer gateway was created and returns False if the customer gateway was not created.

CLI Example:

```bash
salt myminion boto_vpc.create_customer_gateway 'ipsec.1', '12.1.2.3', 65534
```

```bash
salt.modules.boto_vpc.create_dhcp_options(domain_name=None, domain_name_servers=None, ntp_servers=None, netbios_name_servers=None, netbios_node_type=None, dhcp_options_name=None, tags=None, vpc_id=None, vpc_name=None, region=None, key=None, keyid=None, profile=None)
```

Given valid DHCP options, create a DHCP options record, optionally associating it with an existing VPC.

Returns True if the DHCP options record was created and returns False if the DHCP options record was not deleted.

Changed in version 2015.8.0: Added vpc_name and vpc_id arguments

CLI Example:

```bash
salt myminion boto_vpc.create_dhcp_options domain_name='example.com' \ domain_name_servers='[1.2.3.4]' ntp_servers='[5.6.7.8]' \ netbios_name_servers='[10.0.0.1]' netbios_node_type=1 \ vpc_name='myvpc'
```
salt.modules.boto_vpc.create_internet_gateway(internet_gateway_name=None, vpc_id=None, vpc_name=None, tags=None, region=None, key=None, keyid=None, profile=None)

Create an Internet Gateway, optionally attaching it to an existing VPC.

Returns the internet gateway id if the internet gateway was created and returns False if the internet gateways was not created.

New in version 2015.8.0.

CLI Example:

```
salt myminion boto_vpc.create_internet_gateway internet_gateway_name=myigw vpc_name=myvpc
```

salt.modules.boto_vpc.create_network_acl(vpc_id=None, vpc_name=None, network_acl_name=None, subnet_id=None, subnet_name=None, tags=None, region=None, key=None, keyid=None, profile=None)

Given a vpc_id, creates a network acl.

Returns the network acl id if successful, otherwise returns False.

Changed in version 2015.8.0: Added vpc_name, subnet_id, and subnet_name arguments

CLI Example:

```
salt myminion boto_vpc.create_network_acl 'vpc-6b1fe402'
```

salt.modules.boto_vpc.create_network_acl_entry(network_acl_id=None, rule_number=None, protocol=None, rule_action=None, cidr_block=None, egress=None, network_acl_name=None, icmp_code=None, icmp_type=None, port_range_from=None, port_range_to=None, region=None, key=None, keyid=None, profile=None)

Creates a network acl entry.

CLI Example:

```
salt myminion boto_vpc.create_network_acl_entry 'acl-5fb85d36' '32767' 'all' 'deny' '0.0.0.0/0' egress=true
```

salt.modules.boto_vpc.create_route(route_table_id=None, destination_cidr_block=None, route_table_name=None, gateway_id=None, internet_gateway_name=None, instance_id=None, interface_id=None, region=None, key=None, keyid=None, profile=None)

Creates a route.

CLI Example:

```
salt myminion boto_vpc.create_route 'rtb-1f382e7d' '10.0.0.0/16' gateway_id='vgw-a1b2c3'
```

salt.modules.boto_vpc.create_route_table(vpc_id=None, vpc_name=None, route_table_name=None, tags=None, region=None, key=None, keyid=None, profile=None)

Creates a route table.
Changed in version 2015.8.0: Added vpc_name argument

CLI Examples:

```salt
salt myminion boto_vpc.create_route_table vpc_id='vpc-6b1fe402' route_table_name='myroutetable'
salt myminion boto_vpc.create_route_table vpc_name='myvpc' route_table_name='myroutetable'
```

```python
salt.modules.boto_vpc.create_subnet(vpc_id=None, cidr_block=None, vpc_name=None, availability_zone=None, subnet_name=None, tags=None, region=None, key=None, keyid=None, profile=None)
```

Given a valid VPC ID or Name and a CIDR block, create a subnet for the VPC.

An optional availability zone argument can be provided.

Returns True if the VPC subnet was created and returns False if the VPC subnet was not created.

Changed in version 2015.8.0: Added vpc_name argument

CLI Examples:

```salt
salt myminion boto_vpc.create_subnet vpc_id='vpc-6b1fe402' subnet_name='mysubnet' cidr_block='10.0.0.0/25'
salt myminion boto_vpc.create_subnet vpc_name='myvpc' subnet_name='mysubnet', cidr_block='10.0.0.0/25'
```

```python
salt.modules.boto_vpc.customer_gateway_exists(customer_gateway_id=None, customer_gateway_name=None, region=None, key=None, keyid=None, profile=None)
```

Given a customer gateway ID, check if the customer gateway ID exists.

Returns True if the customer gateway ID exists; Returns False otherwise.

CLI Example:

```salt
salt myminion boto_vpc.customer_gateway_exists cgw-b6a247df
salt myminion boto_vpc.customer_gateway_exists customer_gateway_name=mycgw
```

```python
salt.modules.boto_vpc.delete(vpc_id=None, name=None, vpc_name=None, tags=None, region=None, key=None, keyid=None, profile=None)
```

Given a VPC ID or VPC name, delete the VPC.

Returns [deleted: true] if the VPC was deleted and returns [deleted: false] if the VPC was not deleted.

CLI Example:

```salt
salt myminion boto_vpc.delete vpc_id='vpc-6b1fe402'
salt myminion boto_vpc.delete name='myvpc'
```

```python
salt.modules.boto_vpc.delete_customer_gateway(customer_gateway_id=None, customer_gateway_name=None, region=None, key=None, keyid=None, profile=None)
```

Given a customer gateway ID or name, delete the customer gateway.

Returns True if the customer gateway was deleted and returns False if the customer gateway was not deleted.

Changed in version 2015.8.0: Added customer_gateway_name argument

CLI Example:
salt myminion boto_vpc.delete_customer_gateway 'cgw-b6a247df'

salt.modules.boto_vpc.delete_dhcp_options(dhcp_options_id=None, dhcp_options_name=None, region=None, key=None, keyid=None, profile=None)

Delete dhcp options by id or name.
New in version 2015.8.0.
CLI Example:

salt myminion boto_vpc.delete_dhcp_options 'dopt-b6a247df'

salt.modules.boto_vpc.delete_internet_gateway(internet_gateway_id=None, internet_gateway_name=None, detach=False, region=None, key=None, keyid=None, profile=None)

Delete an internet gateway (by name or id).
Returns True if the internet gateway was deleted and otherwise False.
New in version 2015.8.0.
CLI Examples:

salt myminion boto_vpc.delete_internet_gateway internet_gateway_id=igw-1a2b3c
salt myminion boto_vpc.delete_internet_gateway internet_gateway_name=myigw

salt.modules.boto_vpc.delete_network_acl(network_acl_id=None, network_acl_name=None, disassociate=False, region=None, key=None, keyid=None, profile=None)

Delete a network acl based on the network_acl_id or network_acl_name provided.

CLI Examples:

salt myminion boto_vpc.delete_network_acl network_acl_id='acl-5fb85d36' \ disassociate=false
salt myminion boto_vpc.delete_network_acl network_acl_name='myacl' \ disassociate=true

salt.modules.boto_vpc.delete_network_acl_entry(network_acl_id=None, rule_number=None, egress=None, network_acl_name=None, region=None, key=None, keyid=None, profile=None)

Deletes a network acl entry.

CLI Example:

salt myminion boto_vpc.delete_network_acl_entry 'acl-5fb85d36' '32767'

salt.modules.boto_vpc.delete_route(route_table_id=None, destination_cidr_block=None, route_table_name=None, region=None, key=None, keyid=None, profile=None)

Deletes a route.

CLI Example:

salt myminion boto_vpc.delete_route 'rtb-1f382e7d' '10.0.0.0/16'
salt.modules.boto_vpc.delete_route_table(route_table_id=None, route_table_name=None, region=None, key=None, keyid=None, profile=None)

Deletes a route table.

CLI Examples:

salt myminion boto_vpc.delete_route_table route_table_id='rtb-1f382e7d'
salt myminion boto_vpc.delete_route_table route_table_name='myroutetable'

salt.modules.boto_vpc.delete_subnet(subnet_id=None, subnet_name=None, region=None, key=None, keyid=None, profile=None)

Given a subnet ID or name, delete the subnet.
Returns True if the subnet was deleted and returns False if the subnet was not deleted.
Changed in version 2015.8.0: Added subnet_name argument

CLI Example:

salt myminion boto_vpc.delete_subnet 'subnet-6a1fe403'

salt.modules.boto_vpc.describe(vpc_id=None, vpc_name=None, region=None, key=None, keyid=None, profile=None)

Given a VPC ID describe its properties.
Returns a dictionary of interesting properties.
Changed in version 2015.8.0: Added vpc_name argument

CLI Example:

salt myminion boto_vpc.describe vpc_id=vpc-123456
salt myminion boto_vpc.describe vpc_name=myvpc

salt.modules.boto_vpc.describe_route_table(route_table_id=None, route_table_name=None, tags=None, region=None, key=None, keyid=None, profile=None)

Given route table properties, return route table details if matching table(s) exist.
New in version 2015.8.0.

CLI Example:

salt myminion boto_vpc.describe_route_table route_table_id='rtb-1f382e7d'

salt.modules.boto_vpc.describe_subnet(subnet_id=None, subnet_name=None, region=None, key=None, keyid=None, profile=None)

Given a subnet id or name, describe its properties.
Returns a dictionary of interesting properties.
New in version 2015.8.0.

CLI Examples:

salt myminion boto_vpc.describe_subnet subnet_id=subnet-123456
salt myminion boto_vpc.describe_subnet subnet_name=mysubnet

salt.modules.boto_vpc.describe_subnets(subnet_ids=None, subnet_names=None, vpc_id=None, cidr=None, region=None, key=None, keyid=None, profile=None)

Given a VPC ID or subnet CIDR, returns a list of associated subnets and their details. Return all subnets if VPC ID or CIDR are not provided. If a subnet id or CIDR is provided, only its associated subnet details will be returned.
New in version 2015.8.0.

CLI Examples:

```bash
salt myminion boto_vpc.describe_subnets
```

```bash
salt myminion boto_vpc.describe_subnets subnet_ids=['subnet-ba1987ab', 'subnet-ba1987cd']
```

```bash
salt myminion boto_vpc.describe_subnets vpc_id=vpc-123456
```

```bash
salt myminion boto_vpc.describe_subnets cidr=10.0.0.0/21
```

```bash
salt.modules.boto_vpc.describe_vpcs(vpc_id=None, name=None, cidr=None, region=None, key=None, keyid=None, profile=None)
```

Describe all VPCs, matching the filter criteria if provided.

Returns a a list of dictionaries with interesting properties.

New in version 2015.8.0.

CLI Example:

```bash
salt myminion boto_vpc.describe_vpcs
```

```bash
salt.modules.boto_vpc.dhcp_options_exists(dhcp_options_id=None, name=None, dhcp_options_name=None, region=None, key=None, keyid=None, profile=None)
```

Check if a dhcp option exists.

Returns True if the dhcp option exists; Returns False otherwise.

CLI Example:

```bash
salt myminion boto_vpc.dhcp_options_exists dhcp_options_id='dhcp-a0bl34pp'
```

```bash
salt.modules.boto_vpc.disassociate_network_acl(subnet_id=None, vpc_id=None, subnet_name=None, vpc_name=None, region=None, key=None, keyid=None, profile=None)
```

Given a subnet ID, disassociates a network acl.

CLI Example:

```bash
salt myminion boto_vpc.disassociate_network_acl 'subnet-6a1fe403'
```

```bash
salt.modules.boto_vpc.disassociate_route_table(association_id, region=None, key=None, keyid=None, profile=None)
```

Disasssociates a route table.

association_id The Route Table Association ID to disassociate

CLI Example:

```bash
salt myminion boto_vpc.disassociate_route_table 'rtbassoc-d8ccddba'
```

```bash
salt.modules.boto_vpc.exists(vpc_id=None, name=None, cidr=None, tags=None, region=None, key=None, keyid=None, profile=None)
```

Given a VPC ID, check to see if the given VPC ID exists.

Returns True if the given VPC ID exists and returns False if the given VPC ID does not exist.

CLI Example:
Given VPC properties, return the VPC id if a match is found.

CLI Example:

```bash
salt myminion boto_vpc.get_id myvpc
```

Get an AWS id for a VPC resource by type and name.

New in version 2015.8.0.

CLI Example:

```bash
salt myminion boto_vpc.get_resource_id internet_gateway myigw
```

Given a subnet (aka: a vpc zone identifier) or list of subnets, returns vpc association.

Returns a VPC ID if the given subnets are associated with the same VPC ID. Returns False on an error or if the given subnets are associated with different VPC IDs.

CLI Examples:

```bash
salt myminion boto_vpc.get_subnet_association subnet-61b47516
salt myminion boto_vpc.get_subnet_association [subnet-61b47516, subnet-2cb9785b]
```

Checks if a network acl exists.

Returns True if the network acl exists or returns False if it doesn’t exist.

CLI Example:

```bash
salt myminion boto_vpc.network_acl_exists network_acl_id='acl-5fb85d36'
```

Replaces a network acl entry.

CLI Example:

```bash
salt myminion boto_vpc.replace_network_acl_entry 'acl-5fb85d36' '32767' 'all' 'deny' '0.0.0.0/0' egress=true
```
salt.modules.boto_vpc.replace_route(route_table_id=None, destination_cidr_block=None, route_table_name=None, gateway_id=None, instance_id=None, interface_id=None, region=None, key=None, keyid=None, profile=None)

Replaces a route.

CLI Example:
```
salt myminion boto_vpc.replace_route 'rtb-1f382e7d' '10.0.0.0/16' gateway_id='vgw-a1b2c3'
```

salt.modules.boto_vpc.replace_route_table_association(association_id, route_table_id, region=None, key=None, keyid=None, profile=None)

Replaces a route table association.

CLI Example:
```
salt myminion boto_vpc.replace_route_table_association 'rtbassoc-d8ccddba' 'rtb-1f382e7d'
```

salt.modules.boto_vpc.resource_exists(resource, name=None, resource_id=None, tags=None, region=None, key=None, keyid=None, profile=None)

Given a resource type and name, return {exists: true} if it exists, {exists: false} if it does not exist, or {error: {message: error text}} on error.

New in version 2015.8.0.

CLI Example:
```
salt myminion boto_vpc.resource_exists internet_gateway myigw
```

salt.modules.boto_vpc.route_exists(destination_cidr_block, route_table_name=None, route_table_id=None, gateway_id=None, instance_id=None, interface_id=None, tags=None, region=None, key=None, keyid=None, profile=None)

Checks if a route exists.

New in version 2015.8.0.

CLI Example:
```
salt myminion boto_vpc.route_exists destination_cidr_block='10.0.0.0/20' gateway_id='local' route_table_name='test'
```

salt.modules.boto_vpc.route_table_exists(route_table_id=None, name=None, route_table_name=None, tags=None, region=None, key=None, keyid=None, profile=None)

Checks if a route table exists.

CLI Example:
```
salt myminion boto_vpc.route_table_exists route_table_id='rtb-1f382e7d'
```

salt.modules.boto_vpc.subnet_exists(subnet_id=None, name=None, subnet_name=None, cidr=None, tags=None, zones=None, region=None, key=None, keyid=None, profile=None)

Check if a subnet exists.

Returns True if the subnet exists, otherwise returns False.

Changed in version 2015.8.0: Added subnet_name argument Deprecated name argument

CLI Example:
31.16.31 salt.modules.bower

Manage and query Bower packages

This module manages the installed packages using Bower. Note that npm, git and bower must be installed for this module to be available.

salt.modules.bower.install(pkg, dir, pkgs=None, runas=None, env=None)

Install a Bower package.

If no package is specified, the dependencies (from bower.json) of the package in the given directory will be installed.

- **pkg** A package name in any format accepted by Bower, including a version identifier
- **dir** The target directory in which to install the package
- **pkgs** A list of package names in the same format as the **pkg** parameter
- **runas** The user to run Bower with
- **env** Environment variables to set when invoking Bower. Uses the same **env** format as the ```cmd.run``` execution function.

CLI Example:

```bash
salt '*' bower.install underscore /path/to/project
salt '*' bower.install jquery#2.0 /path/to/project
```

salt.modules.bower.list(dir, runas=None, env=None)

List installed Bower packages.

- **dir** The directory whose packages will be listed
- **runas** The user to run Bower with
- **env** Environment variables to set when invoking Bower. Uses the same **env** format as the ```cmd.run``` execution function.

CLI Example:

```bash
salt '*' bower.list /path/to/project
```

salt.modules.bower.uninstall(pkg, dir, runas=None, env=None)

Uninstall a Bower package.

- **pkg** A package name in any format accepted by Bower
- **dir** The target directory from which to uninstall the package
- **runas** The user to run Bower with
- **env** Environment variables to set when invoking Bower. Uses the same **env** format as the ```cmd.run``` execution function.

CLI Example:

```bash
salt '*' bower.uninstall underscore /path/to/project
```
31.16.32 salt.modules.brew

Homebrew for Mac OS X

salt.modules.brew.install(name=None, pkgs=None, taps=None, options=None, **kwargs)

Install the passed package(s) with brew install

name The name of the formula to be installed. Note that this parameter is ignored if `"pkgs"` is passed.

CLI Example:

```
salt '*' pkg.install <package name>
```

taps Unofficial GitHub repos to use when updating and installing formulas.

CLI Example:

```
salt '*' pkg.install <package name> tap='<tap>'
salt '*' pkg.install zlib taps='homebrew/dupes'
salt '*' pkg.install php54 taps='["josegonzalez/php", "homebrew/dupes"]'
```

options Options to pass to brew. Only applies to initial install. Due to how brew works, modifying chosen options requires a full uninstall followed by a fresh install. Note that if `"pkgs"` is used, all options will be passed to all packages. Unrecognized options for a package will be silently ignored by brew.

CLI Example:

```
salt '*' pkg.install <package name> tap='<tap>'
salt '*' pkg.install php54 taps='["josegonzalez/php", "homebrew/dupes"]' options='["--with-fpm"]'
```

Multiple Package Installation Options:

pkgs A list of formulas to install. Must be passed as a python list.

CLI Example:

```
salt '*' pkg.install pkgs='["foo","bar"]'
```

Returns a dict containing the new package names and versions:

```
{'<package>': {'old': '<old-version>', 'new': '<new-version>'}}
```

CLI Example:

```
salt '*' pkg.install 'package package package'
```

salt.modules.brew.latest_version(*names, **kwargs)

Return the latest version of the named package available for upgrade or installation

Note that this currently not fully implemented but needs to return something to avoid a traceback when calling pkg.latest.

CLI Example:

```
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package1> <package2> <package3>
```

salt.modules.brew.list_pkgs(versions_as_list=False, **kwargs)

List the packages currently installed in a dict:
{'<package_name>': '<version>'}

CLI Example:
salt '*' pkg.list_pkgs

salt.modules.brew.list_upgrades(refresh=True)
Check whether or not an upgrade is available for all packages

CLI Example:
salt '*' pkg.list_upgrades

salt.modules.brew.refresh_db()
Update the homebrew package repository.

CLI Example:
salt '*' pkg.refresh_db

salt.modules.brew.remove(name=None, pkgs=None, **kwargs)
Removes packages with brew uninstall.

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs='["foo", "bar"]'

salt.modules.brew.upgrade(refresh=True)
Upgrade outdated, unpinned brews.

refresh Fetch the newest version of Homebrew and all formulae from GitHub before installing.

Return a dict containing the new package names and versions:

{'<package>': {'old': '<old-version>',
              'new': '<new-version>'}}

CLI Example:
salt '*' pkg.upgrade

salt.modules.brew.upgrade_available(pkg)
Check whether or not an upgrade is available for a given package

CLI Example:
salt '*' pkg.upgrade_available <package name>
salt.modules.brew.version(*names, **kwargs)
    Returns a string representing the package version or an empty string if not installed. If more than one package
    name is specified, a dict of name/version pairs is returned.

    CLI Example:
    salt '*' pkg.version <package name>
salt '*' pkg.version <package1> <package2> <package3>

31.16.33 salt.modules.bridge

Module for gathering and managing bridging information
salt.modules.bridge.add(br=None)
    Creates a bridge
    CLI Example:
salt '*' bridge.add br0

salt.modules.bridge.addif(br=None, iface=None)
    Adds an interface to a bridge
    CLI Example:
salt '*' bridge.addif br0 eth0

salt.modules.bridge.delete(br=None)
    Deletes a bridge
    CLI Example:
salt '*' bridge.delete br0

salt.modules.bridge.delif(br=None, iface=None)
    Removes an interface from a bridge
    CLI Example:
salt '*' bridge.delif br0 eth0

salt.modules.bridge.find_interfaces(*args)
    Returns the bridge to which the interfaces are bond to
    CLI Example:
salt '*' bridge.find_interfaces eth0 [eth1...]

salt.modules.bridge.interfaces(br=None)
    Returns interfaces attached to a bridge
    CLI Example:
salt '*' bridge.interfaces br0

salt.modules.bridge.list()
    Returns the machine's bridges list
    CLI Example:
salt 'x' bridge.list

salt.modules.bridge.show(br=None)
Returns bridges interfaces along with enslaved physical interfaces. If no interface is given, all bridges are shown, else only the specified bridge values are returned.

CLI Example:
salt 'x' bridge.show
salt 'x' bridge.show br0

salt.modules.bridge.stp(br=None, state='disable', iface=None)
Sets Spanning Tree Protocol state for a bridge

CLI Example:
salt 'x' bridge.stp br0 enable
salt 'x' bridge.stp br0 disable

For BSD-like operating systems, it is required to add the interface on which to enable the STP.

CLI Example:
salt 'x' bridge.stp bridge0 enable fxp0
salt 'x' bridge.stp bridge0 disable fxp0

31.16.34 salt.modules.bsd_shadow

Manage the password database on BSD systems

salt.modules.bsd_shadow.default_hash()
Returns the default hash used for unset passwords

CLI Example:
salt 'x' shadow.default_hash

salt.modules.bsd_shadow.info(name)
Return information for the specified user

CLI Example:
salt 'x' shadow.info someuser

salt.modules.bsd_shadow.set_change(name, change)
Sets the time at which the password expires (in seconds since the EPOCH). See man usermod on NetBSD and OpenBSD or man pw on FreeBSD. ``0'' means the password never expires.

CLI Example:
salt 'x' shadow.set_change username 1419980400

salt.modules.bsd_shadow.set_expire(name, expire)
Sets the time at which the account expires (in seconds since the EPOCH). See man usermod on NetBSD and OpenBSD or man pw on FreeBSD. ``0'' means the account never expires.

CLI Example:
salt 'x' shadow.set_expire username 1419980400

31.16. Full list of builtin execution modules
salt.modules.bsd_shadow.set_password(name, password)
Set the password for a named user. The password must be a properly defined hash. The password hash can be
generated with this command:

```
python -c "import crypt; print crypt.crypt('password', ciphersalt)"
```

NOTE: When constructing the ciphersalt string, you must escape any dollar signs, to avoid them being
interpolated by the shell.

'password' is, of course, the password for which you want to generate a hash.

ciphersalt is a combination of a cipher identifier, an optional number of rounds, and the cryptographic
salt. The arrangement and format of these fields depends on the cipher and which flavor of BSD you are using.
For more information on this, see the manpage for crypt(3). On NetBSD, additional information is available
in passwd.conf(5).

It is important to make sure that a supported cipher is used.

CLI Example:
```
salt '*' shadow.set_password someuser '$1$UYCIxa628.9qXjpQCjM4a..'
```

31.16.35 salt.modules.btrfs

Module for managing BTRFS file systems.

salt.modules.btrfs.add(mountpoint, *devices, **kwargs)
Add a devices to a BTRFS filesystem.

General options:

- **nodiscard**: Do not perform whole device TRIM
- **force**: Force overwrite existing filesystem on the disk

CLI Example:
```
salt '*' btrfs.add /mountpoint /dev/sda1 /dev/sda2
```

salt.modules.btrfs.convert(device, permanent=False, keeplf=False)
Convert ext2/3/4 to BTRFS. Device should be mounted.

Filesystem can be converted temporarily so the further processing and rollback is possible, or permanently,
where previous extended filesystem image gets deleted. Please note, permanent conversion takes a while as
BTRFS filesystem needs to be properly rebalanced afterwards.

General options:

- **permanent**: Specify if the migration should be permanent (false by default)
- **keeplf**: Keep lost+found of the partition (removed by default, but still in the image, if not perma-
nent migration)

CLI Example:
```
salt '*' btrfs.convert /dev/sda1
salt '*' btrfs.convert /dev/sda1 permanent=True
```

salt.modules.btrfs.defragment(path)
Defragment mounted BTRFS filesystem. In order to defragment a filesystem, device should be properly
mounted and writable.
If passed a device name, then defragmented whole filesystem, mounted on in. If passed a mount point of the filesystem, then only this mount point is defragmented.

CLI Example:

```
salt '*' btrfs.defragment /dev/sda1
salt '*' btrfs.defragment /path/on/filesystem
```

salt.modules.btrfs.delete(mountpoint, *devices, **kwargs)
Remove devices from a BTRFS filesystem.

CLI Example:

```
salt '*' btrfs.delete /mountpoint /dev/sda1 /dev/sda2
```

salt.modules.btrfs.devices()
Get known BTRFS formatted devices on the system.

CLI Example:

```
salt '*' btrfs.devices
```

caller.modules.btrfs.features()
List currently available BTRFS features.

CLI Example:

```
salt '*' btrfs.mkfs_features
```

caller.modules.btrfs.info(device)
Get BTRFS filesystem information.

CLI Example:

```
salt '*' btrfs.info /dev/sda1
```

caller.modules.btrfs.mkfs(*devices, **kwargs)
Create a filesystem on the specified device. By default wipes out with force.

General options:

- **allocsize**: Specify the BTRFS offset from the start of the device.
- **bytecount**: Specify the size of the resultant filesystem.
- **nodesize**: Node size.
- **leafsize**: Specify the nodesize, the tree block size in which btrfs stores data.
- **noforce**: Prevent force overwrite when an existing filesystem is detected on the device.
- **sectorsize**: Specify the sector size, the minimum data block allocation unit.
- **nodiscard**: Do not perform whole device TRIM operation by default.
- **uuid**: Pass UUID or pass True to generate one.

Options:

- **dto**: (raid0|raid1|raid5|raid6|raid10|single|dup) Specify how the data must be spanned across the devices specified.
- **mto**: (raid0|raid1|raid5|raid6|raid10|single|dup) Specify how metadata must be spanned across the devices specified.
- **fts**: Features (call salt <host> btrfs.features for full list of available features)
See the `mkfs.btrfs(8)` manpage for a more complete description of corresponding options description.

CLI Example:
```
salt '*' btrfs.mkfs /dev/sdal
salt '*' btrfs.mkfs /dev/sdal noforce=True
```

```
salt.modules.btrfs.properties(obj, type=None, set=None)
 List properties for given btrfs object. The object can be path of BTRFS device, mount point, or any directories/files inside the BTRFS filesystem.

General options:
• type: Possible types are s[ubvol], f[ilesystem], i[node] and d[evice].
• force: Force overwrite existing filesystem on the disk
• set: <key=value,key1=value1…> Options for a filesystem properties.

CLI Example:
```
salt '*' btrfs.properties /mountpoint
salt '*' btrfs.properties /dev/sdal type=subvol set='ro=false,label="My Storage"'
```

```
salt.modules.btrfs.resize(mountpoint, size)
 Resize filesystem.

General options:
• mountpoint: Specify the BTRFS mountpoint to resize.
• size: ([+/-]<newsize>[kKmMgGtTpPeE]|max) Specify the new size of the target.

CLI Example:
```
salt '*' btrfs.resize /mountpoint size=+1g
salt '*' btrfs.resize /dev/sdal size=max
```

```
salt.modules.btrfs.usage(path)
 Show in which disk the chunks are allocated.

CLI Example:
```
salt '*' btrfs.usage /your/mountpoint
```

```
salt.modules.btrfs.version()
 Return BTRFS version.

CLI Example:
```
salt '*' btrfs.version
```

31.16.36 salt.modules.cabal

Manage and query Cabal packages

New in version 2015.8.0.

```
salt.modules.cabal.install(pkg=None, pkgs=None, user=None, install_global=False, env=None)
 Install a cabal package.
```

pkg A package name in format accepted by cabal-install. See: https://wiki.haskell.org/Cabal-Install
**pkgs** A list of packages names in same format as `pkg`

**user** The user to run cabal install with

**install_global** Install package globally instead of locally

**env** Environment variables to set when invoking cabal. Uses the same `env` format as the `cmd.run` execution function

**CLI Example:**

```bash
salt '*/' cabal.install shellcheck
salt '*/' cabal.install shellcheck-0.3.5
```

salt.modules.cabal.list(**pkg=None, user=None, installed=False, env=None**)  
List packages matching a search string.

**pkg** Search string for matching package names

**user** The user to run cabal list with

**installed** If True, only return installed packages.

**env** Environment variables to set when invoking cabal. Uses the same `env` format as the `cmd.run` execution function

**CLI Example:**

```bash
salt '*' cabal.list
salt '*' cabal.list ShellCheck
```

salt.modules.cabal.uninstall(**pkg, user=None, env=None**)  
Uninstall a cabal package.

**pkg** The package to uninstall

**user** The user to run ghc-pkg unregister with

**env** Environment variables to set when invoking cabal. Uses the same `env` format as the `cmd.run` execution function

salt.modules.cabal.update(**user=None, env=None**)  
Updates list of known packages.

### 31.16.37 salt.modules.cassandra

Cassandra NoSQL Database Module

**depends**

- pycassa Cassandra Python adapter

**configuration** The location of the `nodetool` command, host, and thrift port needs to be specified via pillar:

```yaml
    cassandra.nodetool: /usr/local/bin/nodetool
cassandra.host: localhost
cassandra.thrift_port: 9160
```

salt.modules.cassandra.column_families(**keyspace=None**)  
Return existing column families for all keyspaces or just the provided one.

**CLI Example:**

```bash
```
salt '*' cassandra.column_families
salt '*' cassandra.column_families <keyspace>

salt.modules.cassandra.column_family_definition(keyspace, column_family)
Return a dictionary of column family definitions for the given keyspace/column_family

CLI Example:
salt '*' cassandra.column_family_definition <keyspace> <column_family>

salt.modules.cassandra.compactionstats()
Return compactionstats info

CLI Example:
salt '*' cassandra.compactionstats

salt.modules.cassandra.info()
Return cassandra node info

CLI Example:
salt '*' cassandra.info

salt.modules.cassandra.keyspaces()
Return existing keyspaces

CLI Example:
salt '*' cassandra.keyspaces

salt.modules.cassandra.netstats()
Return netstats info

CLI Example:
salt '*' cassandra.netstats

salt.modules.cassandra.ring()
Return cassandra ring info

CLI Example:
salt '*' cassandra.ring

salt.modules.cassandra.tpstats()
Return tpstats info

CLI Example:
salt '*' cassandra.tpstats

salt.modules.cassandra.version()
Return the cassandra version

CLI Example:
salt '*' cassandra.version
31.16.38  salt.modules.cassandra_cql

Cassandra Database Module
New in version 2015.5.0.

depends  DataStax Python Driver for Apache Cassandra  https://github.com/datastax/python-driver  pip install cassandra-driver

referenced by  Salt's cassandra_cql returner

configuration  The Cassandra cluster members and connection port can either be specified in the master or minion config, the minion's pillar or be passed to the module.

Example configuration in the config for a single node:

```
cassandra:
  cluster: 192.168.50.10
  port: 9000
```

Example configuration in the config for a cluster:

```
cassandra:
  cluster:
    - 192.168.50.10
    - 192.168.50.11
    - 192.168.50.12
  port: 9000
  username: cas_admin
```

salt.modules.cassandra_cql.cql_query(query, contact_points=None, port=None, cql_user=None, cql_pass=None)

Run a query on a Cassandra cluster and return a dictionary.

Parameters

- `query (str)` -- The query to execute.
- `contact_points (str / list[str])` -- The Cassandra cluster addresses, can either be a string or a list of IPs.
- `cql_user (str)` -- The Cassandra user if authentication is turned on.
- `cql_pass (str)` -- The Cassandra user password if authentication is turned on.
- `port (int)` -- The Cassandra cluster port, defaults to None.
- `params (str)` -- The parameters for the query, optional.

Returns  A dictionary from the return values of the query

Return type  list[dict]

salt.modules.cassandra_cql.create_keyspace(keyspace, replication_strategy='SimpleStrategy', replication_factor=1, replication_datacenters=None, contact_points=None, port=None, cql_user=None, cql_pass=None)

Create a new keyspace in Cassandra.

Parameters

- `keyspace (str)` -- The keyspace name
- `replication_strategy (str)` -- either SimpleStrategy or NetworkTopologyStrategy
• `replication_factor` *(int)* -- number of replicas of data on multiple nodes. Not used if using NetworkTopologyStrategy.

• `replication_datacenters` *(str | dict[str, int]*) -- string or dict of datacenter names to replication factors, required if using NetworkTopologyStrategy (will be a dict if coming from state file).

• `contact_points` *(str | list[str]*) -- The Cassandra cluster addresses, can either be a string or a list of IPs.

• `cql_user` *(str)* -- The Cassandra user if authentication is turned on.

• `cql_pass` *(str)* -- The Cassandra user password if authentication is turned on.

• `port` *(int)* -- The Cassandra cluster port, defaults to None.

Returns
The info for the keyspace or False if it does not exist.

Return type
`dict`

```python
salt 'minion1' cassandra_cql.create_keyspace keyspace=newkeyspace
salt 'minion1' cassandra_cql.create_keyspace keyspace=newkeyspace replication_strategy=NetworkTopologyStrategy
```

salt.modules.cassandra_cql.create_user *(username, password, superuser=False, contact_points=None, port=None, cql_user=None, cql_pass=None)*

Create a new cassandra user with credentials and superuser status.

Parameters

• `username` *(str)* -- The name of the new user.

• `password` *(str)* -- The password of the new user.

• `superuser` *(bool)* -- Is the new user going to be a superuser? default: False

• `contact_points` *(str | list[str]*) -- The Cassandra cluster addresses, can either be a string or a list of IPs.

• `cql_user` *(str)* -- The Cassandra user if authentication is turned on.

• `cql_pass` *(str)* -- The Cassandra user password if authentication is turned on.

• `port` *(int)* -- The Cassandra cluster port, defaults to None.

Returns

Return type
`dict`

```python
salt 'minion1' cassandra_cql.create_user username=joe password=secret
salt 'minion1' cassandra_cql.create_user username=joe password=secret superuser=True
salt 'minion1' cassandra_cql.create_user username=joe password=secret superuser=True contact_points=Minion1
```

salt.modules.cassandra_cql.drop_keyspace *(keyspace, contact_points=None, port=None, cql_user=None, cql_pass=None)*

Drop a keyspace if it exists in a Cassandra cluster.

Parameters

• `keyspace` *(str)* -- The keyspace to drop.

• `contact_points` *(str | list[str]*) -- The Cassandra cluster addresses, can either be a string or a list of IPs.
• **cql_user** *(str)* -- The Cassandra user if authentication is turned on.
• **cql_pass** *(str)* -- The Cassandra user password if authentication is turned on.
• **port** *(int)* -- The Cassandra cluster port, defaults to None.

Returns

The info for the keyspace or False if it does not exist.

Return type  
dict

CLI Example:

```bash
salt 'minion1' cassandra_cql.drop_keyspace keyspace=test
salt 'minion1' cassandra_cql.drop_keyspace keyspace=test contact_points=minion1
```

```python
salt.modules.cassandra_cql.grant_permission(username, resource=None, resource_type='keyspace', permission=None, contact_points=None, port=None, cql_user=None, cql_pass=None)
```

Grant permissions to a user.

Parameters

• **username** *(str)* -- The name of the user to grant permissions to.
• **resource** *(str)* -- The resource (keyspace or table), if None, permissions for all resources are granted.
• **resource_type** *(str)* -- The resource_type (keyspace or table), defaults to `keyspace`.
• **permission** *(str)* -- A permission name (e.g. select), if None, all permissions are granted.
• **contact_points** *(str|list[str])* -- The Cassandra cluster addresses, can either be a string or a list of IPs.
• **cql_user** *(str)* -- The Cassandra user if authentication is turned on.
• **cql_pass** *(str)* -- The Cassandra user password if authentication is turned on.
• **port** *(int)* -- The Cassandra cluster port, defaults to None.

Returns

Return type

```bash
salt 'minion1' cassandra_cql.grant_permission
salt 'minion1' cassandra_cql.grant_permission username=joe resource=test_keyspace permission=select contact_points=None
salt 'minion1' cassandra_cql.grant_permission username=joe resource=test_table resource_type=table permission=select contact_points=None
```

```python
salt.modules.cassandra_cql.info(contact_points=None, port=None, cql_user=None, cql_pass=None)
```

Show the Cassandra information for this cluster.

Parameters

• **contact_points** *(str|list[str])* -- The Cassandra cluster addresses, can either be a string or a list of IPs.
• **cql_user** *(str)* -- The Cassandra user if authentication is turned on.
• **cql_pass** *(str)* -- The Cassandra user password if authentication is turned on.
• **port** *(int)* -- The Cassandra cluster port, defaults to None.
Returns  The information for this Cassandra cluster.

Return type  dict

CLI Example:
salt 'minion1' cassandra_cql.info
salt 'minion1' cassandra_cql.info  contact_points=minion1

salt.modules.cassandra_cql.keyspace_exists(
    keyspace,  contact_points=None,  port=None,
cql_user=None,  cql_pass=None)

Check if a keyspace exists in a Cassandra cluster.

:returns: bool

CLI Example:
salt 'minion1' cassandra_cql.keyspace_exists  keyspace=system
salt 'minion1' cassandra_cql.list_keyspaces  keyspace=system  contact_points=minion1

salt.modules.cassandra_cql.list_column_families(
    keyspace=None,  contact_points=None,  port=None,
cql_user=None,  cql_pass=None)

List column families in a Cassandra cluster for all keyspaces or just the provided one.

Parameters

  - keyspace (str) -- The keyspace to provide the column families for, optional.
  - contact_points (str | list[str]) -- The Cassandra cluster addresses, can either be a string or a list of IPs.
  - cql_user (str) -- The Cassandra user if authentication is turned on.
  - cql_pass (str) -- The Cassandra user password if authentication is turned on.
  - port (int) -- The Cassandra cluster port, defaults to None.

Returns  The column families in this Cassandra cluster.

Return type  list[dict]

CLI Example:
salt 'minion1' cassandra_cql.list_column_families
salt 'minion1' cassandra_cql.list_column_families  contact_points=minion1
salt 'minion1' cassandra_cql.list_column_families  keyspace=system

salt.modules.cassandra_cql.list_keyspaces(
    contact_points=None,  port=None,
cql_user=None,  cql_pass=None)

List keyspaces in a Cassandra cluster.

Parameters

  - contact_points (str | list[str]) -- The Cassandra cluster addresses, can either be a string or a list of IPs.
- **cql_user** *(str)* -- The Cassandra user if authentication is turned on.
- **cql_pass** *(str)* -- The Cassandra user password if authentication is turned on.
- **port** *(int)* -- The Cassandra cluster port, defaults to None.

**Returns**  The keyspaces in this Cassandra cluster.

**Return type**  list[dict]

**CLI Example:**

```bash
salt 'minion1' cassandra_cql.list_keyspaces
salt 'minion1' cassandra_cql.list_keyspaces contact_points=minion1 port=9000
```

```
salt.modules.cassandra_cql.list_permissions(username=None, resource=None, resource_type='keyspace', permission=None, contact_points=None, port=None, cql_user=None, cql_pass=None)
```

List permissions.

**Parameters**

- **username** *(str)* -- The name of the user to list permissions for.
- **resource** *(str)* -- The resource (keyspace or table), if None, permissions for all resources are listed.
- **resource_type** *(str)* -- The resource_type (keyspace or table), defaults to `keyspace`.
- **permission** *(str)* -- A permission name (e.g. select), if None, all permissions are listed.
- **contact_points** *(str|list[str]*) -- The Cassandra cluster addresses, can either be a string or a list of IPs.
- **cql_user** *(str)* -- The Cassandra user if authentication is turned on.
- **cql_pass** *(str)* -- The Cassandra user password if authentication is turned on.
- **port** *(int)* -- The Cassandra cluster port, defaults to None.

**Returns**  Dictionary of permissions.

**Return type**  dict

```bash
salt 'minion1' cassandra_cql.list_permissions
salt 'minion1' cassandra_cql.list_permissions username=joe resource=test_keyspace permission=select
salt 'minion1' cassandra_cql.list_permissions username=joe resource=test_table resource_type=table
```

```
salt.modules.cassandra_cql.list_users(contact_points=None, port=None, cql_user=None, cql_pass=None)
```

List existing users in this Cassandra cluster.

**Parameters**

- **contact_points** *(str|list[str]*) -- The Cassandra cluster addresses, can either be a string or a list of IPs.
- **port** *(int)* -- The Cassandra cluster port, defaults to None.
- **cql_user** *(str)* -- The Cassandra user if authentication is turned on.
- **cql_pass** *(str)* -- The Cassandra user password if authentication is turned on.

31.16. Full list of builtin execution modules

731
Returns  The list of existing users.

Return type  dict

.. code-block:: salt

    salt 'minion1' cassandra_cql.list_users
    salt 'minion1' cassandra_cql.list_users contact_points=minion1

salt.modules.cassandra_cql.version(contact_points=None, port=None, cql_user=None, cql_pass=None)

Show the Cassandra version.

Parameters

- **contact_points** (*str / list[**str**]*) -- The Cassandra cluster addresses, can either be a string or a list of IPs.
- **cql_user** (*str*) -- The Cassandra user if authentication is turned on.
- **cql_pass** (*str*) -- The Cassandra user password if authentication is turned on.
- **port** (*int*) -- The Cassandra cluster port, defaults to None.

Returns  The version for this Cassandra cluster.

Return type  str

CLI Example:

.. code-block:: salt

    salt 'minion1' cassandra_cql.version
    salt 'minion1' cassandra_cql.version contact_points=minion1

31.16.39  salt.modules.chef

Execute chef in server or solo mode

salt.modules.chef.client(whyrun=False, localmode=False, logfile=None, **kwargs)

Execute a chef client run and return a dict with the stderr, stdout, return code, and pid.

CLI Example:

.. code-block:: salt

    salt '*' chef.client server=https://localhost

server  The chef server URL

client_key  Set the client key file location

config  The configuration file to use

config-file-jail  Directory under which config files are allowed to be loaded (no client.rb or knife.rb outside this path will be loaded).

environment  Set the Chef Environment on the node

group  Group to set privilege to

json-attributes  Load attributes from a JSON file or URL

localmode  Point chef-client at local repository if True

log_level  Set the log level (debug, info, warn, error, fatal)

logfile  Set the log file location
node-name  The node name for this client

override-runlist  Replace current run list with specified items for a single run

pid  Set the PID file location, defaults to /tmp/chef-client.pid

run-lock-timeout  Set maximum duration to wait for another client run to finish, default is indefinitely.

runlist  Permanently replace current run list with specified items

user  User to set privilege to

validation_key  Set the validation key file location, used for registering new clients

whyrun  Enable whyrun mode when set to True

```
salt.modules.chef.solo(whyrun=False, logfile=None, **kwargs)
```
Execute a chef solo run and return a dict with the stderr, stdout, return code, and pid.

CLI Example:

```
salt '*' chef.solo override-runlist=test
```

config  The configuration file to use

environment  Set the Chef Environment on the node

group  Group to set privilege to

json-attributes  Load attributes from a JSON file or URL

log_level  Set the log level (debug, info, warn, error, fatal)

logfile  Set the log file location

node-name  The node name for this client

override-runlist  Replace current run list with specified items for a single run

recipe-url  Pull down a remote gzipped tarball of recipes and untar it to the cookbook cache

run-lock-timeout  Set maximum duration to wait for another client run to finish, default is indefinitely.

task-runner  Start a task runner.

user  User to set privilege to

whyrun  Enable whyrun mode when set to True

31.16.40  salt.modules.chocolatey

A dead simple module wrapping calls to the Chocolatey package manager (http://chocolatey.org)

New in version 2014.1.0.

```
salt.modules.chocolatey.bootstrap(force=False)
```
 Download and install the latest version of the Chocolatey package manager via the official bootstrap.

Chocolatey requires Windows PowerShell and the .NET v4.0 runtime. Depending on the host’s version of Windows, chocolatey.bootstrap will attempt to ensure these prerequisites are met by downloading and executing the appropriate installers from Microsoft.

Note that if PowerShell is installed, you may have to restart the host machine for Chocolatey to work.

force  Run the bootstrap process even if Chocolatey is found in the path.

CLI Example:
salt '*' chocolatey.bootstrap
salt '*' chocolatey.bootstrap force=True

salt.modules.chocolatey.chocolatey_version()

New in version 2014.7.0.

Returns the version of Chocolatey installed on the minion.

CLI Example:
salt '*' chocolatey.chocolatey_version

salt.modules.chocolatey.install(name, version=None, source=None, force=False, install_args=None, override_args=False, force_x86=False)

Instructs Chocolatey to install a package.

name The name of the package to be installed. Only accepts a single argument.

version Install a specific version of the package. Defaults to latest version.

source Chocolatey repository (directory, share or remote URL feed) the package comes from. Defaults to the official Chocolatey feed.

force Reinstall the current version of an existing package.

install_args A list of install arguments you want to pass to the installation process i.e product key or feature list

override_args

Set to true if you want to override the original install arguments (for the native installer) in the package and use your own. When this is set to False install_args will be appended to the end of the default arguments

force_x86 Force x86 (32bit) installation on 64 bit systems. Defaults to false.

CLI Example:
salt '*' chocolatey.install <package name>
salt '*' chocolatey.install <package name> version=<package version>
salt '*' chocolatey.install <package name> install_args=<args> override_args=True

salt.modules.chocolatey.install_cygwin(name, install_args=None, override_args=False)

Instructs Chocolatey to install a package via Cygwin.

name The name of the package to be installed. Only accepts a single argument.

install_args A list of install arguments you want to pass to the installation process i.e product key or feature list

override_args

Set to true if you want to override the original install arguments (for the native installer) in the package and use your own. When this is set to False install_args will be appended to the end of the default arguments

CLI Example:
salt '*' chocolatey.install_cygwin <package name>
salt '*' chocolatey.install_cygwin <package name> install_args=<args> override_args=True

salt.modules.chocolatey.install_gem(name, version=None, install_args=None, override_args=False)

Instructs Chocolatey to install a package via Ruby’s Gems.
name  The name of the package to be installed. Only accepts a single argument.

version Install a specific version of the package. Defaults to latest version available.

install_args A list of install arguments you want to pass to the installation process i.e product key or feature list

override_args

Set to true if you want to override the original install arguments (for the native installer) in the package and use your own. When this is set to False install_args will be appended to the end of the default arguments

CLI Example:
	salt '*' chocolatey.install_gem <package name>
	salt '*' chocolatey.install_gem <package name> version=<package version>
	salt '*' chocolatey.install_gem <package name> install_args=<args> override_args=True

salt.modules.chocolatey.install_missing(name, version=None, source=None)
Instructs Chocolatey to install a package if it doesn't already exist.

Changed in version 2014.7.0: If the minion has Chocolatey >= 0.9.8.24 installed, this function calls chocolatey.install instead, as installmissing is deprecated as of that version and will be removed in Chocolatey 1.0.

name  The name of the package to be installed. Only accepts a single argument.

version Install a specific version of the package. Defaults to latest version available.

source Chocolatey repository (directory, share or remote URL feed) the package comes from. Defaults to the official Chocolatey feed.

CLI Example:
	salt '*' chocolatey.install_missing <package name>
	salt '*' chocolatey.install_missing <package name> version=<package version>

salt.modules.chocolatey.install_python(name, version=None, install_args=None, override_args=False)
Instructs Chocolatey to install a package via Python's easy_install.

name  The name of the package to be installed. Only accepts a single argument.

version Install a specific version of the package. Defaults to latest version available.

install_args A list of install arguments you want to pass to the installation process i.e product key or feature list

override_args

Set to true if you want to override the original install arguments (for the native installer) in the package and use your own. When this is set to False install_args will be appended to the end of the default arguments

CLI Example:
	salt '*' chocolatey.install_python <package name>
	salt '*' chocolatey.install_python <package name> version=<package version>
	salt '*' chocolatey.install_python <package name> install_args=<args> override_args=True

salt.modules.chocolatey.install_webpi(name, install_args=None, override_args=False)
Instructs Chocolatey to install a package via the Microsoft Web PI service.
**name**  The name of the package to be installed. Only accepts a single argument.

**install_args**  A list of install arguments you want to pass to the installation process i.e product key or feature list

**override_args**

*Set to true if you want to override the original install arguments (for the native installer) in the package and use your own. When this is set to False install_args will be appended to the end of the default arguments*

CLI Example:

```python
salt '*' chocolatey.install_webpi <package name>
salt '*' chocolatey.install_webpi <package name> install_args=<args> override_args=True
```

salt.modules.chocolatey.install_windowsfeatures(name)

Instructs Chocolatey to install a Windows Feature via the Deployment Image Servicing and Management tool.

**name**  The name of the feature to be installed. Only accepts a single argument.

CLI Example:

```python
salt '*' chocolatey.install_windowsfeatures <package name>
```

salt.modules.chocolatey.list(narrow=None, all_versions=False, pre_versions=False, source=None, local_only=False)

Instructs Chocolatey to pull a vague package list from the repository.

**narrow**  Term used to narrow down results. Searches against name/description/tag.

**all_versions**  Display all available package versions in results. Defaults to False.

**pre_versions**  Display pre-release packages in results. Defaults to False.

**source**  Chocolatey repository (directory, share or remote URL feed) the package comes from. Defaults to the official Chocolatey feed.

**local_only**  Display packages only installed locally

CLI Example:

```python
salt '*' chocolatey.list <narrow>
salt '*' chocolatey.list <narrow> all_versions=True
```

salt.modules.chocolatey.list_webpi()

Instructs Chocolatey to pull a full package list from the Microsoft Web PI repository.

CLI Example:

```python
salt '*' chocolatey.list_webpi
```

salt.modules.chocolatey.list_windowsfeatures()

Instructs Chocolatey to pull a full package list from the Windows Features list, via the Deployment Image Servicing and Management tool.

CLI Example:

```python
salt '*' chocolatey.list_windowsfeatures
```

salt.modules.chocolatey.uninstall(name, version=None, uninstall_args=None, override_args=False)

Instructs Chocolatey to uninstall a package.
name  The name of the package to be uninstalled. Only accepts a single argument.

version  Uninstalls a specific version of the package. Defaults to latest version installed.

uninstall_args  A list of uninstall arguments you want to pass to the uninstallation process i.e product key or feature list

override_args

Set to true if you want to override the original uninstall arguments (for the native uninstaller) in the package and use your own. When this is set to False uninstall_args will be appended to the end of the default arguments

CLI Example:

salt '*' chocolatey.uninstall <package name>
salt '*' chocolatey.uninstall <package name> version=<package version>
salt '*' chocolatey.uninstall <package name> version=<package version> uninstall_args=args override_args=True

salt.modules.chocolatey.update(name, source=None, pre_versions=False)

Instructs Chocolatey to update packages on the system.

name  The name of the package to update, or `all` to update everything installed on the system.

source  Chocolatey repository (directory, share or remote URL feed) the package comes from. Defaults to the official Chocolatey feed.

pre_versions  Include pre-release packages in comparison. Defaults to False.

CLI Example:

salt "*" chocolatey.update all
salt "*" chocolatey.update <package name> pre_versions=True

salt.modules.chocolatey.version(name, check_remote=False, source=None, pre_versions=False)

Instructs Chocolatey to check an installed package version, and optionally compare it to one available from a remote feed.

name  The name of the package to check.

check_remote  Get the version number of the latest package from the remote feed. Defaults to False.

source  Chocolatey repository (directory, share or remote URL feed) the package comes from. Defaults to the official Chocolatey feed.

pre_versions  Include pre-release packages in comparison. Defaults to False.

CLI Example:

salt "*" chocolatey.version <package name>
salt "*" chocolatey.version <package name> check_remote=True

31.16.41  salt.modules.cloud

Salt-specific interface for calling Salt Cloud directly

salt.modules.cloud.action(fun=None, cloudmap=None, names=None, provider=None, instance=None, **kwargs)

Execute a single action on the given provider/instance

CLI Example:
```python
salt '*' cloud.action start instance=myinstance
salt '*' cloud.action stop instance=myinstance
salt '*' cloud.action show_image provider=my-ec2-config image=ami-1624987f

salt.modules.cloud.create(provider, names, **kwargs)
    Create an instance using Salt Cloud
    CLI Example:
    salt minionname cloud.create my-ec2-config myinstance image=ami-1624987f size='t1.micro' ssh_user=ec2-user

salt.modules.cloud.destroy(names)
    Destroy the named VM(s)
    CLI Example:
    salt '*' cloud.destroy myinstance

salt.modules.cloud.full_query(query_type='list_nodes_full')
    List all available cloud provider data
    CLI Example:
    salt '*' cloud.full_query

salt.modules.cloud.get_instance(name, provider=None)
    Return details on an instance.
    Similar to the cloud action show_instance but returns only the instance details.
    CLI Example:
    salt '*' cloud.get_instance myinstance
    SLS Example:
    {{ salt['cloud.get_instance']('myinstance')['mac_address'] }}

salt.modules.cloud.has_instance(name, provider=None)
    Return true if the instance is found on a provider
    CLI Example:
    salt '*' cloud.has_instance myinstance

salt.modules.cloud.list_images(provider='all')
    List cloud provider images for the given providers
    CLI Example:
    salt '*' cloud.list_images my-gce-config

salt.modules.cloud.list_locations(provider='all')
    List cloud provider locations for the given providers
    CLI Example:
    salt '*' cloud.list_locations my-gce-config

salt.modules.cloud.list_sizes(provider='all')
    List cloud provider sizes for the given providers
```
CLI Example:
```
salt '*' cloud.list_sizes my-gce-config
```

```
salt.modules.cloud.network_create(provider, names, **kwargs)
    Create private network
CLI Example:
salt minionname cloud.network_create my-nova names=['salt'] cidr='192.168.100.0/24'
```

```
salt.modules.cloud.network_list(provider)
    List private networks
CLI Example:
salt minionname cloud.network_list my-nova
```

```
salt.modules.cloud.profile(profile, names, vm_overrides=None, **kwargs)
    Spin up an instance using Salt Cloud
CLI Example:
salt '*' cloud.profile my-gce-config myinstance
```

```
salt.modules.cloud.query(query_type='list_nodes')
    List cloud provider data for all providers
CLI Examples:
salt '*' cloud.query
salt '*' cloud.query list_nodes_full
salt '*' cloud.query list_nodes_select
```

```
salt.modules.cloud.select_query(query_type='list_nodes_select')
    List selected nodes
CLI Example:
salt '*' cloud.select_query
```

```
salt.modules.cloud.virtual_interface_create(provider, names, **kwargs)
    Attach private interfaces to a server
CLI Example:
salt minionname cloud.virtual_interface_create my-nova names=['salt-master'] net_name='salt'
```

```
salt.modules.cloud.virtual_interface_list(provider, names, **kwargs)
    List virtual interfaces on a server
CLI Example:
salt minionname cloud.virtual_interface_list my-nova names=['salt-master']
```

```
salt.modules.cloud.volume_attach(provider, names, **kwargs)
    Attach volume to a server
CLI Example:
salt minionname cloud.volume_attach my-nova myblock server_name=myserver device='/dev/xvdf'
```

31.16. Full list of built-in execution modules
salt.modules.cloud.volume_create(provider, names, **kwargs)
Create volume

CLI Example:
```
salt minionname cloud.volume_create my-nova myblock size=100 voltype=SSD
```

salt.modules.cloud.volume_delete(provider, names, **kwargs)
Delete volume

CLI Example:
```
salt minionname cloud.volume_delete my-nova myblock
```

salt.modules.cloud.volume_detach(provider, names, **kwargs)
Detach volume from a server

CLI Example:
```
salt minionname cloud.volume_detach my-nova myblock server_name=myserver
```

salt.modules.cloud.volume_list(provider)
List block storage volumes

CLI Example:
```
salt minionname cloud.volume_list my-nova
```

31.16.42 salt.modules.cmdmod

A module for shelling out.

Keep in mind that this module is insecure, in that it can give whomever has access to the master root execution access to all salt minions.

salt.modules.cmdmod.exec_code(lang, code, cwd=None)
Pass in two strings, the first naming the executable language, aka - python2, python3, ruby, perl, lua, etc. the second string containing the code you wish to execute. The stdout will be returned.

CLI Example:
```
salt '*' cmd.exec_code ruby 'puts "cheese"'
```

salt.modules.cmdmod.exec_code_all(lang, code, cwd=None)
Pass in two strings, the first naming the executable language, aka - python2, python3, ruby, perl, lua, etc. the second string containing the code you wish to execute. All cmd artifacts (stdout, stderr, retcode, pid) will be returned.

CLI Example:
```
salt '*' cmd.exec_code_all ruby 'puts "cheese"'
```

salt.modules.cmdmod.has_exec(cmd)
Returns true if the executable is available on the minion, false otherwise

CLI Example:
```
salt '*' cmd.has_exec cat
```
salt.modules.cmdmod.retcodex(cmd, cwd=None, stdin=None, runas=None, shell='/bin/bash',
   python_shell=None, env=None, clean_env=False, template=None, umask=None, output_loglevel='debug', log_callback=None, timeout=None, reset_system_locale=True, ignore_retcode=False, saltenv='base', use_vt=False, **kwargs)

Execute a shell command and return the command’s return code.

cmd: The command to run. ex: `ls -lart /home`
cwd  The current working directory to execute the command in, defaults to /root
stdin  A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input.: runas  User to run script as.
sHELL  Shell to execute under. Defaults to the system default shell.
python_shell  If True, let python handle the positional arguments. Set to False to use shell features, such as pipes or redirection
ev

   A list of environment variables to be set prior to execution. Example:

   ```
salt://scripts/foo.sh:
cmd.script:
   - env:
      - BATCH: 'yes'
   ```

**Warning:** The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH`:

```
salt://scripts/bar.sh:
cmd.script:
   - env: "PATH=/some/path:$PATH"
```

One can still use the existing $PATH by using a bit of Jinja:

```
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
   cmd.run:
      - name: ls -l /
      - env:
         - PATH: {{ [current_path, '/my/special/bin']|join('::') }}
```

clean_env: Attempt to clean out all other shell environment variables and set only those provided in the `env` argument to this function.

template  If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported
rstrip  Strip all whitespace off the end of output before it is returned.

31.16. Full list of builtin execution modules  741
**output_loglevel**  Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

**timeout**  A timeout in seconds for the executed process to return.

**use_vt**  Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

Note that env represents the environment variables for the command, and should be formatted as a dict, or a YAML string which resolves to a dict.

- **Return type** int
- **Return type** None
- **Returns**  Return Code as an int or None if there was an exception.

**CLI Example:**

```
salt '*' cmd.retcode "file /bin/bash"
```

The template arg can be set to 'jinja' or another supported template engine to render the command arguments before execution. For example:

```
salt '*' cmd.retcode template=jinja "file {{grains.pythonpath[0]}}/python"
```

A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input:

```
salt '*' cmd.retcode "grep f" stdin='one
two
three
four
five
'
```

```
salt.modules.cmdmod.run(cmd, cwd=None, stdin=None, runas=None, shell='/bin/bash', python_shell=None, env=None, clean_env=False, template=None, rstrip=True, umask=None, output_loglevel='debug', log_callback=None, timeout=None, reset_system_locale=True, ignore_retcode=False, saltenv='base', use_vt=False, **kwargs)
```

Execute the passed command and return the output as a string

Note that env represents the environment variables for the command, and should be formatted as a dict, or a YAML string which resolves to a dict.

- **cmd**  The command to run. ex: `ls -lart /home`
- **cwd**  The current working directory to execute the command in, defaults to /root
- **stdin**  A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input.: 
- **runas**  User to run script as.
- **shell**  Shell to execute under. Defaults to the system default shell.
- **python_shell**  If True, let python handle the positional arguments. Set to False to use shell features, such as pipes or redirection
- **env**  A list of environment variables to be set prior to execution. Example:

```
salt://scripts/foo.sh:
  cmd.script:
    - env:
        - BATCH: 'yes'
```
Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH`:

```
salt://scripts/bar.sh:
  cmd.script:
    - env: "PATH=/some/path:$PATH"
```

One can still use the existing $PATH by using a bit of Jinja:

```
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}
mycommand:
  cmd.run:
    - name: ls -l /
    - env:
      PATH: {{ [current_path, '/my/special/bin']|join(':') }}
```

### clean_env

Attempt to clean out all other shell environment variables and set only those provided in the `env` argument to this function.

### template

If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported.

### rstrip

Strip all whitespace off the end of output before it is returned.

### umask

The umask (in octal) to use when running the command.

### output_loglevel

Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

### timeout

A timeout in seconds for the executed process to return.

### use_vt

Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

**Warning:** This function does not process commands through a shell unless the python_shell flag is set to True. This means that any shell-specific functionality such as `echo` or the use of pipes, redirection or `&&`, should either be migrated to cmd.shell or have the python_shell=True flag set here.

The use of python_shell=True means that the shell will accept _any_ input including potentially malicious commands such as `good_command;rm -rf /`. Be absolutely certain that you have sanitized your input prior to using python_shell=True

**CLI Example:**

```
salt '*' cmd.run "ls -l | awk '/foo/{print \$2}"
```

The template arg can be set to `jinja` or another supported template engine to render the command arguments before execution. For example:

```
salt '*' cmd.run template=jinja "ls -l /tmp/{{grains.id}} | awk '/foo/{print \$2}"
```

Specify an alternate shell with the shell parameter:
A string of standard input can be specified for the command to be run using the `stdin` parameter. This can be useful in cases where sensitive information must be read from standard input:

```shell
salt '*' cmd.run "grep f" stdin='one

two

three

four

five\n'
```

If an equal sign (=) appears in an argument to a Salt command it is interpreted as a keyword argument in the format key=val. That processing can be bypassed in order to pass an equal sign through to the remote shell command by manually specifying the kwarg:

```shell
salt '*' cmd.run cmd='sed -e s/=/:/g'
```

```
salt.modules.cmdmod.run_all(cmd, cwd=None, stdin=None, runas=None, shell='/bin/bash', python_shell=None, env=None, clean_env=False, template=None, rstrip=True, umask=None, output_loglevel='debug', ignore_retcode=False, saltenv='base', use_vt=False, **kwargs)
```

Execute the passed command and return a dict of return data

- **cmd**: The command to run. ex: `ls -lart /home`
- **cwd**: The current working directory to execute the command in, defaults to /root
- **stdin**: A string of standard input can be specified for the command to be run using the `stdin` parameter. This can be useful in cases where sensitive information must be read from standard input.
- **runas**: User to run script as.
- **shell**: Shell to execute under. Defaults to the system default shell.
- **python_shell**: If True, let python handle the positional arguments. Set to False to use shell features, such as pipes or redirection
- **env**: A list of environment variables to be set prior to execution. Example:

```
salt://scripts/foo.sh:
  cmd.script:
    - env:
    - BATCH: 'yes'
```

**Warning**: The above illustrates a common PyYAML pitfall, that `yes`, `no`, `on`, `off`, `true`, and `false` are all loaded as boolean `True` and `False` values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So `$PATH` in the following example is a literal `'$PATH'`:

```
salt://scripts/bar.sh:
  cmd.script:
    - env: "PATH=/some/path:$PATH"
```

One can still use the existing `$PATH` by using a bit of Jinja:

```
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}
mycommand:
```
cmd.run:
- name: ls -l /
- env:
  - PATH: {{ [current_path, '/my/special/bin']|join(':') }}

clean_env: Attempt to clean out all other shell environment variables and set only those provided in the 'env' argument to this function.

template If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported

rstrip Strip all whitespace off the end of output before it is returned.

umask The umask (in octal) to use when running the command.

output_loglevel Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

timeout A timeout in seconds for the executed process to return.

use_vt Use VT utils (saltstack) to stream the command output more interactively to the console and the logs.
This is experimental.

Note that env represents the environment variables for the command, and should be formatted as a dict, or a YAML string which resolves to a dict.

CLI Example:

salt '*' cmd.run_all "ls -l | awk '/foo/{print \$2}'"

The template arg can be set to 'jinja' or another supported template engine to render the command arguments before execution. For example:

salt '*' cmd.run_all template=jinja "ls -l /tmp/{{grains.id}} | awk '/foo/{print \$2}'"

A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input:

salt '*' cmd.run_all "grep f" stdin='one
two
three
four
five'

salt.modules.cmdmod.run_chroot(root, cmd, cwd=None, stdin=None, runas=None, shell='/bin/bash', python_shell=True, env=None, clean_env=False, template=None, rstrip=True, umask=None, output_loglevel='quiet', log_callback=None, quiet=False, timeout=None, reset_system_locale=True, ignore_retcode=False, saltenv='base', use_vt=False, **kwargs)

New in version 2014.7.0.
This function runs cmd.run_all wrapped within a chroot, with dev and proc mounted in the chroot

root: Path to the root of the jail to use.

cmd: The command to run. ex: `ls -lart /home`

cwd The current working directory to execute the command in, defaults to /root

stdin A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input:

runas User to run script as.

shell Shell to execute under. Defaults to the system default shell.
**python_shell**  If True, let python handle the positional arguments. Set to False to use shell features, such as pipes or redirection

**env**

A list of environment variables to be set prior to execution. Example:

```yaml
salt://scripts/foo.sh:
  cmd.script:
    - env:
      - BATCH: 'yes'
```

**Warning:** The above illustrates a common PyYAML pitfall, that **yes**, **no**, **on**, **off**, **true**, and **false** are all loaded as boolean **True** and **False** values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So **PATH** in the following example is a literal `$PATH`:

```yaml
salt://scripts/bar.sh:
  cmd.script:
    - env: "PATH=/some/path:$PATH"
```

One can still use the existing **PATH** by using a bit of Jinja:

```yaml
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
  cmd.run:
    - name: ls -l /
    - env:
      - PATH: {{ [current_path, '/my/special/bin']|join(':') }}
```

**clean_env**: Attempt to clean out all other shell environment variables and set only those provided in the `env` argument to this function.

**template**  If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported

**rstrip** Strip all whitespace off the end of output before it is returned.

**umask**  The umask (in octal) to use when running the command.

**output_loglevel** Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless **quiet** is used for this value.

**timeout** A timeout in seconds for the executed process to return.

**use_vt** Use VT utils (saltstack) to stream the command output more interactively to the console and the logs.

This is experimental.

CLI Example:

```
salt '*' cmd.run_chroot /var/lib/lxc/container_name/rootfs 'sh /tmp/bootstrap.sh'
```
Execute a command and only return the standard error

**cmd**: The command to run. ex: `ls -l /home`

**cwd**: The current working directory to execute the command in, defaults to `/root`

**stdin**: A string of standard input can be specified for the command to be run using the `stdin` parameter. This can be useful in cases where sensitive information must be read from standard input:

**runas**: User to run script as.

**shell**: Shell to execute under. Defaults to the system default shell.

**python_shell**: If True, let python handle the positional arguments. Set to False to use shell features, such as pipes or redirection

**env**: A list of environment variables to be set prior to execution. Example:

```yaml
salt://scripts/foo.sh:
  cmd.script:
    - env:
      - BATCH: 'yes'
```

**Warning**: The above illustrates a common PyYAML pitfall, that `yes`, `no`, `on`, `off`, `true`, and `false` are all loaded as boolean `True` and `False` values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So `PATH` in the following example is a literal `$PATH`:

```yaml
salt://scripts/bar.sh:
  cmd.script:
    - env: "$PATH=/some/path:$PATH"
```

One can still use the existing `PATH` by using a bit of Jinja:

```yaml
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
  cmd.run:
    - name: ls -l /
    - env:
      - PATH: {{ [current_path, '/my/special/bin']|join(':') }}
```

**clean_env**: Attempt to clean out all other shell environment variables and set only those provided in the `env` argument to this function.

**template**: If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported

**rstrip**: Strip all whitespace off the end of output before it is returned.

**umask**: The umask (in octal) to use when running the command.
output_loglevel  Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

timeout  A timeout in seconds for the executed process to return.

use_vt  Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

Note that env represents the environment variables for the command, and should be formatted as a dict, or a YAML string which resolves to a dict.

CLI Example:

```
salt '*' cmd.run_stderr "ls -l | awk '/foo/{print $2}'"
```

The template arg can be set to 'jinja' or another supported template engine to render the command arguments before execution. For example:

```
salt '*' cmd.run_stderr template=jinja "ls -l /tmp/{{grains.id}} | awk '/foo/{print $2}'"
```

A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input:

```
salt '*' cmd.run_stderr "grep f" stdin='one
two
three
four
five\n'
```

salt.modules.cmdmod.run_stdout(cmd, cwd=None, stdin=None, runas=None, shell='/bin/bash', python_shell=None, env=None, clean_env=False, template=None, log_callback=None, timeout=None, reset_system_locale=True, ignore_retcode=False, saltenv='base', use_vt=False, **kwargs)

Execute a command, and only return the standard out

- **cmd**: The command to run. ex: `ls -lart /home`
- **cwd**: The current working directory to execute the command in, defaults to /root
- **stdin**: A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input.
- **runas**: User to run script as.
- **shell**: Shell to execute under. Defaults to the system default shell.
- **python_shell**: If True, let python handle the positional arguments. Set to False to use shell features, such as pipes or redirection
- **env**: A list of environment variables to be set prior to execution. Example:

```
salt://scripts/foo.sh:
  cmd.script:
    - env:
      - BATCH: 'yes'
```

**Warning**: The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH`:
salt://scripts/bar.sh:
    cmd.script:
        - env: "PATH=/some/path:$PATH"

One can still use the existing $PATH by using a bit of Jinja:

```
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
    cmd.run:
        - name: ls -l /
        - env:
            - PATH: {{ [current_path, '/my/special/bin']|join(':') }}
```

### clean_env

Attempt to clean out all other shell environment variables and set only those provided in the `env` argument to this function.

### template

If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported.

### rstrip

Strip all whitespace off the end of output before it is returned.

### umask

The umask (in octal) to use when running the command.

### output_loglevel

Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

### timeout

A timeout in seconds for the executed process to return.

### use_vt

Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

Note that env represents the environment variables for the command, and should be formatted as a dict, or a YAML string which resolves to a dict.

### CLI Example:

```
salt '*' cmd.run_stdout "ls -l | awk '/foo/ {print $2}'"
```

The template arg can be set to `jinja` or another supported template engine to render the command arguments before execution. For example:

```
salt '*' cmd.run_stdout template=jinja "ls -l /tmp/{{grains.id}} | awk '/foo/ {print $2}'"
```

A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input:

```
salt '*' cmd.run_stdout "grep f stdin='one\ntwo\nthree\nfour\nfive\n'
```

salt.modules.cmdmod.script(source, args=None, cwd=None, stdin=None, runas=None, shell="/bin/bash", python_shell=None, env=None, template=None, umask=None, output_loglevel='debug', log_callback=None, quiet=False, timeout=None, reset_system_locale=True, __env__=None, saltenv='base', use_vt=False, **kwargs)

Download a script from a remote location and execute the script locally. The script can be located on the salt master file server or on an HTTP/FTP server.

The script will be executed directly, so it can be written in any available programming language.
source  The location of the script to download. If the file is located on the master in the directory named spam, and is called eggs, the source string is salt://spam/eggs

args  String of command line args to pass to the script. Only used if no args are specified as part of the name argument. To pass a string containing spaces in YAML, you will need to doubly-quote it: `arg1 'arg two' arg3`

cwd  The current working directory to execute the command in, defaults to /root

stdin  A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input.

runas  User to run script as.

shell  Shell to execute under. Defaults to the system default shell.

python_shell  If True, let python handle the positional arguments. Set to False to use shell features, such as pipes or redirection

eenv  A list of environment variables to be set prior to execution. Example:

```
salt://scripts/foo.sh:
  cmd.script:
    - env:
      - BATCH: 'yes'
```

**Warning:** The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH`:

```
salt://scripts/bar.sh:
  cmd.script:
    - env: "PATH=/some/path:$PATH"
```

One can still use the existing $PATH by using a bit of Jinja:

```
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
  cmd.run:
    - name: ls -l /
    - env:
        - PATH: {{ [current_path, '/my/special/bin']|join(':') }}
```

template  If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported

umask  The umask (in octal) to use when running the command.

output_loglevel  Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

quiet  The command will be executed quietly, meaning no log entries of the actual command or its return data. This is deprecated as of the 2014.1.0 release, and is being replaced with output_loglevel: quiet.

timeout  If the command has not terminated after timeout seconds, send the subprocess sigterm, and if sigterm is ignored, follow up with sigkill

use_vt  Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.
CLI Example:

```bash
salt '*' cmd.script salt://scripts/runme.sh
salt '*' cmd.script salt://scripts/runme.sh 'arg1 arg2 "arg 3"'
salt '*' cmd.script salt://scripts/windows_task.ps1 args=' -Input c:\tmp\infile.txt'
```

```bash
salt '*' cmd.script salt://scripts/runme.sh stdin='one
two
three
four
five'
```

```bash
salt.modules.cmdmod.script_retcode(source, args=None, cwd=None, stdin=None, runas=None, shell='/bin/bash', python_shell=None, env=None, template='jinja', umask=None, timeout=None, reset_system_locale=True, __env__=None, saltenv='base', output_loglevel='debug', log_callback=None, use_vt=False, **kwargs)
```

Download a script from a remote location and execute the script locally. The script can be located on the salt master file server or on an HTTP/FTP server.

The script will be executed directly, so it can be written in any available programming language.

The script can also be formatted as a template, the default is jinja.

Only evaluate the script return code and do not block for terminal output

**source** The location of the script to download. If the file is located on the master in the directory named spam, and is called eggs, the source string is salt://spam/eggs

**args** String of command line args to pass to the script. Only used if no args are specified as part of the name argument. To pass a string containing spaces in YAML, you will need to doubly-quote it: ``arg1 'arg two' arg3``

**cwd** The current working directory to execute the command in, defaults to /root

**stdin** A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input.

**runas** User to run script as.

**shell** Shell to execute under. Defaults to the system default shell.

**python_shell** If True, let python handle the positional arguments. Set to False to use shell features, such as pipes or redirection

**env** A list of environment variables to be set prior to execution. Example:

```bash
salt://scripts/foo.sh:
cmd.script:
  - env:
    - BATCH: 'yes'
```

**Warning:** The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found here.

Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH`:

```bash
salt://scripts/bar.sh:
cmd.script:
  - env: "PATH=/some/path:$PATH"
```

One can still use the existing $PATH by using a bit of Jinja:
```yaml
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
  cmd.run:
    - name: ls -l /
    - env:
      - PATH: {{ [current_path, '/my/special/bin']|join(':') }}
```

template  If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported

umask  The umask (in octal) to use when running the command.

output_loglevel  Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

quiet  The command will be executed quietly, meaning no log entries of the actual command or its return data. This is deprecated as of the 2014.1.0 release, and is being replaced with output_loglevel: quiet.

timeout  If the command has not terminated after timeout seconds, send the subprocess sigterm, and if sigterm is ignored, follow up with sigkill

use_vt  Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

CLI Example:

```bash
salt '*' cmd.script_retcode salt://scripts/runme.sh
salt '*' cmd.script_retcode salt://scripts/runme.sh 'arg1 arg2 "arg 3"'
salt '*' cmd.script_retcode salt://scripts/windows_task.ps1 args=' -Input c:\tmp\infile.txt' shell='powershell'
```

A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input.:

```bash
salt '*' cmd.script_retcode salt://scripts/runme.sh stdin='one
two
three
four
five
'
salt.modules.cmdmod.shell(cmd, cwd=None, stdin=None, runas=None, shell='/bin/bash', env=None, clean_env=False, template=None, rstrip=True, umask=None, output_loglevel='debug', log_callback=None, quiet=False, timeout=None, reset_system_locale=True, ignore_retcode=False, saltenv='base', use_vt=False, **kwargs)
```

Execute the passed command and return the output as a string.

New in version 2015.5.0.

cmd: The command to run. ex: `ls -lart /home`

cwd: The current working directory to execute the command in, defaults to /root

stdin: A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input:

runas: User to run script as.

shell: Shell to execute under. Defaults to the system default shell.

env: A list of environment variables to be set prior to execution. Example:
- env:
  - BATCH: 'yes'

**Warning:** The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH`:

```
salt://scripts/bar.sh:
  cmd.script:
    - env: "PATH=/some/path:$PATH"
```

One can still use the existing $PATH by using a bit of Jinja:

```
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
  cmd.run:
    - name: ls -l /
    - env:
      - PATH: {{ current_path, '/my/special/bin'|join(':') }}
```

**clean_env:** Attempt to clean out all other shell environment variables and set only those provided in the `env` argument to this function.

**template** If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and wempy are supported

**rstrip** Strip all whitespace off the end of output before it is returned.

**umask** The umask (in octal) to use when running the command.

**output_loglevel** Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

**timeout** A timeout in seconds for the executed process to return.

**use_vt** Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

**Warning:** This passes the cmd argument directly to the shell without any further processing! Be absolutely sure that you have properly sanitized the command passed to this function and do not use untrusted inputs.

Note that env represents the environment variables for the command, and should be formatted as a dict, or a YAML string which resolves to a dict.

**CLI Example:**

```
salt '*' cmd.shell "ls -l | awk '/foo/{print \$2}'"
```

The template arg can be set to 'jinja' or another supported template engine to render the command arguments before execution. For example:

```
salt '*' cmd.shell template=jinja "ls -l /tmp/{{grains.id}} | awk '/foo/{print \$2}'"
```

Specify an alternate shell with the shell parameter:
A string of standard input can be specified for the command to be run using the `stdin` parameter. This can be useful in cases where sensitive information must be read from standard input:

```
salt '*' cmd.shell "grep f stdin='one\ntag\ntwone\nthree\nfour\nfive\n'
```

If an equal sign (=) appears in an argument to a Salt command it is interpreted as a keyword argument in the format `key=val`. That processing can be bypassed in order to pass an equal sign through to the remote shell command by manually specifying the kwarg:

```
salt '*' cmd.shell cmd='sed -e s/=/:/g'
```

### salt.modules.cmdmod.shells()

List the valid shells on this system via the `/etc/shells` file

New in version 2015.5.0.

CLI Example:
```
salt '*' cmd.shells
```

### salt.modules.cmdmod.tty

Echo a string to a specific tty

CLI Example:
```
salt '*' cmd.tty tty0 'This is a test'
salt '*' cmd.tty pts3 'This is a test'
```

### salt.modules.cmdmod.which(cmd)

Returns the path of an executable available on the minion, `None` otherwise

CLI Example:
```
salt '*' cmd.which cat
```

### salt.modules.cmdmod.which_bin(cmds)

Returns the first command found in a list of commands

CLI Example:
```
salt '*' cmd.which_bin 'pip2, pip, pip-python'
```

## 31.16.43 salt.modules.composer

Use composer to install PHP dependencies for a directory

### salt.modules.composer.did_composer_install(dir)

Test to see if the vendor directory exists in this directory

**dir** Directory location of the composer.json file

CLI Example:
```
salt '*' composer.did_composer_install /var/www/application
```

### salt.modules.composer.install(dir, composer=None, php=None, runas=None, prefer_source=None, prefer_dist=None, no_scripts=None, no_plugins=None, optimize=None, no_dev=None, quiet=False, composer_home='/root')

Install composer dependencies for a directory.
If composer has not been installed globally making it available in the system PATH & making it executable, the composer and php parameters will need to be set to the location of the executables.

**dir** Directory location of the composer.json file.

**composer** Location of the composer.phar file. If not set composer will just execute `"composer"` as if it is installed globally. (i.e. /path/to/composer.phar)

**php** Location of the php executable to use with composer. (i.e. /usr/bin/php)

**runas** Which system user to run composer as.

**prefer_source** --prefer-source option of composer.

**prefer_dist** --prefer-dist option of composer.

**no_scripts** --no-scripts option of composer.

**no_plugins** --no-plugins option of composer.

**optimize** --optimize-autoloader option of composer. Recommended for production.

**no_dev** --no-dev option for composer. Recommended for production.

**quiet** --quiet option for composer. Whether or not to return output from composer.

**composer_home** $COMPOSER_HOME environment variable

CLI Example:

```
salt '*' composer.install /var/www/application
```

salt.modules.composer.selfupdate((composer=None, php=None, runas=None, quiet=False, composer_home='/root'))

Update composer itself.

If composer has not been installed globally making it available in the system PATH & making it executable, the composer and php parameters will need to be set to the location of the executables.

**composer** Location of the composer.phar file. If not set composer will just execute `"composer"` as if it is installed globally. (i.e. /path/to/composer.phar)

**php** Location of the php executable to use with composer. (i.e. /usr/bin/php)

**runas** Which system user to run composer as.

**quiet** --quiet option for composer. Whether or not to return output from composer.

**composer_home** $COMPOSER_HOME environment variable

CLI Example:

```
salt '*' composer.selfupdate
```

salt.modules.composer.update((dir=None, composer=None, php=None, runas=None, prefer_source=None, prefer_dist=None, no_scripts=None, no_plugins=None, optimize=None, no_dev=None, quiet=False, composer_home='/root'))

Update composer dependencies for a directory.

If composer install has not yet been run, this runs composer install instead.

If composer has not been installed globally making it available in the system PATH & making it executable, the composer and php parameters will need to be set to the location of the executables.

**dir** Directory location of the composer.json file.
**composer** Location of the composer.phar file. If not set composer will just execute "composer" as if it is installed globally. (i.e. /path/to/composer.phar)

**php** Location of the php executable to use with composer. (i.e. /usr/bin/php)

**runas** Which system user to run composer as.

**prefer_source** --prefer-source option of composer.

**prefer_dist** --prefer-dist option of composer.

**no_scripts** --no-scripts option of composer.

**no_plugins** --no-plugins option of composer.

**optimize** --optimize-autoloader option of composer. Recommended for production.

**no_dev** --no-dev option for composer. Recommended for production.

**quiet** --quiet option for composer. Whether or not to return output from composer.

**composer_home** $COMPOSER_HOME environment variable

CLI Example:

```
salt '*' composer.update /var/www/application

salt '*' composer.update /var/www/application no_dev=True optimize=True
```

### 31.16.44 salt.modules.config

Return config information

**salt.modules.config.backup_mode**(*backup='*')

Return the backup mode

CLI Example:

```
salt '*' config.backup_mode
```

**salt.modules.config.dot_vals**(*value*)

Pass in a configuration value that should be preceded by the module name and a dot, this will return a list of all read key/value pairs

CLI Example:

```
salt '*' config.dot_vals host
```

**salt.modules.config.gather_bootstrap_script**(*bootstrap=None*)

Download the salt-bootstrap script, and return its location

**bootstrap** URL of alternate bootstrap script

CLI Example:

```
salt '*' config.gather_bootstrap_script
```

**salt.modules.config.get**(*key, default='*', delimiter=':', merge=None*)

Attempt to retrieve the named value from the minion config file, pillar, grains or the master config. If the named value is not available, return the value specified by default. If not specified, the default is an empty string.

Values can also be retrieved from nested dictionaries. Assume the below data structure:
To retrieve the value associated with the `apache` key, in the sub-dictionary corresponding to the `pkg` key, the following command can be used:

```bash
salt myminion config.get pkg:apache
```

The `:` (colon) is used to represent a nested dictionary level.

Changed in version 2015.5.0: The `delimiter` argument was added, to allow delimiters other than `:` to be used.

This function traverses these data stores in this order, returning the first match found:

- Minion config file
- Minion’s grains
- Minion’s pillar data
- Master config file

This means that if there is a value that is going to be the same for the majority of minions, it can be configured in the Master config file, and then overridden using the grains, pillar, or Minion config file.

### Arguments

- **delimiter** New in version 2015.5.0.

  Override the delimiter used to separate nested levels of a data structure.

- **merge** New in version 2015.5.0.

  If passed, this parameter will change the behavior of the function so that, instead of traversing each data store above in order and returning the first match, the data stores are first merged together and then searched. The pillar data is merged into the master config data, then the grains are merged, followed by the Minion config data. The resulting data structure is then searched for a match. This allows for configurations to be more flexible.

**Note:** The merging described above does not mean that grain data will end up in the Minion’s pillar data, or pillar data will end up in the master config data, etc. The data is just combined for the purposes of searching an amalgam of the different data stores.

The supported merge strategies are as follows:

- **recurse** - If a key exists in both dictionaries, and the new value is not a dictionary, it is replaced. Otherwise, the sub-dictionaries are merged together into a single dictionary, recursively on down, following the same criteria. For example:

```python
>>> dict1 = {'foo': {'bar': 1, 'qux': True},
            'hosts': ['a', 'b', 'c'],
            'only_x': None}
>>> dict2 = {'foo': {'baz': 2, 'qux': False},
            'hosts': ['d', 'e', 'f'],
            'only_y': None}
>>> merged
{'foo': {'bar': 1, 'baz': 2, 'qux': False},
 'hosts': ['d', 'e', 'f'],
 'only_dict1': None,
 'only_dict2': None}
```
• **overwrite** - If a key exists in the top level of both dictionaries, the new value completely overwrites the old. For example:

```python
dict1 = {'foo': {'bar': 1, 'qux': True},
         'hosts': ['a', 'b', 'c'],
         'only_x': None}
dict2 = {'foo': {'baz': 2, 'qux': False},
         'hosts': ['d', 'e', 'f'],
         'only_y': None}
```

```python
>>> merged = {'foo': {'baz': 2, 'qux': False},
            'hosts': ['d', 'e', 'f'],
            'only_dict1': None,
            'only_dict2': None}
```

**CLI Example:**

```
salt '*' config.get pkg:apache
salt '*' config.get lxc.container_profile:centos merge=recurse
```

salt.modules.config.manage_mode(mode)

Return a mode value, normalized to a string.

**CLI Example:**

```
salt '*' config.manage_mode
```

salt.modules.config.merge(value, default='`, omit_opts=False, omit_master=False, omit_pillar=False)

Retrieves an option based on key, merging all matches.

Same as `option()` except that it merges all matches, rather than taking the first match.

**CLI Example:**

```
salt '*' config.merge schedule
```

salt.modules.config.option(value, default='`, omit_opts=False, omit_master=False, omit_pillar=False)

Pass in a generic option and receive the value that will be assigned.

**CLI Example:**

```
salt '*' config.option redis.host
```

salt.modules.config.valid_fileproto(uri)

Returns a boolean value based on whether or not the URI passed has a valid remote file protocol designation.

**CLI Example:**

```
salt '*' config.valid_fileproto salt://path/to/file
```

### 31.16.45 **salt.modules.consul**

Interact with Consul

https://www.consul.io

salt.modules.consul.acl_clone(consul_url=None, **kwargs)

Information about an ACL token.
Parameters

- **consul_url** -- The Consul server URL.
- **id** -- Unique identifier for the ACL to update.

Returns Boolean, message of success or failure, and new ID of cloned ACL.

CLI Example:
```
salt '*' consul.acl_info id='c1c4d223-91cb-3d1f-1ee8-f2af9e7b6716'
```

salt.modules.consul.acl_create(**kwargs)
Create a new ACL token.

Parameters

- **consul_url** -- The Consul server URL.
- **name** -- Meaningful indicator of the ACL’s purpose.
- **type** -- Type is either client or management. A management token is comparable to a root user and has the ability to perform any action including creating, modifying, and deleting ACLs.
- **rules** -- The Consul server URL.

Returns Boolean & message of success or failure.

CLI Example:
```
salt '*' consul.acl_create
```

salt.modules.consul.acl_delete(**kwargs)
Delete an ACL token.

Parameters

- **consul_url** -- The Consul server URL.
- **id** -- Unique identifier for the ACL to update.

Returns Boolean & message of success or failure.

CLI Example:
```
salt '*' consul.acl_delete id='c1c4d223-91cb-3d1f-1ee8-f2af9e7b6716'
```

salt.modules.consul.acl_info(**kwargs)
Information about an ACL token.

Parameters

- **consul_url** -- The Consul server URL.
- **id** -- Unique identifier for the ACL to update.

Returns Information about the ACL requested.

CLI Example:
```
salt '*' consul.acl_info id='c1c4d223-91cb-3d1f-1ee8-f2af9e7b6716'
```

salt.modules.consul.acl_list(**kwargs)
List the ACL tokens.

Parameters **consul_url** -- The Consul server URL.
Returns  List of ACLs

CLI Example:

```bash
salt '*' consul.acl_list
```

```
salt.modules.consul.acl_update(consul_url=None, **kwargs)
```

Update an ACL token.

Parameters

- **consul_url** -- The Consul server URL.
- **name** -- Meaningful indicator of the ACL’s purpose.
- **id** -- Unique identifier for the ACL to update.
- **type** -- Type is either client or management. A management token is comparable to a root user and has the ability to perform any action including creating, modifying, and deleting ACLs.
- **rules** -- The Consul server URL.

Returns  Boolean & message of success or failure.

CLI Example:

```bash
salt '*' consul.acl_update
```

```
salt.modules.consul.agent_check_deregister(consul_url=None, checkid=None)
```

The agent will take care of deregistering the check from the Catalog.

Parameters

- **consul_url** -- The Consul server URL.
- **checkid** -- The ID of the check to deregister from Consul.

Returns  Boolean and message indicating success or failure.

CLI Example:

```bash
salt '*' consul.agent_check_deregister checkid='Memory Utilization'
```

```
salt.modules.consul.agent_check_fail(consul_url=None, checkid=None, **kwargs)
```

This endpoint is used with a check that is of the TTL type. When this is called, the status of the check is set to critical and the TTL clock is reset.

Parameters

- **consul_url** -- The Consul server URL.
- **checkid** -- The ID of the check to deregister from Consul.
- **note** -- A human-readable message with the status of the check.

Returns  Boolean and message indicating success or failure.

CLI Example:

```bash
salt '*' consul.agent_check_fail checkid='redis_check1' 
    note='Forcing check into critical state.'
```

```
salt.modules.consul.agent_check_pass(consul_url=None, checkid=None, **kwargs)
```

This endpoint is used with a check that is of the TTL type. When this is called, the status of the check is set to passing and the TTL clock is reset.
Parameters

- **consul_url** -- The Consul server URL.
- **checkid** -- The ID of the check to mark as passing.
- **note** -- A human-readable message with the status of the check.

Returns Boolean and message indicating success or failure.

CLI Example:

```bash
salt '*' consul.agent_check_pass checkid='redis_check1'
  note='Forcing check into passing state.'
```

salt.modules.consul.agent_check_register(consul_url=None, **kwargs)
The register endpoint is used to add a new check to the local agent.

Parameters

- **consul_url** -- The Consul server URL.
- **name** -- The description of what the check is for.
- **id** -- The unique name to use for the check, if not provided `name` is used.
- **notes** -- Human readable description of the check.
- **script** -- If script is provided, the check type is a script, and Consul will evaluate that script based on the interval parameter.
- **http** -- Check will perform an HTTP GET request against the value of HTTP (expected to be a URL) based on the interval parameter.
- **ttl** -- If a TTL type is used, then the TTL update endpoint must be used periodically to update the state of the check.
- **interval** -- Interval at which the check should run.

Returns Boolean and message indicating success or failure.

CLI Example:

```bash
salt '*' consul.agent_check_register name='Memory Utilization'
  script='/usr/local/bin/check_mem.py'
  interval='15s'
```

salt.modules.consul.agent_check_warn(consul_url=None, checkid=None, **kwargs)
This endpoint is used with a check that is of the TTL type. When this is called, the status of the check is set to warning and the TTL clock is reset.

Parameters

- **consul_url** -- The Consul server URL.
- **checkid** -- The ID of the check to deregister from Consul.
- **note** -- A human-readable message with the status of the check.

Returns Boolean and message indicating success or failure.

CLI Example:

```bash
salt '*' consul.agent_check_warn checkid='redis_check1'
  note='Forcing check into warning state.'
```

salt.modules.consul.agent_checks(consul_url=None)
Returns the checks the local agent is managing.
Parameters **consul_url** -- The Consul server URL.

Returns Returns the checks the local agent is managing

CLI Example:

```bash
salt '*' consul.agent_checks
```

salt.modules.consul.agent_join(*consul_url=*, **address=*, **kwargs*)

Triggers the local agent to join a node

Parameters

- **consul_url** -- The Consul server URL.
- **address** -- The address for the agent to connect to.
- **wan** -- Causes the agent to attempt to join using the WAN pool.

Returns Boolean and message indicating success or failure.

CLI Example:

```bash
salt '*' consul.agent_join address='192.168.1.1'
```

salt.modules.consul.agent_leave(*consul_url=*, **node=*)

Used to instruct the agent to force a node into the left state.

Parameters

- **consul_url** -- The Consul server URL.
- **node** -- The node the agent will force into left state

Returns Boolean and message indicating success or failure.

CLI Example:

```bash
salt '*' consul.agent_leave node='web1.example.com'
```

salt.modules.consul.agent_maintenance(*consul_url=*, **kwargs*)

Manages node maintenance mode

Parameters

- **consul_url** -- The Consul server URL.
- **enable** -- The enable flag is required. Acceptable values are either true (to enter maintenance mode) or false (to resume normal operation).
- **reason** -- If provided, its value should be a text string explaining the reason for placing the node into maintenance mode.

Returns Boolean and message indicating success or failure.

CLI Example:

```bash
salt '*' consul.agent_maintenance enable='False' reason='Upgrade in progress'
```

salt.modules.consul.agent_members(*consul_url=*, **kwargs*)

Returns the members as seen by the local serf agent

Parameters **consul_url** -- The Consul server URL.

Returns Returns the members as seen by the local serf agent

CLI Example:
salt '*' consul.agent_members

```python
salt.modules.consul.agent_self(consul_url=None)
```

Returns the local node configuration

Parameters:
- **consul_url** -- The Consul server URL.

Returns: Returns the local node configuration

CLI Example:
```bash
salt '*' consul.agent_self
```

salt.modules.consul.agent_service_deregister(consul_url=None, serviceid=None)

Used to remove a service.

Parameters:
- **consul_url** -- The Consul server URL.
- **serviceid** -- A name describing the service.

Returns: Boolean and message indicating success or failure.

CLI Example:
```bash
salt '*' consul.agent_service_deregister serviceid='redis'
```

salt.modules.consul.agent_service_maintenance(consul_url=None, serviceid=None, **kwargs)

Used to place a service into maintenance mode.

Parameters:
- **consul_url** -- The Consul server URL.
- **serviceid** -- A name of the service.
- **enable** -- Whether the service should be enabled or disabled.
- **reason** -- A human readable message of why the service was enabled or disabled.

Returns: Boolean and message indicating success or failure.

CLI Example:
```bash
salt '*' consul.agent_service_deregister serviceid='redis'
enable='True' reason='Down for upgrade'
```

salt.modules.consul.agent_service_register(consul_url=None, **kwargs)

The used to add a new service, with an optional health check, to the local agent.

Parameters:
- **consul_url** -- The Consul server URL.
- **name** -- A name describing the service.
- **address** -- The address used by the service, defaults to the address of the agent.
- **port** -- The port used by the service.
- **id** -- Unique ID to identify the service, if not provided the value of the name parameter is used.
- **tags** -- Identifying tags for service, string or list.
• **script** -- If script is provided, the check type is a script, and Consul will evaluate that script based on the interval parameter.

• **http** -- Check will perform an HTTP GET request against the value of HTTP (expected to be a URL) based on the interval parameter.

• **check_ttl** -- If a TTL type is used, then the TTL update endpoint must be used periodically to update the state of the check.

• **check_interval** -- Interval at which the check should run.

**Returns** Boolean and message indicating success or failure.

CLI Example:
```bash
salt '*' consul.agent_service_register name='redis' tags='["master", "v1"]' address="127.0.0.1" port="8080" check_script="/usr/local/bin/check_redis.py" interval="10s"
```

salt.modules.consul.agent_services(consul_url=None)
Returns the services the local agent is managing

**Parameters**
- **consul_url** -- The Consul server URL.

**Returns**
Returns the services the local agent is managing

CLI Example:
```bash
salt '*' consul.agent_services
```

salt.modules.consul.catalog_datacenters(consul_url=None)
Return list of available datacenters from catalog.

**Parameters**
- **consul_url** -- The Consul server URL.

**Returns**
The list of available datacenters.

CLI Example:
```bash
salt '*' consul.catalog_datacenters
```

salt.modules.consul.catalog_deregister(consul_url=None, **kwargs)
Deregisters a node, service, or check

**Parameters**
- **consul_url** -- The Consul server URL.
- **node** -- The node to deregister.
- **datacenter** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `dc` parameter.
- **checkid** -- The ID of the health check to deregister.
- **serviceid** -- The ID of the service to deregister.

**Returns**
Boolean & message of success or failure.

CLI Example:
```bash
salt '*' consul.catalog_register node='node1' serviceid='redis_server1' checkid='redis_check1'
```

salt.modules.consul.catalog_node(consul_url=None, node=None, **kwargs)
Information about the registered node.
Parameters

- **consul_url** -- The Consul server URL.
- **node** -- The node to request information about.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `"dc"` parameter.

Returns Information about the requested node.

CLI Example:
```
salt '*' consul.catalog_service service='redis'
```

```
salt.modules.consul.catalog_nodes(consul_url=None, **kwargs)

Return list of available nodes from catalog.

Parameters

- **consul_url** -- The Consul server URL.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `"dc"` parameter.

Returns The list of available nodes.

CLI Example:
```
salt '*' consul.catalog_nodes
```

salt.modules.consul.catalog_register(consul_url=None, **kwargs)

Registers a new node, service, or check

Parameters

- **consul_url** -- The Consul server URL.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `"dc"` parameter.
- **node** -- The node to register.
- **address** -- The address of the node.
- **service** -- The service that will be registered.
- **service_address** -- The address that the service listens on.
- **service_port** -- The port for the service.
- **service_id** -- A unique identifier for the service, if this is not provided `"name"` will be used.
- **service_tags** -- Any tags associated with the service.
- **check** -- The name of the health check to register
- **check_status** -- The initial status of the check, must be one of unknown, passing, warning, or critical.
- **check_service** -- The service that the check is performed against.
- **check_id** -- Unique identifier for the service.
- **check_notes** -- An opaque field that is meant to hold human-readable text.

Returns Boolean & message of success or failure.
CLI Example:

```bash
salt '*' consul.catalog_register node='node1' address='192.168.1.1'
    service='redis' service_address='127.0.0.1' service_port='8080'
    service_id='redis_server1'
```

salt.modules.consul.catalog_service(consul_url=None, service=None, **kwargs)

Information about the registered service.

Parameters

- **consul_url** -- The Consul server URL.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `"dc"` parameter.
- **tag** -- Filter returned services with tag parameter.

Returns Information about the requested service.

CLI Example:

```bash
salt '*' consul.catalog_service service='redis'
```

salt.modules.consul.catalog_services(consul_url=None, **kwargs)

Return list of available services from catalog.

Parameters

- **consul_url** -- The Consul server URL.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `"dc"` parameter.

Returns The list of available services.

CLI Example:

```bash
salt '*' consul.catalog_services
```

salt.modules.consul.delete(consul_url=None, key=None, **kwargs)

Delete values from Consul

Parameters

- **consul_url** -- The Consul server URL.
- **key** -- The key to use as the starting point for the list.
- **recurse** -- Delete values recursively beginning at the value of key.
- **cas** -- This flag is used to turn the DELETE into a Check-And-Set operation.

Returns Boolean & message of success or failure.

CLI Example:

```bash
salt '*' consul.delete key='web'

salt '*' consul.delete key='web' recurse='True'
```

salt.modules.consul.event_fire(consul_url=None, name=None, **kwargs)

List the ACL tokens.

Parameters
Salt Documentation, Release 2015.8.0

- **consul_url** -- The Consul server URL.
- **name** -- The name of the event to fire.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `"dc"` parameter.
- **node** -- Filter by node name.
- **service** -- Filter by service name.
- **tag** -- Filter by tag name.

**Returns** List of ACLs

**CLI Example:**

```
salt '*' consul.event_fire name='deploy'
```

**salt.modules.consul.event_list(consul_url=None, **kwargs)**

List the recent events.

**Parameters**

- **consul_url** -- The Consul server URL.
- **name** -- The name of the event to fire.

**Returns** List of ACLs

**CLI Example:**

```
salt '*' consul.event_list
```

**salt.modules.consul.get(consul_url=None, key=None, recurse=False, decode=False, raw=False)**

Get key from Consul

**Parameters**

- **consul_url** -- The Consul server URL.
- **key** -- The key to use as the starting point for the list.
- **recurse** -- Return values recursively beginning at the value of key.
- **decode** -- By default values are stored as Base64 encoded values, decode will return the whole key with the value decoded.
- **raw** -- Simply return the decoded value of the key.

**Returns** The keys in Consul.

**CLI Example:**

```
salt '*' consul.get key='web/key1'
salt '*' consul.list key='web' recurse='True'
salt '*' consul.list key='web' recurse='True' decode='True'
```

By default values stored in Consul are base64 encoded, passing the decode option will show them as the decoded values.

```
salt '*' consul.list key='web' recurse='True' decode='True' raw='True'
```
By default Consult will return other information about the key, the raw option will return only the raw value.

salt.modules.consul.health_checks(consul_url=None, service=None, **kwargs)
Health information about the registered service.

Parameters

• consul_url -- The Consul server URL.
• service -- The service to request health information about.
• dc -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `dc` parameter.

Returns Health information about the requested node.

CLI Example:
salt '*' consul.health_checks service='redis1'

salt.modules.consul.health_node(consul_url=None, node=None, **kwargs)
Health information about the registered node.

Parameters

• consul_url -- The Consul server URL.
• node -- The node to request health information about.
• dc -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `dc` parameter.

Returns Health information about the requested node.

CLI Example:
salt '*' consul.health_node node='node1'

salt.modules.consul.health_service(consul_url=None, service=None, **kwargs)
Health information about the registered service.

Parameters

• consul_url -- The Consul server URL.
• service -- The service to request health information about.
• dc -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `dc` parameter.
• tag -- Filter returned services with tag parameter.
• passing -- Filter results to only nodes with all checks in the passing state.

Returns Health information about the requested node.

CLI Example:
salt '*' consul.health_service service='redis1'
salt '*' consul.health_service service='redis1' passing='True'

salt.modules.consul.health_state(consul_url=None, state=None, **kwargs)
Returns the checks in the state provided on the path.
Parameters

- **consul_url** -- The Consul server URL.
- **state** -- The state to show checks for. The supported states are any, unknown, passing, warning, or critical. The any state is a wildcard that can be used to return all checks.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the "dc" parameter.

**Returns** The checks in the provided state.

```bash
salt '*' consul.health_state state='redis1'
salt '*' consul.health_state service='redis1' passing='True'
```

```python
salt.modules.consul.list(consul_url=None, key=None, **kwargs)
List keys in Consul

Parameters

- **consul_url** -- The Consul server URL.
- **key** -- The key to use as the starting point for the list.

**Returns** The list of keys.

```bash
salt '*' consul.list
salt '*' consul.list key='web'
```

```python
salt.modules.consul.put(consul_url=None, key=None, value=None, **kwargs)
Put values into Consul

Parameters

- **consul_url** -- The Consul server URL.
- **key** -- The key to use as the starting point for the list.
- **value** -- The value to set the key to.
- **flags** -- This can be used to specify an unsigned value between 0 and 2^64-1. Clients can choose to use this however makes sense for their application.
- **cas** -- This flag is used to turn the PUT into a Check-And-Set operation.
- **acquire** -- This flag is used to turn the PUT into a lock acquisition operation.
- **release** -- This flag is used to turn the PUT into a lock release operation.

**Returns** Boolean & message of success or failure.

```bash
salt '*' consul.put key='web/key1' value="Hello there"
salt '*' consul.put key='web/key1' value="Hello there"
   acquire='d5d371f4-c380-5280-12fd-8810be175592'
salt '*' consul.put key='web/key1' value="Hello there"
   release='d5d371f4-c380-5280-12fd-8810be175592'
```
salt.modules.consul.session_create(consul_url=None, **kwargs)

Used to create a session.

Parameters

- **consul_url** -- The Consul server URL.
- **lockdelay** -- Duration string using a `s` suffix for seconds. The default is 15s.
- **node** -- Must refer to a node that is already registered, if specified. By default, the agent's own node name is used.
- **name** -- A human-readable name for the session
- **checks** -- A list of associated health checks. It is highly recommended that, if you override this list, you include the default `serfHealth`.
- **behavior** -- Can be set to either release or delete. This controls the behavior when a session is invalidated. By default, this is release, causing any locks that are held to be released. Changing this to delete causes any locks that are held to be deleted. delete is useful for creating ephemeral key/value entries.
- **ttl** -- Session is invalidated if it is not renewed before the TTL expires

Returns

Boolean and message indicating success or failure.

CLI Example:

```
salt '*' consul.session_create node='node1' name='my-session'
    behavior='delete' ttl='3600s'
```

salt.modules.consul.session_destroy(consul_url=None, session=None, **kwargs)

Destroy session

Parameters

- **consul_url** -- The Consul server URL.
- **session** -- The ID of the session to destroy.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `dc` parameter.

Returns

Boolean & message of success or failure.

CLI Example:

```
salt '*' consul.session_destroy session='c1c4d223-91cb-3d1f-1ee8-f2af9e7b6716'
```

salt.modules.consul.session_info(consul_url=None, session=None, **kwargs)

Information about a session

Parameters

- **consul_url** -- The Consul server URL.
- **session** -- The ID of the session to return information about.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the `dc` parameter.

Returns

Boolean & message of success or failure.

CLI Example:
salt '*_' consul.session_info session='c1c4d223-91cb-3d1f-1ee8-f2af9e7b6716'

salt.modules.consul.session_list(consul_url=None, return_list=False, **kwargs)

Used to list sessions.

Parameters

- **consul_url** -- The Consul server URL.
- **dc** -- By default, the datacenter of the agent is queried; however, the dc can be provided using the "`dc" parameter.
- **return_list** -- By default, all information about the sessions is returned, using the return_list parameter will return a list of session IDs.

Returns A list of all available sessions.

CLI Example:

```
salt '*_' consul.session_list
```

salt.modules.consul.status_leader(consul_url=None)

Returns the current Raft leader

Parameters **consul_url** -- The Consul server URL.

Returns The address of the Raft leader.

CLI Example:

```
salt '*_' consul.status_leader
```

salt.modules.consul.status_peers(consul_url)

Returns the current Raft peer set

Parameters **consul_url** -- The Consul server URL.

Returns Retrieves the Raft peers for the datacenter in which the the agent is running.

CLI Example:

```
salt '*_' consul.status_peers
```

### 31.16.46 salt.modules.container_resource

Common resources for LXC and systemd-nspawn containers

New in version 2015.8.0.

These functions are not designed to be called directly, but instead from the `lxc`, `nspawn`, and `dockerng` execution modules. They provide for common logic to be re-used for common actions.

salt.modules.container_resource.cache_file(source)

Wrapper for `cp.cache_file` which raises an error if the file was unable to be cached.

CLI Example:

```
salt myminion container_resource.cache_file salt://foo/bar/baz.txt
```

salt.modules.container_resource.copy_to(*args, **kwargs)

Common logic for copying files to containers

- **path** path to the container parent (for LXC only) default: `/var/lib/lxc` (system default)
CLI Example:
```
salt myminion container_resource.copy_to mycontainer /local/file/path /container/file/path
docker
nsenter
salt.modules.container_resource.run(*args, **kwargs)
Common logic for running shell commands in containers
```
```
path: path to the container parent (for LXC only) default: /var/lib/lxc (system default)
```
```
CLI Example:
salt myminion container_resource.run mycontainer 'ps aux' container_type=docker exec_driver=nsenter
```

31.16.47 salt.modules.cp

Minion side functions for salt-cp

salt.modules.cp.cache_dir(path, saltenv='base', include_empty=False, include_pat=None, exclude_pat=None, env=None)

Download and cache everything under a directory from the master

include_pat [None] Glob or regex to narrow down the files cached from the given path. If matching with a regex, the regex must be prefixed with E@, otherwise the expression will be interpreted as a glob.

New in version 2014.7.0.

exclude_pat [None] Glob or regex to exclude certain files from being cached from the given path. If matching with a regex, the regex must be prefixed with E@, otherwise the expression will be interpreted as a glob.

Note: If used with include_pat, files matching this pattern will be excluded from the subset of files defined by include_pat.

New in version 2014.7.0.

CLI Examples:
```
salt '*' cp.cache_dir salt://path/to/dir
salt '*' cp.cache_dir salt://path/to/dir include_pat='E@*.py$'
```

salt.modules.cp.cache_file(path, saltenv='base', env=None)

Used to cache a single file on the salt-minion Returns the location of the new cached file on the minion

CLI Example:
```
salt '*' cp.cache_file salt://path/to/file
```

salt.modules.cp.cache_files(paths, saltenv='base', env=None)

Used to gather many files from the master, the gathered files will be saved in the minion cachedir reflective to the paths retrieved from the master.

CLI Example:
```
salt '*' cp.cache_files salt://path/to/file1,salt://path/to/file1
```

salt.modules.cp.cache_local_file(path)

Cache a local file on the minion in the localfiles cache

CLI Example:
salt 'salt-master' cp.cache_local_file /etc/hosts

salt.modules.cp.cache_master(saltenv='base', env=None)
Retrieve all of the files on the master and cache them locally

CLI Example:
salt '*' cp.cache_master

salt.modules.cp.get_dir(path, dest, saltenv='base', template=None, gzip=None, env=None, **kwargs)
Used to recursively copy a directory from the salt master

CLI Example:
salt '*' cp.get_dir salt://path/to/dir/ /minion/dest

get_dir supports the same template and gzip arguments as get_file.

salt.modules.cp.get_file(path, dest, saltenv='base', makedirs=False, template=None, gzip=None, env=None, **kwargs)
Used to get a single file from the salt master

CLI Example:
salt '*' cp.get_file salt://path/to/file /minion/dest

Template rendering can be enabled on both the source and destination file names like so:
salt '*' cp.get_file "salt://{{grains.os}}/vimrc" /etc/vimrc template=jinja

This example would instruct all Salt minions to download the vimrc from a directory with the same name as their os grain and copy it to /etc/vimrc

For larger files, the cp.get_file module also supports gzip compression. Because gzip is CPU-intensive, this should only be used in scenarios where the compression ratio is very high (e.g. pretty-printed JSON or YAML files).

Use the gzip named argument to enable it. Valid values are 1..9, where 1 is the lightest compression and 9 the heaviest. 1 uses the least CPU on the master (and minion), 9 uses the most.

salt.modules.cp.get_file_str(path, saltenv='base', env=None)
Return the contents of a file from a URL

CLI Example:
salt '*' cp.get_file_str salt://my/file

salt.modules.cp.get_template(path, dest, template='jinja', saltenv='base', env=None, makedirs=False, **kwargs)
Render a file as a template before setting it down. Warning, order is not the same as in fileclient.cp for non breaking old API.

CLI Example:
salt '*' cp.get_template salt://path/to/template /minion/dest

salt.modules.cp.get_url(path, dest, saltenv='base', env=None)
Used to get a single file from a URL.

The default behaviour is to write the fetched file to the given destination path. To simply return the text contents instead, set destination to None.
CLI Example:
```
salt '*' cp.get_url salt://my/file /tmp/mine
salt '*' cp.get_url http://www.slashdot.org /tmp/index.html
```

```
salt.modules.cp.hash_file(path, saltenv='base', env=None)
Return the hash of a file, to get the hash of a file on the salt master file server prepend the path with salt://<file
on server> otherwise, prepend the file with / for a local file.

CLI Example:
salt '*' cp.hash_file salt://path/to/file
```

```
salt.modules.cp.is_cached(path, saltenv='base', env=None)
Return a boolean if the given path on the master has been cached on the minion

CLI Example:
salt '*' cp.is_cached salt://path/to/file
```

```
salt.modules.cp.list_master(saltenv='base', prefix='`, env=None)
List all of the files stored on the master

CLI Example:
salt '*' cp.list_master
```

```
salt.modules.cp.list_master_dirs(saltenv='base', prefix='`, env=None)
List all of the directories stored on the master

CLI Example:
salt '*' cp.list_master_dirs
```

```
salt.modules.cp.list_master_symlinks(saltenv='base', prefix='`, env=None)
List all of the symlinks stored on the master

CLI Example:
salt '*' cp.list_master_symlinks
```

```
salt.modules.cp.list_minion(saltenv='base', env=None)
List all of the files cached on the minion

CLI Example:
salt '*' cp.list_minion
```

```
salt.modules.cp.list_states(saltenv='base', env=None)
List all of the available state modules in an environment

CLI Example:
salt '*' cp.list_states
```

```
salt.modules.cp.push(path, keep_symlinks=False, upload_path=None)
Push a file from the minion up to the master, the file will be saved to the salt master in the master's minion
files cachedir (defaults to /var/cache/salt/master/minions/minion-id/files)
Since this feature allows a minion to push a file up to the master server it is disabled by default for security
purposes. To enable, set file_recv to True in the master configuration file, and restart the master.

keep_symlinks Keep the path value without resolving its canonical form
upload_path  Provide a different path inside the master's minion files cachedir

CLI Example:

```bash
salt '*' cp.push /etc/fstab
salt '*' cp.push /etc/system-release keep_symlinks=True
salt '*' cp.push /etc/fstab upload_path='/new/path/fstab'
```

salt.modules.cp.push_dir(path, glob=None, upload_path=None)

Push a directory from the minion up to the master, the files will be saved to the salt master in the master's minion files cachedir (defaults to /var/cache/salt/master/minions/minion-id/files). It also has a glob for matching specific files using globbing.

New in version 2014.7.0.

Since this feature allows a minion to push files up to the master server it is disabled by default for security purposes. To enable, set file_recv to True in the master configuration file, and restart the master.

upload_path  Provide a different path and directory name inside the master's minion files cachedir

CLI Example:

```bash
salt '*' cp.push /usr/lib/mysql
salt '*' cp.push /usr/lib/mysql upload_path='/newmysql/path'
salt '*' cp.push_dir /etc/modprobe.d/ glob='*.conf'
```

salt.modules.cp.recv(files, dest)

Used with salt-cp, pass the files dict, and the destination.

This function receives small fast copy files from the master via salt-cp. It does not work via the CLI.

31.16.48  salt.modules.cpan

Manage Perl modules using CPAN

New in version 2015.5.0.

salt.modules.cpan.install(module)

Install a Perl module from CPAN

CLI Example:

```bash
salt '*' cpan.install Template::Alloy
```

salt.modules.cpan.list()

List installed Perl modules, and the version installed

CLI Example:

```bash
salt '*' cpan.list
```

salt.modules.cpan.remove(module, details=False)

Attempt to remove a Perl module that was installed from CPAN. Because the cpan command doesn't actually support `uninstall`-like functionality, this function will attempt to do what it can, with what it has from CPAN.

Until this function is declared stable, USE AT YOUR OWN RISK!

CLI Example:

```bash
salt '*' cpan.remove Old::Package
```
salt.modules.cpan.show(module)
    Show information about a specific Perl module
    CLI Example:
    ```
salt '*' cpan.show Template::Alloy
    ```

salt.modules.cpan.show_config()
    Return a dict of CPAN configuration values
    CLI Example:
    ```
salt '*' cpan.show_config
    ```

31.16.49 salt.modules.cron

Work with cron
salt.modules.cron.list_tab(user)
    Return the contents of the specified user's crontab
    CLI Example:
    ```
salt '*' cron.list_tab root
    ```

salt.modules.cron.ls(user)
    Return the contents of the specified user's crontab
    CLI Example:
    ```
salt '*' cron.list_tab root
    ```

salt.modules.cron.raw_cron(user)
    Return the contents of the user's crontab
    CLI Example:
    ```
salt '*' cron.raw_cron root
    ```

salt.modules.cron.rm(user, cmd, minute=None, hour=None, daymonth=None, month=None, dayweek=None, identifier=None)
    Remove a cron job for a specified user. If any of the day/time params are specified, the job will only be removed if the specified params match.
    CLI Example:
    ```
salt '*' cron.rm_job root /usr/local/weekly
salt '*' cron.rm_job root /usr/bin/foo dayweek=1
    ```

salt.modules.cron.rm_env(user, name)
    Remove cron environment variable for a specified user.
    CLI Example:
    ```
salt '*' cron.rm_env root MAILTO
    ```

salt.modules.cron.rm_job(user, cmd, minute=None, hour=None, daymonth=None, month=None, dayweek=None, identifier=None)
    Remove a cron job for a specified user. If any of the day/time params are specified, the job will only be removed if the specified params match.
CLI Example:

```
salt '*' cron.rm_job root /usr/local/weekly
salt '*' cron.rm_job root /usr/bin/foo dayweek=1
```

```python
salt.modules.cron.set_env(user, name, value=None)
```
Set up an environment variable in the crontab.

CLI Example:

```
salt '*' cron.set_env root MAILTO user@example.com
```

```python
salt.modules.cron.set_job(user, minute, hour, daymonth, month, dayweek, cmd, comment=None, identifier=None)
```
Sets a cron job up for a specified user.

CLI Example:

```
salt '*' cron.set_job root '*' '*' '*' '*' 1 /usr/local/weekly
```

```python
salt.modules.cron.set_special(user, special, cmd)
```
Set up a special command in the crontab.

CLI Example:

```
salt '*' cron.set_special root @hourly 'echo foobar'
```

```python
salt.modules.cron.write_cron_file(user, path)
```
Writes the contents of a file to a user's crontab

CLI Example:

```
salt '*' cron.write_cron_file root /tmp/new_cron
```

```python
salt.modules.cron.write_cron_file_verbose(user, path)
```
Writes the contents of a file to a user's crontab and return error message on error

CLI Example:

```
salt '*' cron.write_cron_file_verbose root /tmp/new_cron
```

31.16.50 salt.modules.cyg

Manage cygwin packages.
Module file to accompany the cyg state.

```python
salt.modules.cyg.check_valid_package(package, cyg_arch='x86_64', mirrors=None)
```
Check if the package is valid on the given mirrors.

```python
salt.modules.cyg.install(packages=None, cyg_arch='x86_64', mirrors=None)
```
Install one or several packages.

```
packages [None] The packages to install
cyg_arch [x86_64] Specify the architecture to install the package under Current options are x86 and x86_64
```

CLI Example:

```
salt '*' cyg.install dos2unix
salt '*' cyg.install dos2unix mirrors=[{"http://mirror': 'http://url/to/public/key}]
```
salt.modules.cyg.list(`package='`', `cyg_arch='x86_64'`)  
List locally installed packages.

    package ['`'] package name to check. else all  
    cyg_arch : Cygwin architecture to use Options are x86 and x86_64  

CLI Example:

    salt '*' cyg.list

salt.modules.cyg.uninstall(`packages, `cyg_arch='x86_64', `mirrors=None`)  
Uninstall one or several packages.

    packages The packages to uninstall.  
    cyg_arch [x86_64] Specify the architecture to remove the package from Current options are x86 and x86_64  

CLI Example:

    salt '*' cyg.uninstall dos2unix  
    salt '*' cyg.uninstall dos2unix mirrors=['http://mirror': 'http://url/to/public/key']

salt.modules.cyg.update(`cyg_arch='x86_64', `mirrors=None)  
Update all packages.

    cyg_arch [x86_64] Specify the cygwin architecture update Current options are x86 and x86_64  

CLI Example:

    salt '*' cyg.update  
    salt '*' cyg.update dos2unix mirrors=['http://mirror': 'http://url/to/public/key']

31.16.51 salt.modules.daemontools

Daemontools service module. This module will create daemontools type service watcher.

This module is compatible with the service states, so it can be used to maintain services using the provider argument:

    myservice:  
        service.running:  
            - provider: daemontools

salt.modules.daemontools.available(`name`)  
Returns True if the specified service is available, otherwise returns False.

CLI Example:

    salt '*' daemontools.available foo

salt.modules.daemontools.full_restart(`name`)  
Calls daemontools.restart() function

CLI Example:

    salt '*' daemontools.full_restart <service name>

salt.modules.daemontools.get_all()  
Return a list of all available services

CLI Example:
salt '∗' daemontools.get_all

salt.modules.daemontools.missing(name)
The inverse of daemontools.available. Returns True if the specified service is not available, otherwise returns False.

CLI Example:
salt '∗' daemontools.missing foo

salt.modules.daemontools.reload(name)
Wrapper for term()

CLI Example:
salt '∗' daemontools.reload <service name>

salt.modules.daemontools.restart(name)
Restart service via daemontools. This will stop/start service

CLI Example:
salt '∗' daemontools.restart <service name>

salt.modules.daemontools.start(name)
Starts service via daemontools

CLI Example:
salt '∗' daemontools.start <service name>

salt.modules.daemontools.status(name, sig=None)
Return the status for a service via daemontools, return pid if running

CLI Example:
salt '∗' daemontools.status <service name>

salt.modules.daemontools.stop(name)
Stops service via daemontools

CLI Example:
salt '∗' daemontools.stop <service name>

salt.modules.daemontools.term(name)
Send a TERM to service via daemontools

CLI Example:
salt '∗' daemontools.term <service name>

31.16.52 salt.modules.darwin_pkgutil

Installer support for OS X.

Installer is the native .pkg/mpkg package manager for OS X.

salt.modules.darwin_pkgutil.install(source, package_id=None)
Install a .pkg from an URI or an absolute path.

CLI Example:
salt modules.darwin_pkgutil.is_installed(package_id)
Returns whether a given package id is installed.

CLI Example:
salt '*' darwin_pkgutil.is_installed com.apple.pkg.gcc4.2Leo

salt.modules.darwin_pkgutil.list()
List the installed packages.

CLI Example:
salt '*' darwin_pkgutil.list

31.16.53 salt.modules.darwin_sysctl
Module for viewing and modifying sysctl parameters

salt.modules.darwin_sysctl.assign(name, value)
Assign a single sysctl parameter for this minion

name  The name of the sysctl value to edit.
value  The sysctl value to apply.

CLI Example:
salt '*' sysctl.assign net.inet.icmp.icmplim 50

salt.modules.darwin_sysctl.get(name)
Return a single sysctl parameter for this minion

name  The name of the sysctl value to display.

CLI Example:
salt '*' sysctl.get hw.physmem

salt.modules.darwin_sysctl.persist(name, value, config='/etc/sysctl.conf', apply_change=False)
Assign and persist a simple sysctl parameter for this minion

name  The name of the sysctl value to edit.
value  The sysctl value to apply.
config  The location of the sysctl configuration file.
apply_change  Default is False; Default behavior only creates or edits the sysctl.conf file. If apply is set to True, the changes are applied to the system.

CLI Example:
salt '*' sysctl.persist net.inet.icmp.icmplim 50
salt '*' sysctl.persist coretemp_load NO config=/etc/sysctl.conf

salt.modules.darwin_sysctl.show(config_file=False)
Return a list of sysctl parameters for this minion

CLI Example:
**31.16.54 salt.modules.data**

Manage a local persistent data structure that can hold any arbitrary data specific to the minion

```python
salt.modules.data.cas(key, value, old_value)
```
Check and set a value in the minion datastore

CLI Example:
```
salt '*' data.cas <key> <value> <old_value>
```

```python
salt.modules.data.clear()
```
Clear out all of the data in the minion datastore, this function is destructive!

CLI Example:
```
salt '*' data.clear
```

```python
salt.modules.data.dump(new_data)
```
Replace the entire datastore with a passed data structure

CLI Example:
```
salt '*' data.dump '{'eggs': 'spam'}'
```

```python
salt.modules.data.get(key, default=None)
```
Get a (list of) value(s) from the minion datastore

New in version 2015.8.0.

CLI Example:
```
salt '*' data.get <key(s)>
```

```python
salt.modules.data.getval(key)
```
Get a value from the minion datastore

Deprecated since version Boron: Use get instead

CLI Example:
```
salt '*' data.getval <key>
```

```python
salt.modules.data.getvals(*keylist)
```
Get values from the minion datastore

Deprecated since version Boron: Use get instead

CLI Example:
```
salt '*' data.getvals <key> [<key> ...]
```

```python
salt.modules.data.has_key(key)
```
Check if key is in the minion datastore

New in version 2015.8.0.

CLI Example:
salt 'data has_key <mykey>

salt.modules.data.items()

Get items from the minion datastore

New in version 2015.8.0.

CLI Example:
	salt '*' data.items

salt.modules.data.keys()

Get all keys from the minion datastore

New in version 2015.8.0.

CLI Example:
	salt '*' data.keys

salt.modules.data.load()

Return all of the data in the minion datastore

CLI Example:
	salt '*' data.load

salt.modules.data.pop(key, default=None)

Pop (return & delete) a value from the minion datastore

New in version 2015.5.2.

CLI Example:
	salt '*' data.pop <key> "there was no val"

salt.modules.data.update(key, value)

Update a key with a value in the minion datastore

CLI Example:
	salt '*' data.update <key> <value>

salt.modules.data.values()

Get values from the minion datastore

New in version 2015.8.0.

CLI Example:
	salt '*' data.values

31.16.55 salt.modules.ddns

Support for RFC 2136 dynamic DNS updates.

depends

- dnspython Python module
configuration If you want to use TSIG authentication for the server, there are a couple of optional configuration parameters made available to support this (the keyname is only needed if the keyring contains more than one key):

- keyring: keyring file (default=None)
- keyname: key name in file (default=None)

The keyring file needs to be in json format and the key name needs to end with an extra period in the file, similar to this:

```
{"keyname." : "keycontent"}
```

salt.modules.ddns.add_host(zone, name, ttl, ip, nameserver='127.0.0.1', replace=True, **kwargs)
Add, replace, or update the A and PTR (reverse) records for a host.

CLI Example:

```bash
salt ns1 ddns.add_host example.com host1 60 10.1.1.1
```

salt.modules.ddns.delete(zone, name, rdtype=None, data=None, nameserver='127.0.0.1', **kwargs)
Delete a DNS record.

CLI Example:

```bash
salt ns1 ddns.delete example.com host1 A
```

salt.modules.ddns.delete_host(zone, name, nameserver='127.0.0.1', **kwargs)
Delete the forward and reverse records for a host.

Returns true if any records are deleted.

CLI Example:

```bash
salt ns1 ddns.delete_host example.com host1
```

salt.modules.ddns.update(zone, name, ttl, rdtype, data, nameserver='127.0.0.1', replace=False, **kwargs)
Add, replace, or update a DNS record. nameserver must be an IP address and the minion running this module must have update privileges on that server. If replace is true, first deletes all records for this name and type.

CLI Example:

```bash
salt ns1 ddns.update example.com host1 60 A 10.0.0.1
```

31.16.56 salt.modules.deb_apache

Support for Apache

Please note: The functions in here are Debian-specific. Placing them in this separate file will allow them to load only on Debian-based systems, while still loading under the apache namespace.

salt.modules.deb_apache.a2dismod(mod)
Runs a2dismod for the given mod.

This will only be functional on Debian-based operating systems (Ubuntu, Mint, etc).

CLI Examples:

```bash
salt '*' apache.a2dismod vhost_alias
```
salt.modules.deb_apache.a2dissite(site)
    Runs a2dissite for the given site.
    This will only be functional on Debian-based operating systems (Ubuntu, Mint, etc).
    CLI Examples:
    ```
salt '*' apache.a2dissite example.com
    ```

salt.modules.deb_apache.a2enmod(mod)
    Runs a2enmod for the given mod.
    This will only be functional on Debian-based operating systems (Ubuntu, Mint, etc).
    CLI Examples:
    ```
salt '*' apache.a2enmod vhost_alias
    ```

salt.modules.deb_apache.a2ensite(site)
    Runs a2ensite for the given site.
    This will only be functional on Debian-based operating systems (Ubuntu, Mint, etc).
    CLI Examples:
    ```
salt '*' apache.a2ensite example.com
    ```

salt.modules.deb_apache.check_mod_enabled(mod)
    Checks to see if the specific mod symlink is in /etc/apache2/mods-enabled.
    This will only be functional on Debian-based operating systems (Ubuntu, Mint, etc).
    CLI Examples:
    ```
salt '*' apache.check_mod_enabled status.conf
salt '*' apache.check_mod_enabled status.load
    ```

salt.modules.deb_apache.check_site_enabled(site)
    Checks to see if the specific Site symlink is in /etc/apache2/sites-enabled.
    This will only be functional on Debian-based operating systems (Ubuntu, Mint, etc).
    CLI Examples:
    ```
salt '*' apache.check_site_enabled example.com
    ```

31.16.57 salt.modules.deb_postgres

Module to provide Postgres compatibility to salt for debian family specific tools.

salt.modules.deb_postgres.cluster_create(version, name='main', port=None, locale=None, encoding=None, datadir=None)
    Adds a cluster to the Postgres server.
    CLI Example:
    ```
salt '*' postgres.cluster_create '9.3'
salt '*' postgres.cluster_create '9.3' 'main'
salt '*' postgres.cluster_create '9.3' locale='fr_FR'
```
salt.modules.deb_postgres.cluster_exists(version, name='main')
Checks if a given version and name of a cluster exists.

CLI Example:

```
salt '*' postgres.cluster_exists '9.3'
salt '*' postgres.cluster_exists '9.3' 'main'
```

salt.modules.deb_postgres.cluster_list(verbos=False)
Return a list of cluster of Postgress server (tuples of version and name).

CLI Example:

```
salt '*' postgres.cluster_list
salt '*' postgres.cluster_list verbose=True
```

salt.modules.deb_postgres.cluster_remove(version, name='main', stop=False)
Remove a cluster on a Postgress server. By default it doesn't try to stop the cluster.

CLI Example:

```
salt '*' postgres.cluster_remove '9.3'
salt '*' postgres.cluster_remove '9.3' 'main'
salt '*' postgres.cluster_remove '9.3' 'main' stop=True
```

31.16.58 salt.modules.debconfmod

Support for Debcconf

salt.modules.debconfmod.get_selections(fetchempty=True)
Answers to debconf questions for all packages in the following format:

```
{'package': [[{'question', 'type', 'value'}, ...]]}
```

CLI Example:

```
salt '*' debconf.get_selections
```

salt.modules.debconfmod.set(package, question, type, value, *extra)
Set answers to debconf questions for a package.

CLI Example:

```
salt '*' debconf.set <package> <question> <type> <value> [...] [...]
```

salt.modules.debconfmod.set_file(path, saltenv='base', **kwargs)
Set answers to debconf questions from a file.

CLI Example:

```
salt '*' debconf.set_file salt://path/to/pkg.selections
```

salt.modules.debconfmod.set_template(path, template, context, defaults, saltenv='base', **kwargs)
Set answers to debconf questions from a template.
path  location of the file containing the package selections

template  template format

context  variables to add to the template environment

default  default values for the template environment

CLI Example:
```
salt '*' debconf.set_template salt://path/to/pkg.selections.jinja jinja None None
```

salt.modules.debconfmod.show(name)
Answers to debconf questions for a package in the following format:
```
[{'question': 'question', 'type': 'type', 'value': 'value'}, ...]
```
If debconf doesn't know about a package, we return None.

CLI Example:
```
salt '*' debconf.show <package name>
```

### 31.16.59 salt.modules.debian_ip

The networking module for Debian based distros

References:

salt.modules.debian_ip.apply_network_settings(**settings)
Apply global network configuration.

CLI Example:
```
salt '*' ip.apply_network_settings
```

salt.modules.debian_ip.build_bond(iface, **settings)
Create a bond script in /etc/modprobe.d with the passed settings and load the bonding kernel module.

CLI Example:
```
salt '*' ip.build_bond bond0 mode=balance-alb
```

salt.modules.debian_ip.build_interface(iface, iface_type, enabled, **settings)
Build an interface script for a network interface.

CLI Example:
```
salt '*' ip.build_interface eth0 eth <settings>
```

salt.modules.debian_ip.build_network_settings(**settings)
Build the global network script.

CLI Example:
```
salt '*' ip.build_network_settings <settings>
```

salt.modules.debian_ip.build_routes(iface, **settings)
Add route scripts for a network interface using up commands.

CLI Example:
salt '*' ip.build_routes eth0 <settings>

salt.modules.debian_ip.down(iface, iface_type)
    Shutdown a network interface
    CLI Example:
    
    `salt '*' ip.down eth0 eth`

salt.modules.debian_ip.get_bond(iface)
    Return the content of a bond script
    CLI Example:
    
    `salt '*' ip.get_bond bond0`

salt.modules.debian_ip.get_interface(iface)
    Return the contents of an interface script
    CLI Example:
    
    `salt '*' ip.get_interface eth0`

salt.modules.debian_ip.get_network_settings()
    Return the contents of the global network script.
    CLI Example:
    
    `salt '*' ip.get_network_settings`

salt.modules.debian_ip.get_routes(iface)
    Return the routes for the interface
    CLI Example:
    
    `salt '*' ip.get_routes eth0`

salt.modules.debian_ip.up(iface, iface_type)
    Start up a network interface
    CLI Example:
    
    `salt '*' ip.up eth0 eth`

31.16.60 salt.modules.debian_service

Service support for Debian systems (uses update-rc.d and /sbin/service)

salt.modules.debian_service.available(name)
    Returns True if the specified service is available, otherwise returns False.
    CLI Example:
    
    `salt '*' service.available sshd`

salt.modules.debian_service.disable(name, **kwargs)
    Disable the named service to start at boot
    CLI Example:
salt '*' service.disable <service name>

```
salt.modules.debian_service.disabled(name)
    Return True if the named service is enabled, false otherwise
    CLI Example:
    salt '*' service.disabled <service name>
```

salt.modules.debian_service.enable(name, **kwargs)
    Enable the named service to start at boot
    CLI Example:
    salt '*' service.enable <service name>

salt.modules.debian_service.enabled(name, **kwargs)
    Return True if the named service is enabled, false otherwise
    CLI Example:
    salt '*' service.enabled <service name>

salt.modules.debian_service.force_reload(name)
    Force-reload the named service
    CLI Example:
    salt '*' service.force_reload <service name>

salt.modules.debian_service.get_all()
    Return all available boot services
    CLI Example:
    salt '*' service.get_all

salt.modules.debian_service.get_disabled()
    Return a set of services that are installed but disabled
    CLI Example:
    salt '*' service.get_disabled

salt.modules.debian_service.get_enabled()
    Return a list of service that are enabled on boot
    CLI Example:
    salt '*' service.get_enabled

salt.modules.debian_service.missing(name)
    The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.
    CLI Example:
    salt '*' service.missing sshd

salt.modules.debian_service.reload(name)
    Reload the named service
    CLI Example:
salt 'service name' service.reload

salt.modules.debian_service.restart(name)
    Restart the named service
    CLI Example:
    salt 'service name' service.restart

salt.modules.debian_service.start(name)
    Start the specified service
    CLI Example:
    salt 'service name' service.start

salt.modules.debian_service.status(name, sig=None)
    Return the status for a service, pass a signature to use to find the service via ps
    CLI Example:
    salt 'service name' service.status

salt.modules.debian_service.stop(name)
    Stop the specified service
    CLI Example:
    salt 'service name' service.stop

31.16.61 salt.modules.defaults

salt.modules.defaults.get(key, default=None)
    defaults.get is used much like pillar.get except that it will read a default value for a pillar from defaults.json or defaults.yaml files that are stored in the root of a salt formula.
    When called from the CLI it works exactly like pillar.get.
    CLI Example:
    salt 'core:users:root'

    When called from an SLS file, it works by first reading a defaults.json and second a defaults.yaml file. If the key exists in these files and does not exist in a pillar named after the formula, the value from the defaults file is used.

    Example core/defaults.json file for the `core` formula:

    ```json
    {
        "users": {
            "root": 0
        }
    }
    ```

    With this, from a state file you can use salt['defaults.get']('users:root') to read the `0` value from defaults.json if a core:users:root pillar key is not defined.
31.16.62  salt.modules.devmap

Device-Mapper module

salt.modules.devmap.multipath_flush(device)

Device-Mapper Multipath flush

CLI Example:

```
salt '*' devmap.multipath_flush mpath1
```

salt.modules.devmap.multipath_list()

Device-Mapper Multipath list

CLI Example:

```
salt '*' devmap.multipath_list
```

31.16.63  salt.modules.dig

Compendium of generic DNS utilities. The `dig' command line tool must be installed in order to use this module.

salt.modules.dig.A(host, nameserver=None)

Return the A record for host.

Always returns a list.

CLI Example:

```
salt ns1 dig.A www.google.com
```

salt.modules.dig.AAAA(host, nameserver=None)

Return the AAAA record for host.

Always returns a list.

CLI Example:

```
salt ns1 dig.AAAA www.google.com
```

salt.modules.dig.MX(domain, resolve=False, nameserver=None)

Return a list of lists for the MX of domain.

If the resolve argument is True, resolve IPs for the servers.

It's limited to one IP, because although in practice it's very rarely a round robin, it is an acceptable configuration and pulling just one IP lets the data be similar to the non-resolved version. If you think an MX has multiple IPs, don't use the resolver here, resolve them in a separate step.

CLI Example:

```
salt ns1 dig.MX google.com
```

salt.modules.dig.NS(domain, resolve=True, nameserver=None)

Return a list of IPs of the nameservers for domain.

If resolve is False, don't resolve names.

CLI Example:

```
salt ns1 dig.NS google.com
```
### `salt.modules.dig.SPF` *(domain, record='SPF', nameserver=None)*

Return the allowed IPv4 ranges in the SPF record for `domain`.

- If record is SPF and the SPF record is empty, the TXT record will be searched automatically. If you know the domain uses TXT and not SPF, specifying that will save a lookup.

CLI Example:
```
salt ns1 dig.SPF google.com
```

### `salt.modules.dig.TXT` *(host, nameserver=None)*

Return the TXT record for `host`.

- Always returns a list.

CLI Example:
```
salt ns1 dig.TXT google.com
```

### `salt.modules.dig.check_ip` *(addr)*

Check if address is a valid IP. Returns True if valid, otherwise False.

CLI Example:
```
salt ns1 dig.check_ip 127.0.0.1
```

### 31.16.64 `salt.modules.disk`

Module for gathering disk information

#### `salt.modules.disk.blkid` *(device=None)*

Return block device attributes: UUID, LABEL, etc. This function only works on systems where blkid is available.

CLI Example:
```
salt '*' disk.blkid
salt '*' disk.blkid /dev/sda
```

#### `salt.modules.disk_inodeusage` *(args=None)*

Return inode usage information for volumes mounted on this minion

CLI Example:
```
salt '*' disk_inodeusage
```

#### `salt.modules.disk.percent` *(args=None)*

Return partition information for volumes mounted on this minion

CLI Example:
```
salt '*' disk.percent /var
```

#### `salt.modules.disk.usage` *(args=None)*

Return usage information for volumes mounted on this minion

CLI Example:
```
salt '*' disk.usage
```
31.16.65 salt.modules.djangomod

Manage Django sites

```python
salt.modules.djangomod.collectstatic(settings_module, bin_env=None, no_post_process=False,
ignore=None, dry_run=False, clear=False, link=False,
no_default_ignore=False, pythonpath=None, env=None)
```

Collect static files from each of your applications into a single location that can easily be served in production.

CLI Example:
```
salt '*' django.collectstatic <settings_module>
```

```python
salt.modules.djangomod.command(settings_module, command, bin_env=None, pythonpath=None,
env=None, *args, **kwargs)
```

Run arbitrary django management command

CLI Example:
```
salt '*' django.command <settings_module> <command>
```

```python
salt.modules.djangomod.createsuperuser(settings_module, username, email, bin_env=None,
database=None, pythonpath=None, env=None)
```

Create a super user for the database. This function defaults to use the --noinput flag which prevents the creation of a password for the superuser.

CLI Example:
```
salt '*' django.createsuperuser <settings_module> user user@example.com
```

```python
salt.modules.djangomod.loaddata(settings_module, fixtures, bin_env=None, database=None,
pythonpath=None, env=None)
```

Load fixture data

**Fixtures**: comma separated list of fixtures to load

CLI Example:
```
salt '*' django.loaddata <settings_module> <comma delimited list of fixtures>
```

```python
salt.modules.djangomod.syncdb(settings_module, bin_env=None, migrate=False, database=None,
pythonpath=None, env=None, noinput=True)
```

Run syncdb

Execute the Django-Admin syncdb command, if South is available on the minion the migrate option can be passed as True calling the migrations to run after the syncdb completes

CLI Example:
```
salt '*' django.syncdb <settings_module>
```

31.16.66 salt.modules.dnsmasq

Module for managing dnsmasq

```python
salt.modules.dnsmasq.fullversion()
```

Shows installed version of dnsmasq and compile options.

CLI Example:
```
```
salt ' '*' dnsmasq.version

salt.modules.dnsmasq.get_config(config_file='/etc/dnsmasq.conf')
Dumps all options from the config file.

CLI Examples:

    salt '*' dnsmasq.get_config
    salt '*' dnsmasq.get_config file=/etc/dnsmasq.conf

salt.modules.dnsmasq.set_config(config_file='/etc/dnsmasq.conf', follow=True, **kwargs)
Sets a value or a set of values in the specified file. By default, if conf-dir is configured in this file, salt will
attempt to set the option in any file inside the conf-dir where it has already been enabled. If it does not find it
inside any files, it will append it to the main config file. Setting follow to False will turn off this behavior.

If a config option currently appears multiple times (such as dhcp-host, which is specified at least once per
host), the new option will be added to the end of the main config file (and not to any includes). If you need an
option added to a specific include file, specify it as the config_file.

CLI Examples:

    salt '*' dnsmasq.set_config domain=mydomain.com
    salt '*' dnsmasq.set_config follow=False domain=mydomain.com
    salt '*' dnsmasq.set_config file=/etc/dnsmasq.conf domain=mydomain.com

salt.modules.dnsmasq.version()
Shows installed version of dnsmasq.

CLI Example:

    salt '*' dnsmasq.version

31.16.67 salt.modules.dnsutil

Compendium of generic DNS utilities

salt.modules.dnsutil.A(host, nameserver=None)
Return the A record(s) for host.
Always returns a list.

CLI Example:

    salt ns1 dnsutil.A www.google.com

salt.modules.dnsutil.AAAA(host, nameserver=None)
Return the AAAA record(s) for host.
Always returns a list.
New in version 2014.7.5.

CLI Example:

    salt ns1 dnsutil.AAAA www.google.com

salt.modules.dnsutil.MX(domain, resolve=False, nameserver=None)
Return a list of lists for the MX of domain.

If the `resolve` argument is True, resolve IPs for the servers.
It's limited to one IP, because although in practice it's very rarely a round robin, it is an acceptable configuration and pulling just one IP lets the data be similar to the non-resolved version. If you think an MX has multiple IPs, don't use the resolver here, resolve them in a separate step.

CLI Example:

```bash
salt ns1 dig.MX google.com
```

**salt.modules.dnsutil.NS** *(domain, resolve=True, nameserver=None)*

Return a list of IPs of the nameservers for domain.

If `resolve` is False, don't resolve names.

CLI Example:

```bash
salt ns1 dig.NS google.com
```

**salt.modules.dnsutil.SPF** *(domain, record='SPF', nameserver=None)*

Return the allowed IPv4 ranges in the SPF record for domain.

If record is SPF and the SPF record is empty, the TXT record will be searched automatically. If you know the domain uses TXT and not SPF, specifying that will save a lookup.

CLI Example:

```bash
salt ns1 dig.SPF google.com
```

**salt.modules.dnsutil.check_ip** *(ip_addr)*

Check that string `ip_addr` is a valid IP.

CLI Example:

```bash
salt ns1 dig.check_ip 127.0.0.1
```

**salt.modules.dnsutil.hosts_append** *(hostsfile='/etc/hosts', ip_addr=None, entries=None)*

Append a single line to the `/etc/hosts` file.

CLI Example:

```bash
salt '*' dnsutil.hosts_append /etc/hosts 127.0.0.1 ad1.yuk.co,ad2.yuk.co
```

**salt.modules.dnsutil.hosts_remove** *(hostsfile='/etc/hosts', entries=None)*

Remove a host from the `/etc/hosts` file. If doing so will leave a line containing only an IP address, then the line will be deleted. This function will leave comments and blank lines intact.

CLI Examples:

```bash
salt '*' dnsutil.hosts_remove /etc/hosts ad1.yuk.co
salt '*' dnsutil.hosts_remove /etc/hosts ad2.yuk.co,ad1.yuk.co
```

**salt.modules.dnsutil.parse_hosts** *(hostsfile='/etc/hosts', hosts=None)*

Parse `/etc/hosts` file.

CLI Example:

```bash
salt '*' dnsutil.parse_hosts
```

**salt.modules.dnsutil.parse_zone** *(zonefile=None, zone=None)*

Parses a zone file. Can be passed raw zone data on the API level.

CLI Example:
salt.modules.dnsutil.parse_zone /var/lib/named/example.com.zone

salt.modules.dnsutil.serial(zone='`, update=False)

Return, store and update a dns serial for your zone files.
zone: a keyword for a specific zone
update: store an updated version of the serial in a grain
If update is False, the function will retrieve an existing serial or return the current date if no serial is stored. Nothing will be stored
If update is True, the function will set the serial to the current date if none exist or if the existing serial is for a previous date. If a serial for greater than the current date is already stored, the function will increment it.
This module stores the serial in a grain, you can explicitly set the stored value as a grain named dnsserial_<zone_name>.

CLI Example:
salt ns1 dnsutil.serial example.com

31.16.68 salt.modules.dockerio

Management of Docker Containers
New in version 2014.1.0.
Deprecated since version 2015.8.0: Future feature development will be done only in docker-ng. See the documentation for this module for information on the deprecation path.

Note: The DockerIO integration is still in beta; the API is subject to change

General Notes
As we use states, we don’t want to be continuously popping dockers, so we will map each container id (or image) with a grain whenever it is relevant.
As a corollary, we will resolve a container id either directly by the id or try to find a container id matching something stocked in grain.

Installation Prerequisites

- You will need the docker-py python package in your python installation path that is running salt. Its version should support Docker Remote API v1.12.
Currently, docker-py 0.5.0 is known to support Docker Remote API v1.12

    pip install docker-py==0.5.0

Prerequisite Pillar Configuration for Authentication

- To push or pull you will need to be authenticated as the docker-py bindings require it
- For this to happen, you will need to configure a mapping in the pillar representing your per URL authentication bits:

```yaml
docker-registries:
  registry_url:
    email: foo@foo.com
    password: s3cr3t
    username: foo
```

- You need at least an entry to the default docker index:

```yaml
docker-registries:
  https://index.docker.io/v1/:
    email: foo@foo.com
    password: s3cr3t
    username: foo
```

- You can define multiple registry blocks for them to be aggregated. The only thing to keep in mind is that their ID must finish with `-docker-registries`:

```yaml
ac-docker-registries:
  https://index.bar.io/v1/:
    email: foo@foo.com
    password: s3cr3t
    username: foo

ab-docker-registries:
  https://index.foo.io/v1/:
    email: foo@foo.com
    password: s3cr3t
    username: foo
```

This could be also written as:

```yaml
docker-registries:
  https://index.bar.io/v1/:
    email: foo@foo.com
    password: s3cr3t
    username: foo
  https://index.foo.io/v1/:
    email: foo@foo.com
    password: s3cr3t
    username: foo
```

**Methods**

- Registry Dialog
  - login
  - push
  - pull

- Docker Management
  - version
  - info

- Image Management
- search
- inspect_image
- get_images
- remove_image
- import_image
- build
- tag
- save
- load

- Container Management
- start
- stop
- restart
- kill
- wait
- get_containers
- inspect_container
- remove_container
- is_running
- top
- port
- logs
- diff
- commit
- create_container
- export
- get_container_root

Runtime Execution within a specific, already existing/running container

Idea is to use lxc-attach to execute inside the container context. We do not want to use docker run but want to execute something inside a running container.

These are the available methods:

- retcode
- run
- run_all
- run_stderr
- `run_stdout`
- `script`
- `script_retcode`

salt.modules.dockerio.build(path=None, tag=None, quiet=False, fileobj=None, nocache=False, rm=True, timeout=None)

Build a docker image from a dockerfile or an URL

- **path** url/branch/docker_dir or path on the filesystem to the dockerfile
- **tag** tag of the image
- **quiet** quiet mode, Default is False
- **nocache** do not use docker image cache, Default is False
- **rm** remove intermediate commits, Default is True
- **timeout** timeout value before aborting (in seconds)

CLI Example:

```
salt '*' docker.build vieux/apache
salt '*' docker.build github.com/creack/docker-firefox
```

salt.modules.dockerio.commit(container, repository=None, tag=None, message=None, author=None, conf=None)

Commit a container (promotes it to an image)

- **container** container id
- **repository** repository/image to commit to
- **tag** tag of the image (Optional)
- **message** commit message (Optional)
- **author** author name (Optional)
- **conf** conf (Optional)

CLI Example:

```
salt '*' docker.commit <container id>
```

salt.modules.dockerio.create_container(image, command=None, hostname=None, user=None, detach=True, stdin_open=False, tty=False, mem_limit=0, ports=None, environment=None, dns=None, volumes=None, volumes_from=None, name=None, cpu_shares=None, cpuset=None, binds=None)

Create a new container

- **image** image to create the container from
- **command** command to execute while starting
- **hostname** hostname of the container
- **user** user to run docker as
- **detach** daemon mode, Default is True
- **environment** environment variable mapping ({{'foo':'BAR'}})
- **ports** port redirections ({{'222': {}}})
volumes  list of volume mappings in either local volume, bound volume, or read-only bound volume form:

     (['/var/lib/mysql/', '/usr/local/etc:/etc/ssl', '/etc/passwd:/etc/passwd:ro'])

binds  complete dictionary of bound volume mappings:

     { '/usr/local/etc/ssl/certs/internal.crt': {'bind': '/etc/ssl/certs/com.example.internal.crt', 'ro': True}, '/var/lib/mysql': { 'bind': '/var/lib/mysql/', 'ro': False} }

This dictionary is suitable for feeding directly into the Docker API, and all keys are required. (see http://docker-py.readthedocs.org/en/latest/volumes/)

tty  attach ttys, Default is False
stdin_open  let stdin open, Default is False
name  name given to container

CPU shares (relative weight)
cpuset  CPUs in which to allow execution ('0-3' or '0,1')

CLI Example:

salt '*' docker.create_container o/ubuntu volumes=['/s','/m:/f']

31.16. Full list of builtin execution modules 799
salt.modules.dockerio.get_container_root(container)

Get the container rootfs path

container container id or grain

CLI Example:

    salt '*' docker.get_container_root <container id>

salt.modules.dockerio.get_containers(all=True, trunc=False, since=None, before=None, limit=1, host=False, inspect=False)

Get a list of mappings representing all containers

all return all containers, Default is True

trunc set it to True to have the short ID, Default is False

host include the Docker host's ipv4 and ipv6 address in return, Default is False

inspect Get more granular information about each container by running a docker inspect

CLI Example:

    salt '*' docker.get_containers
    salt '*' docker.get_containers host=True
    salt '*' docker.get_containers host=True inspect=True

salt.modules.dockerio.get_images(name=None, quiet=False, all=True)

List docker images

name repository name

quiet only show image id, Default is False

all show all images, Default is True

CLI Example:

    salt '*' docker.get_images <name> [quiet=True|False] [all=True|False]

salt.modules.dockerio.import_image(src, repo, tag=None)

Import content from a local tarball or a URL to a docker image

src content to import (URL or absolute path to a tarball)

repo repository to import to

tag set tag of the image (Optional)

CLI Example:

    salt '*' docker.import_image <src> <repo> [tag]

salt.modules.dockerio.info()

Get the version information about docker. This is similar to docker info command

CLI Example:

    salt '*' docker.info

salt.modules.dockerio.inspect_container(container)

Get container information. This is similar to docker inspect command but only for containers

container container id
CLI Example:

```bash
clear
salt '*' docker.inspect_container <container id>
```

**salt.modules.dockerio.inspect_image**(*image*)

Inspect the status of an image and return relative data. This is similar to docker inspect command but only for images

*image* name of the image

CLI Example:

```bash
clear
salt '*' docker.inspect_image <image>
```

**salt.modules.dockerio.is_running**(*container*)

Check if the specified container is running

*container* container id

Returns True if container is running otherwise returns False

CLI Example:

```bash
clear
salt '*' docker.is_running <container id>
```

**salt.modules.dockerio.kill**(*container, signal=None*)

Kill a running container

*container* container id

*signal* signal to send

New in version 2015.8.0.

CLI Example:

```bash
clear
salt '*' docker.kill <container id>
```

**salt.modules.dockerio.load**(*imagepath*)

Load the specified file at imagepath into docker that was generated from a docker save command e.g. docker load < imagepath

*imagepath* imagepath to docker tar file

CLI Example:

```bash
clear
salt '*' docker.load /path/to/image
```

**salt.modules.dockerio.login**(*url=None, username=None, password=None, email=None*)

Wrapper to the docker.py login method (does not do much yet)

*url* registry url to authenticate to

*username* username to authenticate

*password* password to authenticate

*email* email to authenticate

CLI Example:

```bash
clear
salt '*' docker.login <url> <username> <password> <email>
```

**salt.modules.dockerio.logs**(*container*)

Return logs for a specified container
container  container id

CLI Example:
```
salt '*' docker.logs <container id>
```

```
salt.modules.dockerio.port(container, private_port)
```

Private port mapping allocation information. This method is broken on docker-py side. Just use the result of inspect to mangle port allocation

container  container id

private_port  private port on the container to query for

CLI Example:
```
salt '*' docker.port <container id> <private port>
```

```
salt.modules.dockerio.pull(repo, tag=None, insecure_registry=False)
```

Pulls an image from any registry. See documentation at top of this page to configure authenticated access

repo  name of repository

tag  specific tag to pull (Optional)

insecure_registry  set as True to use insecure (non HTTPS) registry. Default is False (only available if using docker-py >= 0.5.0)

CLI Example:
```
salt '*' docker.pull <repository> [tag]
```

```
salt.modules.dockerio.push(repo, tag=None, quiet=False, insecure_registry=False)
```

Pushes an image to any registry. See documentation at top of this page to configure authenticated access

repo  name of repository

tag  specific tag to push (Optional)

quiet  set as True to quiet output, Default is False

insecure_registry  set as True to use insecure (non HTTPS) registry. Default is False (only available if using docker-py >= 0.5.0)

CLI Example:
```
salt '*' docker.push <repository> [tag] [quiet=True|False]
```

```
salt.modules.dockerio.remove_container(container, force=False, v=False)
```

Remove a container from a docker installation

container  container id

force  remove a running container, Default is False

v  remove the volumes associated to the container, Default is False

CLI Example:
```
salt '*' docker.remove_container <container id> [force=True|False] [v=True|False]
```

```
salt.modules.dockerio.remove_image(image)
```

Remove an image from a system.

image  name of image
CLI Example:
```bash
salt '*' docker.remove_image <image>
```

salt.modules.dockerio.restart(containter, timeout=10)

- Restart a running container
  - `container` container id
  - `timeout` timeout for container to exit gracefully before killing it, Default is 10 seconds

CLI Example:
```bash
salt '*' docker.restart <container id> [timeout=20]
```

salt.modules.dockerio.retcode(containter, cmd)

- Wrapper for cmdmod.retcode inside a container context
  - `container` container id (or grain)
  - `cmd` command to execute

**Note:** The return is a bit different as we use the docker struct. Output of the command is in `out` and result is `False` if command failed to execute.

**Warning:** Be advised that this function allows for raw shell access to the named container! If allowing users to execute this directly it may allow more rights than intended!

CLI Example:
```bash
salt '*' docker.retcode <container id> 'ls -l /etc'
```

salt.modules.dockerio.run(containter, cmd)

- Wrapper for cmdmod.run inside a container context
  - `container` container id (or grain)
  - `cmd` command to execute

**Note:** The return is a bit different as we use the docker struct. Output of the command is in `out` and result is `True`.

**Warning:** Be advised that this function allows for raw shell access to the named container! If allowing users to execute this directly it may allow more rights than intended!

CLI Example:
```bash
salt '*' docker.run <container id> 'ls -l /etc'
```

salt.modules.dockerio.run_all(containter, cmd)

- Wrapper for cmdmod.run_all inside a container context
  - `container` container id (or grain)
  - `cmd` command to execute

**Note:** The return is a bit different as we use the docker struct. Output of the command is in `out` and result is `False` if command failed to execute.
Warning: Be advised that this function allows for raw shell access to the named container! If allowing users to execute this directly it may allow more rights than intended!

CLI Example:
```
salt '*' docker.run_all <container id> 'ls -l /etc'
```

```
salt.modules.dockerio.run_stderr(container, cmd)
    Wrapper for cmdmod.run_stderr inside a container context
    container  container id (or grain)
    cmd        command to execute

    Note: The return is a bit different as we use the docker struct. Output of the command is in `out` and result is always True.
```

Warning: Be advised that this function allows for raw shell access to the named container! If allowing users to execute this directly it may allow more rights than intended!

CLI Example:
```
salt '*' docker.run_stderr <container id> 'ls -l /etc'
```

```
salt.modules.dockerio.run_stdout(container, cmd)
    Wrapper for cmdmod.run_stdout inside a container context
    container  container id (or grain)
    cmd        command to execute

    Note: The return is a bit different as we use the docker struct. Output of the command is in `out` and result is always True.
```

Warning: Be advised that this function allows for raw shell access to the named container! If allowing users to execute this directly it may allow more rights than intended!

CLI Example:
```
salt '*' docker.run_stdout <container id> 'ls -l /etc'
```

```
salt.modules.dockerio.save(image, filename)
    New in version 2015.5.0.
    Save the specified image to filename from docker e.g. docker save image > filename
    image  name of image
    filename  The filename of the saved docker image

    CLI Example:
```
salt '*' docker.save arch_image /path/to/save/image
```

```
salt.modules.dockerio.script(container, source, args=None, cwd=None, stdin=None, runas=None, shell='/bin/bash', env=None, template='jinja', umask=None, timeout=None, reset_system_locale=True, no_clean=False, saltenv='base')
```
Wrapper for `cmdmod.script` inside a container context

**container** container id (or grain)

**additional parameters** See `cmd.script`

**Warning:** Be advised that this function allows for raw shell access to the named container! If allowing users to execute this directly it may allow more rights than intended!

Download a script from a remote location and execute the script in the container. The script can be located on the salt master file server or on an HTTP/FTP server.

The script will be executed directly, so it can be written in any available programming language.

The script can also be formatted as a template, the default is jinja. Arguments for the script can be specified as well.

**CLI Example:**

```
salt '*' docker.script <container id> salt://docker_script.py
salt '*' docker.script <container id> salt://scripts/runme.sh 'arg1 arg2 "arg 3"'
salt '*' docker.script <container id> salt://scripts/windows_task.ps1 args=' -Input c:\tmp\infile.txt'
```

A string of standard input can be specified for the command to be run using the stdin parameter. This can be useful in cases where sensitive information must be read from standard input:

**CLI Example:**

```
salt '*' docker.script <container id> salt://scripts/runme.sh stdin='one	two
three
four
five'
```

salt.modules.dockerio.script_retcode(`container`, `source`, `cwd=None`, `runas=None`,
`shell='/bin/bash', env=None, `template='jinja'
`umask=None, `timeout=None`, `reset_system_locale=True`,
`no_clean=False`, `saltenv='base'`)  

Wrapper for `cmdmod.script_retcode` inside a container context

**container** container id (or grain)

**additional parameters** See `cmd.script_retcode`

**Warning:** Be advised that this function allows for raw shell access to the named container! If allowing users to execute this directly it may allow more rights than intended!

**CLI Example:**

```
salt '*' docker.script_retcode <container id> salt://docker_script.py
```

salt.modules.dockerio.search(`term`)  
Search for an image on the registry

**term** search keyword

**CLI Example:**

```
salt '*' docker.search <term>
```

salt.modules.dockerio.start(`container`, `binds=None`, `port_bindings=None`,
`lxc_conf=None, publish_all_ports=None`, `links=None`, privileged=False, `dns=None`,
`volumes_from=None`, `network_mode=None`, `restart_policy=None`,
`cap_add=None`, `cap_drop=None`)  
Start the specified container
```python
container  container id

CLI Example:
salt '*' docker.start <container id>

salt.modules.dockerio.stop(container, timeout=10)
Stop a running container

container  container id
timeout  timeout for container to exit gracefully before killing it, Default is 10 seconds

CLI Example:
salt '*' docker.stop <container id> [timeout=20]

salt.modules.dockerio.tag(image, repository, tag=None, force=False)
Tag an image into a repository

image  name of image
repository  name of repository
tag  tag to apply (Optional)
force  force apply tag. Default is False

CLI Example:
salt '*' docker.tag <image> <repository> [tag] [force=True|False]

salt.modules.dockerio.top(container)
Run the docker top command on a specific container

container  container id

CLI Example:
salt '*' docker.top <container id>

salt.modules.dockerio.version()
Get docker version

CLI Example:
salt '*' docker.version

salt.modules.dockerio.wait(container)
Wait for a container to exit gracefully

container  container id

CLI Example:
salt '*' docker.wait <container id>
```

### 31.16.69 salt.modules.dockerng

Management of Docker Containers

New in version 2015.8.0.
Why Make a Second Docker Module?

We have received a lot of feedback on our Docker support. In the process of implementing recommended improvements, it became obvious that major changes needed to be made to the functions and return data. In the end, a complete rewrite was done.

The changes being too significant, it was decided that making a separate execution module and state module (called dockerng) would be the best option. This will give users a couple release cycles to modify their scripts, SLS files, etc. to use the new functionality, rather than forcing users to change everything immediately.

In the Carbon release of Salt (due early 2016), this execution module will take the place of the default Docker execution module, and backwards-compatible naming will be maintained for a couple releases after that to allow users time to replace references to dockerng with docker.

Installation Prerequisites

This execution module requires at least version 1.0.0 of both docker-py and Docker. docker-py can easily be installed using pip.install:

```
salt myminion pip.install docker-py
```

Authentication

To push or pull images, credentials must be configured. Because a password must be used, it is recommended to place this configuration in Pillar data. The configuration schema is as follows:

```python
docker-registries:
    <registry_url>:
        email: <email_address>
        password: <password>
        username: <username>
```

For example:

```python
docker-registries:
    https://index.docker.io/v1/:
        email: foo@foo.com
        password: s3cr3t
        username: foo
```

Multiple registries can be configured. This can be done in one of two ways. The first way is to configure each registry under the docker-registries pillar key.

```python
docker-registries:
    https://index.foo.io/v1/:
        email: foo@foo.com
        password: s3cr3t
        username: foo
    https://index.bar.io/v1/:
        email: foo@foo.com
        password: s3cr3t
        username: foo
```

The second way is to use separate pillar variables ending in -docker-registries:
foo-docker-registries:
  https://index.foo.io/v1/:
  email: foo@foo.com
  password: s3cr3t
  username: foo

bar-docker-registries:
  https://index.bar.io/v1/:
  email: foo@foo.com
  password: s3cr3t
  username: foo

Both methods can be combined; any registry configured under docker-registries or *-docker-registries will be detected.

Configuration Options

The following options can be set in the minion config:

- `docker.url`: URL to the docker service (default: local socket).
- `docker.version`: API version to use (default: currently 1.4 API).
- `docker.exec_driver`: Execution driver to use, one of the following:
  - nsenter
  - lxc-attach
  - docker-exec

See *Executing Commands Within a Running Container*.

Functions

- Information Gathering
  - `dockerng.depends`
  - `dockerng.diff`
  - `dockerng.exists`
  - `dockerng.history`
  - `dockerng.images`
  - `dockerng.info`
  - `dockerng.inspect`
  - `dockerng.inspect_container`
  - `dockerng.inspect_image`
  - `dockerng.list_containers`
  - `dockerng.list_tags`
  - `dockerng.logs`
  - `dockerng.pid`
  - `dockerng.port`
- dockerng.ps
- dockerng.state
- dockerng.search
- dockerng.top
- dockerng.version

• **Container Management**
  - dockerng.create
  - dockerng.copy_from
  - dockerng.copy_to
  - dockerng.export
  - dockerng.rm

• **Management of Container State**
  - dockerng.kill
  - dockerng.pause
  - dockerng.restart
  - dockerng.start
  - dockerng.stop
  - dockerng.unpause
  - dockerng.wait

• **Image Management**
  - dockerng.build
  - dockerng.commit
  - dockerng.dangling
  - dockerng.import
  - dockerng.load
  - dockerng.pull
  - dockerng.push
  - dockerng.rmi
  - dockerng.save
  - dockerng.tag

**Executing Commands Within a Running Container**

Multiple methods exist for executing commands within Docker containers:

- **lxc-attach**: Default for older versions of docker
- **nsenter**: Enters container namespace to run command
- **docker-exec**: Native support for executing commands in Docker containers (added in Docker 1.3)
Adding a configuration option (see `config.get`) called `docker.exec_driver` will tell Salt which execution driver to use:

```
docker.exec_driver: docker-exec
```

If this configuration option is not found, Salt will use the appropriate interface (either `nsenter` or `lxc-attach`) based on the `Execution Driver` value returned from `docker info`. `docker-exec` will not be used by default, as it is presently (as of version 1.6.2) only able to execute commands as the effective user of the container. Thus, if a `USER` directive was used to run as a non-privileged user, `docker-exec` would be unable to perform the action as root. Salt can still use `docker-exec` as an execution driver, but must be explicitly configured (as in the example above) to do so at this time.

If possible, try to manually specify the execution driver, as it will save Salt a little work.

This execution module provides functions that shadow those from the `cmd` module. They are as follows:

- `dockerng.retcode`
- `dockerng.run`
- `dockerng.run_all`
- `dockerng.run_stderr`
- `dockerng.run_stdout`
- `dockerng.script`
- `dockerng.script_retcode`

**Detailed Function Documentation**

### `salt.modules.dockerng.build`(`path=None, image=None, cache=True, rm=True, api_response=False, fileobj=None`) Build a docker image from a Dockerfile or a URL

- **path** Path to directory on the Minion containing a Dockerfile
- **image** Image to be built, in `repo:tag` notation. If just the repository name is passed, a tag name of `latest` will be assumed. If building from a URL, this parameter can be omitted.
- **cache** [True] Set to `False` to force the build process not to use the Docker image cache, and pull all required intermediate image layers
- **rm** [True] Remove intermediate containers created during build
- **api_response** [False] If `True`: an `API_Response` key will be present in the return data, containing the raw output from the Docker API.
- **fileobj** Allows for a file-like object containing the contents of the Dockerfile to be passed in place of a file `path` argument. This argument should not be used from the CLI, only from other Salt code.

**RETURN DATA**

A dictionary containing one or more of the following keys:

- **Id** - ID of the newly-built image
- **Time_Elapsed** - Time in seconds taken to perform the build
- **Intermediate_Containers** - IDs of containers created during the course of the build process
  
  *(Only present if `rm=False`)*
- **Images** - A dictionary containing one or more of the following keys:
– Already_Pulled - Layers that were already present on the Minion
– Pulled - Layers that were pulled
(Only present if the image specified by the "image" argument was not present on the Minion, or if cache=False)

• Status - A string containing a summary of the pull action (usually a message saying that an image was downloaded, or that it was up to date).
(Only present if the image specified by the "image" argument was not present on the Minion, or if cache=False)

CLI Example:
salt myminion dockerng.build /path/to/docker/build/dir image=myimage:dev
salt myminion dockerng.build https://github.com/myuser/myrepo.git image=myimage:latest

salt.modules.dockerng.commit(name, image, message=None, author=None)
Commits a container, thereby promoting it to an image. Equivalent to running the docker commit Docker CLI command.

name Container name or ID to commit
image Image to be committed, in repo:tag notation. If just the repository name is passed, a tag name of latest will be assumed.
message Commit message (Optional)
author Author name (Optional)

RETURN DATA
A dictionary containing the following keys:

• Id - ID of the newly-created image
• Image - Name of the newly-created image
• Time_Elapsed - Time in seconds taken to perform the commit

CLI Example:
salt myminion dockerng.commit mycontainer myuser/myimage
salt myminion dockerng.commit mycontainer myuser/myimage:mytag

salt.modules.dockerng.copy_from(name, *args, **kwargs)
Copy a file from inside a container to the Minion

name Container name
source Path of the file on the container's filesystem
dest Destination on the Minion. Must be an absolute path. If the destination is a directory, the file will be copied into that directory.
overwrite [False] Unless this option is set to True, then if a file exists at the location specified by the dest argument, an error will be raised.
makedirs [False] Create the parent directory on the container if it does not already exist.

RETURN DATA
A boolean (True if successful, otherwise False)

CLI Example:
salt myminion docker-ng.copy_from mycontainer /var/log/nginx/access.log /home/myuser

salt.modules.docker-ng.copy_to(name, *args, **kwargs)
Copy a file from the host into a container

name  Container name

source  File to be copied to the container. Can be a local path on the Minion or a remote file from the Salt fileserver.

dest  Destination on the container. Must be an absolute path. If the destination is a directory, the file will be copied into that directory.

exec_driver  [None] If not passed, the execution driver will be detected as described above.

overwrite  [False] Unless this option is set to True, then if a file exists at the location specified by the dest argument, an error will be raised.

makedirs  [False] Create the parent directory on the container if it does not already exist.

RETURN DATA
A boolean (True if successful, otherwise False)

CLI Example:
salt myminion docker-ng.copy_to mycontainer /tmp/foo /root/foo

salt.modules.docker-ng.create(*args, **kwargs)
Create a new container

name  Name for the new container. If not provided, Docker will randomly generate one for you.

image  Image from which to create the container

command  Command to run in the container

Example: command=bash

hostname  Hostname of the container. If not provided, and if a name has been provided, the hostname will default to the name that was passed.

Example: hostname=web1

Warning: If the container is started with network_mode=host, the hostname will be overridden by the hostname of the Minion.

domainname  Domain name of the container

Example: domainname=domain.tld

interactive  [False] Leave stdin open

Example: interactive=True

tty  [False] Attach TTYs

Example: tty=True

detach  [True] If True, run command in the background (daemon mode)

Example: detach=False

user  User under which to run docker

Example: user=foo
memory  [0] Memory limit. Can be specified in bytes or using single-letter units (i.e. 512M, 2G, etc.). A value of 0 (the default) means no memory limit.
Example: memory=512M, memory=1073741824

memory_swap  [-1] Total memory limit (memory plus swap). Set to -1 to disable swap. A value of 0 means no swap limit.
Example: memory_swap=1G, memory_swap=2147483648

mac_address  MAC address to use for the container. If not specified, a random MAC address will be used.
Example: mac_address=01:23:45:67:89:0a

network_disabled  [False] If True, networking will be disabled within the container.
Example: network_disabled=True

working_dir  Working directory inside the container
Example: working_dir=/var/log/nginx

entrypoint  Entrypoint for the container. Either a string (e.g. "mycmd --arg1 --arg2") or a Python list (e.g. "['mycmd', '--arg1', '--arg2']")
Example: entrypoint="cat access.log"

environment  Either a dictionary of environment variable names and their values, or a Python list of strings in the format VARNAME=value.
Example: "{'VAR1': 'value', 'VAR2': 'value'}", "['VAR1=value', 'VAR2=value']"

ports  A list of ports to expose on the container. Can be passed as comma-separated list or a Python list. If the protocol is omitted, the port will be assumed to be a TCP port.
Example: 1111,2222/udp, "['1111/tcp', '2222/udp']"

volumes  [None] List of directories to expose as volumes. Can be passed as a comma-separated list or a Python list.
Example: volumes=/mnt/vol1,/mnt/vol2, volumes="[/mnt/vol1, /mnt/vol2]"

cpu_shares  CPU shares (relative weight)
Example: cpu_shares=0.5, cpu_shares=1

cpuset  CPUs on which which to allow execution, specified as a string containing a range (e.g. 0-3) or a comma-separated list of CPUs (e.g. 0,1).
Example: cpuset="0-3", cpuset="0,1"

client_timeout  Timeout in seconds for the Docker client. This is not a timeout for this function, but for receiving a response from the API.

Note: This is only used if Salt needs to pull the requested image.

RETURN DATA
A dictionary containing the following keys:
•Id - ID of the newly-created container
•Name - Name of the newly-created container

CLI Example:
# Create a data-only container
```
salt myminion dockerng.create myuser/mycontainer volumes="/mnt/vol1,/mnt/vol2"
```

# Create a CentOS 7 container that will stay running once started
```
salt myminion dockerng.create centos:7 name=mycent7 interactive=True tty=True command=bash
```

salt.modules.dockerng.dangling(prune=False, force=False)

Return top-level images (those on which no other images depend) which do not have a tag assigned to them. These include:

- Images which were once tagged but were later untagged, such as those which were superseded by committing a new copy of an existing tagged image.
- Images which were loaded using `docker.load` (or the `docker load` Docker CLI command), but not tagged.

**prune** [False] Remove these images

**force** [False] If True, and if prune=True, then forcibly remove these images.

**RETURN DATA**

If prune=False, the return data will be a list of dangling image IDs.

If prune=True, the return data will be a dictionary with each key being the ID of the dangling image, and the following information for each image:

- **Comment** - Any error encountered when trying to prune a dangling image
  
  *(Only present if prune failed)*

- **Removed** - A boolean (True if prune was successful, False if not)

**CLI Example:**
```
salt myminion dockerng.dangling
salt myminion dockerng.dangling prune=True
```

salt.modules.dockerng.depends(name)

Returns the containers and images, if any, which depend on the given image

**name** Name or ID of image

**RETURN DATA**

A dictionary containing the following keys:

- **Containers** - A list of containers which depend on the specified image

- **Images** - A list of IDs of images which depend on the specified image

**CLI Example:**
```
salt myminion dockerng.depends myimage
salt myminion dockerng.depends 0123456789ab
```

salt.modules.dockerng.diff(name, *args, **kwargs)

Get information on changes made to container’s filesystem since it was created. Equivalent to running the `docker diff` Docker CLI command.

**name** Container name or ID

**RETURN DATA**

A dictionary containing any of the following keys:
- **Added** - A list of paths that were added.
- **Changed** - A list of paths that were changed.
- **Deleted** - A list of paths that were deleted.

These keys will only be present if there were changes, so if the container has no differences the return dict will be empty.

CLI Example:

```bash
salt myminion dockerng.diff mycontainer
```

**salt.modules.dockerng.exists(name)**

Check if a given container exists

**RETURN DATA**

A boolean (True if the container exists, otherwise False)

CLI Example:

```bash
salt myminion dockerng.exists mycontainer
```

**salt.modules.dockerng.export(name, *args, **kwargs)**

Exports a container to a tar archive. It can also optionally compress that tar archive, and push it up to the Master.

- **name** Container name or ID
- **path** Absolute path on the Minion where the container will be exported
- **overwrite** [False] Unless this option is set to True, then if a file exists at the location specified by the path argument, an error will be raised.
- **makedirs** [False] If True, then if the parent directory of the file specified by the path argument does not exist, Salt will attempt to create it.
- **compression** [None] Can be set to any of the following:
  - gzip or gz for gzip compression
  - bzip2 or bz2 for bzip2 compression
  - xz or lzma for XZ compression (requires xz-utils, as well as the lzma module from Python 3.3, available in Python 2 and Python 3.0-3.2 as backports.lzma)

This parameter can be omitted and Salt will attempt to determine the compression type by examining the filename passed in the path parameter.

- **push** [False] If True, the container will be pushed to the master using cp.push.

Note: This requires file_recv to be set to True on the Master.

**RETURN DATA**

A dictionary will containing the following keys:

- **Path** - Path of the file that was exported
- **Push** - Reports whether or not the file was successfully pushed to the Master

(Only present if push=True)
- **Size** - Size of the file, in bytes
- **Size_Human** - Size of the file, in human-readable units
- **Time_Elapsed** - Time in seconds taken to perform the export

**CLI Examples:**

```bash
salt myminion dockerng.export mycontainer /tmp/mycontainer.tar
salt myminion dockerng.export mycontainer /tmp/mycontainer.tar.xz push=True
```

### `salt.modules.dockerng.history(name, quiet=False)`

Return the history for an image. Equivalent to running the `docker history` Docker CLI command.

**name** Container name or ID

**quiet** [False] If True, the return data will simply be a list of the commands run to build the container.

```bash
$ salt myminion dockerng.history nginx:latest quiet=True
myminion:
- FROM scratch
- ADD file:e063ed80ae9579362871b9f23b2c0781ef7cd4e6ac822052cf6c9c5a12b1e2 in /
- CMD [/bin/bash]
- MAINTAINER NGINX Docker Maintainers "docker-maint@nginx.com"
- apt-key adv --keyserver pgp.mit.edu --recv-keys 573BFD6B3D8FBC641079A6ABABF5BD8727BD9FB
- echo "deb http://nginx.org/packages/mainline/debian/ wheezy nginx" >> /etc/apt/sources.list
- ENV NGINX_VERSION=1.7.10-1-wheezy
- apt-get update && apt-get install -y ca-certificates nginx=${NGINX_VERSION} &&
- ln -sf /dev/stdout /var/log/nginx/access.log
- ln -sf /dev/stderr /var/log/nginx/error.log
- VOLUME [var/cache/nginx]
- EXPOSE map[80/tcp:{}] 443/tcp:{}]
- CMD [nginx -g daemon off;]

https://github.com/saltstack/salt/pull/22421
```

**RETURN DATA**

If `quiet=False`, the return value will be a list of dictionaries containing information about each step taken to build the image. The keys in each step include the following:

- **Command** - The command executed in this build step
- **Id** - Layer ID
- **Size** - Cumulative image size, in bytes
- **Size_Human** - Cumulative image size, in human-readable units
- **Tags** - Tag(s) assigned to this layer
- **Time_Created_Epoch** - Time this build step was completed (Epoch time)
- **Time_Created_Local** - Time this build step was completed (Minion's local timezone)

**CLI Example:**

```bash
salt myminion dockerng.exists mycontainer
```

### `salt.modules.dockerng.images(verbos=False, **kwargs)`

Returns information about the Docker images on the Minion. Equivalent to running the `docker images` Docker CLI command.

**all** [False] If True, untagged images will also be returned

**verbose** [False] If True, a `docker inspect` will be run on each image returned.
**RETURN DATA**

A dictionary with each key being an image ID, and each value some general info about that image (time created, size, tags associated with the image, etc.)

CLI Example:

```python
salt myminion dockerng.images
salt myminion dockerng.images all=True
```

`salt.modules.dockerng.import(source, image, api_response=False)`

Imports content from a local tarball or a URL as a new docker image

- **source** Content to import (URL or absolute path to a tarball). URL can be a file on the Salt fileserver (i.e. `salt://path/to/rootfs/tarball.tar.xz`). To import a file from a saltenv other than base (e.g. `dev`), pass it at the end of the URL (ex. `salt://path/to/rootfs/tarball.tar.xz?saltenv=dev`).

- **image** Image to be created by the import, in `repo:tag` notation. If just the repository name is passed, a tag name of `latest` will be assumed.

- **api_response** [False] If True an `api_response` key will be present in the return data, containing the raw output from the Docker API.

**RETURN DATA**

A dictionary containing the following keys:

- **Id** - ID of the newly-created image
- **Image** - Name of the newly-created image
- **Time_Elapsed** - Time in seconds taken to perform the commit

CLI Example:

```python
salt myminion dockerng.import /tmp/cent7-minimal.tar.xz myuser/centos
salt myminion dockerng.import /tmp/cent7-minimal.tar.xz myuser/centos:7
salt myminion dockerng.import salt://dockerimages/cent7-minimal.tar.xz myuser/centos:7
```

`salt.modules.dockerng.info(*args, **kwargs)`

Returns a dictionary of system-wide information. Equivalent to running the `docker info` Docker CLI command.

CLI Example:

```python
salt myminion dockerng.info
```

`salt.modules.dockerng.inspect(name)`

This is a generic container/image inspecton function. It will first attempt to get container information for the passed name/ID using `docker.inspect_container`, and then will try to get image information for the passed name/ID using `docker.inspect_image`. If it is already known that the name/ID is an image, it is slightly more efficient to use `docker.inspect_image`.

- **name** Container/image name or ID

**RETURN DATA**

A dictionary of container/image information

CLI Example:

```python
salt myminion dockerng.inspect mycontainer
salt myminion dockerng.inspect busybox
```
salt.modules.dockerng.inspect_container(name, *args, **kwargs)
Retrieves container information. Equivalent to running the docker inspect Docker CLI command, but
will only look for container information.

**name** Container name or ID

**RETURN DATA**
A dictionary of container information

**CLI Example:**
salt myminion dockerng.inspect_container mycontainer
salt myminion dockerng.inspect_container 0123456789ab

salt.modules.dockerng.inspect_image(name)
Retrieves image information. Equivalent to running the docker inspect Docker CLI command, but will
only look for image information.

**name** Image name or ID

**RETURN DATA**
A dictionary of image information

**CLI Examples:**
salt myminion dockerng.inspect_image busybox
salt myminion dockerng.inspect_image centos:6
salt myminion dockerng.inspect_image 0123456789ab

salt.modules.dockerng.kill(*args, **kwargs)
Kill all processes in a running container instead of performing a graceful shutdown

**name** Container name or ID

**RETURN DATA**
A dictionary will be returned, containing the following keys:

- **status** - A dictionary showing the prior state of the container as well as the new state
- **result** - A boolean noting whether or not the action was successful
- **comment** - Only present if the container cannot be killed

**CLI Example:**
salt myminion dockerng.kill mycontainer

salt.modules.dockerng.layers(name)
Returns a list of the IDs of layers belonging to the specified image, with the top-most layer (the one corresp-onding to the passed name) appearing last.

**name** Image name or ID

**CLI Example:**
salt myminion dockerng.layers centos:7

salt.modules.dockerng.list_containers(**kwargs)
Returns a list of containers by name. This is different from dockerng.ps in that dockerng.ps returns its results organized by container ID.

**all** [False] If True, stopped containers will be included in return data
CLI Example:

```python
salt myminion dockerng.inspect_image <image>
```

`salt.modules.dockerng.list_tags()`  
Returns a list of tagged images  
CLI Example:  
```python
salt myminion dockerng.list_tags
```

`salt.modules.dockerng.load(path, image=None)`  
Load a tar archive that was created using `dockerng.save` (or via the Docker CLI using `docker save`).  
**path** Path to docker tar archive. Path can be a file on the Minion, or the URL of a file on the Salt files server (i.e. `salt://path/to/docker/saved/image.tar`). To load a file from a saltenv other than base (e.g. dev), pass it at the end of the URL (ex. `salt://path/to/rootfs/tarball.tar.xz?saltenv=dev`).  
**image** [None] If specified, the topmost layer of the newly-loaded image will be tagged with the specified repo and tag using `dockerng.tag`. The image name should be specified in `repo:tag` notation. If just the repository name is passed, a tag name of `latest` will be assumed.  

**RETURN DATA**  
A dictionary will be returned, containing the following keys:  
- **Path** - Path of the file that was saved  
- **Layers** - A list containing the IDs of the layers which were loaded. Any layers in the file that was loaded, which were already present on the Minion, will not be included.  
- **Image** - Name of tag applied to topmost layer  
  *(Only present if tag was specified and tagging was successful)*  
- **Time_Elapsed** - Time in seconds taken to load the file  
- **Warning** - Message describing any problems encountered in attempt to tag the topmost layer  
  *(Only present if tag was specified and tagging failed)*  

CLI Example:  
```python
salt myminion dockerng.load /path/to/image.tar  
salt myminion dockerng.load salt://path/to/docker/saved/image.tar image=myuser/myimage:mytag
```

`salt.modules.dockerng.logs(name)`  
Returns the logs for the container. Equivalent to running the `docker logs` Docker CLI command.  
**name** Container name or ID  
CLI Example:  
```python
salt myminion dockerng.logs mycontainer
```

`salt.modules.dockerng.pause(*args, **kwargs)`  
Pauses a container  
**name** Container name or ID  

**RETURN DATA**  
A dictionary will be returned, containing the following keys:
• **status** - A dictionary showing the prior state of the container as well as the new state
• **result** - A boolean noting whether or not the action was successful
• **comment** - Only present if the container cannot be paused

CLI Example:

```bash
salt myminion dockerng.pause mycontainer
```

salt.modules.dockerng.pid(name, *args, **kwargs)

Returns the PID of a container

- **name** Container name or ID

CLI Example:

```bash
salt myminion dockerng.pid mycontainer
salt myminion dockerng.pid 0123456789ab
```

salt.modules.dockerng.port(name, *args, **kwargs)

Returns port mapping information for a given container. Equivalent to running the `docker port` Docker CLI command.

- **name** Container name or ID

- **private_port** [None] If specified, get information for that specific port. Can be specified either as a port number (i.e. 5000), or as a port number plus the protocol (i.e. 5000/udp).

  If this argument is omitted, all port mappings will be returned.

**RETURN DATA**

A dictionary of port mappings, with the keys being the port and the values being the mapping(s) for that port.

CLI Examples:

```bash
salt myminion dockerng.port mycontainer
salt myminion dockerng.port mycontainer 5000
salt myminion dockerng.port mycontainer 5000/udp
```

salt.modules.dockerng.ps(**kwargs)

Returns information about the Docker containers on the Minion. Equivalent to running the `docker ps` Docker CLI command.

- **all** [False] If True, stopped containers will also be returned

- **host** False If True, local host's network topology will be included

- **verbose** [False] If True, a `docker inspect` will be run on each container returned.

**RETURN DATA**

A dictionary with each key being an container ID, and each value some general info about that container (time created, name, command, etc.)

CLI Example:

```bash
salt myminion dockerng.ps
salt myminion dockerng.ps all=True
```

salt.modules.dockerng.pull(image, insecure_registry=False, api_response=False, client_timeout=60)

Pulls an image from a Docker registry. See the documentation at the top of this page to configure authenticated access.
image  Image to be pulled, in repo:tag notation. If just the repository name is passed, a tag name of latest will be assumed.

insecure_registry  [False] If True, the Docker client will permit the use of insecure (non-HTTPS) registries.

api_response  [False] If True, an API_Response key will be present in the return data, containing the raw output from the Docker API.

Note: This may result in a lot of additional return data, especially for larger images.

client_timeout  Timeout in seconds for the Docker client. This is not a timeout for this function, but for receiving a response from the API.

RETURN DATA
A dictionary will be returned, containing the following keys:

- **Layers** - A dictionary containing one or more of the following keys:
  - Already_Pulled - Layers that that were already present on the Minion
  - Pulled - Layers that that were pulled
- **Status** - A string containing a summary of the pull action (usually a message saying that an image was downloaded, or that it was up to date).
- **Time_Elapsed** - Time in seconds taken to perform the pull

CLI Example:

```bash
cat
```

```bash
salt myminion dockerng.push centos
salt myminion dockerng.push centos:6
```

salt.modules.dockerng.push(image, insecure_registry=False, api_response=False, client_timeout=60)

Pushes an image to a Docker registry. See the documentation at top of this page to configure authenticated access.

image  Image to be pushed, in repo:tag notation. If just the repository name is passed, a tag name of latest will be assumed.

insecure_registry  [False] If True, the Docker client will permit the use of insecure (non-HTTPS) registries.

api_response  [False] If True, an API_Response key will be present in the return data, containing the raw output from the Docker API.

client_timeout  Timeout in seconds for the Docker client. This is not a timeout for this function, but for receiving a response from the API.

RETURN DATA
A dictionary will be returned, containing the following keys:

- **Id** - ID of the image that was pushed
- **Image** - Name of the image that was pushed
- **Layers** - A dictionary containing one or more of the following keys:
  - Already_Pushed - Layers that that were already present on the Minion
  - Pushed - Layers that that were pushed
- **Time_Elapsed** - Time in seconds taken to perform the push

CLI Example:
salt modules.dockerng.restart(name, *args, **kwargs)

Restarts a container

name Container name or ID

timeout [10] Timeout in seconds after which the container will be killed (if it has not yet gracefully shut down)

RETURN DATA

A dictionary will be returned, containing the following keys:

- status - A dictionary showing the prior state of the container as well as the new state
- result - A boolean noting whether or not the action was successful
- restarted - If restart was successful, this key will be present and will be set to True.

CLI Examples:

salt myminion dockerng.restart mycontainer
salt myminion dockerng.restart mycontainer timeout=20

salt modules.dockerng.retcode(name, cmd, exec_driver=None, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, keep_env=None)

Run cmd.retcode within a container

name Container name or ID in which to run the command

cmd Command to run

exec_driver [None] If not passed, the execution driver will be detected as described above.

stdin [None] Standard input to be used for the command

output_loglevel [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

use_vt [False] Use SaltStack's utils.vt to stream output to console.

keep_env [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container's host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:

salt myminion dockerng.retcode 'ls -l /etc'

salt modules.dockerng.rm(*args, **kwargs)

Removes a container

name Container name or ID

force [False] If True, the container will be killed first before removal, as the Docker API will not permit a running container to be removed. This option is set to False by default to prevent accidental removal of a running container.

volumes [False] Also remove volumes associated with container
RETURN DATA

A list of the IDs of containers which were removed

CLI Example:

```bash
salt myminion docker. rm mycontainer
salt myminion docker. rm mycontainer force=True
```

```python
salt.modules.dockerng.rmi(*names, **kwargs)
```

Removes an image

- **name** Name (in repo:tag notation) or ID of image.
- **force** [False] If True, the image will be removed even if the Minion has containers created from that image
- **prune** [True] If True, untagged parent image layers will be removed as well, set this to False to keep them.

RETURN DATA

A dictionary will be returned, containing the following two keys:

- **Layers** - A list of the IDs of image layers that were removed
- **Tags** - A list of the tags that were removed
- **Errors** - A list of any errors that were encountered

CLI Examples:

```bash
salt myminion docker. rmi busybox
salt myminion docker. rmi busybox force=True
salt myminion docker. rmi foo bar baz
```

```python
salt.modules.dockerng.run(name, cmd, exec_driver=None, stdin=None, python_shell=True,
                          output_loglevel='debug', use_vt=False, ignore_retcode=False,
                          keep_env=None)
```

Run cmd.run within a container

- **name** Container name or ID in which to run the command
- **cmd** Command to run
- **exec_driver** [None] If not passed, the execution driver will be detected as described above.
- **stdin** [None] Standard input to be used for the command
- **output_loglevel** [debug] Level at which to log the output from the command. Set to quiet to suppress logging.
- **use_vt** [False] Use SaltStack’s utils.vt to stream output to console.
- **keep_env** [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container’s host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:

```bash
salt myminion docker. run mycontainer 'ls l /etc'
```

```python
salt.modules.dockerng.run_all(name, cmd, exec_driver=None, stdin=None, python_shell=True,
                               output_loglevel='debug', use_vt=False, ignore_retcode=False,
                               keep_env=None)
```

Run cmd.run_all within a container
Note: While the command is run within the container, it is initiated from the host. Therefore, the PID in the return dict is from the host, not from the container.

name  Container name or ID in which to run the command

**cmd** Command to run

**exec_driver** [None] If not passed, the execution driver will be detected as described above.

stdin [None] Standard input to be used for the command

**output_loglevel** [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

use_vt [False] Use SaltStack's utils.vt to stream output to console.

keep_env [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container's host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:

```
salt myminion dockerng.run_all mycontainer 'ls -l /etc'
```

```
salt.modules.dockerng.run_stderr(name, cmd, exec_driver=None, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, keep_env=None)
```

Run cmd.run_stderr within a container

name  Container name or ID in which to run the command

**cmd** Command to run

**exec_driver** [None] If not passed, the execution driver will be detected as described above.

stdin [None] Standard input to be used for the command

**output_loglevel** [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

use_vt [False] Use SaltStack's utils.vt to stream output to console.

keep_env [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container's host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:

```
salt myminion dockerng.run_stderr mycontainer 'ls -l /etc'
```

```
salt.modules.dockerng.run_stdout(name, cmd, exec_driver=None, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, keep_env=None)
```

Run cmd.run_stdout within a container

name  Container name or ID in which to run the command

**cmd** Command to run

**exec_driver** [None] If not passed, the execution driver will be detected as described above.

stdin [None] Standard input to be used for the command
output_loglevel [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

use_vt [False] Use SaltStack's utils.vt to stream output to console.

keep_env [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container's host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:

```
salt myminion dockerng.run_stdout mycontainer 'ls -l /etc'
```

```
salt.modules.dockerng.save(name, path, overwrite=False, makedirs=False, compression=None, **kwargs)
```

Saves an image and to a file on the minion. Equivalent to running the docker save Docker CLI command, but unlike docker save this will also work on named images instead of just images IDs.

name Name or ID of image. Specify a specific tag by using the repo:tag notation.

path Absolute path on the Minion where the image will be exported

overwrite [False] Unless this option is set to True, then if the destination file exists an error will be raised.

makedirs [False] If True, then if the parent directory of the file specified by the path argument does not exist, Salt will attempt to create it.

compression [None] Can be set to any of the following:

- gzip or gz for gzip compression
- bzip2 or bz2 for bzip2 compression
- xz or lzma for XZ compression (requires xz-utils, as well as the lzma module from Python 3.3, available in Python 2 and Python 3.0-3.2 as backports.lzma)

This parameter can be omitted and Salt will attempt to determine the compression type by examining the filename passed in the path parameter.

Note: Since the Docker API does not support docker save, compression will be a bit slower with this function than with docker.export since the image(s) will first be saved and then the compression done afterwards.

push [False] If True, the container will be pushed to the master using cp.push.

Note: This requires file_recv to be set to True on the Master.

**RETURN DATA**

A dictionary will be returned, containing the following keys:

- **Path** - Path of the file that was saved
- **Push** - Reports whether or not the file was successfully pushed to the Master
  
  *(Only present if push=True)*
- **Size** - Size of the file, in bytes
- **Size_Human** - Size of the file, in human-readable units
- **Time_Elapsed** - Time in seconds taken to perform the save

CLI Examples:
```
salt myminion dockerng.save centos:7 /tmp/cent7.tar
salt myminion dockerng.save 0123456789ab cdef01234567 /tmp/saved.tar
```

salt.modules.dockerng.script(``
name, source, saltenv='base', args=None, template=None, 
exec_driver=None, stdin=None, python_shell=True, output_loglevel='debug', ignore_retcode=False, use_vt=False, 
keep_env=None)
```

Run `cmd.script` within a container

**Note:** While the command is run within the container, it is initiated from the host. Therefore, the PID in the return dict is from the host, not from the container.

**name**  Container name or ID

**source**  Path to the script. Can be a local path on the Minion or a remote file from the Salt fileserver.

**args**  A string containing additional command-line options to pass to the script.

**template**  [None] Templating engine to use on the script before running.

**exec_driver**  [None] If not passed, the execution driver will be detected as described above.

**stdin**  [None] Standard input to be used for the script

**output_loglevel**  [debug] Level at which to log the output from the script. Set to quiet to suppress logging.

**use_vt**  [False] Use SaltStack's `utils.vt` to stream output to console.

**keep_env**  [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container's host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

**CLI Example:**
```
salt myminion dockerng.script mycontainer salt://docker_script.py
salt myminion dockerng.script mycontainer salt://scripts/runme.sh  'arg1 arg2 "arg 3"'
```

salt.modules.dockerng.script_retcode(``
name, source, saltenv='base', args=None, template=None, 
exec_driver=None, stdin=None, python_shell=True, output_loglevel='debug', ignore_retcode=False, use_vt=False, keep_env=None)
```

Run `cmd.script_retcode` within a container

**name**  Container name or ID

**source**  Path to the script. Can be a local path on the Minion or a remote file from the Salt fileserver.

**args**  A string containing additional command-line options to pass to the script.

**template**  [None] Templating engine to use on the script before running.

**exec_driver**  [None] If not passed, the execution driver will be detected as described above.

**stdin**  [None] Standard input to be used for the script

**output_loglevel**  [debug] Level at which to log the output from the script. Set to quiet to suppress logging.

**use_vt**  [False] Use SaltStack's `utils.vt` to stream output to console.

**keep_env**  [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container's host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.
CLI Example:

```bash
salt myminion dockerng.script_retcode mycontainer salt://docker_script.py
salt myminion dockerng.script_retcode mycontainer salt://scripts/runme.sh 'arg1 arg2 "arg 3"'
salt myminion dockerng.script_retcode mycontainer salt://scripts/runme.sh stdin='one	two
three
four
five
'
```

```
salt.modules.dockerng.search(name, official=False, trusted=False)

Searches the registry for an image

name  Search keyword
official  [False] Limit results to official builds
trusted  [False] Limit results to trusted builds

RETURN DATA

A dictionary with each key being the name of an image, and the following information for each image:

- **Description** - Image description
- **Official** - A boolean (True if an official build, False if not)
- **Stars** - Number of stars the image has on the registry
- **Trusted** - A boolean (True if a trusted build, False if not)

CLI Example:

```bash
salt myminion dockerng.search centos
salt myminion dockerng.search centos official=True
```

```
salt.modules.dockerng.signal(*args, **kwargs)

Send a signal to a container. Signals can be either strings or numbers, and are defined in the Standard Signals section of the signal(7) manpage. Run `man 7 signal` on a Linux host to browse this manpage.

name  Container name or ID
signal  Signal to send to container

RETURN DATA

If the signal was successfully sent, True will be returned. Otherwise, an error will be raised.

CLI Example:

```bash
salt myminion dockerng.signal mycontainer SIGHUP
```

```
salt.modules.dockerng.start(*args, **kwargs)

Start a container

name  Container name or ID

validate_ip_addrs  [True] For parameters which accept IP addresses as input, IP address validation will be performed. To disable, set this to False

binds  Files/directories to bind mount. Each bind mount should be passed in the format `<host_path>:`<container_path>`:<read_only>`, where `<read_only>` is one of `rw` (for read-write access) or `ro` (for read-only access). Optionally, the read-only information can be left off the end and the bind mount will be assumed to be read-write. Examples 2 and 3 below are equivalent.

Example 1: `binds=/srv/www:/var/www:ro`
Example 2: `binds=/srv/www:/var/www:rw`
Example 3: `binds=/srv/www:/var/www`
```
**port_bindings** Bind exposed ports which were exposed using the `ports` argument to `dockerng.create`. These should be passed in the same way as the `--publish` argument to the `docker run` CLI command:

- `ip:hostPort:containerPort` - Bind a specific IP and port on the host to a specific port within the container.
- `ip::containerPort` - Bind a specific IP and an ephemeral port to a specific port within the container.
- `hostPort:containerPort` - Bind a specific port on all of the host's interfaces to a specific port within the container.
- `containerPort` - Bind an ephemeral port on all of the host's interfaces to a specific port within the container.

Multiple bindings can be separated by commas, or passed as a Python list. The below two examples are equivalent:

Example 1: `port_bindings="5000:5000,2123:2123/udp,8080"`
Example 2: `port_bindings="[5000:5000, '2123:2123/udp', '8080']"`

**Note:** When configuring bindings for UDP ports, the protocol must be passed in the `containerPort` value, as seen in the examples above.

**lxc_conf** Additional LXC configuration parameters to set before starting the container.

Example: `lxc_conf={"lxc.utsname": "docker"}`

**Note:** These LXC configuration parameters will only have the desired effect if the container is using the LXC execution driver, which has not been the default for some time.

**publish_all_ports** [False] Allocates a random host port for each port exposed using the `ports` argument to `dockerng.create`.

Example: `publish_all_ports=True`

**links** Link this container to another. Links should be specified in the format `<container_name_or_id>:<link_alias>`. Multiple links can be passed, either as a comma-separated list or a Python list.

Example 1: `links=mycontainer:myalias,links=web1:link1,web2:link2`
Example 2: `links=['mycontainer:myalias'] links=['web1:link1', 'web2:link2']`

**dns** List of DNS nameservers. Can be passed as a comma-separated list or a Python list.

Example: `dns=8.8.8.8,8.8.4.4 or dns="[8.8.8.8, 8.8.4.4]"`

**Note:** To skip IP address validation, use `validate_ip_addrs=False`

**dns_search** List of DNS search domains. Can be passed as a comma-separated list or a Python list.

Example: `dns_search=foo1.domain.tld,foo2.domain.tld` or `dns_search="[foo1.domain.tld, foo2.domain.tld]"

**volumes_from** Container names or IDs from which the container will get volumes. Can be passed as a comma-separated list or a Python list.

Example: `volumes_from=foo, volumes_from=foo,bar, volumes_from="[foo, bar]"`
**network_mode**  [bridge] One of the following:

- **bridge** - Creates a new network stack for the container on the docker bridge
- **null** - No networking (equivalent of the Docker CLI argument --net=none)
- **container:<name_or_id>** - Reuses another container's network stack
- **host** - Use the host's network stack inside the container

**Warning:** Using host mode gives the container full access to the host's system's services (such as D-bus), and is therefore considered insecure.

Example: `network_mode=null, network_mode=container:web1`

**restart_policy** Set a restart policy for the container. Must be passed as a string in the format policy[:retry_count] where policy is one of always or on-failure, and retry_count is an optional limit to the number of retries. The retry count is ignored when using the always restart policy.

Example 1: `restart_policy=on-failure:5`
Example 2: `restart_policy=always`

**cap_add** List of capabilities to add within the container. Can be passed as a comma-separated list or a Python list. Requires Docker 1.2.0 or newer.

Example: `cap_add=SYS_ADMIN, MKNOD, cap_add="[SYS_ADMIN, MKNOD]"`

**cap_drop** List of capabilities to drop within the container. Can be passed as a comma-separated string or a Python list. Requires Docker 1.2.0 or newer.

Example: `cap_drop=SYS_ADMIN, MKNOD, cap_drop="[SYS_ADMIN, MKNOD]"`

**extra_hosts** Additional hosts to add to the container's /etc/hosts file. Can be passed as a comma-separated list or a Python list. Requires Docker 1.3.0 or newer.

Example: `extra_hosts=web1:10.9.8.7, web2:10.9.8.8`

**Note:** To skip IP address validation, use `validate_ip_addrs=False`

**pid_mode** Set to host to use the host container's PID namespace within the container. Requires Docker 1.5.0 or newer.

Example: `pid_mode=host`

**RETURN DATA**

A dictionary will be returned, containing the following keys:

- **status** - A dictionary showing the prior state of the container as well as the new state
- **result** - A boolean noting whether or not the action was successful
- **comment** - Only present if the container cannot be started

CLI Example:

```
salt myminion dockerng.start mycontainer
```

```
salt.modules.dockerng.state(name, *args, **kwargs)
```

Returns the state of the container

- **name** Container name or ID
RETURN DATA
A string representing the current state of the container (either running, paused, or stopped)
CLI Example:
salt myminion dockerng.state mycontainer

salt.modules.dockerng.stop(*args, **kwargs)
Stops a running container
name Container name or ID
unpause [False] If True and the container is paused, it will be unpaused before attempting to stop the container.
timeout [10] Timeout in seconds after which the container will be killed (if it has not yet gracefully shut down)

RETURN DATA
A dictionary will be returned, containing the following keys:
• status - A dictionary showing the prior state of the container as well as the new state
• result - A boolean noting whether or not the action was successful
• comment - Only present if the container can not be stopped

CLI Examples:
salt myminion dockerng.stop mycontainer
salt myminion dockerng.stop mycontainer unpause=True
salt myminion dockerng.stop mycontainer timeout=20

salt.modules.dockerng.tag(name, image, force=False)
Tag an image into a repository and return True. If the tag was unsuccessful, an error will be raised.
name ID of image
image Tag to apply to the image, in repo:tag notation. If just the repository name is passed, a tag name of latest will be assumed.
force [False] Force apply tag

CLI Example:
salt myminion dockerng.tag 0123456789ab myrepo/mycontainer
salt myminion dockerng.tag 0123456789ab myrepo/mycontainer:mytag

salt.modules.dockerng.top(name, *args, **kwargs)
Runs the docker top command on a specific container
name Container name or ID

CLI Example:
RETURN DATA
A list of dictionaries containing information about each process

salt myminion dockerng.top mycontainer
salt myminion dockerng.top 0123456789ab

salt.modules.dockerng.unpause(*args, **kwargs)
Unpauses a container
name  Container name or ID

RETURN DATA
A dictionary will be returned, containing the following keys:

- **status** - A dictionary showing the prior state of the container as well as the new state
- **result** - A boolean noting whether or not the action was successful
- **comment** - Only present if the container cannot be unpaused

CLI Example:
```bash
salt myminion dockerng.pause mycontainer
```

**salt.modules.dockerng.version()**
Returns a dictionary of Docker version information. Equivalent to running the `docker version` Docker CLI command.

CLI Example:
```bash
salt myminion dockerng.version
```

**salt.modules.dockerng.wait(name)**
Wait for the container to exit gracefully, and return its exit code

**Note:** This function will block until the container is stopped.

name  Container name or ID

RETURN DATA
A dictionary will be returned, containing the following keys:

- **status** - A dictionary showing the prior state of the container as well as the new state
- **result** - A boolean noting whether or not the action was successful
- **exit_status** - Exit status for the container
- **comment** - Only present if the container is already stopped

CLI Example:
```bash
salt myminion dockerng.wait mycontainer
```

### 31.16.70 salt.modules.dpkg

Support for DEB packages

**salt.modules.dpkg.bin_pkg_info(path, saltenv='base')**

New in version 2015.8.0.

Parses RPM metadata and returns a dictionary of information about the package (name, version, etc.).

**path**  Path to the file. Can either be an absolute path to a file on the minion, or a salt fileserver URL (e.g. `salt://path/to/file.rpm`). If a salt fileserver URL is passed, the file will be cached to the minion so that it can be examined.

**saltenv**  [base] Salt fileserver environment from which to retrieve the package. Ignored if path is a local file path on the minion.
CLI Example:

```bash
salt '*' lowpkg.bin_pkg_info /root/foo-1.2.3-1ubuntu1_all.deb
salt '*' lowpkg.bin_pkg_info salt://foo-1.2.3-1ubuntu1_all.deb
```

```
salt.modules.dpkg.file_dict('packages')
List the files that belong to a package, grouped by package. Not specifying any packages will return a list of _every_ file on the system's package database (not generally recommended).

CLI Examples:

```bash
salt '*' lowpkg.file_list httpd
salt '*' lowpkg.file_list httpd postfix
salt '*' lowpkg.file_list
```

```
salt.modules.dpkg.file_list('packages')
List the files that belong to a package. Not specifying any packages will return a list of _every_ file on the system's package database (not generally recommended).

CLI Examples:

```bash
salt '*' lowpkg.file_list httpd
salt '*' lowpkg.file_list httpd postfix
salt '*' lowpkg.file_list
```

```
salt.modules.dpkg.info('packages')
Return a detailed package(s) summary information. If no packages specified, all packages will be returned.

Parameters packages --

Returns

CLI example:

```bash
salt '*' lowpkg.info apache2 bash
```

```
salt.modules.dpkg.list_pkgs('packages')
List the packages currently installed in a dict:

`{'<package_name>': '<version>'}`

External dependencies:

Virtual package resolution requires aptitude. Because this function uses dpkg, virtual packages will be reported as not installed.

CLI Example:

```bash
salt '*' lowpkg.list_pkgs
salt '*' lowpkg.list_pkgs httpd
```

```
salt.modules.dpkg.unpurge('packages')
Change package selection for each package specified to `install`

CLI Example:

```bash
salt '*' lowpkg.unpurge curl
```

### 31.16.71 salt.modules.drac

Manage Dell DRAC
salt.modules.drac.change_password(username, password, uid=None)
    Change users password
    CLI Example:
    salt dell drac.change_password [USERNAME] [PASSWORD] [UID - optional]
salt dell drac.change_password diana secret

salt.modules.drac.create_user(username, password, permissions, users=None)
    Create user accounts
    CLI Example:
    salt dell drac.create_user [USERNAME] [PASSWORD] [PRIVELEGES]
salt dell drac.create_user diana secret login,test_alerts,clear_logs

    DRAC Privileges
    • login : Login to iDRAC
    • drac : Configure iDRAC
    • user_management : Configure Users
    • clear_logs : Clear Logs
    • server_control_commands : Execute Server Control Commands
    • console_redirection : Access Console Redirection
    • virtual_media : Access Virtual Media
    • test_alerts : Test Alerts
    • debug_commands : Execute Debug Commands

salt.modules.drac.delete_user(username, uid=None)
    Delete a user
    CLI Example:
    salt dell drac.delete_user [USERNAME] [UID - optional]
salt dell drac.delete_user diana 4

salt.modules.drac.email_alerts(action)
    Enable/Disable email alerts
    CLI Example:
    salt dell drac.email_alerts True
    salt dell drac.email_alerts False

salt.modules.drac.list_users()
    List all DRAC users
    CLI Example:
    salt dell drac.list_users

salt.modules.drac.nameservers(*ns)
    Configure the nameservers on the DRAC
    CLI Example:
salt dell drac.nameservers [NAMESERVERS]
salt dell drac.nameservers ns1.example.com ns2.example.com

salt.modules.drac.network_info()
Return Network Configuration
CLI Example:
salt dell drac.network_info

salt.modules.drac.server_hardreset()
Performs a reset (reboot) operation on the managed server.
CLI Example:
salt dell drac.server_hardreset

salt.modules.drac.server_poweroff()
Powers down the managed server.
CLI Example:
salt dell drac.server_poweroff

salt.modules.drac.server_poweron()
Powers up the managed server.
CLI Example:
salt dell drac.server_poweron

salt.modules.drac.server_pxe()
Configure server to PXE perform a one off PXE boot
CLI Example:
salt dell drac.server_pxe

salt.modules.drac.server_reboot()
Issues a power-cycle operation on the managed server. This action is similar to pressing the power button on the system's front panel to power down and then power up the system.
CLI Example:
salt dell drac.server_reboot

salt.modules.drac.set_network(ip, netmask, gateway)
Configure Network
CLI Example:
salt dell drac.set_network [DRAC IP] [NETMASK] [GATEWAY]
salt dell drac.set_network 192.168.0.2 255.255.255.0 192.168.0.1

salt.modules.drac.set_permissions(username, permissions, uid=None)
Configure users permissions
CLI Example:
salt dell drac.set_permissions [USERNAME] [PRIVELEGES] [USER INDEX - optional]
salt dell drac.set_permissions diana login,test_alerts,clear_logs 4
**DRAC Privileges**

- login: Login to iDRAC
- drac: Configure iDRAC
- user_management: Configure Users
- clear_logs: Clear Logs
- server_control_commands: Execute Server Control Commands
- console_redirection: Access Console Redirection
- virtual_media: Access Virtual Media
- test_alerts: Test Alerts
- debug_commands: Execute Debug Commands

```
salt.modules.drac.set_snmp(community)
Configure SNMP community string

CLI Example:
salt dell drac.set_snmp [COMMUNITY]
salt dell drac.set_snmp public
```

```
salt.modules.drac.syslog(server, enable=True)
Configure syslog remote logging, by default syslog will automatically be enabled if a server is specified. However, if you want to disable syslog you will need to specify a server followed by False

CLI Example:
salt dell drac.syslog [SYSLOG IP] [ENABLE/DISABLE]
salt dell drac.syslog 0.0.0.0 False
```

```
salt.modules.drac.system_info()
Return System information

CLI Example:
salt dell drac.system_info
```

### 31.16.72 salt.modules.drbd

DRBD administration module

```
salt.modules.drbd.overview()
Show status of the DRBD devices

CLI Example:
salt '*' drbd.overview
```

### 31.16.73 salt.modules.ebuild

Support for Portage

```python
optdepends
  * portage Python adapter
```
For now all package names **MUST** include the package category, i.e. 'vim' will not work, 'app-editors/vim' will.

**salt.modules.ebuild.check_db(names, **kwargs)**

New in version 0.17.0.

Returns a dict containing the following information for each specified package:

1. A key `found`, which will be a boolean value denoting if a match was found in the package database.
2. If `found` is `False`, then a second key called `suggestions` will be present, which will contain a list of possible matches. This list will be empty if the package name was specified in `category/pkgname` format, since the suggestions are only intended to disambiguate ambiguous package names (ones submitted without a category).

CLI Examples:

```bash
salt '*' pkg.check_db <package1> <package2> <package3>
```

**salt.modules.ebuild.check_extra_requirements(pkgname, pkgver)**

Check if the installed package already has the given requirements.

CLI Example:

```bash
salt '*' pkg.check_extra_requirements 'sys-devel/gcc' '~>4.1.2:4.1::gentoo[nls,fortran]'
```

**salt.modules.ebuild.depclean(name=None, slot=None, fromrepo=None, pkgs=None)**

Portage has a function to remove unused dependencies. If a package is provided, it will only removed the package if no other package depends on it.

- **name**  The name of the package to be cleaned.
- **slot**  Restrict the remove to a specific slot. Ignored if `name` is `None`.
- **fromrepo**  Restrict the remove to a specific slot. Ignored if `name` is `None`.
- **pkgs**  Clean multiple packages. `slot` and `fromrepo` arguments are ignored if this argument is present. Must be passed as a python list.

Return a list containing the removed packages:

CLI Example:

```bash
salt '*' pkg.depclean <package name>
```

**salt.modules.ebuild.ex_mod_init(low)**

If the config option `ebuild.enforce_nice_config` is set to True, this module will enforce a nice tree structure for `/etc/portage/package.*` configuration files.

New in version 0.17.0: Initial automatic enforcement added when pkg is used on a Gentoo system.

Changed in version 2014.1.0-Hydrogen: Configure option added to make this behaviour optional, defaulting to off.

See also:

- `ebuild.ex_mod_init` is called automatically when a state invokes a pkg state on a Gentoo system.
- `salt.states.pkg.mod_init()`
- `ebuild.ex_mod_init` uses `portage_config.enforce_nice_config` to do the lifting.
- `salt.modules.portage_config.enforce_nice_config()`

CLI Example:
**salt**

`salt '*' pkg.ex_mod_init`

salt.modules.ebuild.

**install**

`install(name=None, refresh=False, pkgs=None, sources=None, slot=None, fromrepo=None, uses=None, binhost=None, **kwargs)`

Install the passed package(s), add refresh=True to sync the portage tree before package is installed.

**name**
The name of the package to be installed. Note that this parameter is ignored if either `pkgs` or `sources` is passed. Additionally, please note that this option can only be used to emerge a package from the portage tree. To install a tar.bz2 package manually, use the `sources` option described below.

CLI Example:

```
salt '*' pkg.install <package name>
```

**refresh**
Whether or not to sync the portage tree before installing.

**version**
Install a specific version of the package, e.g. 1.0.9-r1. Ignored if `pkgs` or `sources` is passed.

**slot**
Similar to version, but specifies a valid slot to be installed. It will install the latest available version in the specified slot. Ignored if `pkgs` or `sources` or `version` is passed.

CLI Example:

```
salt '*' pkg.install sys-devel/gcc slot='4.4'
```

**fromrepo**
Similar to slot, but specifies the repository from the package will be installed. It will install the latest available version in the specified repository. Ignored if `pkgs` or `sources` or `version` is passed.

CLI Example:

```
salt '*' pkg.install salt fromrepo='gentoo'
```

**uses**
Similar to slot, but specifies a list of use flag. Ignored if `pkgs` or `sources` or `version` is passed.

CLI Example:

```
salt '*' pkg.install sys-devel/gcc uses=['nptl','-nossp']
```

Multiple Package Installation Options:

**pkgs**
A list of packages to install from the portage tree. Must be passed as a python list.

CLI Example:

```
salt '*' pkg.install pkgs=['"foo","bar","-category/package:slot::repository[use]"']
```

**sources**
A list of tar.bz2 packages to install. Must be passed as a list of dicts, with the keys being package names, and the values being the source URI or local path to the package.

CLI Example:

```
salt '*' pkg.install sources='["foo": "salt://foo.tbz2"],["bar": "salt://bar.tbz2"]'
```

**binhost**
has two options try and force. try - tells emerge to try and install the package from a configured binhost. force - forces emerge to install the package from a binhost otherwise it fails out.

Returns a dict containing the new package names and versions:

```
{'<package>': {'old': '<old-version>',
              'new': '<new-version>'}}
```
salt.modules.ebuild.latest_version(*names, **kwargs)
Return the latest version of the named package available for upgrade or installation. If more than one package name is specified, a dict of name/version pairs is returned.

CLI Example:
```python
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package1> <package2> <package3> ...
```

salt.modules.ebuild.list_pkgs(versions_as_list=False, **kwargs)
List the packages currently installed in a dict:
```python
{'<package_name>': '<version>'}
```

CLI Example:
```python
salt '*' pkg.list_pkgs
```

salt.modules.ebuild.list_upgrades(refresh=True, backtrack=3)
List all available package upgrades.
- **refresh** Whether or not to sync the portage tree before checking for upgrades.
- **backtrack** Specifies an integer number of times to backtrack if dependency calculation fails due to a conflict or an unsatisfied dependency (default: `3`).

CLI Example:
```python
salt '*' pkg.list_upgrades
```

salt.modules.ebuild.porttree_matches(name)
Returns a list containing the matches for a given package name from the portage tree. Note that the specific version of the package will not be provided for packages that have several versions in the portage tree, but rather the name of the package (i.e. ``dev-python/paramiko``).

salt.modules.ebuild.purge(name=None, slot=None, fromrepo=None, pkgs=None, **kwargs)
Portage does not have a purge, this function calls remove followed by depclean to emulate a purge process
- **name** The name of the package to be deleted.
- **slot** Restrict the remove to a specific slot. Ignored if name is None.
- **fromrepo** Restrict the remove to a specific slot. Ignored if name is None.

Multiple Package Options:
- **pkgs** Uninstall multiple packages. slot and fromrepo arguments are ignored if this argument is present. Must be passed as a python list.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:
```python
salt '*' pkg.purge <package name>
salt '*' pkg.purge <package name> slot=4.4
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs=('["foo", "bar"]')
```

salt.modules.ebuild.refresh_db()
Updates the portage tree (emerge --sync). Uses eix-sync if available.

CLI Example:
salt '★' pkg.refresh_db

salt.modules.ebuild.remove(name=None, slot=None, fromrepo=None, pkgs=None, **kwargs)
Remove packages via emerge --unmerge.

name  The name of the package to be deleted.
slot  Restrict the remove to a specific slot. Ignored if name is None.
fromrepo  Restrict the remove to a specific slot. Ignored if name is None.

Multiple Package Options:

pkgs  Uninstall multiple packages. slot and fromrepo arguments are ignored if this argument is present.

Must be passed as a python list.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

salt '★' pkg.remove <package name>
salt '★' pkg.remove <package name> slot=4.4 fromrepo=gentoo
salt '★' pkg.remove <package1>,<package2>,<package3>
salt '★' pkg.remove pkgs='["foo", "bar"]'

salt.modules.ebuild.update(pkgs, slot=None, fromrepo=None, refresh=False, binhost=None)
Updates the passed package (emerge --update package)

slot  Restrict the update to a particular slot. It will update to the latest version within the slot.
fromrepo  Restrict the update to a particular repository. It will update to the latest version within the repository.

binhost  has two options try and force. try - tells emerge to try and install the package from a configured binhost. force - forces emerge to install the package from a binhost otherwise it fails out.

Return a dict containing the new package names and versions:

{<package>: {'old': <old-version>,
             'new': <new-version>}}

CLI Example:

salt '★' pkg.update <package name>

salt.modules.ebuild.upgrade(refresh=True, binhost=None, backtrack=3)
Run a full system upgrade (emerge -uDN @world)

binhost  has two options try and force. try - tells emerge to try and install the package from a configured
binhost. force - forces emerge to install the package from a binhost otherwise it fails out.

backtrack  Specifies an integer number of times to backtrack if dependency calculation fails due to a conflict
or an unsatisfied dependency (default: 3).

Return a dict containing the new package names and versions:

{<package>: {'old': <old-version>,
             'new': <new-version>}}

CLI Example:
salt '*' pkg.upgrade

salt.modules.ebuild.upgrade_available(name)
    Check whether or not an upgrade is available for a given package
    CLI Example:
    salt '*' pkg.upgrade_available <package name>

salt.modules.ebuild.version('names', **kwargs)
    Returns a string representing the package version or an empty string if not installed. If more than one package
    name is specified, a dict of name/version pairs is returned.
    CLI Example:
    salt '*' pkg.version <package name>
    salt '*' pkg.version <package1> <package2> <package3> ...

salt.modules.ebuild.version_clean(version)
    Clean the version string removing extra data.
    CLI Example:
    salt '*' pkg.version_clean <version_string>

salt.modules.ebuild.version_cmp(pkg1, pkg2)
    Do a cmp-style comparison on two packages. Return -1 if pkg1 < pkg2, 0 if pkg1 == pkg2, and 1 if pkg1 >
    pkg2. Return None if there was a problem making the comparison.
    CLI Example:
    salt '*' pkg.version_cmp '0.2.4-0' '0.2.4.1-0'

31.16.74 salt.modules.eix

Support for Eix
salt.modules.eix.sync()
    Sync portage/overlay trees and update the eix database
    CLI Example:
    salt '*' eix.sync

salt.modules.eix.update()
    Update the eix database
    CLI Example:
    salt '*' eix.update

31.16.75 salt.modules.elasticsearch

Elasticsearch - A distributed RESTful search and analytics server
Module to provide Elasticsearch compatibility to Salt (compatible with Elasticsearch version 1.5.2+)
New in version 2015.8.0.
**depends**  elasticsearch-py

**configuration**  This module accepts connection configuration details either as parameters or as configuration settings in /etc/salt/minion on the relevant minions:

```yaml
elasticsearch:
  host: '10.10.10.100:9200'

elasticsearch:
  hosts:
    - '10.10.10.100:9200'
    - '10.10.10.101:9200'
    - '10.10.10.102:9200'

elasticsearch:
  hosts:
    - '10.10.10.100:9200'
  number_of_shards: 1
  number_of_replicas: 0
  functions_blacklist:
    - 'saltutil.find_job'
    - 'pillar.items'
    - 'grains.items'
```

This data can also be passed into pillar. Options passed into opts will overwrite options passed into pillar.

```python
salt.modules.elasticsearch.alias_create(indices, alias, hosts=None, body=None, profile=None)
```

Create an alias for a specific index/indices

CLI example:

```bash
salt myminion elasticsearch.alias_create testindex_v1 testindex
```

```python
salt.modules.elasticsearch.alias_delete(indices, aliases, hosts=None, body=None, profile=None)
```

Delete an alias of an index

CLI example:

```bash
salt myminion elasticsearch.alias_delete testindex_v1 testindex
```

```python
salt.modules.elasticsearch.alias_exists(aliases, indices=None, hosts=None, profile=None)
```

Return a boolean indicating whether given alias exists

CLI example:

```bash
salt myminion elasticsearch.alias_exists testindex
```

```python
salt.modules.elasticsearch.alias_get(indices=None, aliases=None, hosts=None, profile=None)
```

Check for the existence of an alias and if it exists, return it

CLI example:

```bash
salt myminion elasticsearch.alias_get testindex
```

```python
salt.modules.elasticsearch.document_create(index, doc_type, body=None, id=None, hosts=None, profile=None)
```

Create a document in a specified index

CLI example:
salt module documentation

salt.modules.elasticsearch.document_create(index, body=None, hosts=None, profile=None)

Create a new index.

CLI example:

salt myminion elasticsearch.document_create testindex doctype1 '{}'

salt.modules.elasticsearch.document_delete(index, doc_type, id, hosts=None, profile=None)

Delete a document from an index.

CLI example:

salt myminion elasticsearch.document_delete testindex doctype1 AUx-384m0Bug_8U80wQZ

salt.modules.elasticsearch.document_exists(index, id, doc_type='_all', hosts=None, profile=None)

Check for the existence of a document and if it exists, return it.

CLI example:

salt myminion elasticsearch.document_exists testindex AUx-384m0Bug_8U80wQZ

salt.modules.elasticsearch.document_get(index, id, doc_type='_all', hosts=None, profile=None)

Check for the existence of a document and if it exists, return it.

CLI example:

salt myminion elasticsearch.document_get testindex AUx-384m0Bug_8U80wQZ

salt.modules.elasticsearch.index_create(index, body=None, hosts=None, profile=None)

Create a new index.

CLI example:

salt myminion elasticsearch.index_create testindex

salt.modules.elasticsearch.index_delete(index, hosts=None, profile=None)

Delete a new index.

CLI example:

salt myminion elasticsearch.index_delete testindex

salt.modules.elasticsearch.index_exists(index, hosts=None, profile=None)

Check for the existence of an index and if it exists, return it.

CLI example:

salt myminion elasticsearch.index_exists testindex

salt.modules.elasticsearch.index_get(index, hosts=None, profile=None)

Check for the existence of an index and if it exists, return it.

CLI example:

salt myminion elasticsearch.index_get testindex

salt.modules.elasticsearch.index_template_create(name, body, hosts=None, profile=None)

Create an index template.

CLI example:

salt myminion elasticsearch.index_template_create testindextempl '{ "template": "logstash-*", "settings": { "number_of_replicas": 1 } }'
salt.modules.elasticsearch.index_template_delete(name, hosts=None, profile=None)
Delete an index template (type) along with its data

CLI example:
    salt myminion elasticsearch.index_template_delete testindex_templ user

salt.modules.elasticsearch.index_template_exists(name, hosts=None, profile=None)
Return a boolean indicating whether given index template exists

CLI example:
    salt myminion elasticsearch.index_template_exists testindex_templ

salt.modules.elasticsearch.index_template_get(name, hosts=None, profile=None)
Retrieves template definition of index or index/type

CLI example:
    salt myminion elasticsearch.index_template_get testindex_templ user

salt.modules.elasticsearch.mapping_create(index, doc_type, body, hosts=None, profile=None)
Create a mapping in a given index

CLI example:
    salt myminion elasticsearch.mapping_create testindex user '{ "user" : { "properties" : { "message" : {"type" : "string", "store" : true } } } }

salt.modules.elasticsearch.mapping_delete(index, doc_type, hosts=None, profile=None)
Delete a mapping (type) along with its data

CLI example:
    salt myminion elasticsearch.mapping_delete testindex user

salt.modules.elasticsearch.mapping_get(index, doc_type, hosts=None, profile=None)
Retrieves mapping definition of index or index/type

CLI example:
    salt myminion elasticsearch.mapping_get testindex user

31.16.76 salt.modules.environ

Support for getting and setting the environment variables of the current salt process.

salt.modules.environ.get(key, default='')
Get a single salt process environment variable.

key String used as the key for environment lookup.

default If the key is not found in the environment, return this value. Default: ''

CLI Example:
    salt '*' environ.get foo
    salt '*' environ.get baz default=False

salt.modules.environ.has_value(key, value=None)
Determine whether the key exists in the current salt process environment dictionary. Optionally compare the current value of the environment against the supplied value string.

31.16. Full list of builtin execution modules
key: Must be a string. Used as key for environment lookup.

value: Optional. If key exists in the environment, compare the current value with this value. Return True if they are equal.

CLI Example:

```
salt '*' environ.has_value foo
```

salt.modules.environ.item(keys, default='')
Get one or more salt process environment variables. Returns a dict.

keys: Either a string or a list of strings that will be used as the keys for environment lookup.

default: If the key is not found in the environment, return this value. Default: ''

CLI Example:

```
salt '*' environ.item foo
salt '*' environ.item ['foo', 'baz'] default=None
```

salt.modules.environ.items()
Return a dict of the entire environment set for the salt process

CLI Example:

```
salt '*' environ.items
```

salt.modules.environ.setenv(environ, false_unsets=False, clear_all=False, update_minion=False)
Set multiple salt process environment variables from a dict. Returns a dict.

environ: Must be a dict. The top-level keys of the dict are the names of the environment variables to set. Each key's value must be a string or False. Refer to the 'false_unsets' parameter for behavior when a value set to False.

false_unsets: If a key's value is False and false_unsets is True, then the key will be removed from the salt processes environment dict entirely. If a key's value is False and false_unsets is not True, then the key's value will be set to an empty string. Default: False.

clear_all: USE WITH CAUTION! This option can unset environment variables needed for salt to function properly. If clear_all is True, then any environment variables not defined in the environ dict will be deleted. Default: False.

update_minion: If True, apply these environ changes to the main salt-minion process. If False, the environ changes will only affect the current salt subprocess. Default: False.

CLI Example:

```
salt '*' environ.setenv '{"foo": "bar", "baz": "quux"}'
salt '*' environ.setenv '{"a": "b", "c": False}' false_unsets=True
```

salt.modules.environ.setval(key, val, false_unsets=False)
Set a single salt process environment variable. Returns True on success.

key: The environment key to set. Must be a string.

val: The value to set. Must be a string or False. Refer to the 'false_unsets' parameter for behavior when set to False.

false_unsets: If val is False and false_unsets is True, then the key will be removed from the salt processes environment dict entirely. If val is False and false_unsets is not True, then the key's value will be set to an empty string. Default: False.
CLI Example:

```python
salt '*' environ.setval foo bar
salt '*' environ.setval baz val=False false_unsets=True
```

## 31.16.77 `salt.modules.eselect`

Support for eeselect, Gentoo's configuration and management tool.

```python
salt.modules.eselect.exec_action(module, action, module_parameter=None, action_parameter=None, state_only=False)
```

Execute an arbitrary action on a module.

- **module**: name of the module to be executed
- **action**: name of the module's action to be run
- **module_parameter**: additional params passed to the defined module
- **action_parameter**: additional params passed to the defined action
- **state_only**: don't return any output but only the success/failure of the operation

CLI Example (updating the php implementation used for apache2):

```bash
salt '*' eeselect.exec_action php update action_parameter='apache2'
```

```python
salt.modules.eselect.get_current_target(module, module_parameter=None, action_parameter=None)
```

Get the currently selected target for the given module.

- **module**: name of the module to be queried for its current target
- **module_parameter**: additional params passed to the defined module
- **action_parameter**: additional params passed to the 'show' action

CLI Example (current target of system-wide java-vm):

```bash
salt '*' eeselect.get_current_target java-vm action_parameter='system'
```

CLI Example (current target of kernel symlink):

```bash
salt '*' eeselect.get_current_target kernel
```

```python
salt.modules.eselect.get_modules()
```

List available eeselect modules.

CLI Example:

```bash
salt '*' eeselect.get_modules
```

```python
salt.modules.eselect.get_target_list(module)
```

List available targets for the given module.

- **module**: name of the module to be queried for its targets

CLI Example:

```bash
salt '*' eeselect.get_target_list kernel
```
salt.modules.eselect.set_target(module, target, module_parameter=None, action_parameter=None)

Set the target for the given module. Target can be specified by index or name.

module name of the module for which a target should be set
target name of the target to be set for this module
module_parameter additional params passed to the defined module
action_parameter additional params passed to the defined action

CLI Example (setting target of system-wide java-vm):

```
salt '*' eselect.set_target java-vm icedtea-bin-7 action_parameter='system'
```

CLI Example (setting target of kernel symlink):

```
salt '*' eselect.set_target kernel linux-3.17.5-gentoo
```

### 31.16.78 salt.modules.etcd_mod

Execution module to work with etcd

depends

- python-etcd

In order to use an etcd server, a profile should be created in the master configuration file:

```
my_etd_config:
  etcd.host: 127.0.0.1
  etcd.port: 4001
```

It is technically possible to configure etcd without using a profile, but this is not considered to be a best practice, especially when multiple etcd servers or clusters are available.

```
etcd.host: 127.0.0.1
etcd.port: 4001
```

salt.modules.etcd_mod.get(key, recurse=False, profile=None)

New in version 2014.7.0.

Get a value from etcd, by direct path

CLI Examples:

```
salt myminion etcd.get /path/to/key
salt myminion etcd.get /path/to/key profile=my_etcd_config
salt myminion etcd.get /path/to/key recurse=True profile=my_etcd_config
```

salt.modules.etcd_mod.ls(path='/', profile=None)

New in version 2014.7.0.

Return all keys and dirs inside a specific path

CLI Example:

```
salt myminion etcd.ls /path/to/dir/
salt myminion etcd.ls /path/to/dir/ profile=my_etcd_config
```
salt.modules.etcd_mod.rm(key, recurse=False, profile=None)

Delete a key from etcd

CLI Example:

```bash
salt myminion etcd.rm /path/to/key
salt myminion etcd.rm /path/to/key recurse=True profile=my_etcd_config
```

salt.modules.etcd_mod.set(key, value, profile=None)

Set a value in etcd, by direct path

CLI Example:

```bash
salt myminion etcd.set /path/to/key value
salt myminion etcd.set /path/to/key value profile=my_etcd_config
```

salt.modules.etcd_mod.tree(path='/', profile=None)

Recurse through etcd and return all values

CLI Example:

```bash
salt myminion etcd.tree
salt myminion etcd.tree profile=my_etcd_config
salt myminion etcd.tree /path/to/keys profile=my_etcd_config
```

31.16.79 salt.modules.event

Use the Salt Event System to fire events from the master to the minion and vice-versa.

salt.modules.event.fire(data, tag)

Fire an event on the local minion event bus. Data must be formed as a dict.

CLI Example:

```bash
salt '*' event.fire '{"data":"my event data"}' 'tag'
```

salt.modules.event.fire_master(data, tag, preload=None)

Fire an event off up to the master server

CLI Example:

```bash
salt '*' event.fire_master '{"data":"my event data"}' 'tag'
```

salt.modules.event.send(tag, data=None, preload=None, with_env=False, with_grains=False, with_pillar=False, **kwargs)

Send an event to the Salt Master

New in version 2014.7.0.

Parameters

- **tag** -- A tag to give the event. Use slashes to create a namespace for related events. E.g., myco/build/buildserver1/start, myco/build/buildserver1/success, myco/build/buildserver1/failure.
- **data** -- A dictionary of data to send in the event. This is free-form. Send any data points that are needed for whoever is consuming the event. Arguments on the CLI are interpreted as YAML so complex data structures are possible.

- **with_env** (Specify `True` to include all environment variables, or specify a list of strings of variable names to include.) -- Include environment variables from the current shell environment in the event data as `envir...on`. This is a short-hand for working with systems that seed the environment with relevant data such as Jenkins.

- **with_grains** (Specify `True` to include all grains, or specify a list of strings of grain names to include.) -- Include grains from the current minion in the event data as `grains`.

- **with_pillar** (Specify `True` to include all Pillar values, or specify a list of strings of Pillar keys to include.) -- Include Pillar values from the current minion in the event data as `pillar`. Remember Pillar data is often sensitive data so be careful. This is useful for passing ephemeral Pillar values through an event. Such as passing the `pillar={} kwarg in state.sls` from the Master, through an event on the Minion, then back to the Master.

- **kwargs** -- Any additional keyword arguments passed to this function will be interpreted as key-value pairs and included in the event data. This provides a convenient alternative to YAML for simple values.

  **CLI Example:**

  ```
  salt-call event.send myco/mytag foo=Foo bar=Bar
  salt-call event.send 'myco/mytag' '{foo: Foo, bar: Bar}'
  ```

  A convenient way to allow Jenkins to execute `salt-call` is via sudo. The following rule in sudoers will allow the `jenkins` user to run only the following command.

  `/etc/sudoers (allow preserving the environment):
  
  jenkins ALL=(ALL) NOPASSWD:SETENV: /usr/bin/salt-call event.send*`

  Call Jenkins via sudo (preserve the environment):

  ```
  sudo -E salt-call event.send myco/jenkins/build/success with_env=[BUILD_ID, BUILD_URL, GIT_BRANCH, ...]
  ```

31.16.80 salt.modules.extfs

Module for managing ext2/3/4 file systems

**salt.modules.extfs.attributes** *(device, args=None)*

Return attributes from dumpe2fs for a specified device

**CLI Example:**

```
salt '*' extfs.attributes /dev/sda1
```

**salt.modules.extfs.blocks** *(device, args=None)*

Return block and inode info from dumpe2fs for a specified device

**CLI Example:**

```
salt '*' extfs.blocks /dev/sda1
```

**salt.modules.extfs.dump** *(device, args=None)*

Return all contents of dumpe2fs for a specified device
CLI Example:

```bash
salt '*' extfs.dump /dev/sda1
```

```python
salt.modules.extfs.mkfs(device=fs_type,**kwargs)
Create a file system on the specified device
```

CLI Example:

```bash
salt '*' extfs.mkfs /dev/sda1 fs_type=ext4 opts='acl,noexec'
```

Valid options are:

- `block_size`: 1024, 2048 or 4096
- `check`: check for bad blocks
- `direct`: use direct IO
- `ext_opt`: extended file system options (comma-separated)
- `fragment_size`: size of fragments
- `force`: setting force to True will cause mke2fs to specify the -F option twice (it is already set once); this is truly dangerous
- `blocks_per_group`: number of blocks in a block group
- `number_of_groups`: ext4 option for a virtual block group
- `bytes_per_inode`: set the bytes/inode ratio
- `inode_size`: size of the inode
- `journal`: set to True to create a journal (default on ext3/4)
- `journal_opt`: options for the fs journal (comma separated)
- `blocks_file`: read bad blocks from file
- `label`: label to apply to the file system
- `reserved`: percentage of blocks reserved for super-user
- `last_dir`: last mounted directory
- `test`: set to True to not actually create the file system (mke2fs -n)
- `number_of_inodes`: override default number of inodes
- `creator_os`: override `creator operating system` field
- `opts`: mount options (comma separated)
- `revision`: set the filesystem revision (default 1)
- `super`: write superblock and group descriptors only
- `fs_type`: set the filesystem type (REQUIRED)
- `usage_type`: how the filesystem is going to be used
- `uuid`: set the UUID for the file system

See the `mke2fs(8)` manpage for a more complete description of these options.
salt.modules.extfs.tune(device, **kwargs)
    Set attributes for the specified device (using tune2fs)

    CLI Example:
    ```
    salt '*' extfs.tune /dev/sda1 force=True label=wildstallyns opts='acl,noexec'
    ```

    Valid options are:

    - **max**: max mount count
    - **count**: mount count
    - **error**: error behavior
    - **extended_opts**: extended options (comma separated)
    - **force**: force, even if there are errors (set to True)
    - **group**: group name or gid that can use the reserved blocks
    - **interval**: interval between checks
    - **journal**: set to True to create a journal (default on ext3/4)
    - **journal_opts**: options for the fs journal (comma separated)
    - **label**: label to apply to the file system
    - **reserved**: percentage of blocks reserved for super-user
    - **last_dir**: last mounted directory
    - **opts**: mount options (comma separated)
    - **feature**: set or clear a feature (comma separated)
    - **mmp_check**: mmp check interval
    - **reserved**: reserved blocks count
    - **quota_opts**: quota options (comma separated)
    - **time**: time last checked
    - **user**: user or uid who can use the reserved blocks
    - **uuid**: set the UUID for the file system

    See the mke2fs(8) manpage for a more complete description of these options.

31.16.81 salt.modules.file

Manage information about regular files, directories, and special files on the minion, set/read user, group, mode, and data

salt.modules.file.access(path, mode)
    New in version 2014.1.0.

    Test whether the Salt process has the specified access to the file. One of the following modes must be specified:

    CLI Example:
    ```
    salt '*' file.access /path/to/file f
    salt '*' file.access /path/to/file x
    ```
salt.modules.file.append(path, *args, **kwargs)
   New in version 0.9.5.
   Append text to the end of a file

   path  path to file
   *args  strings to append to file

   CLI Example:
   
   salt '*' file.append /etc/motd
       "With all thine offerings thou shalt offer salt."
       "Salt is what makes things taste bad when it isn't in them."

   **Attention**
   
   If you need to pass a string to append and that string contains an equal sign, you must include the argument name, args. For example:

   salt '*' file.append /etc/motd args='cheese=spam'
   salt '*' file.append /etc/motd args="['cheese=spam', 'spam=cheese']"

salt.modules.file.basename(path)
   Returns the final component of a pathname

   New in version 2015.5.0.
   This can be useful at the CLI but is frequently useful when scripting.

   {%- set filename = salt['file.basename'](source_file) %}

   CLI Example:
   
   salt '*' file.basename 'test/test.config'

salt.modules.file.blockreplace(path, marker_start='-- start managed zone --', marker_end='-- end managed zone --', content='', append_if_not_found=False, prepend_if_not_found=False, backup='.bak', dry_run=False, show_changes=True)
   New in version 2014.1.0.
   Replace content of a text block in a file, delimited by line markers

   A block of content delimited by comments can help you manage several lines entries without worrying about old entries removal.

   **Note:** This function will store two copies of the file in-memory (the original version and the edited version) in order to detect changes and only edit the targeted file if necessary.

   path  Filesystem path to the file to be edited
   marker_start  The line content identifying a line as the start of the content block. Note that the whole line containing this marker will be considered, so whitespace or extra content before or after the marker is included in final output
   marker_end  The line content identifying a line as the end of the content block. Note that the whole line containing this marker will be considered, so whitespace or extra content before or after the marker is included in final output
content  The content to be used between the two lines identified by marker_start and marker_stop.

append_if_not_found  [False] If markers are not found and set to True then, the markers and content will be appended to the file.

prepend_if_not_found  [False] If markers are not found and set to True then, the markers and content will be prepended to the file.

backup  The file extension to use for a backup of the file if any edit is made. Set to False to skip making a backup.

dry_run  Don’t make any edits to the file.

show_changes  Output a unified diff of the old file and the new file. If False, return a boolean if any changes were made.

CLI Example:

```
salt '*' file.blockreplace /etc/hosts '#-- start managed zone foobar : DO NOT EDIT
#-- end managed zone foobar --' localhost/10.0.1.1 foo.foobar\n10.0.1.2 bar.foobar' True
```

salt.modules.file.check_file_meta(name, sfn, source, source_sum, user, group, mode, saltenv, contents=None)

Check for the changes in the file metadata.

CLI Example:

```
salt '*' file.check_file_meta /etc/httpd/conf.d/httpd.conf salt://httpd/conf.d httpd.conf {hash_type: 'md5', hsum: <md5sum>}
```

Note: Supported hash types include sha512, sha384, sha256, sha224, sha1, and md5.

name  Path to file destination

sfn  Template-processed source file contents

source  URL to file source

source_sum  File checksum information as a dictionary

    {hash_type: md5, hsum: <md5sum>}

user  Destination file user owner

group  Destination file group owner

mode  Destination file permissions mode

saltenv  Salt environment used to resolve source files

contents  File contents

salt.modules.file.check_hash(path, file_hash)

Check if a file matches the given hash string

Returns true if the hash matched, otherwise false. Raises ValueError if the hash was not formatted correctly.

path  A file path

hash  A string in the form <hash_type>:<hash_value>. For example: md5:e138491e9d5b97023cea823fe17bac22

CLI Example:
salt '.*' file.check_hash /etc/fstab md5:<md5sum>

```
salt.modules.file.check_managed(name, source, source_hash, user, group, mode, template, context, defaults, saltenv, contents=None, **kwargs)
```

Check to see what changes need to be made for a file

CLI Example:

```
salt '.*' file.check_managed /etc/httpd/conf.d/httpd.conf salt://http/httpd.conf '{hash_type: 'md5', 'hsum': <md5sum>}' root, root, '755' jinja True None None base
```

```
salt.modules.file.check_managed_changes(name, source, source_hash, user, group, mode, template, context, defaults, saltenv, contents=None, **kwargs)
```

Return a dictionary of what changes need to be made for a file

CLI Example:

```
salt '.*' file.check_managed_changes /etc/httpd/conf.d/httpd.conf salt://http/httpd.conf '{hash_type: 'md5', 'hsum': <md5sum>}' root, root, '755' jinja True None None base
```

```
salt.modules.file.check_perms(name, ret, user, group, mode, follow_symlinks=False)
```

Check the permissions on files and chown if needed

CLI Example:

```
salt '.*' file.check_perms /etc/sudoers '{}' root root 400
```

```
salt.modules.file.chgrp(path, group)
```

Change the group of a file

```
path  path to the file or directory

group group owner
```

CLI Example:

```
salt '.*' file.chgrp /etc/passwd root
```

```
salt.modules.file.chown(path, user, group)
```

Chown a file, pass the file the desired user and group

```
path  path to the file or directory

user  user owner

group group owner
```

CLI Example:

```
salt '.*' file.chown /etc/passwd root root
```

```
salt.modules.file.comment(path, regex, char='#', backup='.bak')
```

Deprecated since version 0.17.0: Use replace() instead.

Comment out specified lines in a file

```
path  The full path to the file to be edited

regex  A regular expression used to find the lines that are to be commented; this pattern will be wrapped in parenthesis and will move any preceding/trailing ^ or $ characters outside the parenthesis (e.g., the pattern ^foo$ will be rewritten as ^(foo)$)

char  [#] The character to be inserted at the beginning of a line in order to comment it out
```

31.16. Full list of builtin execution modules
backup [.bak] The file will be backed up before edit with this file extension

**Warning:** This backup will be overwritten each time `sed / comment / uncomment` is called. Meaning the backup will only be useful after the first invocation.

**CLI Example:**
```
salt '*' file.comment /etc/modules pcspkr
```

salt.modules.file.comment_line(path, regex, char='#', cmnt=True, backup='.bak')
Comment or Uncomment a line in a text file.

**Parameters**

- **path** -- string The full path to the text file.
- **regex** -- string A regex expression that begins with ^ that will find the line you wish to comment. Can be as simple as `^color =`
- **char** -- string The character used to comment a line in the type of file you're referencing. Default is #
- **cmnt** -- boolean True to comment the line. False to uncomment the line. Default is True.
- **backup** -- string The file extension to give the backup file. Default is .bak

**Returns** boolean Returns True if successful, False if not

**CLI Example:**
The following example will comment out the pcspkr line in the /etc/modules file using the default # character and create a backup file named modules.bak
```
salt '*' file.comment_line '/etc/modules' '^pcspkr'
```

**CLI Example:**
The following example will uncomment the log_level setting in minion config file if it is set to either warning, info, or debug using the # character and create a backup file named minion.bk
```
salt '*' file.comment_line 'C:\salt\conf\minion' '^log_level: (warning|info|debug)' '#' False '.bk'
```

salt.modules.file.contains(path, text)
Deprecated since version 0.17.0: Use `search()` instead.

Returns True if the file at path contains text

**CLI Example:**
```
salt '*' file.contains /etc/crontab 'mymaintenance.sh'
```

salt.modules.file.contains_glob(path, glob_expr)
Deprecated since version 0.17.0: Use `search()` instead.

Returns True if the given glob matches a string in the named file

**CLI Example:**
```
salt '*' file.contains_glob /etc/foobar '*cheese*' 
```

salt.modules.file.contains_regex(path, regex, lchar='`)
Deprecated since version 0.17.0: Use `search()` instead.

Returns True if the given regular expression matches on any line in the text of a given file.
If the leading char argument (leading char) is specified, it will strip leading char from the left side of each line before trying to match.

**CLI Example:**
```
salt '*' file.contains_regex /etc/crontab
```

### `salt.modules.file.contains_regex_multiline(path, regex)`

* Deprecated since version 0.17.0: Use `search()` instead.*

Return `True` if the given regular expression matches anything in the text of a given file. Traverses multiple lines at a time, via the salt BufferedReader (reads in chunks).

**CLI Example:**
```
salt '*' file.contains_regex_multiline /etc/crontab '^maint'
```

### `salt.modules.file.copy(src, dst, recurse=False, remove_existing=False)`

Copy a file or directory from source to destination.

In order to copy a directory, the recurse flag is required, and will by default overwrite files in the destination with the same path, and retain all other existing files. (similar to cp -r on unix)

`remove_existing` will remove all files in the target directory, and then copy files from the source.

**CLI Example:**
```
salt '*' file.copy /path/to/src /path/to/dst
salt '*' file.copy /path/to/src_dir /path/to/dst_dir recurse=True
salt '*' file.copy /path/to/src_dir /path/to/dst_dir recurse=True remove_existing=True
```

### `salt.modules.file.delete_backup(path, backup_id)`

* New in version 0.17.0.*

Delete a previous version of a file that was backed up using Salt’s file state backup system.

`path` The path on the minion to check for backups

`backup_id` The numeric id for the backup you wish to delete, as found using `file.list_backups`

**CLI Example:**
```
salt '*' file.restore_backup /foo/bar/baz.txt 0
```

### `salt.modules.file.directory_exists(path)`

Tests to see if path is a valid directory. Returns True/False.

**CLI Example:**
```
salt '*' file.directory_exists /etc
```

### `salt.modules.file.dirname(path)`

Returns the directory component of a path name.

* New in version 2015.5.0.*

This can be useful at the CLI but is frequently useful when scripting.

```
{% from salt['file.dirname'](tpldir) + '/vars.jinja' import parent_vars %}
```

**CLI Example:**
```
```
salt '*t' file.dirname 'test/path/filename.config'

salt.modules.file.diskusage(path)
Recursively calculate disk usage of path and return it in bytes
CLI Example:
salt '*t' file.diskusage /path/to/check

salt.modules.file.extract_hash(hash_fn, hash_type='sha256', file_name='')
This routine is called from the file.managed state to pull a hash from a remote file. Regular expressions are used line by line on the source_hash file, to find a potential candidate of the indicated hash type. This avoids many problems of arbitrary file layout rules. It specifically permits pulling hash codes from debian *.dsc files.
For example:

```
openerp_7.0_latest-1.tar.gz:
  file.managed:
    - name: /tmp/openerp_7.0-20121227-075624-1_all.deb
    - source: http://nightly.openerp.com/7.0/nightly/deb/openerp_7.0-20121227-075624-1.tar.gz
    - source_hash: http://nightly.openerp.com/7.0/nightly/deb/openerp_7.0-20121227-075624-1.dsc
```

CLI Example:
salt '*t' file.extract_hash /etc/foo sha512 /path/to/hash/file

salt.modules.file.file_exists(path)
Tests to see if path is a valid file. Returns True/False.
CLI Example:
salt 't' file.file_exists /etc/passwd

salt.modules.file.find(path, *args, **kwargs)
Approximate the Unix find(1) command and return a list of paths that meet the specified criteria.
The options include match criteria:

```
name      = path-glob       # case sensitive
iname     = path-glob       # case insensitive
regex     = path-regex      # case sensitive
iregex    = path-regex      # case insensitive
type      = file-types      # match any listed type
user       = users          # match any listed user
group     = groups         # match any listed group
size       = [+][-]number[size-unit] # default unit = byte
mtime      = interval       # modified since date
grep       = regex         # search file contents
```

and/or actions:
```
delete    [= file-types]  # default type = 'f'
exec       = command [arg ...] # where {} is replaced by pathname
print      [= print-opts]
```

and/or depth criteria:
```
maxdepth = maximum depth to transverse in path
mindepth = minimum depth to transverse before checking files or directories
```
The default action is `print=path`

**path-glob:**

* = match zero or more chars  
? = match any char  
[abc] = match a, b, or c  
[^abc] = match anything except a, b, and c  
[x-y] = match chars x through y  
[^x-y] = match anything except chars x through y  
{a,b,c} = match a or b or c

**path-regex:** a Python Regex (regular expression) pattern to match pathnames

**file-types:** a string of one or more of the following:

- a: all file types  
- b: block device  
- c: character device  
- d: directory  
- p: FIFO (named pipe)  
- f: plain file  
- l: symlink  
- s: socket

**users:** a space and/or comma separated list of user names and/or uids

**groups:** a space and/or comma separated list of group names and/or gids

**size-unit:**

- b: bytes  
- k: kilobytes  
- m: megabytes  
- g: gigabytes  
- t: terabytes

**interval:**

`[<num>w] [<num>d] [<num>h] [<num>m] [<num>s]`

where:

- w: week  
- d: day  
- h: hour  
- m: minute  
- s: second

**print-opts:** a comma and/or space separated list of one or more of the following:

- group: group name  
- md5: MD5 digest of file contents  
- mode: file permissions (as integer)  
- mtime: last modification time (as time_t)  
- name: file basename  
- path: file absolute path  
- size: file size in bytes  
- type: file type  
- user: user name

CLI Examples:
```
salt '*' file.find / type=f name='*.bak' size='+10m
salt '*' file.find /var mtime='+30d' size='+10m' print=path,size,mtime
salt '*' file.find /var/log name='*.[0-9]' mtime='+30d' size='+10m' delete
```

**salt.modules.file.get_devmm(name)**

Get major/minor info from a device

CLI Example:
```
salt '*' file.get_devmm /dev/chr
```

**salt.modules.file.get_diff(minionfile, masterfile, env=None, saltenv='base')**

Return unified diff of file compared to file on master

CLI Example:
```
salt '*' file.get_diff /home/fred/.vimrc salt://users/fred/.vimrc
```

**salt.modules.file.get_gid(path, follow_symlinks=True)**

Return the id of the group that owns a given file

- **path** file or directory of which to get the gid
- **follow_symlinks** indicated if symlinks should be followed

CLI Example:
```
salt '*' file.get_gid /etc/passwd
```

Changed in version 0.16.4: follow_symlinks option added

**salt.modules.file.get_group(path, follow_symlinks=True)**

Return the group that owns a given file

- **path** file or directory of which to get the group
- **follow_symlinks** indicated if symlinks should be followed

CLI Example:
```
salt '*' file.get_group /etc/passwd
```

Changed in version 0.16.4: follow_symlinks option added

**salt.modules.file.get_hash(path, form='sha256', chunk_size=65536)**

Get the hash sum of a file

This is better than **get_sum** for the following reasons:

- It does not read the entire file into memory.
- It does not return a string on error. The returned value of **get_sum** cannot really be trusted since it is vulnerable to collisions: get_sum(..., 'xyz') == 'Hash xyz not supported'

- **path** path to the file or directory
- **form** desired sum format
- **chunk_size** amount to sum at once

CLI Example:
salt '*' file.get_hash /etc/shadow

salt.modules.file.get_managed(name, template, source, source_hash, user, group, mode, saltenv, context, defaults, **kwargs)

Return the managed file data for file.managed

name  location where the file lives on the server
template  template format
source  managed source file
source_hash  hash of the source file
user  user owner
group  group owner
mode  file mode
context  variables to add to the environment
default  default values of for context_dict

CLI Example:

```
```

salt.modules.file.get_mode(path, follow_symlinks=True)

Return the mode of a file

path  file or directory of which to get the mode
follow_symlinks  indicated if symlinks should be followed

CLI Example:

```
salt '*' file.get_mode /etc/passwd
```

Changed in version 2014.1.0: follow_symlinks option added

salt.modules.file.get_selinux_context(path)

Get an SELinux context from a given path

CLI Example:

```
salt '*' file.get_selinux_context /etc/hosts
```

salt.modules.file.get_sum(path, form='sha256')

Return the checksum for the given file. The following checksum algorithms are supported:

- md5
- sha1
- sha224
- sha256 (default)
- sha384
- sha512

path  path to the file or directory
form  desired sum format
**CLI Example:**

```bash
cd /etc/audit
salt '*' file.get_sum /etc/passwd sha512
```

`salt.modules.file.get_uid(path, follow_symlinks=True)`

Return the id of the user that owns a given file

- `path` : file or directory of which to get the uid
- `follow_symlinks` : indicated if symlinks should be followed

**CLI Example:**

```bash
cd /etc/audit
salt '*' file.get_uid /etc/passwd
```

Changed in version 0.16.4: `follow_symlinks` option added

`salt.modules.file.get_user(path, follow_symlinks=True)`

Return the user that owns a given file

- `path` : file or directory of which to get the user
- `follow_symlinks` : indicated if symlinks should be followed

**CLI Example:**

```bash
cd /etc/audit
salt '*' file.get_user /etc/passwd
```

Changed in version 0.16.4: `follow_symlinks` option added

`salt.modules.file.gid_to_group(gid)`

Convert the group id to the group name on this system

- `gid` : gid to convert to a group name

**CLI Example:**

```bash
cd /etc/audit
salt '*' file.gid_to_group 0
```

`salt.modules.file.grep(path, pattern, *args)`

Grep for a string in the specified file

**Note:** This function’s return value is slated for refinement in future versions of Salt

- `path` : A file path
- `pattern` : A string. For example: `test a[0-5]`
- `args` : grep options. For example: " -v" " -i -B2"

**CLI Example:**

```bash
cd /etc/audit
salt '*' file.grep /etc/passwd nobody
salt '*' file.grep /etc/sysconfig/network-scripts/ifcfg-eth0 ipaddr " -i"
salt '*' file.grep /etc/sysconfig/network-scripts/ifcfg-eth0 ipaddr " -i -B2"
salt '*' file.grep "/etc/sysconfig/network-scripts/*" ipaddr " -i -l"
```

`salt.modules.file.group_to_gid(group)`

Convert the group to the gid on this system

- `group` : group to convert to its gid

**CLI Example:**

```bash
cd /etc/audit
```
salt '.transition' file.group_to_gid root

salt.modules.file.is_blkdev(name)
Check if a file exists and is a block device.

CLI Example:

    salt '*' file.is_blkdev /dev/blk

salt.modules.file.is_chrdev(name)
Check if a file exists and is a character device.

CLI Example:

    salt '*' file.is_chrdev /dev/chr

salt.modules.file.is_fifo(name)
Check if a file exists and is a FIFO.

CLI Example:

    salt '*' file.is_fifo /dev/fifo

salt.modules.file.is_link(path)
Check if the path is a symlink

CLI Example:

    salt '*' file.is_link /path/to/link

salt.modules.file.join(*args)
Return a normalized file system path for the underlying OS

New in version 2014.7.0.

This can be useful at the CLI but is frequently useful when scripting combining path variables:

    {% set www_root = '/var' %}
    {% set app_dir = 'myapp' %}

    myapp_config:
        file:
            - managed
            - name: {{ salt['file.join'](www_root, app_dir, 'config.yaml') }}

    CLI Example:

    salt '*' file.join '/usr/local/bin'

salt.modules.file.lchown(path, user, group)
Chown a file, pass the file the desired user and group without following symlinks.

    path  path to the file or directory
    user  user owner
    group group owner

CLI Example:

    salt '*' file.lchown /etc/passwd root root
salt.modules.file.line(path, content, match=None, mode=None, location=None, before=None, after=None, show_changes=True, backup=False, quiet=False, indent=True)

New in version 2015.8.0.

Edit a line in the configuration file.

Parameters

- **path** -- Filesystem path to the file to be edited.
- **content** -- Content of the line.
- **match** -- Match the target line for an action by a fragment of a string or regular expression.
- **mode** --
  
  Ensure If line does not exist, it will be added.
  Replace If line already exist, it will be replaced.
  Delete Delete the line, once found.
  Insert Insert a line.
- **location** --
  
  start Place the content at the beginning of the file.
  end Place the content at the end of the file.
- **before** -- Regular expression or an exact case-sensitive fragment of the string.
- **after** -- Regular expression or an exact case-sensitive fragment of the string.

**:param show_changes** Output a unified diff of the old file and the new file. If False return a boolean if any changes were made. Default is True

**Note:** Using this option will store two copies of the file in-memory (the original version and the edited version) in order to generate the diff.

**:param backup** Create a backup of the original file with the extension: ``Year-Month-Day-Hour-Minutes-Seconds``.

**:param quiet** Do not raise any exceptions. E.g. ignore the fact that the file that is tried to be edited does not exist and nothing really happened.

**:param indent** Keep indentation with the previous line.

CLI Examples:

```
salt '*' file.line /etc/nsswitch.conf "networks: files dns", after="hosts:.:*", mode='ensure'
```

salt.modules.file.link(src, path)

New in version 2014.1.0.

Create a hard link to a file

CLI Example:

```
salt '*' file.link /path/to/file /path/to/link
```

salt.modules.file.list_backups(path, limit=None)

New in version 0.17.0.

Lists the previous versions of a file backed up using Salt’s file state backup system.
path  The path on the minion to check for backups
limit  Limit the number of results to the most recent N backups

CLI Example:
salt '*' file.list_backups /foo/bar/baz.txt

salt.modules.file.list_backups_dir(path, limit=None)
Lists the previous versions of a directory backed up using Salt's file state backup system.
path  The directory on the minion to check for backups
limit  Limit the number of results to the most recent N backups

CLI Example:
salt '*' file.list_backups_dir /foo/bar/baz/

salt.modules.file.lstat(path)
New in version 2014.1.0.
Returns the lstat attributes for the given file or dir. Does not support symbolic links.

CLI Example:
salt '*' file.lstat /path/to/file

salt.modules.file.makedirs(path, user=None, group=None, mode=None)
Ensure that the directory containing this path is available.

Note: The path must end with a trailing slash otherwise the directory/directories will be created up to the parent directory. For example if path is /opt/code, then it would be treated as /opt/ but if the path ends with a trailing slash like /opt/code/, then it would be treated as /opt/code/.

CLI Example:
salt '*' file.makedirs /opt/code/

salt.modules.file.makedirs_perms(name, user=None, group=None, mode='0755')
Taken and modified from os.makedirs to set user, group and mode for each directory created.

CLI Example:
salt '*' file.makedirs_perms /opt/code

salt.modules.file.manage_file(name, sfn, ret, source, source_sum, user, group, mode, saltenv, backup, makedirs=False, template=None, show_diff=True, contents=None, dir_mode=None, follow_symlinks=True)
Checks the destination against what was retrieved with get_managed and makes the appropriate modifications (if necessary).

name  location to place the file
sfn  location of cached file on the minion

This is the path to the file stored on the minion. This file is placed on the minion using cp.cache_file. If the hash sum of that file matches the source_sum, we do not transfer the file to the minion again.

This file is then grabbed and if it has template set, it renders the file to be placed into the correct place on the system using salt.files.utils.copyfile()

ret  The initial state return data structure. Pass in None to use the default structure.
source  file reference on the master
source_hash  sum hash for source
user  user owner
group  group owner
backup  backup_mode
makedirs  make directories if they do not exist
template  format of templating
show_diff  Include diff in state return
contents:  contents to be placed in the file
dir_mode  mode for directories created with makedirs

CLI Example:

```bash
salt '*' file.manage_file /etc/httpd/conf.d/httpd.conf '{hash_type: md5, hsum: '5259b1b3525'} salt://httpd/httpd.conf {hash_type: md5, hsum: '<md5sum>}'
```

Changed in version 2014.7.0: follow_symlinks option added

```bash
salt.modules.file.mkdir(dir_path, user=None, group=None, mode=None)
```

Ensure that a directory is available.

CLI Example:

```bash
salt '*' file.mkdir /opt/jetty/context
```

```bash
salt.modules.file.mknod(name, ntype, major=0, minor=0, user=None, group=None, mode='0600')
```

New in version 0.17.0.
Create a block device, character device, or fifo pipe. Identical to the gnu mknod.

CLI Examples:

```bash
salt '*' file.mknod /dev/chr c 180 31
salt '*' file.mknod /dev/blk b 8 999
salt '*' file.mknod /dev/fifo p
```

```bash
salt.modules.file.mknod_blkdev(name, major, minor, user=None, group=None, mode='0660')
```

New in version 0.17.0.
Create a block device.

CLI Example:

```bash
salt '*' file.mknod_blkdev /dev/blk 8 999
```

```bash
salt.modules.file.mknod_chrdev(name, major, minor, user=None, group=None, mode='0660')
```

New in version 0.17.0.
Create a character device.

CLI Example:

```bash
salt '*' file.mknod_chrdev /dev/chr 180 31
```

```bash
salt.modules.file.mknod_fifo(name, user=None, group=None, mode='0660')
```

New in version 0.17.0.
Create a FIFO pipe.
CLI Example:
```
salt '*' file.mknod_fifo /dev/fifo
```

salt.modules.file.move(src, dst)
Move a file or directory

CLI Example:
```
salt '*' file.move /path/to/src /path/to/dst
```

salt.modules.file.normpath(path)
Returns Normalize path, eliminating double slashes, etc.

New in version 2015.5.0.
This can be useful at the CLI but is frequently useful when scripting.

```
{% from salt['file.normpath'](tpldir + '/../vars.jinja') import parent_vars %}
```

CLI Example:
```
salt '*' file.normpath 'a/b/c/..
```

salt.modules.file.open_files(by_pid=False)
Return a list of all physical open files on the system.

CLI Examples:
```
salt '*' file.open_files
salt '*' file.open_files by_pid=True
```

salt.modules.file.pardir()
Return the relative parent directory path symbol for underlying OS

New in version 2014.7.0.
This can be useful when constructing Salt Formulas.

```
{% set pardir = salt['file.pardir']() %}
{% set final_path = salt['file.join']('subdir', pardir, 'confdir') %}
```

CLI Example:
```
salt '*' file.pardir
```

salt.modules.file.patch(originalfile, patchfile, options='~', dry_run=False)
Apply a patch to a file

Equivalent to:

```
patch <options> <originalfile> <patchfile>
```

originalfile The full path to the file or directory to be patched

patchfile A patch file to apply to originalfile

options Options to pass to patch.

CLI Example:
salt '/*' file.patch /opt/file.txt /tmp/file.txt.patch

salt.modules.file.path_exists_glob(path)
Tests to see if path after expansion is a valid path (file or directory). Expansion allows usage of ? * and character ranges []. Tilde expansion is not supported. Returns True/False.
New in version Helium.
CLI Example:

```
salt '/*' file.path_exists_glob /etc/pam*/pass*
```

salt.modules.file.prepend(path, *args, **kwargs)
New in version 2014.7.0.
Prepend text to the beginning of a file

**path** path to file

**args** strings to prepend to the file

CLI Example:

```
salt '/*' file.prepend /etc/motd
  "With all thine offerings thou shalt offer salt."
  "Salt is what makes things taste bad when it isn't in them."
```

Attention
If you need to pass a string to append and that string contains an equal sign, you must include the argument name, args. For example:

```
salt '/*' file.prepend /etc/motd args='cheese=spam'
salt '/*' file.prepend /etc/motd args="[\'cheese=spam\',\'spam=cheese\']"
```

salt.modules.file.psed(path, before, after, limit='', backup='.bak', flags='gMS', escape_all=False, multi=False)
Deprecated since version 0.17.0: Use replace() instead.
Make a simple edit to a file (pure Python version)
Equivalent to:

```
sed <backup> <options> "/<limit>/ s/<before>/<after>/<flags> <file>"
```

**path** The full path to the file to be edited
**before** A pattern to find in order to replace with after
**after** Text that will replace before
**limit** ['',] An initial pattern to search for before searching for before
**backup** ['.bak] The file will be backed up before edit with this file extension; WARNING: each time sed/comment/uncomment is called will overwrite this backup
**flags** [gMS]
Flags to modify the search. Valid values are:
- g: Replace all occurrences of the pattern, not just the first.
I: Ignore case.
L: Make \w, \W, \b, \B, \s and \S dependent on the locale.
M: Treat multiple lines as a single line.
S: Make . match all characters, including newlines.
U: Make \w, \W, \b, \B, \d, \D, \s and \S dependent on Unicode.
X: Verbose (whitespace is ignored).

multi: False If True, treat the entire file as a single line

Forward slashes and single quotes will be escaped automatically in the before and after patterns.

CLI Example:
```
salt '*' file.sed /etc/httpd/httpd.conf 'LogLevel warn' 'LogLevel info'
```

salt.modules.file.readdir(path)
New in version 2014.1.0.
Return a list containing the contents of a directory

CLI Example:
```
salt '*' file.readdir /path/to/dir/
```

salt.modules.file.readlink(path, canonicalize=False)
New in version 2014.1.0.
Return the path that a symlink points to If canonicalize is set to True, then it return the final target

CLI Example:
```
salt '*' file.readlink /path/to/link
```

salt.modules.file.remove(path)
Remove the named file

CLI Example:
```
salt '*' file.remove /tmp/foo
```

salt.modules.file.rename(src, dst)
Rename a file or directory

CLI Example:
```
salt '*' file.rename /path/to/src /path/to/dst
```

salt.modules.file.replace(path, pattern, repl, count=0, flags=0, bufsize=1, append_if_not_found=False, prepend_if_not_found=False, not_found_content=None, backup='.bak', dry_run=False, search_only=False, show_changes=True, ignore_if_missing=False, preserve_inode=True)
New in version 0.17.0.
Replace occurrences of a pattern in a file
This is a pure Python implementation that wraps Python's sub().

path  Filesystem path to the file to be edited
pattern  Python's regular expression search [https://docs.python.org/2/library/re.html](https://docs.python.org/2/library/re.html)

repl  The replacement text

count  Maximum number of pattern occurrences to be replaced

flags (list or int)  A list of flags defined in the re module documentation. Each list item should be a string that will correlate to the human-friendly flag name. E.g., ['IGNORECASE', 'MULTILINE']. Note: multiline searches must specify file as the bufsize argument below.

bufsize (int or str)  How much of the file to buffer into memory at once. The default value 1 processes one line at a time. The special value file may be specified which will read the entire file into memory before processing. Note: multiline searches must specify file buffering.

append_if_not_found  New in version 2014.7.0.

If pattern is not found and set to True then, the content will be appended to the file. Default is False

prepend_if_not_found  New in version 2014.7.0.

If pattern is not found and set to True then, the content will be appended to the file. Default is False

not_found_content  New in version 2014.7.0.

Content to use for append/prepend if not found. If None (default), uses repl. Useful when repl uses references to group in pattern.

backup  The file extension to use for a backup of the file before editing. Set to False to skip making a backup. Default is .bak

dry_run  Don't make any edits to the file, Default is False

search_only  Just search for the pattern; ignore the replacement; stop on the first match. Default is False

show_changes  Output a unified diff of the old file and the new file. If False return a boolean if any changes were made. Default is True

Note: Using this option will store two copies of the file in-memory (the original version and the edited version) in order to generate the diff.

ignore_if_missing  New in version 2015.8.0.

When this parameter is True, file.replace will return False if the file doesn't exist. When this parameter is False, file.replace will throw an error if the file doesn't exist. Default is False (to maintain compatibility with prior behaviour).

preserve_inode  New in version 2015.8.0.

Preserve the inode of the file, so that any hard links continue to share the inode with the original filename. This works by copying the file, reading from the copy, and writing to the file at the original inode. If False, the file will be moved rather than copied, and a new file will be written to a new inode, but using the original filename. Hard links will then share an inode with the backup, instead (if using backup to create a backup copy). Default is True.

If an equal sign (=) appears in an argument to a Salt command it is interpreted as a keyword argument in the format key=val. That processing can be bypassed in order to pass an equal sign through to the remote shell command by manually specifying the kwarg:

```
salt '*' file.replace /path/to/file pattern='=' repl=':'
salt '*' file.replace /path/to/file pattern="bind-address\$s*=" repl='bind-address: '
```

CLI Examples:
salt.modules.file.restore_backup(path, backup_id)
    New in version 0.17.0.
    Restore a previous version of a file that was backed up using Salt’s file state backup system.
    
    path  The path on the minion to check for backups
    backup_id  The numeric id for the backup you wish to restore, as found using file.list_backups
    
    CLI Example:
    ```
salt '*' file.restore_backup /foo/bar/baz.txt 0
    ```

salt.modules.file.restorecon(path, recursive=False)
    Reset the SELinux context on a given path
    
    CLI Example:
    ```
salt '*' file.restorecon /home/user/.ssh/authorized_keys
    ```

salt.modules.file.rmdir(path)
    New in version 2014.1.0.
    Remove the specified directory. Fails if a directory is not empty.
    
    CLI Example:
    ```
salt '*' file.rmdir /tmp/foo/
    ```

salt.modules.file.search(path, pattern, flags=0, bufsize=1, ignore_if_missing=False, multiline=False)
    New in version 0.17.0.
    Search for occurrences of a pattern in a file
    Except for multiline, params are identical to replace().
    
    multiline  If true, inserts `MULTILINE' into flags and sets bufsize to `file'.
                New in version 2015.8.0.
    
    CLI Example:
    ```
salt '*' file.search /etc/crontab 'mymaintenance.sh'
    ```

salt.modules.file.sed(path, before, after, limit='', backup='.bak', options='-r -e', flags='g', escape_all=False, negate_match=False)
    Deprecated since version 0.17.0: Use replace() instead.
    Make a simple edit to a file
    Equivalent to:
    ```
sed <backup> <options> "/<limit>/ s/<before>/<after>/<flags> <file>"
    ```
    
    path  The full path to the file to be edited
    before  A pattern to find in order to replace with after
    after  Text that will replace before
    limit  [''] An initial pattern to search for before searching for before
backup [.bak] The file will be backed up before edit with this file extension; WARNING: each time sed/comment/uncomment is called will overwrite this backup

options [-r -e] Options to pass to sed
flags [g] Flags to modify the sed search; e.g., i for case-insensitive pattern matching
negate_match [False] Negate the search command (!)

New in version 0.17.0.

Forward slashes and single quotes will be escaped automatically in the before and after patterns.

CLI Example:
```
salt '*' file.sed /etc/httpd/httpd.conf 'LogLevel warn' 'LogLevel info'
```

salt.modules.file.sed_contains(path, text, limit='', flags='g')

Deprecated since version 0.17.0: Use search() instead.

Return True if the file at path contains text. Utilizes sed to perform the search (line-wise search).

Note: the p flag will be added to any flags you pass in.

CLI Example:
```
salt '*' file.contains /etc/crontab 'mymaintenance.sh'
```

salt.modules.file.seek_read(path, size, offset)

New in version 2014.1.0.

Seek to a position on a file and read it

path path to file
seek amount to read at once
offset offset to start into the file

CLI Example:
```
salt '*' file.seek_read /path/to/file 4096 0
```

salt.modules.file.seek_write(path, data, offset)

New in version 2014.1.0.

Seek to a position on a file and write to it

path path to file
data data to write to file
offset position in file to start writing

CLI Example:
```
salt '*' file.seek_write /path/to/file 'some data' 4096
```

salt.modules.file.set_mode(path, mode)

Set the mode of a file

path file or directory of which to set the mode
mode mode to set the path to

CLI Example:
**Salt Documentation, Release 2015.8.0**

---

```
salt '*' file.set_mode /etc/passwd 0644
```

salt.modules.file.set_selinux_context(path, user=None, role=None, type=None, range=None)

Set a specific SELinux label on a given path

CLI Example:

```
salt '*' file.set_selinux_context path <role> <type> <range>
```

salt.modules.file.source_list(source, source_hash, saltenv)

Check the source list and return the source to use

CLI Example:

```
salt '*' file.source_list salt://http/httpd.conf '{hash_type: 'md5', 'hsum': <md5sum>}' base
```

salt.modules.file.stats(path, hash_type=None, follow_symlinks=True)

Return a dict containing the stats for a given file

CLI Example:

```
salt '*' file.stats /etc/passwd
```

salt.modules.file.statvfs(path)

New in version 2014.1.0.

Perform a statvfs call against the filesystem that the file resides on

CLI Example:

```
salt '*' file.statvfs /path/to/file
```

salt.modules.file.symlink(src, path)

Create a symbolic link to a file

CLI Example:

```
salt '*' file.symlink /path/to/file /path/to/link
```

salt.modules.file.touch(name, atime=None, mtime=None)

New in version 0.9.5.

Just like the touch command, create a file if it doesn’t exist or simply update the atime and mtime if it already does.

- **atime**: Access time in Unix epoch time
- **mtime**: Last modification in Unix epoch time

CLI Example:

```
salt '*' file.touch /var/log/emptyfile
```

salt.modules.file.truncate(path, length)

New in version 2014.1.0.

Seek to a position on a file and delete everything after that point

- **path**: path to file
- **length**: offset into file to truncate

CLI Example:

```
salt '*' file.truncate /path/to/file
```
salt '*' file.truncate /path/to/file 512

salt.modules.file.uid_to_user(uid)
   Convert a uid to a user name
   uid  uid to convert to a username
   CLI Example:
   salt '*' file.uid_to_user 0

salt.modules.file.uncomment(path, regex='^', char='#', backup='.bak')
   Deprecated since version 0.17.0: Use replace() instead.
   Uncomment specified commented lines in a file
   path  The full path to the file to be edited
   regex A regular expression used to find the lines that are to be uncommented. This regex should not include the comment character. A leading ^ character will be stripped for convenience (for easily switching between comment() and uncomment()).
   char  [#] The character to remove in order to uncomment a line
   backup [.bak] The file will be backed up before edit with this file extension; WARNING: each time sed/comment/uncomment is called will overwrite this backup
   CLI Example:
   salt '*' file.uncomment /etc/hosts.deny 'ALL: PARANOID'

salt.modules.file.user_to_uid(user)
   Convert username to a uid
   user  user name to convert to its uid
   CLI Example:
   salt '*' file.user_to_uid root

salt.modules.file.write(path, *args, **kwargs)
   New in version 2014.7.0.
   Write text to a file, overwriting any existing contents.
   path  path to file
   *args strings to write to the file
   CLI Example:
   salt '*' file.write /etc/motd "With all thine offerings thou shalt offer salt."

Attention
   If you need to pass a string to append and that string contains an equal sign, you must include the argument name, args. For example:
   salt '*' file.write /etc/motd args='cheese=spam'
   salt '*' file.write /etc/motd args="['cheese=spam','spam=cheese']"
31.16.82  salt.modules.firewalld

Support for firewalld.

New in version 2015.2.0.

```
salt.modules.firewalld.add_masquerade(zone)
```
Enable masquerade on a zone.

New in version 2015.8.0.

CLI Example:

```
salt '*' firewalld.add_masquerade
```

```
salt.modules.firewalld.add_port(zone, port)
```
Allow specific ports in a zone.

New in version 2015.8.0.

CLI Example:

```
salt '*' firewalld.add_port internal 443/tcp
```

```
salt.modules.firewalld.add_port_fwd(zone, src, dest, proto='tcp', dstaddr='')
```
Add port forwarding.

New in version 2015.8.0.

CLI Example:

```
salt '*' firewalld.add_port_fwd public 80 443 tcp
```

```
salt.modules.firewalld.add_service(name, zone=None, permanent=True)
```
Add a service for zone. If zone is omitted, default zone will be used.

CLI Example:

```
salt '*' firewalld.add_service ssh
```

To assign a service to a specific zone:

```
salt '*' firewalld.add_service ssh my_zone
```

```
salt.modules.firewalld.allow_icmp(zone, icmp)
```
Allow a specific ICMP type on a zone

New in version 2015.8.0.

CLI Example:

```
salt '*' firewalld.allow_icmp zone echo-reply
```

```
salt.modules.firewalld.block_icmp(zone, icmp)
```
Block a specific ICMP type on a zone

New in version 2015.8.0.

CLI Example:

```
salt '*' firewalld.block_icmp zone echo-reply
```
salt.modules.firewalld.default_zone()  
Print default zone for connections and interfaces  
CLI Example:
```
salt '*' firewalld.default_zone
```

salt.modules.firewalld.delete_service(name, restart=True)  
Delete an existing service  
CLI Example:
```
salt '*' firewalld.delete_service my_service
```
By default firewalld will be reloaded. However, to avoid reloading you need to specify the restart as False
```
salt '*' firewalld.delete_service my_service False
```

salt.modules.firewalld.delete_zone(zone, restart=True)  
Delete an existing zone  
CLI Example:
```
salt '*' firewalld.delete_zone my_zone
```
By default firewalld will be reloaded. However, to avoid reloading you need to specify the restart as False
```
salt '*' firewalld.delete_zone my_zone False
```

salt.modules.firewalld.get_icmp_types()  
Print predefined icmp types  
CLI Example:
```
salt '*' firewalld.get_icmp_types
```

salt.modules.firewalld.get_masquerade(zone)  
Show if masquerading is enabled on a zone  
CLI Example:
```
salt '*' firewalld.get_masquerade zone
```

salt.modules.firewalld.get_services()  
Print predefined services  
CLI Example:
```
salt '*' firewalld.get_services
```

salt.modules.firewalld.get_zones()  
Print predefined zones  
CLI Example:
```
salt '*' firewalld.get_zones
```

salt.modules.firewalld.list_all(zone=None)  
List everything added for or enabled in a zone  
CLI Example:
salt ' numerous firewalld.list_all

List a specific zone
salt ' numerous firewalld.list_all my_zone

salt.modules.firewalld.list_all

salt.modules.firewalld.list_all

salt.modules.firewalld.list_icmp_block(zone)
List ICMP blocks on a zone
New in version 2015.8.0.
CLI Example:
salt ' numerous firewalld.list_icmp_block zone

salt.modules.firewalld.list_port_fwd(zone)
List port forwarding
New in version 2015.8.0.
CLI Example:
salt ' numerous firewalld.list_port_fwd public

salt.modules.firewalld.list_ports(zone)
List all ports in a zone.
New in version 2015.8.0.
CLI Example:
salt ' numerous firewalld.list_ports

salt.modules.firewalld.list_services(zone=None)
List services added for zone as a space separated list. If zone is omitted, default zone will be used.
CLI Example:
salt ' numerous firewalld.list_services

List a specific zone
salt ' numerous firewalld.list_services my_zone

salt.modules.firewalld.list_zones()
List everything added for or enabled in all zones
CLI Example:
salt ' numerous firewalld.list_zones

salt.modules.firewalld.new_service(name, restart=True)
Add a new service
CLI Example:
salt ' numerous firewalld.new_service my_service

By default firewalld will be reloaded. However, to avoid reloading you need to specify the restart as False
salt ' numerous firewalld.new_service my_service False
salt.modules.firewalld.new_zone(zone, restart=True)

Add a new zone

CLI Example:

```
salt '*' firewalld.new_zone my_zone
```

By default firewalld will be reloaded. However, to avoid reloading you need to specify the restart as False

```
salt '*' firewalld.new_zone my_zone False
```

salt.modules.firewalld.remove_masquerade(zone)

Remove masquerade on a zone.

New in version 2015.8.0.

CLI Example:

```
salt '*' firewalld.remove_masquerade
```

salt.modules.firewalld.remove_port(zone, port)

Remove a specific port from a zone.

New in version 2015.8.0.

CLI Example:

```
salt '*' firewalld.remove_port internal 443/tcp
```

salt.modules.firewalld.remove_port_fwd(zone, src, dest, proto='tcp')

Remove Port Forwarding.

New in version 2015.8.0.

CLI Example:

```
salt '*' firewalld.remove_port_fwd public 80 443 tcp
```

salt.modules.firewalld.remove_service(name, zone=None, permanent=True)

Remove a service from zone. This option can be specified multiple times. If zone is omitted, default zone will be used.

CLI Example:

```
salt '*' firewalld.remove_service ssh
```

To remove a service from a specific zone

```
salt '*' firewalld.remove_service ssh dmz
```

salt.modules.firewalld.set_default_zone(zone)

Set default zone

CLI Example:

```
salt '*' firewalld.set_default_zone damian
```

salt.modules.firewalld.version()

Return version from firewall-cmd

CLI Example:
31.16.83 salt.modules.freebsd_sysctl

Module for viewing and modifying sysctl parameters

```
salt.modules.freebsd_sysctl.assign(name, value)
    Assign a single sysctl parameter for this minion
    CLI Example:
    salt '*' sysctl.assign net.inet.icmp.icmplim 50
```

```
salt.modules.freebsd_sysctl.get(name)
    Return a single sysctl parameter for this minion
    CLI Example:
    salt '*' sysctl.get hw.physmem
```

```
salt.modules.freebsd_sysctl.persist(name, value, config='/etc/sysctl.conf')
    Assign and persist a simple sysctl parameter for this minion
    CLI Example:
    salt '*' sysctl.persist net.inet.icmp.icmplim 50
    salt '*' sysctl.persist coretemp_load NO config=/boot/loader.conf
```

```
salt.modules.freebsd_sysctl.show(config_file=False)
    Return a list of sysctl parameters for this minion
    CLI Example:
    salt '*' sysctl.show
```

31.16.84 salt.modules.freebsdjail

The jail module for FreeBSD

```
salt.modules.freebsdjail.fstab(jail)
    Display contents of a fstab(5) file defined in specified jail's configuration. If no file is defined, return False.
    CLI Example:
    salt '*' jail.fstab <jail name>
```

```
salt.modules.freebsdjail.get_enabled()
    Return which jails are set to be run
    CLI Example:
    salt '*' jail.get_enabled
```

```
salt.modules.freebsdjail.is_enabled()
    See if jail service is actually enabled on boot
    CLI Example:
```
salt '.*' jail.is_enabled <jail name>

salt.modules.freebsdjail.restart('jail-')
    Restart the specified jail or all, if none specified
    CLI Example:
    salt '.*' jail.restart [<jail name>]

salt.modules.freebsdjail.show_config(jail)
    Display specified jail's configuration
    CLI Example:
    salt '.*' jail.show_config <jail name>

salt.modules.freebsdjail.start('jail-')
    Start the specified jail or all, if none specified
    CLI Example:
    salt '.*' jail.start [<jail name>]

salt.modules.freebsdjail.status(jail)
    See if specified jail is currently running
    CLI Example:
    salt '.*' jail.status <jail name>

salt.modules.freebsdjail.stop('jail-')
    Stop the specified jail or all, if none specified
    CLI Example:
    salt '.*' jail.stop [<jail name>]

salt.modules.freebsdjail.sysctl()
    Dump all jail related kernel states (sysctl)
    CLI Example:
    salt '.*' jail.sysctl

31.16.85 salt.modules.freebsdkmod

Module to manage FreeBSD kernel modules

salt.modules.freebsdkmod.available()
    Return a list of all available kernel modules
    CLI Example:
    salt '.*' kmod.available

salt.modules.freebsdkmod.check_available(mod)
    Check to see if the specified kernel module is available
    CLI Example:
**salt.modules.freebsdkmod**

- **is_loaded**(mod)**
  
  Check to see if the specified kernel module is loaded

  CLI Example:

  `salt '*' kmod.is_loaded vmm`

- **load**(mod, persist=False)**
  
  Load the specified kernel module

  **mod** Name of the module to add

  **persist** Write the module to sysrc kld_modules to make it load on system reboot

  CLI Example:

  `salt '*' kmod.load bhyve`

- **lsmod()**
  
  Return a dict containing information about currently loaded modules

  CLI Example:

  `salt '*' kmod.lsmod`

- **mod_list**(only_persist=False)**
  
  Return a list of the loaded module names

  CLI Example:

  `salt '*' kmod.mod_list`

- **remove**(mod, persist=False)**
  
  Remove the specified kernel module

  CLI Example:

  `salt '*' kmod.remove vmm`

### 31.16.86 salt.modules.freebsdpkg

Remote package support using pkg_add(1)

**Warning:** This module has been completely rewritten. Up to and including version 0.17.0, it supported pkg_add(1), but checked for the existence of a pkgng local database and, if found, would provide some of pkgng's functionality. The rewrite of this module has removed all pkgng support, and moved it to the pkgng execution module. For versions <= 0.17.0, the documentation here should not be considered accurate. If your Minion is running one of these versions, then the documentation for this module can be viewed using the sys.doc function:

```
salt bsdminion sys.doc pkg
```

This module acts as the default package provider for FreeBSD 9 and older. If you need to use pkgng on a FreeBSD 9 system, you will need to override the pkg provider by setting the providers parameter in your Minion config file, in order to use pkgng.
providers:
    pkg: pkgng

More information on pkgng support can be found in the documentation for the **pkgng** module.

This module will respect the **PACKAGEROOT** and **PACKAGESITE** environment variables, if set, but these values can also be overridden in several ways:

1. **Salt configuration parameters.** The configuration parameters freebsdpkg.PACKAGEROOT and freebsdpkg.PACKAGESITE are recognized. These config parameters are looked up using `config.get` and can thus be specified in the Master config file, Grains, Pillar, or in the Minion config file. Example:

   ```
   ```

2. **CLI arguments.** Both the packageroot (used interchangeably with fromrepo for API compatibility) and packagesite CLI arguments are recognized, and override their config counterparts from section 1 above.

   ```
   salt -G 'os:FreeBSD' pkg.install zsh fromrepo=ftp://ftp2.freebsd.org/
   salt -G 'os:FreeBSD' pkg.install zsh packageroot=ftp://ftp2.freebsd.org/
   salt -G 'os:FreeBSD' pkg.install zsh packagesite=ftp://ftp2.freebsd.org/pub/FreeBSD/ports/ia64/packages-9-stable/Latest/
   ```

   .. note::
   These arguments can also be passed through in states:

   ```
   .. code-block:: yaml
   
   zsh:
       pkg.installed:
   ```

.. code-block:: python

   salt.modules.freebsdpkg.file_dict(*packages*)
   List the files that belong to a package, grouped by package. Not specifying any packages will return a list of _every_ file on the system’s package database (not generally recommended).
   
   CLI Examples:

   ```
   salt '*' pkg.file_list httpd
   salt '*' pkg.file_list httpd postfix
   salt '*' pkg.file_list
   ```

.. code-block:: python

   salt.modules.freebsdpkg.file_list(*packages*)
   List the files that belong to a package. Not specifying any packages will return a list of _every_ file on the system’s package database (not generally recommended).
   
   CLI Examples:

   ```
   salt '*' pkg.file_list httpd
   salt '*' pkg.file_list httpd postfix
   salt '*' pkg.file_list
   ```

.. code-block:: python

   salt.modules.freebsdpkg.install(name=None, refresh=False, fromrepo=None, pkgs=None, 
                                   sources=None, **kwargs)
   Install package(s) using pkg_add(1)
   
   name  The name of the package to be installed.
   
   refresh  Whether or not to refresh the package database before installing.
fromrepo or packageroot  Specify a package repository from which to install. Overrides the system default, as well as the PACKAGEROOT environment variable.

package site  Specify the exact directory from which to install the remote package. Overrides the PACKAGE-SITE environment variable, if present.

Multiple Package Installation Options:

pkgs  A list of packages to install from a software repository. Must be passed as a python list.

   CLI Example:
   ```
salt '*' pkg.install pkgs='["foo", "bar"]'
   ```

sources  A list of packages to install. Must be passed as a list of dicts, with the keys being package names, and the values being the source URI or local path to the package.

   CLI Example:
   ```
salt '*' pkg.install sources='[{"foo": "salt://foo.deb"}, {"bar": "salt://bar.deb"}]'
   ```

Return a dict containing the new package names and versions:

   ```
   {'<package>': {"old": '<old-version>',
                   'new': '<new-version>'}}
   ```

   CLI Example:
   ```
salt '*' pkg.install <package name>
   ```

   ```
salt.modules.freebsdpkg.latest_version('names', **kwargs)
   ```

    pkg_add(1) is not capable of querying for remote packages, so this function will always return results as if there is no package available for install or upgrade.

   CLI Example:
   ```
salt '*' pkg.latest_version <package name>
   ```

   ```
salt '*' pkg.latest_version <package1> <package2> <package3> ...
   ```

   ```
salt.modules.freebsdpkg.list_pkgs(versions_as_list=False, with_origin=False, **kwargs)
   ```

   List the packages currently installed as a dict:

   ```
   {'<package_name>': '<version>'}
   ```

   with_origin  [False] Return a nested dictionary containing both the origin name and version for each installed package.

   New in version 2014.1.0.

   CLI Example:
   ```
salt '*' pkg.list_pkgs
   ```

   ```
salt.modules.freebsdpkg.refresh_db()
   ```

    pkg_add(1) does not use a local database of available packages, so this function simply returns True. It exists merely for API compatibility.

   CLI Example:
   ```
salt '*' pkg.refresh_db
   ```
salt.modules.freebsdpkg.remove(name=None, pkgs=None, **kwargs)

Remove packages using pkg_delete(1)

**name** The name of the package to be deleted.

***Multiple Package Options:***

**pkgs** A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

```
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs='["foo", "bar"]'
```

salt.modules.freebsdpkg.upgrade()

Upgrades are not supported with pkg_add(1). This function is included for API compatibility only and always returns an empty dict.

CLI Example:

```
salt '*' pkg.upgrade
```

salt.modules.freebsdpkg.version(*names, **kwargs)

Returns a string representing the package version or an empty string if not installed. If more than one package name is specified, a dict of name/version pairs is returned.

**with_origin** [False] Return a nested dictionary containing both the origin name and version for each specified package.

New in version 2014.1.0.

CLI Example:

```
salt '*' pkg.version <package name>
salt '*' pkg.version <package1> <package2> <package3> ...
```

31.16.87 salt.modules.freebsdports

Install software from the FreeBSD ports(7) system

New in version 2014.1.0.

This module allows you to install ports using BATCH=yes to bypass configuration prompts. It is recommended to use the ports state to install ports, but it also possible to use this module exclusively from the command line.

```
salt minion-id ports.config security/nmap IPV6=off
salt minion-id ports.install security/nmap
```

salt.modules.freebsdports.config(name, reset=False, **kwargs)

Modify configuration options for a given port. Multiple options can be specified. To see the available options for a port, use ports.showconfig.

**name** The port name, in category/name format

**reset** [False] If True, runs a make rmconfig for the port, clearing its configuration before setting the desired options
CLI Examples:

```bash
salt '*' ports.config security/nmap IPV6=off
```

```
salt.modules.freebsdports.deinstall(name)
De-install a port.
CLI Example:

```
salt '/*' ports.deinstall security/nmap
```

```
salt.modules.freebsdports.install(name, clean=True)
Install a port from the ports tree. Installs using BATCH=yes for non-interactive building. To set config options for a given port, use ports.config.

```clean [True] If True, cleans after installation. Equivalent to running make install clean BATCH=yes.
```

**Note:** It may be helpful to run this function using the `-t` option to set a higher timeout, since compiling a port may cause the Salt command to exceed the default timeout.

CLI Example:

```bash
salt -t 1200 '/*' ports.install security/nmap
```

```
salt.modules.freebsdports.list_all()
Lists all ports available.
CLI Example:

```
salt '/*' ports.list_all
```

**Warning:** Takes a while to run, and returns a LOT of output

```
salt.modules.freebsdports.rmconfig(name)
Clear the cached options for the specified port; run a make rmconfig
name The name of the port to clear
CLI Example:

```
salt '/*' ports.rmconfig security/nmap
```

```
salt.modules.freebsdports.search(name)
Search for matches in the ports tree. Globs are supported, and the category is optional
CLI Examples:

```
salt '/*' ports.search 'security/*'
salt '/*' ports.search 'security/n*' 
salt '/*' ports.search nmap
```

**Warning:** Takes a while to run

```
salt.modules.freebsdports.showconfig(name, default=False, dict_return=False)
Show the configuration options for a given port.
default [False] Show the default options for a port (not necessarily the same as the current configuration)
dict_return [False] Instead of returning the output of make showconfig, return the data in an dictionary

31.16. Full list of builtin execution modules
CLI Example:
```
salt '*' ports.showconfig security/nmap
salt '*' ports.showconfig security/nmap default=True
```

```python
salt.modules.freebsdports.update(extract=False)
```
Update the ports tree

extract [False] If True, runs a portsnap extract after fetching, should be used for first-time installation of the ports tree.

CLI Example:
```
salt '*' ports.update
```

### 31.16.88 salt.modules.freebsdservice

The service module for FreeBSD

```python
salt.modules.freebsdservice.available(name)
```
Check that the given service is available.

CLI Example:
```
salt '*' service.available sshd
```

```python
salt.modules.freebsdservice.disable(name, **kwargs)
```
Disable the named service to start at boot

Arguments the same as for enable()

CLI Example:
```
salt '*' service.disable <service name>
```

```python
salt.modules.freebsdservice.disabled(name)
```
Return True if the named service is disabled, false otherwise

CLI Example:
```
salt '*' service.disabled <service name>
```

```python
salt.modules.freebsdservice.enable(name, **kwargs)
```
Enable the named service to start at boot

```python
name service name
```

```python
config [/etc/rc.conf] Config file for managing service. If config value is empty string, then /etc/rc.conf.d/<service> used. See man rc.conf(5) for details.
```

Also service.config variable can be used to change default.

CLI Example:
```
salt '*' service.enable <service name>
```

```python
salt.modules.freebsdservice.enabled(name, **kwargs)
```
Return True if the named service is enabled, false otherwise

```
name Service name
```

CLI Example:
salt 'service name'

salt.modules.freebsdservice.get_all()
Return a list of all available services

CLI Example:
salt 'service name'

salt.modules.freebsdservice.get_disabled()
Return what services are available but not enabled to start at boot

CLI Example:
salt 'service name'

salt.modules.freebsdservice.get_enabled()
Return what services are set to run on boot

CLI Example:
salt 'service name'

salt.modules.freebsdservice.missing(name)
The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.

CLI Example:
salt 'service missing sshd'

salt.modules.freebsdservice.reload(name)
Restart the named service

CLI Example:
salt 'service reload <service name>'

salt.modules.freebsdservice.restart(name)
Restart the named service

CLI Example:
salt 'service restart <service name>'

salt.modules.freebsdservice.start(name)
Start the specified service

CLI Example:
salt 'service start <service name>'

salt.modules.freebsdservice.status(name, sig=None)
Return the status for a service (True or False).

name Name of service

CLI Example:
salt 'service status <service name>'
salt.modules.freebsdservice.stop(name)
Stop the specified service

CLI Example:
```
salt '*' service.stop <service name>
```

31.16.89 salt.modules.gem

Manage ruby gems.
salt.modules.gem.install(gems, ruby=None, gem_bin=None, runas=None, version=None, rdoc=False, ri=False, pre_releases=False, proxy=None)
Installs one or several gems.

Parameters
- **gems** -- string The gems to install
- **gem_bin** -- string: None Full path to gem binary to use.
- **ruby** -- string: None If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
- **runas** -- string: None The user to run gem as.
- **version** -- string: None Specify the version to install for the gem. Doesn't play nice with multiple gems at once
- **rdoc** -- boolean: False Generate RDoc documentation for the gem(s).
- **ri** -- boolean: False Generate RI documentation for the gem(s).
- **pre_releases** -- boolean: False Include pre-releases in the available versions
- **proxy** -- string: None Use the specified HTTP proxy server for all outgoing traffic. Format: http://hostname[port]

CLI Example:
```
salt '*' gem.install vagrant
```
```
salt '*' gem.install redphone gem_bin=/opt/sensu/embedded/bin/gem
```

salt.modules.gem.list(prefix='', ruby=None, runas=None, gem_bin=None)
List locally installed gems.

Parameters
- **prefix** -- string: Only list gems when the name matches this prefix.
- **gem_bin** -- string: None Full path to gem binary to use.
- **ruby** -- string: None If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
- **runas** -- string: None The user to run gem as.

CLI Example:
```
salt '*' gem.list
```
salt.modules.gem.list_upgrades(ruby=None, runas=None, gem_bin=None)
New in version 2015.8.0.
Check if an upgrade is available for installed gems

gem_bin [None] Full path to gem binary to use.
ruby [None] If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
runas [None] The user to run gem as.

CLI Example:
salt '*' gem.list_upgrades

salt.modules.gem.sources_add(source_uri, ruby=None, runas=None, gem_bin=None)
Add a gem source.
Parameters

- source_uri -- string The source URI to add.
- gem_bin -- string : None Full path to gem binary to use.
- ruby -- string : None If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
- runas -- string : None The user to run gem as.

CLI Example:
salt '*' gem.sources_add http://rubygems.org/

salt.modules.gem.sources_list(ruby=None, runas=None, gem_bin=None)
List the configured gem sources.
Parameters

- gem_bin -- string : None Full path to gem binary to use.
- ruby -- string : None If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
- runas -- string : None The user to run gem as.

CLI Example:
salt '*' gem.sources_list

salt.modules.gem.sources_remove(source_uri, ruby=None, runas=None, gem_bin=None)
Remove a gem source.
Parameters

- source_uri -- string The source URI to remove.
- gem_bin -- string : None Full path to gem binary to use.
- ruby -- string : None If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
- runas -- string : None The user to run gem as.

CLI Example:
salt '...' gem.sources_remove http://rubygems.org/

salt.modules.gem.uninstall(gems, ruby=None, runas=None, gem_bin=None)
Uninstall one or several gems.

Parameters
- **gems** -- string The gems to uninstall.
- **gem_bin** -- string : None Full path to gem binary to use.
- **ruby** -- string : None If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
- **runas** -- string : None The user to run gem as.

CLI Example:
salt '...' gem.uninstall vagrant

salt.modules.gem.update(gems, ruby=None, runas=None, gem_bin=None)
Update one or several gems.

Parameters
- **gems** -- string The gems to update.
- **gem_bin** -- string : None Full path to gem binary to use.
- **ruby** -- string : None If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
- **runas** -- string : None The user to run gem as.

CLI Example:
salt '...' gem.update vagrant

salt.modules.gem.update_system(version='*', ruby=None, runas=None, gem_bin=None)
Update rubygems.

Parameters
- **version** -- string : (newest) The version of rubygems to install.
- **gem_bin** -- string : None Full path to gem binary to use.
- **ruby** -- string : None If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if gem_bin is specified.
- **runas** -- string : None The user to run gem as.

CLI Example:
salt '...' gem.update_system

31.16.90   salt.modules.genesis

Module for managing container and VM images
New in version 2014.7.0.
salt.modules.genesis.avail_platforms()
   Return which platforms are available
   CLI Example:
   ```bash
   salt myminion genesis.avail_platforms
   ```

salt.modules.genesis.bootstrap(platform, root, img_format='dir', fs_format='ext2', arch=None, flavor=None, repo_url=None, static_qemu=None)
   Create an image for a specific platform.
   Please note that this function MUST be run as root, as images that are created make files belonging to root.
   platform Which platform to use to create the image. Currently supported platforms are rpm, deb and pacman.
   root Local path to create the root of the image filesystem.
   img_format Which format to create the image in. By default, just copies files into a directory on the local filesystem (dir). Future support will exist for sparse.
   fs_format When using a non-dir img_format, which filesystem to format the image to. By default, ext2.
   arch Architecture to install packages for, if supported by the underlying bootstrap tool. Currently only used for deb.
   flavor Which flavor of operating system to install. This correlates to a specific directory on the distribution repositories. For instance, wheezy on Debian.
   repo_url Mainly important for Debian-based repos. Base URL for the mirror to install from. (e.x.: http://ftp.debian.org/debian/)
   static_qemu Local path to the static qemu binary required for this arch. (e.x.: /usr/bin/qemu-amd64-static)
   pkg_confs The location of the conf files to copy into the image, to point the installer to the right repos and configuration.
   CLI Examples:
   ```bash
   salt myminion genesis.bootstrap pacman /root/arch
   salt myminion genesis.bootstrap rpm /root/redhat
   salt myminion genesis.bootstrap deb /root/wheezy arch=amd64 flavor=wheezy static_qemu=/usr/bin/qemu-amd64-static
   ```

salt.modules.genesis.pack(name, root, path=None, pack_format='tar', compress='bzip2')
   Pack up a directory structure, into a specific format
   CLI Examples:
   ```bash
   salt myminion genesis.pack centos /root/centos
   salt myminion genesis.pack centos /root/centos pack_format='tar'
   ```

salt.modules.genesis.unpack(name, dest=None, path=None, pack_format='tar', compress='bz2')
   Unpack an image into a directory structure
   CLI Example:
   ```bash
   salt myminion genesis.unpack centos /root/centos
   ```

31.16.91 salt.modules.gentoo_service

Top level package command wrapper, used to translate the os detected by grains to the correct service manager
salt.modules.gentoo_service.available(name)
 Returns True if the specified service is available, otherwise returns False.

CLI Example:
```
salt '*' service.available sshd
```

salt.modules.gentoo_service.disable(name, **kwargs)
 Disable the named service to start at boot

CLI Example:
```
salt '*' service.disable <service name>
```

salt.modules.gentoo_service.disabled(name)
 Return True if the named service is enabled, false otherwise

CLI Example:
```
salt '*' service.disabled <service name>
```

salt.modules.gentoo_service.enable(name, **kwargs)
 Enable the named service to start at boot

CLI Example:
```
salt '*' service.enable <service name>
```

salt.modules.gentoo_service.enabled(name, **kwargs)
 Return True if the named service is enabled, false otherwise

CLI Example:
```
salt '*' service.enabled <service name>
```

salt.modules.gentoo_service.get_all()
 Return all available boot services

CLI Example:
```
salt '*' service.get_all
```

salt.modules.gentoo_service.get_disabled()
 Return a set of services that are installed but disabled

CLI Example:
```
salt '*' service.get_disabled
```

salt.modules.gentoo_service.get_enabled()
 Return a list of service that are enabled on boot

CLI Example:
```
salt '*' service.get_enabled
```

salt.modules.gentoo_service.missing(name)
 The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.

CLI Example:
salt 's' service.missing sshd

salt.modules.gentoo_service.restart(name)
    Restart the named service
    CLI Example:
    
    salt '*' service.restart <service name>

salt.modules.gentoo_service.start(name)
    Start the specified service
    CLI Example:
    
    salt '*' service.start <service name>

salt.modules.gentoo_service.status(name, sig=None)
    Return the status for a service, returns the PID or an empty string if the service is running or not, pass a signature to use to find the service via ps
    CLI Example:
    
    salt '*' service.status <service name> [service signature]

salt.modules.gentoo_service.stop(name)
    Stop the specified service
    CLI Example:
    
    salt '*' service.stop <service name>

31.16.92 salt.modules.gentoolkitmod

Support for Gentoolkit

salt.modules.gentoolkitmod.eclean_dist( destructive=False, package_names=False, size_limit=0, time_limit=0, fetch_restricted=False, exclude_file='/etc/eclean/distfiles.exclude')

Clean obsolete portage sources

destructive  Only keep minimum for reinstallation

package_names  Protect all versions of installed packages. Only meaningful if used with destructive=True

size_limit <size>  Don’t delete distfiles bigger than <size>. <size> is a size specification: ''10M'' is ''ten megabytes'', ''200K'' is ''two hundreds kilobytes'', etc. Units are: G, M, K and B.

time_limit <time>  Don’t delete distfiles files modified since <time> <time> is an amount of time: ''1y'' is ''one year'', ''2w'' is ''two weeks'', etc. Units are: y (years), m (months), w (weeks), d (days) and h (hours).

fetch_restricted  Protect fetch-restricted files. Only meaningful if used with destructive=True

exclude_file  Path to exclusion file. Default is '/etc/eclean/distfiles.exclude' This is the same default eclean-dist uses. Use None if this file exists and you want to ignore.

Returns a dict containing the cleaned, saved, and deprecated dists:

{'cleaned': {<dist file>: <size>},
 'deprecated': {<package>: <dist file>},
}
CLI Example:

```
salt '*' gentoolkit.eclean_dist destructive=True
```

```
salt.modules.gentoolkitmod.eclean_pkg(destructive=False, package_names=False, time_limit=0, exclude_file='/etc/eclean/packages.exclude')
```

Clean obsolete binary packages

- **destructive** Only keep minimum for reinstallation
- **package_names** Protect all versions of installed packages. Only meaningful if used with destructive=True
- **time_limit** `<time>` Don’t delete distfiles files modified since `<time>` is an amount of time: `''y''` is `''one year''`, `''2w''` is `''two weeks''`, etc. Units are: `y` (years), `m` (months), `w` (weeks), `d` (days) and `h` (hours).
- **exclude_file** Path to exclusion file. Default is `/etc/eclean/packages.exclude` This is the same default `eclean-pkg` uses. Use None if this file exists and you want to ignore.

Returns a dict containing the cleaned binary packages:

```
{'cleaned': {'<dist file>': '<size>'},
'total_cleaned': '<size>'
```

CLI Example:

```
salt '*' gentoolkit.eclean_pkg destructive=True
```

```
salt.modules.gentoolkitmod.glsa_check_list(glsa_list)
```

List the status of Gentoo Linux Security Advisories

- **glsa_list** can contain an arbitrary number of GLSA ids, filenames containing GLSAs or the special identifiers `''all''` and `''affected''`

Returns a dict containing glsa ids with a description, status, and CVEs:

```
{'<glsa_id>': {'description': '<glsa_description>', 'status': '<glsa_status>', 'CVEs': ['<list of CVEs>']}}
```

CLI Example:

```
salt '*' gentoolkit.glsa_check_list 'affected'
```

```
salt.modules.gentoolkitmod.revdep_rebuild(lib=None)
```

Fix up broken reverse dependencies

- **lib** Search for reverse dependencies for a particular library rather than every library on the system. It can be a full path to a library or basic regular expression.

CLI Example:

```
salt '*' gentoolkit.revdep_rebuild
```

## 31.16.93 salt.modules.git

Support for the Git SCM
salt.modules.git.add(cwd, filename, opts='--', user=None, ignore_retcode=False)

Changed in version 2015.8.0: The --verbose command line argument is now implied

**Interface to** git-add(1)

- **cwd** The path to the git checkout
- **filename** The location of the file/directory to add, relative to **cwd**
- **opts** Any additional options to add to the command line, in a single string

**Note:** On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with opts=(as in the CLI examples below) to avoid causing errors with Salt’s own argument parsing.

- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **ignore_retcode** [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

```bash
salt myminion git.add /path/to/repo foo/bar.py
salt myminion git.add /path/to/repo foo/bar.py opts='--dry-run'
```

salt.modules.git.archive(cwd, output, rev='HEAD', fmt=None, prefix=None, user=None, ignore_retcode=False, **kwargs)

Changed in version 2015.8.0: Returns True if successful, raises an error if not.

**Interface to** git-archive(1), exports a tarball/zip file of the repository

- **cwd** The path to be archived

**Note:** git archive permits a partial archive to be created. Thus, this path does not need to be the root of the git repository. Only the files within the directory specified by cwd (and its subdirectories) will be in the resulting archive. For example, if there is a git checkout at /tmp/foo, then passing /tmp/foo/bar as the cwd will result in just the files underneath /tmp/foo/bar to be exported as an archive.

- **output** The path of the archive to be created
- **overwrite** [False] Unless set to True, Salt will over overwrite an existing archive at the path specified by the output argument.

New in version 2015.8.0.

- **rev** [HEAD] The revision from which to create the archive
- **format** Manually specify the file format of the resulting archive. This argument can be omitted, and git archive will attempt to guess the archive type (and compression) from the filename. zip, tar, tar.gz, and tgz are extensions that are recognized automatically, and git can be configured to support other archive types with the addition of git configuration keys.

See the git-archive(1) manpage explanation of the --format argument (as well as the CONFIGURATION section of the manpage) for further information.

New in version 2015.8.0.

- **fmt** Replaced by format in version 2015.8.0

Deprecated since version 2015.8.0.
prefix  Prepend `<prefix>` to every filename in the archive. If unspecified, the name of the directory at the
top level of the repository will be used as the prefix (e.g. if `cwd` is set to `/foo/bar/baz`, the prefix
will be `baz`, and the resulting archive will contain a top-level directory by that name).

**Note:** The default behavior if the `--prefix` option for `git archive` is not specified is to not prepend
a prefix, so Salt's behavior differs slightly from `git archive` in this respect. Use `prefix=''` to create
an archive with no prefix.

Changed in version 2015.8.0: The behavior of this argument has been changed slightly. As of this version,
it is necessary to include the trailing slash when specifying a prefix, if the prefix is intended to create a
top-level directory.

user  User under which to run the git command. By default, the command is run by the user under which the
minion is running.

ignore_reetcode  [False] If `True`, do not log an error to the minion log if the git command returns a nonzero
exit status.

New in version 2015.8.0.

CLI Example:

```
salt myminion git.archive /path/to/repo /path/to/archive.tar
```

**salt.modules.git.branch** *(cwd, name=None, opts=' ', user=None, ignore_reetcode=False)*

Interface to `git-branch(1)`

**cwd**  The path to the git checkout

**name**  Name of the branch on which to operate. If not specified, the current branch will be assumed.

**opts**  Any additional options to add to the command line, in a single string

**Note:** To create a branch based on something other than HEAD, pass the name of the revision as `opts`. If
the revision is in the format `remotename/branch`, then this will also set the remote tracking branch.
Additionally, on the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with
`opts=` (as in the CLI examples below) to avoid causing errors with Salt's own argument parsing.

user  User under which to run the git command. By default, the command is run by the user under which the
minion is running.

ignore_reetcode  [False] If `True`, do not log an error to the minion log if the git command returns a nonzero
exit status.

New in version 2015.8.0.

CLI Examples:

```
# Set remote tracking branch
salt myminion git.branch /path/to/repo mybranch opts='--set-upstream-to origin/mybranch'
# Create new branch
salt myminion git.branch /path/to/repo mybranch upstream/somebranch
# Delete branch
salt myminion git.branch /path/to/repo mybranch opts='--d'
# Rename branch (2015.8.0 and later)
salt myminion git.branch /path/to/repo newbranch opts='--m oldbranch'
```

**salt.modules.git.checkout** *(cwd, rev=None, force=False, opts=' ', user=None, ignore_reetcode=False)*

Interface to `git-checkout(1)`

894 Chapter 31. Reference
**cwd**  The path to the git checkout

**opts**  Any additional options to add to the command line, in a single string

*Note:* On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with `opts=` (as in the CLI examples below) to avoid causing errors with Salt’s own argument parsing.

**rev**  The remote branch or revision to checkout.

  Changed in version 2015.8.0: Optional when using `-b` or `-B` in `opts`.

**force**  [False] Force a checkout even if there might be overwritten changes

**user**  User under which to run the git command. By default, the command is run by the user under which the minion is running.

**ignore_retcode**  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

  New in version 2015.8.0.

CLI Examples:

```
# Checking out local local revisions
salt myminion git.checkout /path/to/repo somebranch user=jeff
salt myminion git.checkout /path/to/repo opts='testbranch -- conf/file1 file2'
salt myminion git.checkout /path/to/repo rev=origin/mybranch opts='--track'

# Checking out remote revision into new branch
salt myminion git.checkout /path/to/repo upstream/master opts='-b newbranch'

# Checking out current revision into new branch (2015.8.0 and later)
salt myminion git.checkout /path/to/repo rev=origin/mybranch opts='--track'
```

**salt.modules.git.clone**(cwd,  url=None,  name=None,  opts='`,  user=None,  identity=None,  https_user=None,  https_pass=None,  ignore_retcode=False,  repository=None)

Interface to `git-clone(1)`

**cwd**  Location of git clone

  Changed in version 2015.8.0: If `name` is passed, then the clone will be made within this directory.

**url**  The URL of the repository to be cloned

  Changed in version 2015.8.0: Argument renamed from `repository` to `url`

**name**  Optional alternate name for the top-level directory to be created by the clone

  New in version 2015.8.0.

**opts**  Any additional options to add to the command line, in a single string

**user**  User under which to run the git command. By default, the command is run by the user under which the minion is running.

  Run git as a user other than what the minion runs as

**identity**  Path to a private key to use for ssh URLs

*Warning:* Key must be passphraseless to allow for non-interactive login. For greater security with passphraseless private keys, see the `sshd(8)` manpage for information on securing the keypair from the remote side in the `authorized_keys` file.

**https_user**  Set HTTP Basic Auth username. Only accepted for HTTPS URLs.

  New in version 2015.5.0.
**https_pass**  Set HTTP Basic Auth password. Only accepted for HTTPS URLs.

New in version 2015.5.0.

**ignore_recode**  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Example:

```python
salt myminion git.clone /path/to/repo_parent_dir git://github.com/saltstack/salt.git
```

salt.modules.git.commit(cwd, message, opts=`, user=None, filename=None, ignore_recode=False)

Interface to `git-commit(1)`

cwd  The path to the git checkout

message  Commit message

opts  Any additional options to add to the command line, in a single string

**Note:** On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with `opts=` (as in the CLI examples below) to avoid causing errors with Salt's own argument parsing.

The `-m` option should not be passed here, as the commit message will be defined by the message argument.

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

filename  The location of the file/directory to commit, relative to `cwd`. This argument is optional, and can be used to commit a file without first staging it.

**Note:** This argument only works on files which are already tracked by the git repository.

New in version 2015.8.0.

ignore_recode  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

```python
salt myminion git.commit /path/to/repo 'The commit message'
salt myminion git.commit /path/to/repo 'The commit message' filename=foo/bar.py
```

salt.modules.git.config_get(key, cwd=None, user=None, ignore_recode=False, **kwargs)

Get the value of a key in the git configuration file

key  The name of the configuration key to get

Changed in version 2015.8.0: Argument renamed from setting_name to key

cwd  The path to the git checkout

Changed in version 2015.8.0: Now optional if global is set to True

global  [False] If True, query the global git configuration. Otherwise, only the local git configuration will be queried.

New in version 2015.8.0.
all  [False] If True, return a list of all values set for key. If the key does not exist, None will be returned.

    New in version 2015.8.0.
user  User under which to run the git command. By default, the command is run by the user under which the
    minion is running.
ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero
    exit status.

    New in version 2015.8.0.

CLI Examples:

    salt myminion git.config_get user.name cwd=/path/to/repo
    salt myminion git.config_get user.email  user.name
    salt myminion git.config_get core.gitproxy cwd=/path/to/repo all=True

salt.modules.git.config_get-regexp(key, value_regex=None, cwd=None, user=None, ignore_retcode=False, **kwargs)

    New in version 2015.8.0.

Get the value of a key or keys in the git configuration file using regexes for more flexible matching. The return
    data is a dictionary mapping keys to lists of values matching the value_regex. If no values match, an empty
dictionary will be returned.

key  Regex on which key names will be matched
value_regex  If specified, return all values matching this regex. The return data will be a dictionary mapping
    keys to lists of values matching the regex.

    Important: Only values matching the value_regex will be part of the return data. So, if key matches
    a multivar, then it is possible that not all of the values will be returned. To get all values set for a multivar,
simply omit the value_regex argument.
cwd  The path to the git checkout
global  [False] If True, query the global git configuration. Otherwise, only the local git configuration will be
    queried.
user  User under which to run the git command. By default, the command is run by the user under which the
    minion is running.
ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero
    exit status.

CLI Examples:

    # Matches any values for key 'foo.bar'
    salt myminion git.config_get-regexp /path/to/repo foo.bar
    # Matches any value starting with 'baz' set for key 'foo.bar'
    salt myminion git.config_get-regexp /path/to/repo foo.bar 'baz.*'
    # Matches any key starting with 'user.'
    salt myminion git.config_get-regexp '^user\.' global=True

salt.modules.git.config_set(key, value=None, add=False, multivar=None, cwd=None, user=None, ignore_retcode=False, **kwargs)

    Changed in version 2015.8.0: Return the value(s) of the key being set

Set a key in the git configuration file

cwd  The path to the git checkout. Must be an absolute path, or the word global to indicate that a global
    key should be set.

31.16. Full list of builtin execution modules 897
Changed in version 2014.7.0: Made cwd argument optional if is_global=True

key  The name of the configuration key to set
    Changed in version 2015.8.0: Argument renamed from setting_name to key
value  The value to set for the specified key. Incompatible with the multivar argument.
    Changed in version 2015.8.0: Argument renamed from setting_value to value
add  [False] Add a value to a key, creating/updating a multivar
    New in version 2015.8.0.

multivar  Set a multivar all at once. Values can be comma-separated or passed as a Python list. Incompatible with the value argument.
    New in version 2015.8.0.
user  User under which to run the git command. By default, the command is run by the user under which the minion is running.
ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.
    New in version 2015.8.0.
global  [False] If True, set a global variable
    Deprecated since version 2015.8.0: Use global instead

CLI Example:

```
salt myminion git.config_set user.email me@example.com cwd=/path/to/repo
salt myminion git.config_set user.email foo@bar.com global=True
```

salt.modules.git.config_unset(key, value_regex=None, cwd=None, user=None, ignore_retcode=False, **kwargs)

New in version 2015.8.0.

Unset a key in the git configuration file

cwd  The path to the git checkout. Must be an absolute path, or the word global to indicate that a global key should be unset.
key  The name of the configuration key to unset
value_regex  Regular expression that matches exactly one key, used to delete a single value from a multivar.
    Ignored if all is set to True.
all  [False] If True unset all values for a multivar. If False, and key is a multivar, an error will be raised.
global  [False] If True, unset set a global variable. Otherwise, a local variable will be unset.
user  User under which to run the git command. By default, the command is run by the user under which the minion is running.
ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

CLI Example:

```
salt myminion git.config_unset /path/to/repo foo.bar
salt myminion git.config_unset /path/to/repo foo.bar all=True
```
salt.modules.git.current_branch(cwd, user=None, ignore_retcode=False)

Returns the current branch name of a local checkout. If HEAD is detached, return the SHA1 of the revision which is currently checked out.

cwd  The path to the git checkout

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

ignore_retcode [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Example:

```
salt myminion git.current_branch /path/to/repo
```

salt.modules.git.describe(cwd, rev='HEAD', user=None, ignore_retcode=False)

Returns the git-describe(1) string (or the SHA1 hash if there are no tags) for the given revision.

cwd  The path to the git checkout

rev  [HEAD] The revision to describe

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

ignore_retcode [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

```
salt myminion git.describe /path/to/repo
salt myminion git.describe /path/to/repo develop
```

salt.modules.git.fetch(cwd, remote=None, force=False, refspecs=None, opts='', user=None, identity=None, ignore_retcode=False)

Interface to git-fetch(1)

cwd  The path to the git checkout

remote  Optional remote name to fetch. If not passed, then git will use its default behavior (as detailed in git-fetch(1)).

New in version 2015.8.0.

force  Force the fetch even when it is not a fast-forward.

New in version 2015.8.0.

refspecs  Override the refspec(s) configured for the remote with this argument. Multiple refspecs can be passed, comma-separated.

New in version 2015.8.0.

opts  Any additional options to add to the command line, in a single string

Note: On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with opts=- (as in the CLI examples below) to avoid causing errors with Salt's own argument parsing.

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.
**identity**  Path to a private key to use for ssh URLs

**Warning:** Key must be passphraseless to allow for non-interactive login. For greater security with passphraseless private keys, see the `sshd(8)` manpage for information on securing the keypair from the remote side in the `authorized_keys` file.

**ignore_retcode**  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Example:

```python
salt myminion git.fetch /path/to/repo upstream
salt myminion git.fetch /path/to/repo identity=/root/.ssh/id_rsa
```

**salt.modules.git.init**

```python
salt.modules.git.init(cwd, bare=False, template=None, separate_git_dir=None, shared=None, opts='--',
                   user=None, ignore_retcode=False)
```

Interface to `git-init(1)`

- **cwd**  The path to the directory to be initialized
- **bare**  [False] If True, init a bare repository

New in version 2015.8.0.

- **template**  Set this argument to specify an alternate template directory

New in version 2015.8.0.

- **separate_git_dir**  Set this argument to specify an alternate $GIT_DIR

New in version 2015.8.0.

- **shared**  Set sharing permissions on git repo. See `git-init(1)` for more details.

New in version 2015.8.0.

- **opts**  Any additional options to add to the command line, in a single string

  **Note:** On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with `opts=` (as in the CLI examples below) to avoid causing errors with Salt’s own argument parsing.

- **user**  User under which to run the git command. By default, the command is run by the user under which the minion is running.

- **ignore_retcode**  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

```python
salt myminion git.init /path/to/repo
# Init a bare repo (before 2015.8.0)
salt myminion git.init /path/to/bare/repo.git opts='--bare'
# Init a bare repo (2015.8.0 and later)
salt myminion git.init /path/to/bare/repo.git bare=True
```

**salt.modules.git.is_worktree**

```python
salt.modules.git.is_worktree(cwd, user=None)
```

New in version 2015.8.0.
This function will attempt to determine if \texttt{cwd} is part of a worktree by checking its \texttt{.git} to see if it is a file containing a reference to another gitdir.

\texttt{cwd} path to the worktree to be removed

\texttt{user} User under which to run the git command. By default, the command is run by the user under which the minion is running.

CLI Example:

```
salt myminion git.is_worktree /path/to/repo
```

\texttt{salt.modules.git.list_branches}(\texttt{cwd}, \texttt{remote=False}, \texttt{user=None}, \texttt{ignore_retcode=False})

New in version 2015.8.0.

Return a list of branches

\texttt{cwd} The path to the git checkout

\texttt{remote} [False] If \texttt{True}, list remote branches. Otherwise, local branches will be listed.

\texttt{Warning:} This option will only return remote branches of which the local checkout is aware, use \texttt{git.fetch} to update remotes.

\texttt{user} User under which to run the git command. By default, the command is run by the user under which the minion is running.

\texttt{ignore_retcode} [False] If \texttt{True}, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

```
salt myminion git.list_branches /path/to/repo
salt myminion git.list_branches /path/to/repo remote=True
```

\texttt{salt.modules.git.list_tags}(\texttt{cwd}, \texttt{user=None}, \texttt{ignore_retcode=False})

New in version 2015.8.0.

Return a list of tags

\texttt{cwd} The path to the git checkout

\texttt{user} User under which to run the git command. By default, the command is run by the user under which the minion is running.

\texttt{ignore_retcode} [False] If \texttt{True}, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

```
salt myminion git.list_tags /path/to/repo
```

\texttt{salt.modules.git.list_worktrees}(\texttt{cwd}, \texttt{stale=False}, \texttt{user=None}, **\texttt{kwargs})

New in version 2015.8.0.

Return a dictionary mapping worktrees to their locations.

\texttt{Note:} This information is compiled by analyzing the administrative data in \texttt{$GIT_DIR/worktrees}. By default,
only worktrees for which the gitdir is still present are returned, but this can be changed using the all and stale arguments (described below).

cwd  The path to the git checkout

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

all  [False] If True, then return all worktrees, including ones whose gitdir is no longer present.

stale  [False] If True, return only worktrees whose gitdir is no longer present.

CLI Examples:

```
salt myminion git.list_worktrees /path/to/repo
salt myminion git.list_worktrees /path/to/repo all=True
salt myminion git.list_worktrees /path/to/repo stale=True
```

salt.modules.git.ls_remote(cwd=None, remote='origin', ref='master', opts='', user=None, identity=None, https_user=None, https_pass=None, ignore_retcode=False)

Interface to git-ls-remote(1). Returns the upstream hash for a remote reference.

cwd  The path to the git checkout. Optional (and ignored if present) when remote is set to a URL instead of a remote name.

remote  [origin] The name of the remote to query. Can be the name of a git remote (which exists in the git checkout defined by the cwd parameter), or the URL of a remote repository.

Changed in version 2015.8.0: Argument renamed from repository to remote

ref  [master] The name of the ref to query. Can be a branch or tag name, or the full name of the reference (for example, to get the hash for a Github pull request number 1234, ref can be set to refs/pull/1234/head

Changed in version 2015.8.0: Argument renamed from branch to ref

opts  Any additional options to add to the command line, in a single string

New in version 2015.8.0.

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

identity  Path to a private key to use for ssh URLs

**Warning:** Key must be passphraseless to allow for non-interactive login. For greater security with passphraseless private keys, see the sshd(8) manpage for information on securing the keypair from the remote side in the authorized_keys file.

https_user  Set HTTP Basic Auth username. Only accepted for HTTPS URLs.

New in version 2015.5.0.

https_pass  Set HTTP Basic Auth password. Only accepted for HTTPS URLs.

New in version 2015.5.0.

ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.
salt.modules.git.merge(cwd, rev=None, opts='`, user=None, branch=None, ignore_retcode=False)

Interface to git-merge(1)

cwd  The path to the git checkout

rev  Revision to merge into the current branch. If not specified, the remote tracking branch will be merged.

New in version 2015.8.0.

branch  The remote branch or revision to merge into the current branch Revision to merge into the current

branch

Deprecated since version 2015.8.0: Use rev instead.

opts  Any additional options to add to the command line, in a single string

Note: On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with opts=
(as in the CLI examples below) to avoid causing errors with Salt's own argument parsing.

user  User under which to run the git command. By default, the command is run by the user under which the

minion is running.

ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero

exit status.

New in version 2015.8.0.

CLI Example:

# Fetch first...
salt myminion git.fetch /path/to/repo
# ... then merge the remote tracking branch
salt myminion git.merge /path/to/repo
# ... or merge another rev
salt myminion git.merge /path/to/repo rev=upstream/foo

salt.modules.git.merge_base(cwd, refs=None, octopus=False, is_ancestor=False, independent=False, fork_point=None, opts='`, user=None, ignore_retcode=False, **kwargs)

New in version 2015.8.0.

Interface to git-merge-base(1).

cwd  The path to the git checkout

refs  Any refs/commits to check for a merge base. Can be passed as a comma-separated list or a Python list.

all  [False] Return a list of all matching merge bases. Not compatible with any of the below options except for

octopus.

octopus  [False] If True, then this function will determine the best common ancestors of all specified commits,
in preparation for an n-way merge. See here for a description of how these bases are determined.

Set all to True with this option to return all computed merge bases, otherwise only the `"best" will be

returned.

is_ancestor  [False] If True, then instead of returning the merge base, return a boolean telling whether or

not the first commit is an ancestor of the second commit.
Note: This option requires two commits to be passed.

**independent** [False] If True, this function will return the IDs of the refs/commits passed which cannot be reached by another commit.

**fork_point** If passed, then this function will return the commit where the commit diverged from the ref specified by *fork_point*. If no fork point is found, None is returned.

Note: At most one commit is permitted to be passed if a *fork_point* is specified. If no commits are passed, then HEAD is assumed.

**opts** Any additional options to add to the command line, in a single string

Note: On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with **opts=** (as in the CLI examples below) to avoid causing errors with Salt's own argument parsing.

This option should not be necessary unless new CLI arguments are added to git-merge-base(1) and are not yet supported in Salt.

**user** User under which to run the git command. By default, the command is run by the user under which the minion is running.

**ignore_retcode** [False] if True, do not log an error to the minion log if the git command returns a nonzero exit status.

CLI Examples:

```plaintext
salt myminion git.merge_base /path/to/repo HEAD upstream/mybranch
salt myminion git.merge_base /path/to/repo 8f2e542,4ad8cab,cdc9886 octopus=True
salt myminion git.merge_base /path/to/repo refs=8f2e542,4ad8cab,cdc9886 independent=True
salt myminion git.merge_base /path/to/repo refs=8f2e542,4ad8cab is_ancestor=True
salt myminion git.merge_base /path/to/repo fork_point=upstream/master
salt myminion git.merge_base /path/to/repo refs=mybranch fork_point=upstream/master
```

**salt.modules.git.merge_tree**(*cwd*, *ref1*, *ref2*, *base=None*, *user=None*, *ignore_retcode=False*)

New in version 2015.8.0.

Interface to git-merge-tree(1), shows the merge results and conflicts from a 3-way merge without touching the index.

**cwd** The path to the git checkout

**ref1** First ref/commit to compare

**ref2** Second ref/commit to compare

**base** The base tree to use for the 3-way-merge. If not provided, then **git.merge_base** will be invoked on *ref1* and *ref2* to determine the merge base to use.

**user** User under which to run the git command. By default, the command is run by the user under which the minion is running.

**ignore_retcode** [False] if True, do not log an error to the minion log if the git command returns a nonzero exit status.

CLI Examples:

```plaintext
salt myminion git.merge_tree /path/to/repo HEAD upstream/dev
salt myminion git.merge_tree /path/to/repo HEAD upstream/dev base=aaf3c3d
```
**salt.modules.git.pull**

```python
salt.modules.git.pull(cwd, opts='--rebase origin master', user=None, identity=None, ignore_retcode=False)
```

Interfaceto **git-pull(1)**

**cwd** The path to the git checkout

**opts** Any additional options to add to the command line, in a single string

**Note:** On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with `opts=` (as in the CLI examples below) to avoid causing errors with Salt's own argument parsing.

**user** User under which to run the git command. By default, the command is run by the user under which the minion is running.

**identity** Path to a private key to use for ssh URLs

**Warning:** Key must be passphraseless to allow for non-interactive login. For greater security with passphraseless private keys, see the `sshd(8)` manpage for information on securing the keypair from the remote side in the `authorized_keys` file.

**ignore_retcode** [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

**CLI Example:**

```
salt myminion git.pull /path/to/repo opts='--rebase origin master'
```

**salt.modules.git.push**

```python
salt.modules.git.push(cwd, remote=None, ref=None, opts='--rebase origin master', user=None, identity=None, ignore_retcode=False, branch=None)
```

Interfaceto **git-push(1)**

**cwd** The path to the git checkout

**remote** Name of the remote to which the ref should being pushed

New in version 2015.8.0.

**ref** [master] Name of the ref to push

**Note:** Being a `refspec`, this argument can include a colon to define local and remote ref names.

**branch** Name of the ref to push

Deprecated since version 2015.8.0: Use `ref` instead

**opts** Any additional options to add to the command line, in a single string

**Note:** On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with `opts=` (as in the CLI examples below) to avoid causing errors with Salt's own argument parsing.

**user** User under which to run the git command. By default, the command is run by the user under which the minion is running.

**identity** Path to a private key to use for ssh URLs

**Warning:** Key must be passphraseless to allow for non-interactive login. For greater security with passphraseless private keys, see the `sshd(8)` manpage for information on securing the keypair from the remote side in the `authorized_keys` file.
**ignore_retcode**  [False] If **True**, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Example:

```bash
# Push master as origin/master
salt myminion git.push /path/to/repo origin master
# Push issue21 as upstream/develop
salt myminion git.push /path/to/repo upstream issue21:develop
# Delete remote branch 'upstream/temp'
salt myminion git.push /path/to/repo upstream :temp
```

salt.modules.git.rebase(cwd, rev='master', opts='-', user=None, ignore_retcode=False)

Interface to `git-rebase(1)`

- **cwd** The path to the git checkout
- **rev** [master] The revision to rebase onto the current branch
- **opts** Any additional options to add to the command line, in a single string

**Note:** On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with **opts=** (as in the CLI examples below) to avoid causing errors with Salt’s own argument parsing.

- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **ignore_retcode** [False] If **True**, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Example:

```bash
salt myminion git.rebase /path/to/repo master
salt myminion git.rebase /path/to/repo 'origin master'
salt myminion git.rebase /path/to/repo origin/master opts='--onto newbranch'
```

salt.modules.git.remote_get(cwd, remote='origin', user=None, redact_auth=True, ignore_retcode=False)

Get the fetch and push URL for a specific remote

- **cwd** The path to the git checkout
- **remote** [origin] Name of the remote to query
- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **redact_auth** [True] Set to **False** to include the username/password if the remote uses HTTPS Basic Auth. Otherwise, this information will be redacted.

**Warning:** Setting this to **False** will not only reveal any HTTPS Basic Auth that is configured, but the return data will also be written to the job cache. When possible, it is recommended to use SSH for authentication.

New in version 2015.5.6.

- **ignore_retcode** [False] If **True**, do not log an error to the minion log if the git command returns a nonzero exit status.
New in version 2015.8.0.

CLI Examples:

```
salt myminion git.remote_get /path/to/repo
salt myminion git.remote_get /path/to/repo upstream
```

```
salt.modules.git.remote.refs(url, heads=False, tags=False, user=None, identity=None, https_user=None, https_pass=None, ignore_retcode=False)
```

New in version 2015.8.0.

Return the remote refs for the specified URL.

- **url**: URL of the remote repository.
- **heads**: [False] Restrict output to heads. Can be combined with `tags`.
- **tags**: [False] Restrict output to tags. Can be combined with `heads`.
- **user**: User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **identity**: Path to a private key to use for ssh URLs.

**Warning**: Key must be passphraseless to allow for non-interactive login. For greater security with passphraseless private keys, see the `sshd(8)` manpage for information on securing the keypair from the remote side in the `authorized_keys` file.

- **https_user**: Set HTTP Basic Auth username. Only accepted for HTTPS URLs.
- **https_pass**: Set HTTP Basic Auth password. Only accepted for HTTPS URLs.
- **ignore_retcode**: [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

CLI Example:

```
salt myminion git.remote.refs https://github.com/saltstack/salt.git
```

```
salt.modules.git.remote.set(cwd, url, remote='origin', user=None, https_user=None, https_pass=None, push_url=None, push_https_user=None, push_https_pass=None, ignore_retcode=False)
```

- **cwd**: The path to the git checkout.
- **url**: Remote URL to set.
- **remote**: [origin] Name of the remote to set.
- **push_url**: If unset, the push URL will be identical to the fetch URL.
  
  New in version 2015.8.0.
- **user**: User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **https_user**: Set HTTP Basic Auth username. Only accepted for HTTPS URLs.
  
  New in version 2015.5.0.
- **https_pass**: Set HTTP Basic Auth password. Only accepted for HTTPS URLs.
  
  New in version 2015.5.0.
**push_https_user** Set HTTP Basic Auth user for `push_url`. Ignored if `push_url` is unset. Only accepted for HTTPS URLs.

New in version 2015.8.0.

**push_https_pass** Set HTTP Basic Auth password for `push_url`. Ignored if `push_url` is unset. Only accepted for HTTPS URLs.

New in version 2015.8.0.

**ignore_recode** [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

**CLI Examples:**

```bash
salt myminion git.remote_set /path/to/repo git@github.com:user/repo.git
salt myminion git.remote_set /path/to/repo git@github.com:user/repo.git
```

**salt.modules.git.remotes**( `cwd`, `user=None`, `redact_auth=True`, `ignore_recode=False` )

Get fetch and push URLs for each remote in a git checkout

- **cwd** The path to the git checkout
- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **redact_auth** [True] Set to False to include the username/password for authenticated remotes in the return data. Otherwise, this information will be redacted.

**Warning:** Setting this to False will not only reveal any HTTPS Basic Auth that is configured, but the return data will also be written to the job cache. When possible, it is recommended to use SSH for authentication.

New in version 2015.5.6.

**ignore_recode** [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

**CLI Example:**

```bash
salt myminion git.remotes /path/to/repo
```

**salt.modules.git.reset**( `cwd`, `opts='`, `user=None`, `ignore_recode=False` )

Interface to `git-reset(1)`, returns the stdout from the git command

- **cwd** The path to the git checkout
- **opts** Any additional options to add to the command line, in a single string

**Note:** On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with `opts=` (as in the CLI examples below) to avoid causing errors with Salt's own argument parsing.

- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **ignore_recode** [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.
New in version 2015.8.0.

CLI Examples:

```
# Soft reset to a specific commit ID
salt myminion git.reset /path/to/repo ac3ee5c

# Hard reset
salt myminion git.reset /path/to/repo opts='--hard origin/master'
```

```
salt.modules.git.rev_parse(cwd, rev='HEAD', opts='', user=None, ignore_retcode=False)
```

New in version 2015.8.0.

Interface to `git-rev-parse(1)`

- **cwd** The path to the git checkout
- **rev** Revision to parse. See the SPECIFYING REVISIONS section of the `git-rev-parse(1)` manpage for details on how to format this argument.
  
  This argument is optional when using the options in the Options for Files section of the `git-rev-parse(1)` manpage.
- **opts** Any additional options to add to the command line, in a single string
- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **ignore_retcode** [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

CLI Examples:

```
# Get the full SHA1 for HEAD
salt myminion git.rev_parse /path/to/repo HEAD

# Get the short SHA1 for HEAD
salt myminion git.rev_parse /path/to/repo HEAD opts='--short'

# Get the develop branch's upstream tracking branch
salt myminion git.rev_parse /path/to/repo 'develop@{upstream}' opts='--abbrev-ref'

# Get the SHA1 for the commit corresponding to tag v1.2.3
salt myminion git.rev_parse /path/to/repo 'v1.2.3^commit'

# Find out whether or not the repo at /path/to/repo is a bare repository
salt myminion git.rev_parse /path/to/repo opts='--is-bare-repository'
```

```
salt.modules.git.revision(cwd, rev='HEAD', short=False, user=None, ignore_retcode=False)
```

Returns the SHA1 hash of a given identifier (hash, branch, tag, HEAD, etc.)

- **cwd** The path to the git checkout
- **rev** [HEAD] The revision
- **short** [False] If True, return an abbreviated SHA1 git hash
- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.
- **ignore_retcode** [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

CLI Example:

```
salt myminion git.revision /path/to/repo mybranch
```
salt.modules.git.rm(cwd, filename, opts='', user=None, ignore_retcode=False)

Interface to git-rm(1)

cwd  The path to the git checkout
filename  The location of the file/directory to remove, relative to cwd

| Note: To remove a directory, -r must be part of the opts parameter. |

| opts  Any additional options to add to the command line, in a single string |
| Note: On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with opts= (as in the CLI examples below) to avoid causing errors with Salt’s own argument parsing. |

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

<table>
<thead>
<tr>
<th>command</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt myminion git.rm /path/to/repo foo/bar.py options='--dry-run'</td>
</tr>
<tr>
<td>salt myminion git.rm /path/to/repo foo/bar.py options='-r'</td>
</tr>
</tbody>
</table>

salt.modules.git.stash(cwd, action='save', opts='', user=None, ignore_retcode=False)

Interface to git-stash(1), returns the stdout from the git command

cwd  The path to the git checkout

| opts  Any additional options to add to the command line, in a single string. Use this to complete the git stash command by adding the remaining arguments (i.e. 'save <stash comment>', 'apply stash@{2}', 'show', etc.). Omitting this argument will simply run git stash. |

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

<table>
<thead>
<tr>
<th>command</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt myminion git.stash /path/to/repo save options='work in progress'</td>
</tr>
<tr>
<td>salt myminion git.stash /path/to/repo apply options='stash@{1}'</td>
</tr>
<tr>
<td>salt myminion git.stash /path/to/repo drop options='stash@{1}'</td>
</tr>
<tr>
<td>salt myminion git.stash /path/to/repo list</td>
</tr>
</tbody>
</table>

salt.modules.git.status(cwd, user=None, ignore_retcode=False)

Changed in version 2015.8.0: Return data has changed from a list of lists to a dictionary

Returns the changes to the repository

cwd  The path to the git checkout

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.
**ignore_retcode**  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Example:

```
salt myminion git.status /path/to/repo
```

**salt.modules.git.submodule** (cwd, command, opts='', user=None, identity=None, init=False, ignore_retcode=False)

Changed in version 2015.8.0: Added the command argument to allow for operations other than update to be run on submodules, and deprecated the init argument. To do a submodule update with init=True moving forward, use command=update opts='--init'

Interface to git-submodule(1)

cwd  The path to the submodule

command  Submodule command to run, see git-submodule(1) <git submodule> for more information. Any additional arguments after the command (such as the URL when adding a submodule) must be passed in the opts parameter.

New in version 2015.8.0.

opts  Any additional options to add to the command line, in a single string

**Note:** On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with opts= (as in the CLI examples below) to avoid causing errors with Salt’s own argument parsing.

**init**  [False] If True, ensures that new submodules are initialized

Deprecated since version 2015.8.0: Pass init as the command parameter, or include --init in the opts param with command set to update.

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

identity  Path to a private key to use for ssh URLs

**Warning:** Key must be passphraseless to allow for non-interactive login. For greater security with passphraseless private keys, see the sshd(8) manpage for information on securing the keypair from the remote side in the authorized_keys file.

**ignore_retcode**  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Example:

```
# Update submodule and ensure it is initialized (before 2015.8.0)
salt myminion git.submodule /path/to/repo/sub/repo init=True

# Update submodule and ensure it is initialized (2015.8.0 and later)
salt myminion git.submodule /path/to/repo/sub/repo update opts='--init'

# Rebase submodule (2015.8.0 and later)
salt myminion git.submodule /path/to/repo/sub/repo update opts='--rebase'

# Add submodule (2015.8.0 and later)
salt myminion git.submodule /path/to/repo/sub/repo add opts='https://mydomain.tld/repo.git'
```
# Unregister submodule (2015.8.0 and later)
salt myminion git.submodule /path/to/repo/sub/repo deinit

```
salt.modules.git.symbolic_ref(cwd, ref, value=None, opts='`, user=None, ignore_retcode=False)
```

New in version 2015.8.0.

**Interface to** `git-symbolic-ref(1)`

- **cwd** The path to the git checkout
- **ref** Symbolic ref to read/modify
- **value** If passed, then the symbolic ref will be set to this value and an empty string will be returned.
  
  If not passed, then the ref to which `ref` points will be returned, unless `--delete` is included in `opts` (in which case the symbolic ref will be deleted).
- **opts** Any additional options to add to the command line, in a single string
- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.

**ignore_retcode** [False] If `True`, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

**CLI Examples:**

```
# Get ref to which HEAD is pointing
salt myminion git.symbolic_ref /path/to/repo HEAD

# Set/overwrite symbolic ref 'FOO' to local branch 'foo'
salt myminion git.symbolic_ref /path/to/repo FOO refs/heads/foo

# Delete symbolic ref 'FOO'
salt myminion git.symbolic_ref /path/to/repo FOO opts='--delete'
```

```
salt.modules.git.version(versioninfo=False)
```

New in version 2015.8.0.

Returns the version of Git installed on the minion

**versioninfo** [False] If `True`, return the version in a versioninfo list (e.g. `[2, 5, 0]`)

**CLI Example:**

```
salt myminion git.version
```

```
salt.modules.git.worktree_add(cwd, worktree_path, branch=None, ref=None, reset_branch=None, force=None, detach=False, opts='`, user=None, ignore_retcode=False)
```

New in version 2015.8.0.

**Interface to** `git-worktree(1)`, adds a worktree

- **cwd** The path to the git checkout
- **worktree_path** Path to the new worktree. Can be either absolute, or relative to `cwd`.
- **branch** Name of new branch to create. If omitted, will be set to the basename of the `worktree_path`. For example, if the `worktree_path` is `/foo/bar/baz`, then `branch` will be `baz`.
- **ref** Name of the ref on which to base the new worktree. If omitted, then HEAD is use, and a new branch will be created, named for the basename of the `worktree_path`. For example, if the `worktree_path` is `/foo/bar/baz` then a new branch `baz` will be created, and pointed at HEAD.
reset_branch  [False] If False, then git-worktree(1) will fail to create the worktree if the targeted branch already exists. Set this argument to True to reset the targeted branch to point at ref, and checkout the newly-reset branch into the new worktree.

force  [False] By default, git-worktree(1) will not permit the same branch to be checked out in more than one worktree. Set this argument to True to override this.

opts  Any additional options to add to the command line, in a single string

Note: On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with opts= to avoid causing errors with Salt's own argument parsing.

All CLI options for adding worktrees as of Git 2.5.0 are already supported by this function as of Salt 2015.8.0, so using this argument is unnecessary unless new CLI arguments are added to git-worktree(1) and are not yet supported in Salt.

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.

CLI Examples:

```bash
salt myminion git.worktree_add /path/to/repo/main ../hotfix
ref=origin/master
```

```bash
salt myminion git.worktree_add /path/to/repo/main ../hotfix
branch=hotfix21 ref=v2.1.9.3
```

salt.modules.git.worktree_prune(cwd, dry_run=False, verbose=True, expire=None, opts='', user=None, ignore_retcode=False)

New in version 2015.8.0.

Interface to git-worktree(1), prunes stale worktree administrative data from the gitdir

cwd  The path to the main git checkout or a linked worktree

dry_run  [False] If True, then this function will report what would have been pruned, but no changes will be made.

verbose  [True] Report all changes made. Set to False to suppress this output.

expire  Only prune unused worktree data older than a specific period of time. The date format for this parameter is described in the documentation for the gc.pruneWorktreesExpire config param in the git-config(1) manpage.

opts  Any additional options to add to the command line, in a single string

Note: On the Salt CLI, if the opts are preceded with a dash, it is necessary to precede them with opts= to avoid causing errors with Salt's own argument parsing.

All CLI options for pruning worktrees as of Git 2.5.0 are already supported by this function as of Salt 2015.8.0, so using this argument is unnecessary unless new CLI arguments are added to git-worktree(1) and are not yet supported in Salt.

user  User under which to run the git command. By default, the command is run by the user under which the minion is running.

ignore_retcode  [False] If True, do not log an error to the minion log if the git command returns a nonzero exit status.

New in version 2015.8.0.
CLI Examples:

```
salt myminion git.worktree_prune /path/to/repo
salt myminion git.worktree_prune /path/to/repo dry_run=True
salt myminion git.worktree_prune /path/to/repo expire=1.day.ago
```

salt.modules.git.worktree_rm(cwd, user=None)

New in version 2015.8.0.

Recursively removes the worktree located at cwd, returning True if successful. This function will attempt to determine if cwd is actually a worktree by invoking git.is_worktree. If the path does not correspond to a worktree, then an error will be raised and no action will be taken.

**Warning:** There is no undoing this action. Be VERY careful before running this function.

- **cwd** Path to the worktree to be removed
- **user** User under which to run the git command. By default, the command is run by the user under which the minion is running.

CLI Examples:

```
salt myminion git.worktree_rm /path/to/worktree
```

31.16.94 salt.modules.glance

Module for handling openstack glance calls.

**optdepends**

- glanceclient Python adapter

**configuration** This module is not usable until the following are specified either in a pillar or in the minion's config file:

```
keystone.user: admin
keystone.password: verybadpass
keystone.tenant: admin
keystone.insecure: False  #(optional)
keystone.auth_url: 'http://127.0.0.1:5000/v2.0/
```

If configuration for multiple openstack accounts is required, they can be set up as different configuration profiles: For example:

```
openstack1:
    keystone.user: admin
    keystone.password: verybadpass
    keystone.tenant: admin
    keystone.auth_url: 'http://127.0.0.1:5000/v2.0/

openstack2:
    keystone.user: admin
    keystone.password: verybadpass
    keystone.tenant: admin
    keystone.auth_url: 'http://127.0.0.2:5000/v2.0/
```

With this configuration in place, any of the glance functions can make use of a configuration profile by declaring it explicitly. For example:
salt '*' glance.image_list profile=openstack1

```
salt.modules.glance.image_create(name, location=None, profile=None, visibility=None, container_format='bare', disk_format='raw', protected=None, copy_from=None, is_public=None)
```

Create an image (glance image-create)

CLI Example, old format:
```
salt '*' glance.image_create name=f16-jeos is_public=true disk_format=qcow2 container_format=ovf copy_from=http://berrange.fedorapeople.org/ images/2012-02-29/f16-x86_64-openstack-sda.qcow2
```

CLI Example, new format resembling Glance API v2:
```
salt '*' glance.image_create name=f16-jeos visibility=public disk_format=qcow2 container_format=ovf copy_from=http://berrange.fedorapeople.org/ images/2012-02-29/f16-x86_64-openstack-sda.qcow2
```

The parameter `visibility' defaults to `public' if neither `visibility' nor `is_public' is specified.

```
salt.modules.glance.image_delete(id=None, name=None, profile=None)
```

Delete an image (glance image-delete)

CLI Examples:
```
salt '*' glance.image_delete c2eb2eb0-53e1-4a80-b990-8ec887eae7df
salt '*' glance.image_delete id=c2eb2eb0-53e1-4a80-b990-8ec887eae7df
salt '*' glance.image_delete name=f16-jeos
```

```
salt.modules.glance.image_list(id=None, profile=None, name=None)
```

Return a list of available images (glance image-list)

CLI Example:
```
salt '*' glance.image_list
```

```
salt.modules.glance.image_schema(profile=None)
```

Returns names and descriptions of the schema `image`'s properties for this profile's instance of glance

```
salt.modules.glance.image_show(id=None, name=None, profile=None)
```

Return details about a specific image (glance image-show)

CLI Example:
```
salt '*' glance.image_show
```

```
salt.modules.glance.image_update(id=None, name=None, profile=None, **kwargs)
```

Update properties of given image. Known to work for: - min_ram (in MB) - protected (bool) - visibility (`public' or `private')

```
salt.modules.glance.schema_get(name, profile=None)
```

Known valid names of schemas are:
- image
- images
- member
- members
31.16.95  salt.modules.glusterfs

Manage a glusterfs pool

salt.modules.glusterfs.add_volume_bricks(name, bricks)
Add brick(s) to an existing volume
  name  Volume name
  bricks  List of bricks to add to the volume

salt.modules.glusterfs.create(name, bricks, stripe=False, replica=False, device_vg=False, transport='tcp', start=False, force=False)
Create a glusterfs volume.
  name  Name of the gluster volume
  bricks  Bricks to create volume from, in <peer>:<brick path> format. For multiple bricks use list format: `[
               "<peer1>:<brick1>,`",`<peer2>:<brick2>"'
           ]`
  stripe  Stripe count, the number of bricks should be a multiple of the stripe count for a distributed striped volume
  replica  Replica count, the number of bricks should be a multiple of the replica count for a distributed replicated volume
  device_vg  If true, specifies volume should use block backend instead of regular posix backend. Block device backend volume does not support multiple bricks
  transport  Transport protocol to use, can be `tcp`, `rdma` or `tcp,rdma`
  start  Start the volume after creation
  force  Force volume creation, this works even if creating in root FS

CLI Example:
  salt host1 glusterfs.create newvolume host1:/brick
  salt gluster1 glusterfs.create vol2 '[
          gluster1:/export/vol2/brick,
          gluster2:/export/vol2/brick'

salt.modules.glusterfs.delete(target, stop=True)
Deletes a gluster volume
  target  Volume to delete
  stop  Stop volume before delete if it is started, True by default

salt.modules.glusterfs.list_peers()
Return a list of gluster peers

CLI Example:
  salt '*' glusterfs.list_peers

GLUSTER direct CLI example (to show what salt is sending to gluster):
  $ gluster peer status

GLUSTER CLI 3.4.4 return example (so we know what we are parsing):
  Number of Peers: 2
  Hostname: ftp2 Port: 24007 Uuid: cbcb256b-e66e-4ec7-a718-21082d396c24 State: Peer in Cluster (Connected)
salt.modules.glusterfs.list_volumes()
List configured volumes

CLI Example:

```
salt '*' glusterfs.list_volumes
```

salt.modules.glusterfs.peer(name)
Add another node into the peer list.

name The remote host to probe.

CLI Example:

```
salt 'one.gluster.*' glusterfs.peer two
```

GLUSTER direct CLI example (to show what salt is sending to gluster):

```
$ gluster peer probe ftp2
```

GLUSTER CLI 3.4.4 return example (so we know what we are parsing):

```
# if the `peer` is the local host:
peer probe: success: on localhost not needed

# if the peer was just added: peer probe: success

# if the peer was already part of the cluster: peer probe: success: host ftp2 port 24007 already in peer list
```

salt.modules.glusterfs.start_volume(name)
Start a gluster volume.

name Volume name

CLI Example:

```
salt '*' glusterfs.start mycluster
```

salt.modules.glusterfs.status(name)
Check the status of a gluster volume.

name Volume name

CLI Example:

```
salt '*' glusterfs.status myvolume
```

salt.modules.glusterfs.stop_volume(name)
Stop a gluster volume.

name Volume name

CLI Example:

```
salt '*' glusterfs.stop_volume mycluster
```

31.16.96 salt.modules.gnomedesktop

GNOME implementations

31.16. Full list of builtin execution modules
salt.modules.gnomedesktop.get(schema=None, key=None, user=None, **kwargs)
Get key in a particular GNOME schema

CLI Example:
```
salt '*' gnome.get user=<username> schema=org.gnome.desktop.screensaver key=idle-activation-enabled
```

salt.modules.gnomedesktop.getClockFormat(**kwargs)
Return the current clock format, either 12h or 24h format.

CLI Example:
```
salt '*' gnome.getClockFormat user=<username>
```

salt.modules.gnomedesktop.getClockShowDate(**kwargs)
Return the current setting, if the date is shown in the clock

CLI Example:
```
salt '*' gnome.getClockShowDate user=<username>
```

salt.modules.gnomedesktop.getIdleActivation(**kwargs)
Get whether the idle activation is enabled

CLI Example:
```
salt '*' gnome.getIdleActivation user=<username>
```

salt.modules.gnomedesktop.getIdleDelay(**kwargs)
Return the current idle delay setting in seconds

CLI Example:
```
salt '*' gnome.getIdleDelay user=<username>
```

salt.modules.gnomedesktop.ping(**kwargs)
A test to ensure the GNOME module is loaded

CLI Example:
```
salt '*' gnome.ping user=<username>
```

salt.modules.gnomedesktop.setClockFormat(clockFormat, **kwargs)
Set the clock format, either 12h or 24h format.

CLI Example:
```
salt '*' gnome.setClockFormat <12h|24h> user=<username>
```

salt.modules.gnomedesktop.setClockShowDate(kvalue, **kwargs)
Set whether the date is visible in the clock

CLI Example:
```
salt '*' gnome.setClockShowDate <True|False> user=<username>
```

salt.modules.gnomedesktop.setIdleActivation(kvalue, **kwargs)
Set whether the idle activation is enabled

CLI Example:
salt '*' gnome.setIdleActivation <True|False> user=<username>

salt.modules.gnomedesktop.setIdleDelay(delaySeconds, **kwargs)
    Set the current idle delay setting in seconds
    CLI Example:
    
    salt '*' gnome.setIdleDelay <seconds> user=<username>

salt.modules.gnomedesktop.set(schema=None, key=None, user=None, value=None, **kwargs)
    Set key in a particular GNOME schema
    CLI Example:
    
    salt '*' gnome.set user=<username> schema=org.gnome.desktop.screensaver key=idle-activation-enabled value=False

31.16.97 salt.modules.gpg

Manage a GPG keychains, add keys, create keys, retrieve keys from keyservers. Sign, encrypt and sign & encrypt text and files.

New in version 2015.5.0.

Note: The python-gnupg library and gpg binary are required to be installed.

salt.modules.gpg.create_key(key_type='RSA', key_length=1024, name_real='Autogenerated Key', name_comment='Generated by SaltStack', name_email=None, subkey_type=None, subkey_length=None, expire_date=None, use_passphrase=False, user=None, gnupghome=None)

Create a key in the GPG keychain

Note: GPG key generation requires a lot of entropy and randomness. Difficult to do over a remote connection, consider having another process available which is generating randomness for the machine. Also especially difficult on virtual machines, consider the rng-tools package.

The create_key process takes awhile so increasing the timeout may be necessary, e.g. -t 15.

key_type  The type of the primary key to generate. It must be capable of signing. `RSA` or `DSA`.

key_length  The length of the primary key in bits.

name_real  The real name of the user identity which is represented by the key.

name_comment  A comment to attach to the user id.

name_email  An email address for the user.

subkey_type  The type of the secondary key to generate.

subkey_length  The length of the secondary key in bits.

expire_date  The expiration date for the primary and any secondary key. You can specify an ISO date, A number of days/weeks/months/years, an epoch value, or 0 for a non-expiring key.

use_passphrase  Whether to use a passphrase with the signing key. Passphrase is received from pillar.

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt` will set the GPG home directory to /etc/salt/gpgkeys.

gnupghome  Specify the location where GPG related files are stored.
CLI Example:
```bash
salt -t 15 '*' gpg.create_key
```

```python
salt.modules.gpg.decrypt(user=None, text=None, filename=None, output=None, use_passphrase=False, gnupghome=None, bare=False)
```

Decrypt a message or file

- **user** Which user’s keychain to access, defaults to user Salt is running as. Passing the user as `salt` will set the GPG home directory to `/etc/salt/gpgkeys`.
- **text** The encrypted text to decrypt.
- **filename** The encrypted filename to decrypt.
- **output** The filename where the decrypted data will be written, default is standard out.
- **use_passphrase** Whether to use a passphrase with the signing key. Passphrase is received from pillar.
- **gnupghome** Specify the location where GPG related files are stored.
- **bare** If True, return the (armored) decrypted block as a string without the standard comment/res dict

CLI Example:
```bash
salt '*' gpg.decrypt filename="/path/to/important.file.gpg"
```

```bash
salt '*' gpg.decrypt filename="/path/to/important.file.gpg" use_passphrase=True
```

```python
salt.modules.gpg.delete_key(keyid=None, fingerprint=None, delete_secret=False, user=None, gnupghome=None)
```

Get a key from the GPG keychain

- **keyid** The keyid of the key to be deleted.
- **fingerprint** The fingerprint of the key to be deleted.
- **delete_secret** Whether to delete a corresponding secret key prior to deleting the public key. Secret keys must be deleted before deleting any corresponding public keys.
- **user** Which user’s keychain to access, defaults to user Salt is running as. Passing the user as `salt` will set the GPG home directory to `/etc/salt/gpgkeys`.
- **gnupghome** Specify the location where GPG related files are stored.

CLI Example:
```bash
salt '*' gpg.delete_key keyid=3FAD9F1E
salt '*' gpg.delete_key fingerprint=53C96788253E58416D20BCD352952C84C3252192
salt '*' gpg.delete_key keyid=3FAD9F1E user=username
salt '*' gpg.delete_key keyid=3FAD9F1E user=username delete_secret=True
```

```python
salt.modules.gpg.encrypt(user=None, recipients=None, text=None, filename=None, output=None, sign=None, use_passphrase=False, gnupghome=None, bare=False)
```

Encrypt a message or file

- **user** Which user’s keychain to access, defaults to user Salt is running as. Passing the user as `salt` will set the GPG home directory to `/etc/salt/gpgkeys`.
- **recipients** The fingerprints for those recipient whom the data is being encrypted for.
- **text** The text to encrypt.
filename  The filename to encrypt.

output  The filename where the signed file will be written, default is standard out.

sign  Whether to sign, in addition to encrypt, the data. True to use default key or fingerprint to specify a different key to sign with.

use_passphrase  Whether to use a passphrase with the signing key. Passphrase is received from pillar.

gnupghome  Specify the location where GPG related files are stored.

bare  If True, return the (armored) encrypted block as a string without the standard comment/res dict

CLI Example:

```
salt '*' gpg.encrypt text='Hello there. How are you?'
salt '*' gpg.encrypt filename='/path/to/important.file'
salt '*' gpg.encrypt filename='/path/to/important.file' use_passphrase=True
```

salt.modules.gpg.export_key(keyids=None, secret=False, user=None, gnupghome=None)

Export a key from the GPG keychain

keyids  The keyid(s) of the key(s) to be exported. Can be specified as a comma separated string or a list. Anything which GnuPG itself accepts to identify a key - for example, the keyid or the fingerprint could be used.

secret  Export the secret key identified by the keyid information passed.

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

gnupghome  Specify the location where GPG related files are stored.

CLI Example:

```
salt '*' gpg.export_key keyids=3FAD9F1E
salt '*' gpg.export_key keyids=3FAD9F1E secret=True
salt '*' gpg.export_key keyid="[3FAD9F1E',3FBD8F1E']" user=username
```

salt.modules.gpg.get_key(keyid=None, fingerprint=None, user=None, gnupghome=None)

Get a key from the GPG keychain

keyid  The keyid of the key to be retrieved.

fingerprint  The fingerprint of the key to be retrieved.

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

 gnupghome  Specify the location where GPG related files are stored.

CLI Example:

```
salt '*' gpg.get_key keyid=3FAD9F1E
salt '*' gpg.get_key fingerprint=53C96788253E58416D20BCD352952C84C3252192
salt '*' gpg.get_key keyid=3FAD9F1E user=username
```
salt.modules.gpg.get_secret_key(keyid=None, fingerprint=None, user=None, gnupghome=None)
Get a key from the GPG keychain

keyid  The keyid of the key to be retrieved.

fingerprint  The fingerprint of the key to be retrieved.

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

gnupghome  Specify the location where GPG related files are stored.

CLI Example:

```
salt '*' gpg.get_secret_key keyid=3FAD9F1E
salt '*' gpg.get_secret_key fingerprint=53C96788253E58416D20BCD352952C84C3252192
salt '*' gpg.get_secret_key keyid=3FAD9F1E user=username
```

salt.modules.gpg.import_key(user=None, text=None, filename=None, gnupghome=None)
Import a key from text or file

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

text  The text containing to import.

filename  The filename containing the key to import.

gnupghome  Specify the location where GPG related files are stored.

CLI Example:

```
salt '*' gpg.import_key text='-----BEGIN PGP PUBLIC KEY BLOCK-----
... -----END PGP PUBLIC KEY BLOCK-----'
salt '*' gpg.import_key filename='/path/to/public-key-file'
```

salt.modules.gpg.list_keys(user=None, gnupghome=None)
List keys in GPG keychain

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

gnupghome  Specify the location where GPG related files are stored.

CLI Example:

```
salt '*' gpg.list_keys
```

salt.modules.gpg.list_secret_keys(user=None, gnupghome=None)
List secret keys in GPG keychain

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

gnupghome  Specify the location where GPG related files are stored.

CLI Example:

```
salt '*' gpg.list_secret_keys
```

salt.modules.gpg.receive_keys(keyserver=None, keys=None, user=None, gnupghome=None)
Receive key(s) from keyservers and add them to keychain

keyserver  Keyserver to use for searching for GPG keys, defaults to pgp.mit.edu
keys  The keyID(s) to retrieve from the keyserver. Can be specified as a comma separated string or a list.

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

CLI Example:

```
salt '*' gpg.receive_key keys='3FAD9F1E'
salt '*' gpg.receive_key keys='[3FAD9F1E,3FBD9F2E]'
salt '*' gpg.receive_key keys=3FAD9F1E user=username
```

salt.modules.gpg.search_keys(text, keyserver=None, user=None)

Search keys from keyserver

text  Text to search the keyserver for, e.g. email address, keyID or fingerprint.

keyserver  Keyserver to use for searching for GPG keys, defaults to pgp.mit.edu

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

CLI Example:

```
salt '*' gpg.search_keys user@example.com
salt '*' gpg.search_keys user@example.com keyserver=keyserver.ubuntu.com
salt '*' gpg.search_keys user@example.com keyserver=keyserver.ubuntu.com user=username
```

salt.modules.gpg.sign(user=None, keyid=None, text=None, filename=None, output=None, use_passphrase=False, gnupghome=None)

Sign message or file

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

keyid  The keyid of the key to set the trust level for, defaults to first key in the secret keyring.

text  The text to sign.

filename  The filename to sign.

output  The filename where the signed file will be written, default is standard out.

use_passphrase  Whether to use a passphrase with the signing key. Passphrase is received from pillar.

gnupghome  Specify the location where GPG related files are stored.

CLI Example:

```
salt '*' gpg.sign text='Hello there. How are you?'
salt '*' gpg.sign filename='/path/to/important.file'
salt '*' gpg.sign filename='/path/to/important.file' use_passphrase=True
```

salt.modules.gpg.trust_key(keyid=None, fingerprint=None, trust_level=None, user=None)

Set the trust level for a key in GPG keychain

keyid  The keyid of the key to set the trust level for.

fingerprint  The fingerprint of the key to set the trust level for.
trust_level  The trust level to set for the specified key, must be one of the following: expired, unknown, not_trusted, marginally, fully, ultimately

user  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.

CLI Example:

```
salt '*' gpg.trust_key keyid='3FAD9F1E' trust_level='marginally'
salt '*' gpg.trust_key fingerprint='53C96788253E58416D20BCD352952C84C3252192' trust_level='not_trusted'
salt '*' gpg.trust_key keys='3FAD9F1E' trust_level='ultimately' user='username'
```

```
salt.modules.gpg.verify(text=None, user=None, filename=None, gnupghome=None)
```
Verify a message or file

- **text**  The text to verify.
- **filename**  The filename to verify.
- **user**  Which user's keychain to access, defaults to user Salt is running as. Passing the user as `salt' will set the GPG home directory to /etc/salt/gpgkeys.
- **gnupghome**  Specify the location where GPG related files are stored.

CLI Example:

```
salt '*' gpg.verify text='Hello there. How are you?'
salt '*' gpg.verify filename='/path/to/important.file'
salt '*' gpg.verify filename='/path/to/important.file' use_pasphrase=True
```

31.16.98  salt.modules.grains

Return/control aspects of the grains data

```
salt.modules.grains.append(key, val, convert=False, delimiter=':')
```
New in version 0.17.0.

Append a value to a list in the grains config file. If the grain doesn't exist, the grain key is added and the value is appended to the new grain as a list item.

- **key**  The grain key to be appended to
- **val**  The value to append to the grain key

**Parameters**

- **convert**  -- If convert is True, convert non-list contents into a list. If convert is False and the grain contains non-list contents, an error is given. Defaults to False.

- **delimiter**  -- The key can be a nested dict key. Use this parameter to specify the delimiter you use. You can now append values to a list in nested dictionary grains. If the list doesn't exist at this level, it will be created. .. versionadded:: 2014.7.6

CLI Example:

```
salt '*' grains.append key val
```
salt.modules.grains.delval(key, destructive=False)
New in version 0.17.0.
Delete a grain from the grains config file

Parameters destructive -- Delete the key, too. Defaults to False.

CLI Example:
salt '!' grains.delval key

salt.modules.grains.filter_by(lookup_dict, grain='os_family', merge=None, default='default', base=None)
New in version 0.17.0.
Look up the given grain in a given dictionary for the current OS and return the result

Although this may occasionally be useful at the CLI, the primary intent of this function is for use in Jinja to
make short work of creating lookup tables for OS-specific data. For example:

{% set apache = salt['grains.filter_by']({
    'Debian': {'pkg': 'apache2', 'srv': 'apache2'},
    'RedHat': {'pkg': 'httpd', 'srv': 'httpd'},
}, default='Debian') %}

myapache:
    - name: {{ apache.pkg }}
service.running:
    - name: {{ apache.srv }}

Values in the lookup table may be overridden by values in Pillar. An example Pillar to override values in the
example above could be as follows:

apache:
    lookup:
        pkg: apache_13
        srv: apache

The call to filter_by() would be modified as follows to reference those Pillar values:

{% set apache = salt['grains.filter_by']({
    ...,
    }, merge=salt['pillar.get']('apache:lookup')) %}

Parameters

- **lookup_dict** -- A dictionary, keyed by a grain, containing a value or values relevant
to systems matching that grain. For example, a key could be the grain for an OS and the
value could the name of a package on that particular OS.

- **grain** -- The name of a grain to match with the current system's grains. For example, the
value of the `os_family` grain for the current system could be used to pull values from
the lookup_dict dictionary.

- **merge** -- A dictionary to merge with the results of the grain selection from
lookup_dict. This allows Pillar to override the values in the lookup_dict. This
could be useful, for example, to override the values for non-standard package names such
as when using a different Python version from the default Python version provided by the
OS (e.g., python26-mysql instead of python-mysql).
• **default** -- default lookup_dict's key used if the grain does not exists or if the grain value has no match on lookup_dict. If unspecified the value is ``default``.

New in version 2014.1.0.

• **base** -- A lookup_dict key to use for a base dictionary. The grain-selected lookup_dict is merged over this and then finally the merge dictionary is merged. This allows common values for each case to be collected in the base and overridden by the grain selection dictionary and the merge dictionary. Default is unset.

New in version 2015.5.0.

**CLI Example:**

```bash
salt '*' grains.filter_by '{Debian: Debheads rule, RedHat: I love my hat}'
# this one will render {D: {E: I, G: H}, J: K}
# next one renders {A: {B: G}, D: J}
salt '*' grains.filter_by '{default: {A: {B: C}, D: E}, F: {A: {B: G}}, H: {D: I}}' 'xxx' '{D: J}'
# next same as above when default='H' instead of 'F' renders {A: {B: C}, D: J}
```

**salt.modules.grains.get(key, default='`, delimiter=':')**

Attempt to retrieve the named value from grains, if the named value is not available return the passed default. The default return is an empty string.

The value can also represent a value in a nested dict using a ":" delimiter for the dict. This means that if a dict in grains looks like this:

```
{ 'pkg': { 'apache': 'httpd' } }
```

To retrieve the value associated with the apache key in the pkg dict this key can be passed:

```
pkg:apache
```

**delimiter** Specify an alternate delimiter to use when traversing a nested dict

New in version 2014.7.0.

**CLI Example:**

```bash
salt '*' grains.get pkg:apache
```

**salt.modules.grains.get_or_set_hash(name, length=8, chars='abcdefghijklmnopqrstuvwxyz0123456789!@#$%^&*(-_=+)')**

Perform a one-time generation of a hash and write it to the local grains. If that grain has already been set return the value instead.

This is useful for generating passwords or keys that are specific to a single minion that don't need to be stored somewhere centrally.

**State Example:**

```yaml
some_mysql_user:
  mysql_user:
    - present
    - host: localhost
    - password: {{ salt['grains.get_or_set_hash']('mysql:some_mysql_user') }}
```

**CLI Example:**
**salt** `'*' grains.get_or_set_hash 'django:SECRET_KEY' 50`

*Warning:* This function could return strings which may contain characters which are reserved as directives by the YAML parser, such as strings beginning with `%`. To avoid issues when using the output of this function in an SLS file containing YAML+Jinja, surround the call with single quotes.

---

**salt.modules.grains**.has_value(key)

Determine whether a named value exists in the grains dictionary.

Given a grains dictionary that contains the following structure:

```json
{ 'pkg': { 'apache': 'httpd' }}
```

One would determine if the `apache` key in the `pkg` dict exists by:

```python
pkg:apache
```

**CLI Example**

```bash
salt '*' grains.has_value pkg:apache
```

---

**salt.modules.grains**.item(*args, **kwargs)

Return one or more grains

**CLI Example**

```bash
salt '*' grains.item os
salt '*' grains.item os osrelease oscodename
```

Sanitized **CLI Example**:

```bash
salt '*' grains.item host sanitize=True
```

---

**salt.modules.grains**.items(sanitize=False)

Return all of the minion’s grains

**CLI Example**

```bash
salt '*' grains.items
```

Sanitized **CLI Example**:

```bash
salt '*' grains.items sanitize=True
```

---

**salt.modules.grains**.ls()

Return a list of all available grains

**CLI Example**

```bash
salt '*' grains.ls
```

---

**salt.modules.grains**.remove(key, val)

New in version 0.17.0.

Remove a value from a list in the grains config file

**CLI Example**

```bash
salt '*' grains.remove key val
```
salt.modules.grains.set(key, val='`, force=False, destructive=False, delimiter=':')

Set a key to an arbitrary value. It is used like setval but works with nested keys.

This function is conservative. It will only overwrite an entry if its value and the given one are not a list or a
dict. The force parameter is used to allow overwriting in all cases.

New in version 2015.8.0.

Parameters

- **force** -- Force writing over existing entry if given or existing values are list or dict. Defaultsto False.
- **destructive** -- If an operation results in a key being removed, delete the key, too. Defaultsto False.
- **delimiter** -- Specify an alternate delimiter to use when traversing a nested dict

CLI Example:

```
salt '*' grains.set 'apps:myApp:port' 2209
salt '*' grains.set 'apps:myApp' '{port: 2209}'
```

salt.modules.grains.setval(key, val, destructive=False)

Set a grains value in the grains config file

Parameters

- **Destructive** -- If an operation results in a key being removed, delete the key, too.
  Defaultsto False.

CLI Example:

```
salt '*' grains.setval key val
salt '*' grains.setval key "{'sub-key': 'val', 'sub-key2': 'val2'}"
```

salt.modules.grains.setvals(grains, destructive=False)

Set new grains values in the grains config file

Parameters

- **Destructive** -- If an operation results in a key being removed, delete the key, too.
  Defaultsto False.

CLI Example:

```
salt '*' grains.setvals "{'key1': 'val1', 'key2': 'val2'}"
```

31.16.99 salt.modules.groupadd

Manage groups on Linux, OpenBSD and NetBSD

salt.modules.groupadd.add(name, gid=None, system=False)

Add the specified group

CLI Example:

```
salt '*' group.add foo 3456
```

salt.modules.groupadd.adduser(name, username)

Add a user in the group.

CLI Example:

```
salt '*' group.adduser foo bar
```
Verifies if a valid username 'bar' as a member of an existing group 'foo', if not then adds it.

```
salt.modules.groupadd.chgid(name, gid)
    Change the gid for a named group
    
    CLI Example:
    
    salt '*' group.chgid foo 4376
```

```
salt.modules.groupadd.delete(name)
    Remove the named group
    
    CLI Example:
    
    salt '*' group.delete foo
```

```
salt.modules.groupadd.deluser(name, username)
    Remove a user from the group.
    
    CLI Example:
    
    salt '*' group.deluser foo bar
```

Removes a member user 'bar' from a group 'foo'. If group is not present then returns True.

```
salt.modules.groupadd.getent(refresh=False)
    Return info on all groups
    
    CLI Example:
    
    salt '*' group.getent
```

```
salt.modules.groupadd.info(name)
    Return information about a group
    
    CLI Example:
    
    salt '*' group.info foo
```

```
salt.modules.groupadd.members(name, members_list)
    Replaces members of the group with a provided list.
    
    CLI Example:
    
    salt '*' group.members foo 'user1,user2,user3,...'
```

Replaces a membership list for a local group 'foo'. foo:x:1234:user1,user2,user3,...

31.16.100 salt.modules.grub_legacy

Support for GRUB Legacy

```
salt.modules.grub_legacy.conf()
    Parse GRUB conf file
    
    CLI Example:
    
    salt '*' grub.conf
```

31.16. Full list of built-in execution modules
salt.modules.grub_legacy.version()
  Return server version from grub --version
  CLI Example:
  
  salt '*' grub.version

31.16.101 salt.modules.guestfs

Interact with virtual machine images via libguestfs

  depends
  
  • libguestfs

salt.modules.guestfs.mount(location, access='rw')
  Mount an image
  
  CLI Example:
  
  salt '*' guest.mount /srv/images/fedora.qcow

31.16.102 salt.modules.hadoop

Support for hadoop

  maintainer  Yann Jouanin <yann.jouanin@intelunix.fr>
  maturity   new
  depends
  
  platform   linux

salt.modules.hadoop.dfs(command=None, *args)
  Execute a command on DFS
  
  CLI Example:
  
  salt '*' hadoop.dfs ls /

salt.modules.hadoop.dfs_absent(path)
  Check if a file or directory is absent on the distributed FS.
  
  CLI Example:
  
  salt '*' hadoop.dfs_absent /some_random_file

    Returns True if the file is absent

salt.modules.hadoop.dfs_present(path)
  Check if a file or directory is present on the distributed FS.
  
  CLI Example:
  
  salt '*' hadoop.dfs_present /some_random_file

    Returns True if the file is present

salt.modules.hadoop.namenode_format(force=None)
  Format a name node
salt '*' hadoop.namenode_format force=True

salt.modules.hadoop.version()
    Return version from hadoop version
    CLI Example:
    salt '*' hadoop.version

31.16.103 salt.modules.haproxyconn

Support for haproxy
New in version 2014.7.0.

salt.modules.haproxyconn.disable_server(name, backend, socket='/var/run/haproxy.sock')
    Disable server in haproxy.
    name  Server to disable
    backend  haproxy backend
    socket  haproxy stats socket
    CLI Example:
    salt '*' haproxy.disable_server db1.example.com mysql

salt.modules.haproxyconn.enable_server(name, backend, socket='/var/run/haproxy.sock')
    Enable Server in haproxy
    name  Server to enable
    backend  haproxy backend
    socket  haproxy stats socket
    CLI Example:
    salt '*' haproxy.enable_server web1.example.com www

salt.modules.haproxyconn.get_weight(name, backend, socket='/var/run/haproxy.sock')
    Get server weight
    name  Server name
    backend  haproxy backend
    socket  haproxy stats socket
    CLI Example:
    salt '*' haproxy.get_weight web1.example.com www

salt.modules.haproxyconn.list_servers(backend, socket='/var/run/haproxy.sock', objec-
tify=False)
    List servers in haproxy backend.
    backend  haproxy backend
    socket  haproxy stats socket
    CLI Example:
Salt Documentation, Release 2015.8.0

* salt '*' haproxy.list_servers mysql

salt.modules.haproxyconn.set_weight(name, backend, weight=0, socket='/var/run/haproxy.sock')
Set server weight
- name Server name
- backend haproxy backend
- weight Server Weight
- socket haproxy stats socket

CLI Example:
* salt '*' haproxy.set_weight web1.example.com www 13

salt.modules.haproxyconn.show_backends(socket='/var/run/haproxy.sock')
Show HaProxy Backends
- socket haproxy stats socket

CLI Example:
* salt '*' haproxy.show_backends

salt.modules.haproxyconn.show_frontends(socket='/var/run/haproxy.sock')
Show HaProxy frontends
- socket haproxy stats socket

CLI Example:
* salt '*' haproxy.show_frontends

---

### 31.16.104 salt.modules.hashutil

A collection of hashing and encoding functions

salt.modules.hashutil.base64_decodestring(instr)
Decode a base64-encoded string

New in version 2014.7.0.

CLI Example:
* salt '*' hashutil.base64_decodestring 'Z2V0IHNhbHRlZA==\n'

salt.modules.hashutil.base64_encodestring(instr)
Encode a string as base64

New in version 2014.7.0.

CLI Example:
* salt '*' hashutil.base64_encodestring 'get salted'

salt.modules.hashutil.hmac_signature(string, shared_secret, challenge_hmac)
Verify a challenging hmac signature against a string / shared-secret

New in version 2014.7.0.
Returns a boolean if the verification succeeded or failed.

CLI Example:
```
salt '*' hashutil.hmac_signature 'get salted' 'shared secret' 'eBWf9bstXg+NiPSA0wpp85HMvZlYMpZEM'
```

```python
salt.modules.hashutil.md5_digest(instr)
```
Generate an MD5 hash of a given string
New in version 2014.7.0.

CLI Example:
```
salt '*' hashutil.md5_digest 'get salted'
```

```python
salt.modules.hashutil.sha256_digest(instr)
```
Generate a SHA256 hash of a given string
New in version 2014.7.0.

CLI Example:
```
salt '*' hashutil.sha256_digest 'get salted'
```

```python
salt.modules.hashutil.sha512_digest(instr)
```
Generate a SHA512 hash of a given string
New in version 2014.7.0.

CLI Example:
```
salt '*' hashutil.sha512_digest 'get salted'
```

### 31.16.105 salt.modules.hg

Support for the Mercurial SCM

```python
salt.modules.hg.archive(cwd, output, rev='tip', fmt=None, prefix=None, user=None)
```
Export a tarball from the repository

- **cwd** The path to the Mercurial repository
- **output** The path to the archive tarball
- **rev** The revision to create an archive from
- **fmt** None Format of the resulting archive. Mercurial supports: tar, tbz2, tgz, zip, uzip, and files formats.
- **prefix** [None] Prepend `<prefix>/` to every filename in the archive
- **user** [None] Run hg as a user other than what the minion runs as

If **prefix** is not specified it defaults to the basename of the repo directory.

CLI Example:
```
salt '*' hg.archive /path/to/repo output=/tmp/archive.tgz fmt=tgz
```

```python
salt.modules.hg.clone(cwd, repository, opts=None, user=None, identity=None)
```
Clone a new repository

- **cwd** The path to the Mercurial repository
- **repository** The hg URI of the repository
opts [None] Any additional options to add to the command line
user [None] Run hg as a user other than what the minion runs as
identity [None] Private SSH key on the minion server for authentication (ssh://)

New in version 2015.5.0.

CLI Example:

    salt '*' hg.clone /path/to/repo https://bitbucket.org/birkenfeld/sphinx

\texttt{salt.modules.hg.describe(cwd, rev='tip', user=None)}

Mimic \texttt{git describe} and return an identifier for the given revision

\begin{itemize}
  \item cwd The path to the Mercurial repository
  \item rev: tip The path to the archive tarball
  \item user [None] Run hg as a user other than what the minion runs as
\end{itemize}

CLI Example:

    salt '*' hg.describe /path/to/repo

\texttt{salt.modules.hg.pull(cwd, opts=None, user=None, identity=None, repository=None)}

Perform a pull on the given repository

\begin{itemize}
  \item cwd The path to the Mercurial repository
  \item repository [None] Perform pull from the repository different from \texttt{.hg/hgrc:[paths]:default}
  \item opts [None] Any additional options to add to the command line
  \item user [None] Run hg as a user other than what the minion runs as
  \item identity [None] Private SSH key on the minion server for authentication (ssh://)
\end{itemize}

New in version 2015.5.0.

CLI Example:

    salt '*' hg.pull /path/to/repo opts=-u

\texttt{salt.modules.hg.revision(cwd, rev='tip', short=False, user=None)}

Returns the long hash of a given identifier (hash, branch, tag, HEAD, etc)

\begin{itemize}
  \item cwd The path to the Mercurial repository
  \item rev: tip The revision
  \item short: False Return an abbreviated commit hash
  \item user [None] Run hg as a user other than what the minion runs as
\end{itemize}

CLI Example:

    salt '*' hg.revision /path/to/repo mybranch

\texttt{salt.modules.hg.update(cwd, rev, force=False, user=None)}

Update to a given revision

\begin{itemize}
  \item cwd The path to the Mercurial repository
  \item rev The revision to update to
  \item force [False] Force an update
\end{itemize}
**user** [None] Run hg as a user other than what the minion runs as

CLI Example:

```
salt devserver1 hg.update /path/to/repo somebranch
```

### 31.16.106 salt.modules.hipchat

Module for sending messages to hipchat.

New in version 2015.5.0.

**configuration** This module can be used by either passing an api key and version directly or by specifying both in a configuration profile in the salt master/minion config.

For example:

```
  hipchat:
  api_key: peWcBiMOS9HrZG15peWcBiMOS9HrZG15
  api_version: v1
```

**salt.modules.hipchat.find_room(name, api_key=None, api_version=None)**

Find a room by name and return it.  

: **param** name: The room name.  
: **param** api_key: The HipChat admin api key.  
: **param** api_version: The HipChat api version, if not specified in the configuration.  
: **return**: The room object.

CLI Example:

```
salt '*' hipchat.find_room name="Development Room"
```

```
salt '*' hipchat.find_room name="Development Room" api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15 api_version=v1
```

**salt.modules.hipchat.find_user(name, api_key=None, api_version=None)**

Find a user by name and return it.  

: **param** name: The user name.  
: **param** api_key: The HipChat admin api key.  
: **param** api_version: The HipChat api version, if not specified in the configuration.  
: **return**: The user object.

CLI Example:

```
salt '*' hipchat.find_user name="Thomas Hatch"
```

```
salt '*' hipchat.find_user name="Thomas Hatch" api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15 api_version=v1
```

**salt.modules.hipchat.list_rooms(api_key=None, api_version=None)**

List all HipChat rooms.

**Parameters**

- **api_key** -- The HipChat admin api key.
- **api_version** -- The HipChat api version, if not specified in the configuration.

**Returns** The room list.

CLI Example:

```
salt '*' hipchat.list_rooms
```

```
salt '*' hipchat.list_rooms api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15 api_version=v1
```

31.16. Full list of builtin execution modules
salt.modules.hipchat.list_users(api_key=None, api_version=None)

List all HipChat users.  

:param api_key: The HipChat admin api key.  
:param api_version: The HipChat api version, if not specified in the configuration.  
:return: The user list.

CLI Example:

```
salt '*' hipchat.list_users
salt '*' hipchat.list_users api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15 api_version=v1
```

salt.modules.hipchat.send_message(room_id, message, from_name, api_key=None, api_version=None, color='yellow', notify=False)

Send a message to a HipChat room.  

:param room_id: The room id or room name, either will work.  
:param message: The message to send to the HipChat room.  
:param from_name: Specify who the message is from.  
:param api_key: The HipChat api key, if not specified in the configuration.  
:param api_version: The HipChat api version, if not specified in the configuration.  
:param color: The color for the message, default: yellow.  
:param notify: Whether to notify the room, default: False.  
:return: Boolean if message was sent successfully.

CLI Example:

```
salt '*' hipchat.send_message room_id="Development Room" message="Build is done" from_name="Build Server"
salt '*' hipchat.send_message room_id="Development Room" message="Build failed" from_name="Build Server" color="red" notify=True
```

31.16.107 salt.modules.hosts

Manage the information in the hosts file

salt.modules.hosts.add_host(ip, alias)

Add a host to an existing entry, if the entry is not in place then create it with the given host

CLI Example:

```
salt '*' hosts.add_host <ip> <alias>
```

salt.modules.hosts.get_alias(ip)

Return the list of aliases associated with an ip

CLI Example:

```
salt '*' hosts.get_alias <ip addr>
```

salt.modules.hosts.get_ip(host)

Return the ip associated with the named host

CLI Example:

```
salt '*' hosts.get_ip <hostname>
```

salt.modules.hosts.has_pair(ip, alias)

Return true if the alias is set

CLI Example:

```
salt '*' hosts.has_pair <ip> <alias>
```

salt.modules.hosts.list_hosts()

Return the hosts found in the hosts file in this format:
{'<ip addr>': ['alias1', 'alias2', ...]}

CLI Example:
salt '*' hosts.list_hosts

salt.modules.hosts.rm_host(ip, alias)
Remove a host entry from the hosts file

CLI Example:
salt '*' hosts.rm_host <ip> <alias>

salt.modules.hosts.set_host(ip, alias)
Set the host entry in the hosts file for the given ip, this will overwrite any previous entry for the given ip

CLI Example:
salt '*' hosts.set_host <ip> <alias>

31.16.108 salt.modules.htpasswd

Support for htpasswd command
New in version 2014.1.0.

The functions here will load inside the webutil module. This allows other functions that don't use htpasswd to use
the webutil module name.

salt.modules.htpasswd.useradd(pwfile, user, password, opts='r', runas=None)
Add a user to htpasswd file using the htpasswd command. If the htpasswd file does not exist, it will be created.

pwfile  Path to htpasswd file
user  User name
password  User password
opts  Valid options that can be passed are:
  • n  Don't update file; display results on stdout.
  • m  Force MD5 encryption of the password (default).
  • d  Force CRYPT encryption of the password.
  • p  Do not encrypt the password (plaintext).
  • s  Force SHA encryption of the password.
runas  The system user to run htpasswd command with

CLI Examples:
salt '*' webutil.useradd /etc/httpd/htpasswd larry badpassword
salt '*' webutil.useradd /etc/httpd/htpasswd larry badpass opts=ns

salt.modules.htpasswd.useradd_all(pwfile, user, password, opts='r', runas=None)
Add a user to htpasswd file using the htpasswd command. If the htpasswd file does not exist, it will be created.

pwfile  Path to htpasswd file
user  User name
password  User password

opts  Valid options that can be passed are:
  •  n  Don’t update file; display results on stdout.
  •  m  Force MD5 encryption of the password (default).
  •  d  Force CRYPT encryption of the password.
  •  p  Do not encrypt the password (plaintext).
  •  s  Force SHA encryption of the password.

runas  The system user to run htpasswd command with

CLI Examples:

```shell
salt '*' webutil.useradd /etc/httpd/htpasswd larry badpassword
salt '*' webutil.useradd /etc/httpd/htpasswd larry badpass opts=ns
```

salt.modules.htpasswd.userdel(pwfile, user, runas=’None’)
Delete a user from the specified htpasswd file.

   pwfile  Path to htpasswd file
   user  User name
   runas  The system user to run htpasswd command with

CLI Examples:

```shell
salt '*' webutil.userdel /etc/httpd/htpasswd larry
```

31.16.109  salt.modules.http

Module for making various web calls. Primarily designed for webhooks and the like, but also useful for basic http testing.

New in version 2015.5.0.

salt.modules.http.query(url, **kwargs)
Query a resource, and decode the return data

New in version 2015.5.0.

CLI Example:

```shell
salt '*' http.query http://somelink.com/
salt '*' http.query http://somelink.com/ method=POST params='key1=val1&key2=val2'
salt '*' http.query http://somelink.com/ method=POST data='<xml>somecontent</xml>'
```

salt.modules.http.update_ca_bundle(target=’None’, source=’None’, merge_files=’None’)
Update the local CA bundle file from a URL.

New in version 2015.5.0.

CLI Example:

```shell
salt '*' http.update_ca_bundle
salt '*' http.update_ca_bundle target=/path/to/cacerts.pem
salt '*' http.update_ca_bundle source=https://example.com/cacerts.pem
```
If the target is not specified, it will be pulled from the \texttt{ca\_cert} configuration variable available to the minion. If it cannot be found there, it will be placed at \texttt{<<FILE\_ROOTS>>/cacerts.pem}.

If the source is not specified, it will be pulled from the \texttt{ca\_cert\_url} configuration variable available to the minion. If it cannot be found, it will be downloaded from the cURL website, using an http (not https) URL. USING THE DEFAULT URL SHOULD BE AVOIDED!

\texttt{merge\_files} may also be specified, which includes a string or list of strings representing a file or files to be appended to the end of the CA bundle, once it is downloaded.

CLI Example:

\begin{verbatim}
salt '*' http.update_ca_bundle merge_files=/path/to/mycert.pem
\end{verbatim}

### 31.16.110 salt.modules.ifttt

Support for IFTTT

New in version 2015.8.0.

Requires an \texttt{api\_key} in /etc/salt/minion:

\begin{verbatim}
salt.modules.ifttt.trigger_event(event=None, **kwargs)
\end{verbatim}

Trigger a configured event in IFTTT.

- **Parameters**
  - \texttt{event} -- The name of the event to trigger.

- **Returns**
  - A dictionary with status, text, and error if result was failure.

CLI Example:

### 31.16.111 salt.modules.ilo

Manage HP ILO

- \texttt{depends} hponecfg (SmartStart Scripting Toolkit Linux Edition)

\begin{verbatim}
salt.modules.ilo.change_password(username, password)
\end{verbatim}

Reset a users password

CLI Example:

\begin{verbatim}
salt '*' ilo.change_password damianMyerscough
\end{verbatim}

\begin{verbatim}
salt.modules.ilo.change_username(old_username, new_username)
\end{verbatim}

Change a username

CLI Example:

\begin{verbatim}
salt '*' ilo.change_username damian diana
\end{verbatim}

\begin{verbatim}
salt.modules.ilo.configure_network(ip, netmask, gateway)
\end{verbatim}

Configure Network Interface

CLI Example:

\begin{verbatim}
salt '*' ilo.configure_network [IP ADDRESS] [NETMASK] [GATEWAY]
\end{verbatim}
salt.modules.ilo.configure_snmp(community, snmp_port=161, snmp_trapport=161)
Configure SNMP

CLI Example:
```
salt '*' ilo.configure_snmp [COMMUNITY STRING] [SNMP PORT] [SNMP TRAP PORT]
```

salt.modules.ilo.create_user(name, password, *privileges)
Create user

CLI Example:
```
salt '*' ilo.create_user damian secretagent VIRTUAL_MEDIA_PRIV
```

If no permissions are specify the user will only have a read-only account.

Supported privileges:
- ADMIN_PRIV Enables the user to administer user accounts.
- REMOTE_CONS_PRIV Enables the user to access the Remote Console functionality.
- RESET_SERVER_PRIV Enables the user to remotely manipulate the server power setting.
- VIRTUAL_MEDIA_PRIV Enables the user permission to access the virtual media functionality.
- CONFIG_ILO_PRIV Enables the user to configure iLO settings.

salt.modules.ilo.delete_ssh_key(username)
Delete a users SSH key from the ILO

CLI Example:
```
salt '*' ilo.delete_user_sshkey damian
```

salt.modules.ilo.delete_user(username)
Delete a user

CLI Example:
```
salt '*' ilo.delete_user damian
```

salt.modules.ilo.disable_dhcp()
Disable DHCP

CLI Example:
```
salt '*' ilo.disable_dhcp
```

salt.modules.ilo.disable_ssh()
Disable the SSH daemon

CLI Example:
```
salt '*' ilo.disable_ssh
```

salt.modules.ilo.enable_dhcp()
Enable DHCP

CLI Example:
```
salt '*' ilo.enable_dhcp
```
salt.modules.ilo.enable_ssh()
    Enable the SSH daemon

    CLI Example:
    salt '*' ilo.enable_ssh

salt.modules.ilo.get_user(username)
    Returns local user information, excluding the password

    CLI Example:
    salt '*' ilo.get_user damian

salt.modules.ilo.global_settings()
    Show global settings

    CLI Example:
    salt '*' ilo.global_settings

salt.modules.ilo.list_users()
    List all users

    CLI Example:
    salt '*' ilo.list_users

salt.modules.ilo.list_users_info()
    List all users in detail

    CLI Example:
    salt '*' ilo.list_users_info

salt.modules.ilo.network()
    Grab the current network settings

    CLI Example:
    salt '*' ilo.network

salt.modules.ilo.set_http_port(port=80)
    Configure the port HTTP should listen on

    CLI Example:
    salt '*' ilo.set_http_port 8080

salt.modules.ilo.set_https_port(port=443)
    Configure the port HTTPS should listen on

    CLI Example:
    salt '*' ilo.set_https_port 4334

salt.modules.ilo.set_ssh_key(public_key)
    Configure SSH public keys for specific users

    CLI Example:
    salt '*' ilo.set_ssh_key "ssh-dss AAAAB3NzaC1kc3MAAACBA... damian"
The SSH public key needs to be DSA and the last argument in the key needs to be the username (case-sensitive) of the ILO username.

```python
salt.modules.ilo.set_ssh_port(port=22)
```
Enable SSH on a user defined port

CLI Example:

```bash
salt '*' ilo.set_ssh_port 2222
```

### 31.16.112 salt.modules.img

Virtual machine image management tools

```python
salt.modules.img.bootstrap(location, size, fmt)
```
HIGHLY EXPERIMENTAL Bootstrap a virtual machine image

- **location**: The location to create the image
- **size**: The size of the image to create in megabytes
- **fmt**: The image format, raw or qcow2

CLI Example:

```bash
salt '*' img.bootstrap /srv/salt-images/host.qcow 4096 qcow2
```

```python
salt.modules.img.mount_image(location)
```
Mount the named image and return the mount point

```bash
salt '*' img.mount_image /tmp/foo
```

```python
salt.modules.img.umount_image(mnt)
```
Unmount an image mountpoint

```bash
salt '*' img.umount_image /mnt/foo
```

### 31.16.113 salt.modules.incron

Work with incron

```python
salt.modules.incron.list_tab(user)
```
Return the contents of the specified user’s incrontab

```bash
salt '*' incron.list_tab root
```

```python
salt.modules.incron.ls(user)
```
Return the contents of the specified user’s incrontab

```bash
salt '*' incron.list_tab root
```
<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>CLI Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>salt.modules.incron.raw_incron(user)</code></td>
<td>Return the contents of the user's incrontab</td>
<td><code>salt '*' incron.raw_incron root</code></td>
</tr>
<tr>
<td><code>salt.modules.incron.raw_system_incron()</code></td>
<td>Return the contents of the system wide incrontab</td>
<td><code>salt '*' incron.raw_system_incron</code></td>
</tr>
<tr>
<td><code>salt.modules.incron.rm(user, path, mask, cmd)</code></td>
<td>Remove an incron job for a specified user. If any of the day/time params are specified, the job will only be removed if the specified params match.</td>
<td><code>salt '*' incron.rm_job root /path</code></td>
</tr>
<tr>
<td><code>salt.modules.incron.set_job(user, path, mask, cmd)</code></td>
<td>Sets an incron job up for a specified user.</td>
<td><code>salt '*' incron.set_job root '/root' 'IN_MODIFY' 'echo &quot;$$ $@ $$ $% $&amp;&quot;'</code></td>
</tr>
<tr>
<td><code>salt.modules.incron.write_incron_file(user, path)</code></td>
<td>Writes the contents of a file to a user's incrontab</td>
<td><code>salt '*' incron.write_incron_file root /tmp/new_incron</code></td>
</tr>
<tr>
<td><code>salt.modules.incron.write_incron_file_verbose(user, path)</code></td>
<td>Writes the contents of a file to a user's incrontab and return error message on error</td>
<td><code>salt '*' incron.write_incron_file_verbose root /tmp/new_incron</code></td>
</tr>
</tbody>
</table>

### 31.16.114 salt.modules.influx

InfluxDB - A distributed time series database

Module to provide InfluxDB compatibility to Salt (compatible with InfluxDB version 0.5+)

New in version 2014.7.0.

**depends**
- influxdb Python module

31.16. Full list of built-in execution modules 943
configuration  This module accepts connection configuration details either as parameters or as configuration settings in /etc/salt/minion on the relevant minions:

```yaml
influxdb.host: 'localhost'
influxdb.port: 8086
influxdb.user: 'root'
influxdb.password: 'root'
```

This data can also be passed into pillar. Options passed into opts will overwrite options passed into pillar.

**salt.modules.influx.db_create**(name, user=None, password=None, host=None, port=None)
Create a database

- **name**  Database name to create
- **user**  The user to connect as
- **password**  The password of the user
- **host**  The host to connect to
- **port**  The port to connect to

CLI Example:

```
salt '*' influxdb.db_create <name>
salt '*' influxdb.db_create <name> <user> <password> <host> <port>
```

**salt.modules.influx.db_exists**(name, user=None, password=None, host=None, port=None)
Checks if a database exists in InfluxDB

- **name**  Database name to create
- **user**  The user to connect as
- **password**  The password of the user
- **host**  The host to connect to
- **port**  The port to connect to

CLI Example:

```
salt '*' influxdb.db_exists <name>
salt '*' influxdb.db_exists <name> <user> <password> <host> <port>
```

**salt.modules.influx.db_list**(user=None, password=None, host=None, port=None)
List all InfluxDB databases

- **user**  The user to connect as
- **password**  The password of the user
- **host**  The host to connect to
- **port**  The port to connect to

CLI Example:

```
salt '*' influxdb.db_list
salt '*' influxdb.db_list <user> <password> <host> <port>
```

**salt.modules.influx.db_remove**(name, user=None, password=None, host=None, port=None)
Remove a database
name  Database name to remove
user  The user to connect as
password  The password of the user
host  The host to connect to
port  The port to connect to

CLI Example:

```
salt '*' influxdb.db_remove <name>
salt '*' influxdb.db_remove <name> <user> <password> <host> <port>
```

```python
salt.modules.influx.login_test(name, password, database=None, host=None, port=None)
```

Checks if a credential pair can log in at all.

If a database is specified: it will check for database user existence. If a database is not specified: it will check for cluster admin existence.

name  The user to connect as
password  The password of the user
database  The database to try to log in to
host  The host to connect to
port  The port to connect to

CLI Example:

```
salt '*' influxdb.login_test <name>
salt '*' influxdb.login_test <name> <database>
salt '*' influxdb.login_test <name> <database> <user> <password> <host> <port>
```

```python
salt.modules.influx.query(database, query, time_precision='s', chunked=False, user=None, password=None, host=None, port=None)
```

Querying data
database  The database to query
query  Query to be executed
time_precision  Time precision to use ("s", "m", or "u")
chunked  Whether is chunked or not
user  The user to connect as
password  The password of the user
host  The host to connect to
port  The port to connect to

CLI Example:

```
salt '*' influxdb.query <database> <query>
salt '*' influxdb.query <database> <query> <time_precision> <chunked> <user> <password> <host> <port>
```

```python
salt.modules.influx.user_chpass(name, passwd, database=None, user=None, password=None, host=None, port=None)
```

Change password for a cluster admin or a database user.
If a database is specified: it will update database user password. If a database is not specified: it will update cluster admin password.

**name** User name for whom to change the password

**passwd** New password

**database** The database on which to operate

**user** The user to connect as

**password** The password of the user

**host** The host to connect to

**port** The port to connect to

CLI Example:

```
salt '*' influxdb.user_chpass <name> <passwd>
salt '*' influxdb.user_chpass <name> <passwd> <database>
salt '*' influxdb.user_chpass <name> <passwd> <database> <user> <password> <host> <port>
```

**salt.modules.influx.user_create**(name, passwd, database=None, user=None, password=None, host=None, port=None)

Create a cluster admin or a database user.

If a database is specified: it will create database user. If a database is not specified: it will create a cluster admin.

**name** User name for the new user to create

**passwd** Password for the new user to create

**database** The database to create the user in

**user** The user to connect as

**password** The password of the user

**host** The host to connect to

**port** The port to connect to

CLI Example:

```
salt '*' influxdb.user_create <name> <passwd>
salt '*' influxdb.user_create <name> <passwd> <database>
salt '*' influxdb.user_create <name> <passwd> <database> <user> <password> <host> <port>
```

**salt.modules.influx.user_exists**(name, database=None, user=None, password=None, host=None, port=None)

Checks if a cluster admin or database user exists.

If a database is specified: it will check for database user existence. If a database is not specified: it will check for cluster admin existence.

**name** User name

**database** The database to check for the user to exist

**user** The user to connect as

**password** The password of the user

**host** The host to connect to

**port** The port to connect to
CLI Example:

```
salt '*' influxdb.user_exists <name>
salt '*' influxdb.user_exists <name> <database>
salt '*' influxdb.user_exists <name> <database> <user> <password> <host> <port>
```

```
salt.modules.influx.user_list(database=None, user=None, password=None, host=None, port=None)
```

List cluster admins or database users.

If a database is specified: it will return database users list. If a database is not specified: it will return cluster admins list.

- **database**: The database to list the users from
- **user**: The user to connect as
- **password**: The password of the user
- **host**: The host to connect to
- **port**: The port to connect to

CLI Example:

```
salt '*' influxdb.user_list
salt '*' influxdb.user_list <database>
salt '*' influxdb.user_list <database> <user> <password> <host> <port>
```

```
salt.modules.influx.user_remove(name, database=None, user=None, password=None, host=None, port=None)
```

Remove a cluster admin or a database user.

If a database is specified: it will remove the database user. If a database is not specified: it will remove the cluster admin.

- **name**: User name to remove
- **database**: The database to remove the user from
- **user**: User name for the new user to delete
- **user**: The user to connect as
- **password**: The password of the user
- **host**: The host to connect to
- **port**: The port to connect to

CLI Example:

```
salt '*' influxdb.user_remove <name>
salt '*' influxdb.user_remove <name> <database>
salt '*' influxdb.user_remove <name> <database> <user> <password> <host> <port>
```

**31.16.115 salt.modules.ini_manage**

Edit ini files

- **maintainer**: <akilesh1597@gmail.com>
- **maturity**: new
depends re
platform all

Use section as DEFAULT_IMPLICIT if your ini file does not have any section (for example /etc/sysctl.conf)

`salt.modules.ini_manage.get_option(file_name, section, option)`
Get value of a key from a section in an ini file. Returns None if no matching key was found.

API Example:
```
import salt
sc = salt.client.get_local_client()
sc.cmd('target', 'ini.get_option',
       [path_to_ini_file, section_name, option])
```

CLI Example:
```
salt '*' ini.get_option /path/to/ini section_name option_name
```

`salt.modules.ini_manage.get_section(file_name, section)`
Retrieve a section from an ini file. Returns the section as dictionary. If the section is not found, an empty
dictionary is returned.

API Example:
```
import salt
sc = salt.client.get_local_client()
sc.cmd('target', 'ini.get_section',
       [path_to_ini_file, section_name])
```

CLI Example:
```
salt '*' ini.get_section /path/to/ini section_name
```

`salt.modules.ini_manage.remove_option(file_name, section, option)`
Remove a key/value pair from a section in an ini file. Returns the value of the removed key, or None if nothing
was removed.

API Example:
```
import salt
sc = salt.client.get_local_client()
sc.cmd('target', 'ini.remove_option',
       [path_to_ini_file, section_name, option])
```

CLI Example:
```
salt '*' ini.remove_option /path/to/ini section_name option_name
```

`salt.modules.ini_manage.remove_section(file_name, section)`
Remove a section in an ini file. Returns the removed section as dictionary, or None if nothing was removed.

API Example:
```
import salt
sc = salt.client.get_local_client()
sc.cmd('target', 'ini.remove_section',
       [path_to_ini_file, section_name])
```

CLI Example:
salt '...' ini.remove_section /path/to/ini section_name

salt.modules.ini_manage.set_option(file_name, sections=None, summary=True)
Edit an ini file, replacing one or more sections. Returns a dictionary containing the changes made.

file_name  path of ini file
sections  [None] A dictionary representing the sections to be edited ini file
Set summary=False if return data need not have previous option value

API Example:

```python
import salt
sc = salt.client.get_local_client()
sc.cmd('target', 'ini.set_option',
       ['path_to_ini_file', '{"section_to_change": {"key": "value"}]}')
```

CLI Example:

```bash
salt '...' ini.set_option /path/to/ini '{section_foo: {key: value}}'
```

31.16.116 salt.modules.introspect

Functions to perform introspection on a minion, and return data in a format usable by Salt States

salt.modules.introspect.enabled_service_owners()
Return which packages own each of the services that are currently enabled.

CLI Example:

```bash
salt myminion introspect.enabled_service_owners
```

salt.modules.introspect.running_service_owners(exclude=(`/dev', `/home', `/media', `/proc', `/run', `/sys', `/tmp', `/var'))
Determine which packages own the currently running services. By default, excludes files whose full path starts with /dev, /home, /media, /proc, /run, /sys, /tmp and /var. This can be overridden by passing in a new list to exclude.

CLI Example:

```bash
salt myminion introspect.running_service_owners
```

salt.modules.introspect.service_highstate(requires=True)
Return running and enabled services in a highstate structure. By default also returns package dependencies for those services, which means that package definitions must be created outside this function. To drop the package dependencies, set requires to False.

CLI Example:

```bash
salt myminion introspect.service_highstate salt myminion introspect.service_highstate requires=False
```

31.16.117 salt.modules.ipmi

Support IPMI commands over LAN. This module does not talk to the local systems hardware through IPMI drivers. It uses a python module pyghmi.

depends Python module pyghmi. You can install pyghmi using pip:
pip install pyghmi

configuration

The following configuration defaults can be define (pillar or config files):

```python
ipmi.config:
    api_host: 127.0.0.1
    api_user: admin
    api_pass: apassword
    api_port: 623
    api_kg: None
```

Usage can override the config defaults:

```bash
salt-call ipmi.get_user api_host=myipmienabled.system
    api_user=admin api_pass=pass
    uid=1
```

```python
salt.modules.ipmi.create_user(uid, name, password, channel=14, callback=False, link_auth=True, ipmi_msg=True, privilege_level='administrator', **kwargs)
```

create/ensure a user is created with provided settings.

Parameters

- **privilege_level** -- User Privilege Limit. (Determines the maximum privilege level that the user is allowed to switch to on the specified channel)
- **callback**user
- **operator
- **administrator
- **proprietary
- **no_access

- **kwargs**

  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

CLI Examples:

```bash
salt-call ipmi.create_user uid=2 name=steverweber api_host=172.168.0.7 api_pass=nevertell
```

```python
salt.modules.ipmi.fast_connect_test(**kwargs)
```

Returns True if connection success. This uses an aggressive timeout value!

Parameters **kwargs --

- api_host=127.0.0.1
- api_user=admin
- api_pass=example
- api_port=623
- api_kg=None

CLI Examples:

```bash
salt-call ipmi.fast_connect_test api_host=172.168.0.9
```

```python
salt.modules.ipmi.get_bootdev(**kwargs)
```

Get current boot device override information.
Provides the current requested boot device. Be aware that not all IPMI devices support this. Even in BMCs that claim to, occasionally the BIOS or UEFI fail to honor it. This is usually only applicable to the next reboot.

**Parameters**

- **kwargs**
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

**CLI Example:**

```
salt-call ipmi.get_bootdev api_host=127.0.0.1 api_user=admin api_pass=pass
```

```
salt.modules.ipmi.get_channel_access(channel=14, read_mode='non_volatile', **kwargs)
```

```
:param kwargs:api_host='127.0.0.1' api_user='admin' api_pass='example' api_port=623
```

**Parameters**

- **channel** -- number [1:7]
- **read_mode** --
  - non_volatile = get non-volatile Channel Access
  - volatile = get present volatile (active) setting of Channel Access
- **kwargs** --
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

**return** A Python dict with the following keys/values:

```
{
    'alerting':
    'per_msg_auth':
    'user_level_auth':
    'access_mode': { (ONE OF)
        0: 'disabled',
        1: 'pre_boot',
        2: 'always',
        3: 'shared'
    }
    'privilege_level': { (ONE OF)
        1: 'callback',
        2: 'user',
        3: 'operator',
        4: 'operator',
        5: 'proprietary',
    }
}
```
CLI Examples:

```
salt-call ipmi.get_channel_access channel=1
```

```
salt.modules.ipmi.get_channel_info(channel=14, **kwargs)
Get channel info
```

Parameters

- **channel** -- number [1:7]
- **kwargs**
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

**return** channel session supports:
- no_session: channel is session-less
- single: channel is single-session
- multi: channel is multi-session
- auto: channel is session-based (channel could alternate between single- and multi-session operation, as can occur with a serial/modem channel that supports connection mode auto-detect)

```
salt-call ipmi.get_channel_info
```

```
salt.modules.ipmi.get_channel_max_user_count(channel=14, **kwargs)
Get max users in channel
```

Parameters

- **channel** -- number [1:7]
- **kwargs**
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

**Returns** int -- often 16

```
salt-call ipmi.get_channel_max_user_count
```

```
salt.modules.ipmi.get_health(**kwargs)
Get Summarize health
```
This provides a summary of the health of the managed system. It additionally provides an iterable list of reasons for warning, critical, or failed assessments.

good health: `{badreadings: [], `health': 0}

Parameters **kwargs --
  • api_host=127.0.0.1
  • api_user=admin
  • api_pass=example
  • api_port=623
  • api_kg=None

CLI Example:

```
salt-call ipmi.get_health api_host=127.0.0.1 api_user=admin api_pass=pass
```

salt.modules.ipmi.get_power(**kwargs)
Get current power state

The response, if successful, should contain `powerstate' key and either `on' or `off' to indicate current state.

Parameters **kwargs --
  • api_host=127.0.0.1
  • api_user=admin
  • api_pass=example
  • api_port=623
  • api_kg=None

CLI Example:

```
salt-call ipmi.get_power api_host=127.0.0.1 api_user=admin api_pass=pass
```

salt.modules.ipmi.get_sensor_data(**kwargs)
Get sensor readings

Iterates sensor reading objects

Parameters **kwargs --
  • api_host=127.0.0.1
  • api_user=admin
  • api_pass=example
  • api_port=623
  • api_kg=None

CLI Example:

```
salt-call ipmi.get_sensor_data api_host=127.0.0.1 api_user=admin api_pass=pass
```

salt.modules.ipmi.get_user(uid, channel=14, **kwargs)
Get user from uid and access on channel

Parameters
• **uid** -- user number [1:16]
• **channel** -- number [1:7]
• **kwargs** --
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

```python
return
```
```python
name: (str)
uid: (int)
channel: (int)
access:
  - callback (bool)
  - link_auth (bool)
  - ipmi_msg (bool)
  - privilege_level: (str)[callback, user, operator administrator, proprietary, no_access]
```

**CLI Examples:**

```
salt-call ipmi.get_user uid=2
```

```python
salt.modules.ipmi.get_user_access(uid, channel=14, **kwargs)
```

Get user access

**Parameters**

• **uid** -- user number [1:16]
• **channel** -- number [1:7]
• **kwargs** --
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

```python
return
```
```python
channel_info:
  - max_user_count = maximum number of user IDs on this channel
  - enabled_users = count of User ID slots presently in use
  - users_with_fixed_names = count of user IDs with fixed names
access:
  - callback
  - link_auth
  - ipmi_msg
  - privilege_level: [reserved, callback, user, operator administrator, proprietary, no_access]
```
**CLI Examples:**

```
salt-call ipmi.get_user_access uid=2
```

`salt.modules.ipmi.get_user_name(uid, return_none_on_error=True, **kwargs)`

Get user name

**Parameters**

- **uid** -- user number [1:16]
- **return_none_on_error** -- return None on error
- **kwargs**
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

**CLI Examples:**

```
salt-call ipmi.get_user_name uid=2
```

`salt.modules.ipmi.get_users(channel=14, **kwargs)`

get list of users and access information

**Parameters**

- **channel** -- number [1:7]
- **kwargs**
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

**Returns**

- name: (str)
- uid: (int)
- channel: (int)
- access:
  - callback (bool)
  - link_auth (bool)
  - ipmi_msg (bool)
  - privilege_level: (str)[callback, user, operator, administrator, proprietary, no_access]

**CLI Examples:**
salt-call ipmi.get_users api_host=172.168.0.7

salt.modules.ipmi.raw_command(netfn, command, bridge_request=None, data=(), retry=True, delay_xmit=None, **kwargs)

Send raw ipmi command
This allows arbitrary IPMI bytes to be issued. This is commonly used for certain vendor specific commands.

Parameters

- **netfn** -- Net function number
- **command** -- Command value
- **bridge_request** -- The target slave address and channel number for the bridge request.
- **data** -- Command data as a tuple or list
- **kwargs** --
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

Returns dict -- The response from IPMI device

CLI Examples:

```
salt-call ipmi.raw_command netfn=0x06 command=0x46 data=[0x02]
# this will return the name of the user with id 2 in bytes
```

salt.modules.ipmi.set_bootdev(bootdev='default', persist=False, uefiboott=False, **kwargs)

Set boot device to use on next reboot

Parameters

- **bootdev** --
  - network: Request network boot
  - hd: Boot from hard drive
  - safe: Boot from hard drive, requesting `safe mode`
  - optical: boot from CD/DVD/BD drive
  - setup: Boot into setup utility
  - default: remove any IPMI directed boot device request
- **persist** -- If true, ask that system firmware use this device beyond next boot. Be aware many systems do not honor this
- **uefiboott** -- If true, request UEFI boot explicitly. Strictly speaking, the spec sugests that if not set, the system should BIOS boot and offers no `don't care` option. In practice, this flag not being set does not preclude UEFI boot on any system I've encountered.
- **kwargs** --
  - api_host=127.0.0.1
  - api_user=admin
- api_pass=example
- api_port=623
- api_kg=None

**Returns**  dict or True -- If callback is not provided, the response

**CLI Examples:**

```
salt-call ipmi.set_bootdev bootdev=network persist=True
```

```python
salt.modules.ipmi.set_channel_access(channel=14, access_update_mode='non_volatile',
                                      alerting=False, per_msg_auth=False,
                                      user_level_auth=False, access_mode='always',
                                      privilege_update_mode='non_volatile', privilege_level='administrator', **kwargs)
```

Set channel access

**Parameters**

- **channel** -- number [1:7]
- **access_update_mode** --
  - `dont_change` = don’t set or change Channel Access
  - `non_volatile` = set non-volatile Channel Access
  - `volatile` = set volatile (active) setting of Channel Access
- **alerting** -- PEF Alerting Enable/Disable - True = enable PEF Alerting - False = disable PEF Alerting on this channel
  (Alert Immediate command can still be used to generate alerts)
- **per_msg_auth** -- Per-message Authentication - True = enable - False = disable Per-message Authentication. [Authentication required to activate any session on this channel, but authentication not used on subsequent packets for the session.]
- **user_level_auth** -- User Level Authentication Enable/Disable. - True = enable User Level Authentication. All User Level commands are to be authenticated per the Authentication Type that was negotiated when the session was activated.
  - False = disable User Level Authentication. Allow User Level commands to be executed without being authenticated. If the option to disable User Level Command authentication is accepted, the BMC will accept packets with Authentication Type set to None if they contain user level commands. For outgoing packets, the BMC returns responses with the same Authentication Type that was used for the request.
- **access_mode** -- Access Mode for IPMI messaging (PEF Alerting is enabled/disabled separately from IPMI messaging) * disabled = disabled for IPMI messaging * pre_boot = pre-boot only channel only available when system is in a powered down state or in BIOS prior to start of boot.
  - always = channel always available regardless of system mode. BIOS typically dedicates the serial connection to the BMC.
- shared = same as always available, but BIOS typically leaves the serial port available for software use.

- **privilege_update_mode** -- Channel Privilege Level Limit. This value sets the maximum privilege level that can be accepted on the specified channel. * dont_change = don't set or change channel Privilege Level Limit * non_volatile = non-volatile Privilege Level Limit according * volatile = volatile setting of Privilege Level Limit

- **privilege_level** -- Channel Privilege Level Limit * reserved = unused * callback * user * operator * administrator * proprietary = used by OEM

- **kwargs**
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

CLI Examples:

```
salt-call ipmi.set_channel_access privilege_level='administrator'
```
- reset -- reset (without waiting for OS)
- boot -- If system is off, then `on`, else `reset`

**ensure** -- If (bool True), do not return until system actually completes requested state change for 300 seconds. If a non-zero (int), adjust the wait time to the requested number of seconds

**kwargs** --
- api_host=127.0.0.1
- api_user=admin
- api_pass=example
- api_port=623
- api kg=None

**Returns**  
dict -- A dict describing the response retrieved

CLI Examples:

```
salt-call ipmi.set_power state=shutdown wait=True
```

```
salt.modules.ipmi.set_user_access(uid, channel=14, callback=True, link_auth=True, ipmi_msg=True, privilege_level='administrator', **kwargs)
```

Set user access

**Parameters**

- **uid** -- user number [1:16]
- **channel** -- number [1:7]

**Parm callback**  
User Restricted to Callback

**False** = User Privilege Limit is determined by the User Privilege Limit parameter, below, for both callback and non-callback connections.

**True** = User Privilege Limit is determined by the User Privilege Limit parameter for callback connections, but is restricted to Callback level for non-callback connections. Thus, a user can only initiate a Callback when they `call in` to the BMC, but once the callback connection has been made, the user could potentially establish a session as an Operator.

**Parameters**  
**link_auth** -- User Link authentication

enable/disable (used to enable whether this user's name and password information will be used for link authentication, e.g. PPP CHAP) for the given channel. Link authentication itself is a global setting for the channel and is enabled/disabled via the serial/modem configuration parameters.

**Parameters**  
**ipmi_msg** -- User IPMI Messaging:

(used to enable/disable whether this user's name and password information will be used for IPMI Messaging. In this case, `IPMI Messaging` refers to the ability to execute generic IPMI commands that are not associated with a particular payload type. For example, if IPMI Messaging is disabled for a user, but that user is enabled for activating the SOL payload type, then IPMI commands associated with SOL and session management, such as Get SOL Configuration Parameters and Close Session are available, but generic IPMI commands such as Get SEL Time are unavailable.)

**Parameters**  
**privilege_level** --
User Privilege Limit. (Determines the maximum privilege level that the user is allowed to switch to on the specified channel.)

- callback
- user
- operator
- administrator
- proprietary
- no_access

Parameters **kwargs --

- api_host=127.0.0.1
- api_user=admin
- api_pass=example
- api_port=623
- api_kg=None

CLI Examples:

```bash
salt-call ipmi.set_user_access uid=2 privilege_level='operator'
```

```
salt.modules.ipmi.set_user_name(uid, name, **kwargs)
```

Set user name

Parameters

- **uid** -- user number [1:16]
- **name** -- username (limit of 16bytes)
- **kwargs** --
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

CLI Examples:

```bash
salt-call ipmi.set_user_name uid=2 name='steverweber'
```

```
salt.modules.ipmi.set_user_password(uid, mode='set_password', password=None, **kwargs)
```

Set user password and (modes)

Parameters

- **uid** -- id number of user. see: get_names_uid()['name']
- **mode** --
  - disable = disable user connections
  - enable = enable user connections
- set_password = set or ensure password
- test_password = test password is correct

- **password** -- max 16 char string (optional when mode is [disable or enable])
- **kwargs**
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

Returns: True on success when mode = test_password, return False on bad password

CLI Example:

```
salt-call ipmi.set_user_password api_host=127.0.0.1 api_user=admin api_pass=pass uid=1 password=newPass
salt-call ipmi.set_user_password uid=1 mode=enable
```

salt.modules.ipmi..user_delete(uid, channel=14, **kwargs)

Delete user (helper)

Parameters

- **uid** -- user number [1:16]
- **channel** -- number [1:7]
- **kwargs**
  - api_host=127.0.0.1
  - api_user=admin
  - api_pass=example
  - api_port=623
  - api_kg=None

CLI Examples:

```
salt-call ipmi.user_delete uid=2
```

### 31.16.118 salt.modules.ipset

Support for ipset

salt.modules.ipset.add(set=None, entry=None, family='ipv4', **kwargs)

Append an entry to the specified set.

CLI Example:

```
salt '*' ipset.add setname 192.168.1.26
```
salt.modules.ipset.check(set=None, entry=None, family='ipv4')
Check that an entry exists in the specified set.

- **set** The ipset name
- **entry** An entry in the ipset. This parameter can be a single IP address, a range of IP addresses, or a subnet block. Example:
  192.168.0.1
  192.168.0.2-192.168.0.19
  192.168.0.0/25

- **family** IP protocol version: ipv4 or ipv6

CLI Example:
```
salt '*' ipset.check setname '192.168.0.1' comment "Hello"
```

salt.modules.ipset.check_set(set=None, family='ipv4')
Check that given ipset set exists.
New in version 2014.7.0.

CLI Example:
```
salt '*' ipset.check_set setname
```

salt.modules.ipset.delete(set=None, entry=None, family='ipv4', **kwargs)
Delete an entry from the specified set.

CLI Example:
```
```

salt.modules.ipset.delete_set(set=None, family='ipv4')
New in version 2014.7.0.
Delete ipset set.

CLI Example:
```
salt '*' ipset.delete_set custom_set
```

IPv6:
```
salt '*' ipset.delete_set custom_set family=ipv6
```

salt.modules.ipset.flush(set=None, family='ipv4')
Flush entries in the specified set, Flush all sets if set is not specified.

CLI Example:
```
salt '*' ipset.flush
salt '*' ipset.flush set
```

IPv6:
```
salt '*' ipset.flush
salt '*' ipset.flush set
```

salt.modules.ipset.list_sets(family='ipv4')
New in version 2014.7.0.
List all ipset sets.

CLI Example:

```bash
salt '*' ipset.list_sets
```

`salt.modules.ipset.new_set`(set=None, set_type=None, family='ipv4', comment=False, **kwargs)

New in version 2014.7.0.

Create new custom set

CLI Example:

```bash
custom_set
salt '*' ipset.new_set custom_set list:set
```

IPv6:

```bash
custom_set
salt '*' ipset.new_set custom_set list:set family=ipv6
```

`salt.modules.ipset.rename_set`(set=None, new_set=None, family='ipv4')

New in version 2014.7.0.

Delete ipset set.

CLI Example:

```bash
custom_set
salt '*' ipset.rename_set custom_set new_set=new_set_name
```

IPv6:

```bash
custom_set
salt '*' ipset.rename_set custom_set new_set=new_set_name family=ipv6
```

`salt.modules.ipset.test`(set=None, entry=None, family='ipv4', **kwargs)

Test if an entry is in the specified set.

CLI Example:

```bash
custom_set
salt '*' ipset.test setname 192.168.0.2
```

IPv6:

```bash
custom_set
salt '*' ipset.test setname fd81:fc56:9ac7::/48
```

`salt.modules.ipset.version()`

Return version from `ipset --version`

CLI Example:

```bash
custom_set
salt '*' ipset.version
```

## 31.16.119 salt.modules.iptables

Support for iptables

`salt.modules.iptables.append`(table='filter', chain=None, rule=None, family='ipv4')

Append a rule to the specified table/chain.

This function accepts a rule in a standard `iptables` command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.

CLI Example:
salt '*' iptables.append filter INPUT \
    rule='-m state --state RELATED,ESTABLISHED -j ACCEPT'

IPv6:
salt '*' iptables.append filter INPUT \
    rule='-m state --state RELATED,ESTABLISHED -j ACCEPT' \ 
    family=ipv6

salt.modules.iptables.build_rule(table='filter', chain=None, command=None, position='', full=None, family='ipv4', **kwargs)

Build a well-formatted iptables rule based on kwargs. A table and chain are not required, unless full is True.

If full is True, then table, chain and command are required. command may be specified as either a short option (‘I’) or a long option (‘--insert’). This will return the iptables command, exactly as it would be used from the command line.

If a position is required (as with -I or -D), it may be specified as position. This will only be useful if full is True.

If connstate is passed in, it will automatically be changed to state.

To pass in jump options that doesn’t take arguments, pass in an empty string.

CLI Examples:

salt '*' iptables.build_rule match=state \ 
    connstate=RELATED,ESTABLISHED jump=ACCEPT

salt '*' iptables.build_rule filter INPUT command=I position=3 \ 
    full=True match=state state=RELATED,ESTABLISHED jump=ACCEPT

salt '*' iptables.build_rule filter INPUT command=A \ 
    full=True match=state state=RELATED,ESTABLISHED \ 
    source='127.0.0.1' jump=ACCEPT

.. Invert Rules
salt '*' iptables.build_rule filter INPUT command=A \ 
    full=True match=state state=RELATED,ESTABLISHED \ 
    source='! 127.0.0.1' jump=ACCEPT

salt '*' iptables.build_rule filter INPUT command=A \ 
    full=True match=state state=RELATED,ESTABLISHED \ 
    destination='not 127.0.0.1' jump=ACCEPT

IPv6:
salt '*' iptables.build_rule match=state \ 
    connstate=RELATED,ESTABLISHED jump=ACCEPT \ 
    family=ipv6
salt '*' iptables.build_rule filter INPUT command=I position=3 \ 
    full=True match=state state=RELATED,ESTABLISHED jump=ACCEPT \ 
    family=ipv6

salt.modules.iptables.check(table='filter', chain=None, rule=None, family='ipv4')

Check for the existence of a rule in the table and chain.

This function accepts a rule in a standard iptables command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.

CLI Example:
salt '***' iptables.check filter INPUT
  rule='*m state --state RELATED,ESTABLISHED -j ACCEPT'

IPv6:
salt '***' iptables.check filter INPUT
  rule='*m state --state RELATED,ESTABLISHED -j ACCEPT'
  family=ipv6

salt.modules.iptables.check_chain(table='filter', chain=None, family='ipv4')
  New in version 2014.1.0.
  Check for the existence of a chain in the table
  CLI Example:

  salt '***' iptables.check_chain filter INPUT
  IPv6:
salt '***' iptables.check_chain filter INPUT family=ipv6

salt.modules.iptables.delete(table=chain=None, position=None, rule=None, family=ipv4)
  Delete a rule from the specified table/chain, specifying either the rule in its entirety, or the rule's position in the chain.
  This function accepts a rule in a standard iptables command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.
  CLI Examples:

  salt '***' iptables.delete filter INPUT position=3
  salt '***' iptables.delete filter INPUT
  rule='*m state --state RELATED,ESTABLISHED -j ACCEPT'
  IPv6:
salt '***' iptables.delete filter INPUT position=3 family=ipv6
  salt '***' iptables.delete filter INPUT
  rule='*m state --state RELATED,ESTABLISHED -j ACCEPT'
  family=ipv6

salt.modules.iptables.delete_chain(table='filter', chain=None, family='ipv4')
  New in version 2014.1.0.
  Delete custom chain to the specified table.
  CLI Example:

  salt '***' iptables.delete_chain filter CUSTOM_CHAIN
  IPv6:
salt '***' iptables.delete_chain filter CUSTOM_CHAIN family=ipv6

salt.modules.iptables.flush(table='filter', chain='', family='ipv4')
  Flush the chain in the specified table, flush all chains in the specified table if not specified chain.
  CLI Example:

  salt '***' iptables.flush filter INPUT
### IPv6

```
salt '*' iptables.flush filter INPUT family=ipv6
```

#### `salt.modules.iptables.get_policy(table='filter', chain=None, family='ipv4')`

Return the current policy for the specified table/chain

CLI Example:

```
salt '*' iptables.get_policy filter INPUT
```

#### `salt.modules.iptables.get_saved_policy(table='filter', chain=None, conf_file=None, family='ipv4')`

Return the current policy for the specified table/chain

CLI Examples:

```
salt '*' iptables.get_saved_policy filter INPUT
salt '*' iptables.get_saved_policy filter INPUT /etc/iptables.saved
IPv6:
salt '*' iptables.get_saved_policy filter INPUT family=ipv6
salt '*' iptables.get_saved_policy filter INPUT /etc/iptables.saved family=ipv6
```

#### `salt.modules.iptables.get_rules(family='ipv4')`

Return a data structure of the current, in-memory rules

CLI Example:

```
salt '*' iptables.get_rules
```

IPv6:

```
salt '*' iptables.get_rules family=ipv6
```

#### `salt.modules.iptables.insert(table='filter', chain=None, position=None, rule=None, family='ipv4')`

Insert a rule into the specified table/chain, at the specified position.

This function accepts a rule in a standard `iptables` command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.

If the position specified is a negative number, then the insert will be performed counting from the end of the list. For instance, a position of -1 will insert the rule as the second to last rule. To insert a rule in the last position, use the append function instead.

CLI Examples:
salt '.*' iptables.insert filter INPUT position=3  \
   rules='^-m state --state RELATED,ESTABLISHED -j ACCEPT'

IPv6:
salt '.*' iptables.insert filter INPUT position=3  \r
   rules='^-m state --state RELATED,ESTABLISHED -j ACCEPT'  \
   family=ipv6

salt.modules.iptables.new_chain(\table='filter', chain=None, family='ipv4')

Create new custom chain to the specified table.

CLI Example:

salt '.*' iptables.new_chain filter CUSTOM_CHAIN

IPv6:
salt '.*' iptables.new_chain filter CUSTOM_CHAIN family=ipv6

salt.modules.iptables.save(filename=None, family='ipv4')

Save the current in-memory rules to disk

CLI Example:

salt '.*' iptables.save /etc/sysconfig/iptables

IPv6:
salt '.*' iptables.save /etc/sysconfig/iptables family=ipv6

salt.modules.iptables.set_policy(\table='filter', chain=None, policy=None, family='ipv4')

Set the current policy for the specified table/chain

CLI Example:

salt '.*' iptables.set_policy filter INPUT ACCEPT

IPv6:
salt '.*' iptables.set_policy filter INPUT ACCEPT family=ipv6

salt.modules.iptables.version(family='ipv4')

Return version from iptables --version

CLI Example:

salt '.*' iptables.version

IPv6:
salt '.*' iptables.version family=ipv6

31.16.120 salt.modules.jboss7

Module for managing JBoss AS 7 through the CLI interface.

New in version 2015.5.0.

In order to run each function, jboss_config dictionary with the following properties must be passed:

- cli_path: the path to jboss-cli script, for example: `/opt/jboss/jboss-7.0/bin/jboss-cli.sh`
- controller: the ip address and port of controller, for example: 10.11.12.13:9999
- cli_user: username to connect to jboss administration console if necessary
- cli_password: password to connect to jboss administration console if necessary

Example:

```plaintext
jboss_config:
  cli_path: '/opt/jboss/jboss-7.0/bin/jboss-cli.sh'
  controller: 10.11.12.13:9999
  cli_user: 'jbossadm'
  cli_password: 'jbossadm'

salt.modules.jboss7.create_datasource(jboss_config, name, datasource_properties)
Create datasource in running jboss instance

jboss_config Configuration dictionary with properties specified above.
name Datasource name
datasource_properties
A dictionary of datasource properties to be created:
  - driver-name: mysql
  - connection-url: 'jdbc:mysql://localhost:3306/sampleDatabase'
  - jndi-name: 'java:jboss/datasources/sampleDS'
  - user-name: sampleuser
  - password: secret
  - min-pool-size: 3
  - use-java-context: True

CLI Example:

salt.modules.jboss7.create_simple_binding(jboss_config, binding_name, value)
Create a simple jndi binding in the running jboss instance

jboss_config Configuration dictionary with properties specified above.
binding_name Binding name to be created
value Binding value

CLI Example:
salt '*' jboss7.create_simple_binding \ 
  '{"cli_path": "integration.modules.sysmod.SysModuleTest.test_valid_docs", \ 
  "controller": "10.11.12.13:9999", "cli_user": "jbossadm", "cli_password": "jbossadm"}' \ 
  my_binding_name my_binding_value

salt.modules.jboss7.deploy(jboss_config, source_file)
Deploy the application on the jboss instance from the local file system where minion is running.

jboss_config Configuration dictionary with properties specified above.
source_file Source file to deploy from

CLI Example:
Salt Documentation, Release 2015.8.0


salt.modules.jboss7.list_deployments(jboss_config)
List all deployments on the jboss instance

jboss_config
Configuration dictionary with properties specified above.

CLI Example:

salt.modules.jboss7.read_datasource(jboss_config, name)
Read datasource properties in the running jboss instance.

jboss_config  Configuration dictionary with properties specified above.
name  Datasource name

CLI Example:
salt '*' jboss7.read_datasource '{"cli_path": "integration.modules.sysmod.SysModuleTest.test_valid_docs", "controller": "10.11.12.13:9999", "cli_user": "jbossadm", "cli_password": "jbossadm"}', my_binding_name

salt.modules.jboss7.read_simple_binding(jboss_config, binding_name)
Read jndi binding in the running jboss instance

jboss_config  Configuration dictionary with properties specified above.
binding_name  Binding name to be created

CLI Example:
salt '*' jboss7.read_simple_binding '{\"cli_path": \"integration.modules.sysmod.SysModuleTest.test_valid_docs\", \"controller": \"10.11.12.13:9999\", \"cli_user": \"jbossadm\", \"cli_password": \"jbossadm\"}', my_binding_name

salt.modules.jboss7.reload(jboss_config)
Reload running jboss instance

jboss_config  Configuration dictionary with properties specified above.

CLI Example:

salt.modules.jboss7.remove_datasource(jboss_config, name)
Remove an existing datasource from the running jboss instance.

jboss_config  Configuration dictionary with properties specified above.
name  Datasource name

CLI Example:
salt '*' jboss7.remove_datasource '{"cli_path": "integration.modules.sysmod.SysModuleTest.test_valid_docs", "controller": "10.11.12.13:9999", "cli_user": "jbossadm", "cli_password": "jbossadm"}', my_datasource_name

salt.modules.jboss7.status(jboss_config)
Get status of running jboss instance.

jboss_config  Configuration dictionary with properties specified above.

CLI Example:

salt.modules.jboss7.stop_server(jboss_config)
Stop running jboss instance

  jboss_config  Configuration dictionary with properties specified above.

  CLI Example:

salt.modules.jboss7.undeploy(jboss_config, deployment)
Undeploy the application from jboss instance

  jboss_config  Configuration dictionary with properties specified above.

  deployment  Deployment name to undeploy

  CLI Example:

salt.modules.jboss7.update_datasource(jboss_config, name, new_properties)
Update an existing datasource in running jboss instance. If the property doesn't exist if will be created, if it does, it will be updated with the new value

  jboss_config  Configuration dictionary with properties specified above.

  name  Datasource name

  new_properties

    A dictionary of datasource properties to be updated. For example:

    - driver-name: mysql
    - connection-url: 'jdbc:mysql://localhost:3306/sampleDatabase'
    - jndi-name: 'java:jboss/datasources/sampleDS'
    - user-name: sampleuser
    - password: secret
    - min-pool-size: 3
    - use-java-context: True

  CLI Example:

salt.modules.jboss7.update_simple_binding(jboss_config, binding_name, value)
Update the simple jndi binding in the running jboss instance

  jboss_config  Configuration dictionary with properties specified above.

  binding_name  Binding name to be updated

  value  New binding value

  CLI Example:
salt '*' jboss7.update_simple_binding '{"cli_path": "integration.modules.sysmod.SysModuleTest.test_valid_docs", "controller": "10.11.12.13:9999", "cli_user": "jbossadm", "cli_password": "jbossadm"}' 'my_binding_name my_binding_value'
31.16.121  salt.modules.jboss7_cli

Module for low-level interaction with JbossAS7 through CLI.
This module exposes two ways of interaction with the CLI, either through commands or operations.

Note: Following JBoss documentation (https://developer.jboss.org/wiki/CommandLineInterface): `Operations are considered a low level but comprehensive way to manage the AS controller, i.e. if it can't be done with operations it can't be done in any other way. Commands, on the other hand, are more user-friendly in syntax, although most of them still translate into operation requests and some of them even into a few composite operation requests, i.e. commands also simplify some management operations from the user's point of view.``

The difference between calling a command or operation is in handling the result. Commands return a zero return code if operation is successful or return non-zero return code and print an error to standard output in plain text, in case of an error.

Operations return a json-like structure, that contain more information about the result. In case of a failure, they also return a specific return code. This module parses the output from the operations and returns it as a dictionary so that an execution of an operation can then be verified against specific errors.

In order to run each function, jboss_config dictionary with the following properties must be passed:

- cli_path: the path to jboss-cli script, for example: `/opt/jboss/jboss-7.0/bin/jboss-cli.sh`
- controller: the ip address and port of controller, for example: 10.11.12.13:9999
- cli_user: username to connect to jboss administration console if necessary
- cli_password: password to connect to jboss administration console if necessary

Example:

```
jboss_config:
    cli_path: '/opt/jboss/jboss-7.0/bin/jboss-cli.sh'
    controller: 10.11.12.13:9999
    cli_user: 'jbossadm'
    cli_password: 'jbossadm'
```

salt.modules.jboss7_cli.run_command(jboss_config, command, fail_on_error=True)
Execute a command against jboss instance through the CLI interface.

- jboss_config Configuration dictionary with properties specified above.
- command Command to execute against jboss instance
- fail_on_error (default=True) Is true, raise CommandExecutionException exception if execution fails. If false, `success` property of the returned dictionary is set to False

CLI Example:
```
```

salt.modules.jboss7_cli.run_operation(jboss_config, operation, fail_on_error=True, retries=1)
Execute an operation against jboss instance through the CLI interface.

- jboss_config Configuration dictionary with properties specified above.
- operation An operation to execute against jboss instance
- fail_on_error (default=True) Is true, raise CommandExecutionException exception if execution fails. If false, `success` property of the returned dictionary is set to False
- retries: Number of retries in case of ```JBAS012144: Could not connect to remote``` error.
31.16.122  **salt.modules.junos**

Module for interfacing to Junos devices

ALPHA QUALITY code.

- `salt.modules.junos.call_rpc()`
- `salt.modules.junos.commit()`
- `salt.modules.junos.diff()`
- `salt.modules.junos.facts_refresh()`  
  Reload the facts dictionary from the device. Usually only needed if the device configuration is changed by some other actor.
- `salt.modules.junos.ping()`
- `salt.modules.junos.rollback()`
- `salt.modules.junos.set_hostname(hostname=None, commit_change=True)`

31.16.123  **salt.modules.kerberos**

Manage Kerberos KDC

**configuration** In order to manage your KDC you will need to generate a keytab that can authenticate without requiring a password.

```bash
# ktadd -k /root/secure.keytab kadmin/admin kadmin/changepw
```

On the KDC minion you will need to add the following to the minion configuration file so Salt knows what keytab to use and what principal to authenticate as.

- `auth_keytab: /root/auth.keytab`
- `auth_principal: kadmin/admin`

- `salt.modules.kerberos.create_keytab(name, keytab, enctypes=None)`  
  Create keytab
  
  CLI Example:

  ```
salt 'kdc.example.com' host/host1.example.com host1.example.com.keytab
  ```

- `salt.modules.kerberos.create_principal(name, enctypes=None)`  
  Create Principal
  
  CLI Example:

  ```
salt 'kdc.example.com' kerberos.create_principal host/example.com
  ```

- `salt.modules.kerberos.delete_principal(name)`  
  Delete Principal
  
  CLI Example:
salt.modules.kerberos.get_policy(name)
Get policy details

CLI Example:
salt 'kdc.example.com' kerberos.get_policy my_policy

salt.modules.kerberos.get_principal(name)
Get principal details

CLI Example:
salt 'kdc.example.com' kerberos.get_principal root/admin

salt.modules.kerberos.get_privs()
Current privileges

CLI Example:
salt 'kdc.example.com' kerberos.get_privs

salt.modules.kerberos.list_policies()
List policies

CLI Example:
salt 'kdc.example.com' kerberos.list_policies

salt.modules.kerberos.list_principals()
Get all principals

CLI Example:
salt 'kdc.example.com' kerberos.list_principals

31.16.124 salt.modules.key

Functions to view the minion’s public key information

salt.modules.key.finger()
Return the minion’s public key fingerprint

CLI Example:
salt '*' key.finger

salt.modules.key.finger_master()
Return the fingerprint of the master’s public key on the minion.

CLI Example:
salt '*' key.finger_master

31.16.125 salt.modules.keyboard

Module for managing keyboards on supported POSIX-like systems using systemd, or such as Redhat, Debian and Gentoo.
salt.modules.keyboard.get_sys()  
Get current system keyboard setting

CLI Example:
```
salt '*' keyboard.get_sys
```

salt.modules.keyboard.get_x()  
Get current X keyboard setting

CLI Example:
```
salt '*' keyboard.get_x
```

salt.modules.keyboard.set_sys(layout)  
Set current system keyboard setting

CLI Example:
```
salt '*' keyboard.set_sys dvorak
```

salt.modules.keyboard.set_x(layout)  
Set current X keyboard setting

CLI Example:
```
salt '*' keyboard.set_x dvorak
```

### 31.16.126 salt.modules.keystone

Module for handling openstack keystone calls.

**optdepends**

- keystoneclient Python adapter

**configuration** This module is not usable until the following are specified either in a pillar or in the minion's config file:

```
keystone.user: admin  
keystone.password: verybadpass  
keystone.tenant: admin  
keystone.tenant_id: f80919baedab48ec8931f200c65a50df  
keystone.auth_url: 'http://127.0.0.1:5000/v2.0/
```

OR (for token based authentication)

```
keystone.token: 'ADMIN'  
keystone.endpoint: 'http://127.0.0.1:35357/v2.0'
```

If configuration for multiple openstack accounts is required, they can be set up as different configuration profiles. For example:

```python
openstack1:  
    keystone.user: admin  
    keystone.password: verybadpass  
    keystone.tenant: admin  
    keystone.tenant_id: f80919baedab48ec8931f200c65a50df  
    keystone.auth_url: 'http://127.0.0.1:5000/v2.0/
```
openstack2:
  
  - `keystone.user`: admin
  - `keystone.password`: verybadpass
  - `keystone.tenant`: admin
  - `keystone.tenant_id`: f80919baedab48ec8931f200c65a50df
  - `keystone.auth_url`: 'http://127.0.0.2:5000/v2.0/

With this configuration in place, any of the `keystone` functions can make use of a configuration profile by declaring it explicitly. For example:

```
salt '*' keystone.tenant_list profile=openstack1
```

**salt.modules.keystone.auth**

```
salt.modules.keystone.auth(profile=None, **connection_args)
```

Set up `keystone` credentials. Only intended to be used within Keystone-enabled modules.

**CLI Example:**

```
salt '*' keystone.auth
```

**salt.modules.keystone.ec2_credentials_create**

```
salt.modules.keystone.ec2_credentials_create(user_id=None, name=None, tenant_id=None, tenant=None, profile=None, **connection_args)
```

Create `EC2`-compatible credentials for user per tenant

**CLI Examples:**

```
salt '*' keystone.ec2_credentials_create name=admin tenant=admin
salt '*' keystone.ec2_credentials_create user_id=c965f79c4f864eaa9c3b41904e67082 tenant_id=722787eb540b4915868370dc627ec5f
```

**salt.modules.keystone.ec2_credentials_delete**

```
salt.modules.keystone.ec2_credentials_delete(user_id=None, name=None, access_key=None, profile=None, **connection_args)
```

Delete `EC2`-compatible credentials

**CLI Examples:**

```
salt '*' keystone.ec2_credentials_delete 860f8c2c38ca4fab989f9bc56a061a64 access_key=5f66d2f24f6b8b9cd28886106f442
salt '*' keystone.ec2_credentials_delete name=admin access_key=5f66d2f24f6b8b9cd28886106f442
```

**salt.modules.keystone.ec2_credentials_get**

```
salt.modules.keystone.ec2_credentials_get(user_id=None, name=None, access=None, profile=None, **connection_args)
```

Return `ec2` credentials for a user (keystone ec2-credentials-get)

**CLI Examples:**

```
salt '*' keystone.ec2_credentials_get c965f79c4f864eaa9c3b41904e67082 access=722787eb540b4915868370dc627ec5f
salt '*' keystone.ec2_credentials_get user_id=c965f79c4f864eaa9c3b41904e67082 access=722787eb540b4915868370dc627ec5f
salt '*' keystone.ec2_credentials_get name=nova access=722787eb540b4915868370dc627ec5f
```

**salt.modules.keystone.ec2_credentials_list**

```
salt.modules.keystone.ec2_credentials_list(user_id=None, name=None, profile=None, **connection_args)
```

Return a list of `ec2` credentials for a specific user (keystone ec2-credentials-list)

**CLI Examples:**

```
salt '*' keystone.ec2_credentials_list 298ce377245c4ec9b70e1c639c89e654
salt '*' keystone.ec2_credentials_list user_id=298ce377245c4ec9b70e1c639c89e654
salt '*' keystone.ec2_credentials_list name=jack
```
salt.modules.keystone.endpoint_create(service, publicurl=None, internalurl=None, adminurl=None, region=None, profile=None, **connection_args)

Create an endpoint for an Openstack service

CLI Examples:

```
salt '*' keystone.endpoint_create nova 'http://public/url' 'http://internal/url' 'http://adminurl/url' region
```

salt.modules.keystone.endpoint_delete(service, profile=None, **connection_args)

Delete endpoints of an Openstack service

CLI Examples:

```
salt '*' keystone.endpoint_delete nova
```

salt.modules.keystone.endpoint_get(service, profile=None, **connection_args)

Return a specific endpoint (keystone endpoint-get)

CLI Example:

```
salt '*' keystone.endpoint_get nova
```

salt.modules.keystone.endpoint_list(profile=None, **connection_args)

Return a list of available endpoints (keystone endpoints-list)

CLI Example:

```
salt '*' keystone.endpoint_list
```

salt.modules.keystone.role_create(name, profile=None, **connection_args)

Create a named role.

CLI Example:

```
salt '*' keystone.role_create admin
```

salt.modules.keystone.role_delete(role_id=None, name=None, profile=None, **connection_args)

Delete a role (keystone role-delete)

CLI Examples:

```
salt '*' keystone.role_delete c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.role_delete role_id=c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.role_delete name=admin
```

salt.modules.keystone.role_get(role_id=None, name=None, profile=None, **connection_args)

Return a specific roles (keystone role-get)

CLI Examples:

```
salt '*' keystone.role_get c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.role_get role_id=c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.role_get name=admin
```

salt.modules.keystone.role_list(profile=None, **connection_args)

Return a list of available roles (keystone role-list)

CLI Example:
salt '*' keystone.role_list

salt.modules.keystone.service_create(name, service_type, description=None, profile=None, **connection_args)

Add service to Keystone service catalog

CLI Examples:

salt '*' keystone.service_create nova compute 'OpenStack Compute Service'

salt.modules.keystone.service_delete(service_id=None, name=None, profile=None, **connection_args)

Delete a service from Keystone service catalog

CLI Examples:

salt '*' keystone.service_delete c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.service_delete name=nova

salt.modules.keystone.service_get(service_id=None, name=None, profile=None, **connection_args)

Return a specific services (keystone service-get)

CLI Examples:

salt '*' keystone.service_get c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.service_get service_id=c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.service_get name=nova

salt.modules.keystone.service_list(profile=None, **connection_args)

Return a list of available services (keystone services-list)

CLI Example:

salt '*' keystone.service_list

salt.modules.keystone.tenant_create(name, description=None, enabled=True, profile=None, **connection_args)

Create a keystone tenant

CLI Examples:

salt '*' keystone.tenant_create nova description='nova tenant'
salt '*' keystone.tenant_create test enabled=False

salt.modules.keystone.tenant_delete(tenant_id=None, name=None, profile=None, **connection_args)

Delete a tenant (keystone tenant-delete)

CLI Examples:

salt '*' keystone.tenant_delete c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.tenant_delete tenant_id=c965f79c4f864eaa9c3b41904e67082
salt '*' keystone.tenant_delete name=demo

salt.modules.keystone.tenant_get(tenant_id=None, name=None, profile=None, **connection_args)

Return a specific tenants (keystone tenant-get)

CLI Examples:
salt '***' keystone.tenant_get c965f79c4f864eaaa9c3b41904e67082
salt '***' keystone.tenant_get tenant_id=c965f79c4f864eaaa9c3b41904e67082
salt '***' keystone.tenant_get name=nova

salt.modules.keystone.tenant_list(profile=None, **connection_args)
   Return a list of available tenants (keystone tenants-list)
   CLI Example:
   salt '***' keystone.tenant_list

salt.modules.keystone.tenant_update(tenant_id=None, name=None, description=None,
   enabled=None, profile=None, **connection_args)
   Update a tenant's information (keystone tenant-update) The following fields may be updated: name, email, enabled. Can only update name if targeting by ID
   CLI Examples:
   salt '***' keystone.tenant_update name=admin enabled=True
   salt '***' keystone.tenant_update c965f79c4f864eaaa9c3b41904e67082 name=admin email=admin@domain.com

salt.modules.keystone.token_get(profile=None, **connection_args)
   Return the configured tokens (keystone token-get)
   CLI Example:
   salt '***' keystone.token_get c965f79c4f864eaaa9c3b41904e67082

salt.modules.keystone.user_create(name, password, email, tenant_id=None,
   enabled=True, profile=None, **connection_args)
   Create a user (keystone user-create)
   CLI Examples:
   salt '***' keystone.user_create name=jack password=zero email=jack@halloweentown.org tenant_id=a28

salt.modules.keystone.user_delete(user_id=None, name=None, profile=None, **connection_args)
   Delete a user (keystone user-delete)
   CLI Examples:
   salt '***' keystone.user_delete c965f79c4f864eaaa9c3b41904e67082
   salt '***' keystone.user_delete user_id=c965f79c4f864eaaa9c3b41904e67082
   salt '***' keystone.user_delete name=nova

salt.modules.keystone.user_get(user_id=None, name=None, profile=None, **connection_args)
   Return a specific users (keystone user-get)
   CLI Examples:
   salt '***' keystone.user_get c965f79c4f864eaaa9c3b41904e67082
   salt '***' keystone.user_get user_id=c965f79c4f864eaaa9c3b41904e67082
   salt '***' keystone.user_get name=nova

salt.modules.keystone.user_list(profile=None, **connection_args)
   Return a list of available users (keystone user-list)
   CLI Example:
salt 'salt' user_list

```
salt.modules.keystone.user_password_update (user_id=None, name=None, password=None, profile=None, **connection_args)
Update a user's password (keystone user-password-update)
CLI Examples:
salt '*' keystone.user_password_update user_id=c965f79c4f864eaaa9c3b41904e67082 password=12345
salt '*' keystone.user_password_update name=nova password=12345
```

```
salt.modules.keystone.user_role_add (user_id=None, user=None, tenant_id=None, tenant=None, role_id=None, role=None, profile=None, **connection_args)
Add role for user in tenant (keystone user-role-add)
CLI Examples:
salt '*' keystone.user_role_add user_id=298ce377245c4ecb70e1c639c89e654 tenant_id=7167a092e8ce46b9 role_id=ce3772d45c4ecb70e1c639e8ca6e9cead4
salt '*' keystone.user_role_add user=admin tenant=admin role=admin
```

```
salt.modules.keystone.user_role_list (user_id=None, tenant_id=None, user_name=None, tenant_name=None, profile=None, **connection_args)
Return a list of available user_roles (keystone user-roles-list)
CLI Examples:
salt '*' keystone.user_role_list user_id=298ce377245c4ecb70e1c639c89e654 tenant_id=7167a092e8ce46b9
salt '*' keystone.user_role_list user_name=admin tenant_name=admin
```

```
salt.modules.keystone.user_role_remove (user_id=None, user=None, tenant_id=None, tenant=None, role_id=None, role=None, profile=None, **connection_args)
Remove role for user in tenant (keystone user-role-remove)
CLI Examples:
salt '*' keystone.user_role_remove user_id=298ce377245c4ecb70e1c639c89e654 tenant_id=7167a092e8ce46b9 role_id=ce3772d45c4ecb70e1c639e8ca6e9cead4
salt '*' keystone.user_role_remove user=admin tenant=admin role=admin
```

```
salt.modules.keystone.user_update (user_id=None, name=None, email=None, enabled=None, tenant=None, profile=None, **connection_args)
Update a user's information (keystone user-update) The following fields may be updated: name, email, enabled, tenant. Because the name is one of the fields, a valid user id is required.
CLI Examples:
salt '*' keystone.user_update user_id=c965f79c4f864eaaa9c3b41904e67082 name=newname
salt '*' keystone.user_update c965f79c4f864eaaa9c3b41904e67082 name=newname email=newemail@domain.com
```

```
salt.modules.keystone.user_verify_password (user_id=None, name=None, password=None, profile=None, **connection_args)
Verify a user's password
CLI Examples:
salt '*' keystone.user_verify_password name=test password=foobar
salt '*' keystone.user_verify_password user_id=c965f79c4f864eaaa9c3b41904e67082 password=foobar
```

31.16. Full list of builtin execution modules
31.16.127 salt.modules.kmod

Module to manage Linux kernel modules

salt.modules.kmod.available()
    Return a list of all available kernel modules
    CLI Example:
    salt '*' kmod.available

salt.modules.kmod.check_available(mod)
    Check to see if the specified kernel module is available
    CLI Example:
    salt '*' kmod.check_available kvm

salt.modules.kmod.is_loaded(mod)
    Check to see if the specified kernel module is loaded
    CLI Example:
    salt '*' kmod.is_loaded kvm

salt.modules.kmod.load(mod, persist=False)
    Load the specified kernel module
    mod  Name of module to add
    persist  Write module to /etc/modules to make it load on system reboot
    CLI Example:
    salt '*' kmod.load kvm

salt.modules.kmod.lsmod()
    Return a dict containing information about currently loaded modules
    CLI Example:
    salt '*' kmod.lsmod

salt.modules.kmod.mod_list(only_persist=False)
    Return a list of the loaded module names
    CLI Example:
    salt '*' kmod.mod_list

salt.modules.kmod.remove(mod, persist=False, comment=True)
    Remove the specified kernel module
    mod  Name of module to remove
    persist  Also remove module from /etc/modules
    comment  If persist is set don’t remove line from /etc/modules but only comment it
    CLI Example:
    salt '*' kmod.remove kvm
31.16.128 salt.modules.launchctl

Module for the management of MacOS systems that use launchd/launchctl

depends
- plistlib Python module

salt.modules.launchctl.available(job_label)
Check that the given service is available.

CLI Example:
```
salt '*' service.available com.openssh.sshd
```

salt.modules.launchctl.get_all()
Return all installed services

CLI Example:
```
salt '*' service.get_all
```

salt.modules.launchctl.missing(job_label)
The inverse of service.available Check that the given service is not available.

CLI Example:
```
salt '*' service.missing com.openssh.sshd
```

salt.modules.launchctl.restart(job_label, runas=None)
Restart the named service

CLI Example:
```
salt '*' service.restart <service label>
```

salt.modules.launchctl.start(job_label, runas=None)
Start the specified service

CLI Example:
```
salt '*' service.start <service label>
salt '*' service.start org.ntp.ntpd
salt '*' service.start /System/Library/LaunchDaemons/org.ntp.ntpd.plist
```

salt.modules.launchctl.status(job_label, runas=None)
Return the status for a service, returns a bool whether the service is running.

CLI Example:
```
salt '*' service.status <service label>
```

salt.modules.launchctl.stop(job_label, runas=None)
Stop the specified service

CLI Example:
```
salt '*' service.stop <service label>
salt '*' service.stop org.ntp.ntpd
salt '*' service.stop /System/Library/LaunchDaemons/org.ntp.ntpd.plist
```
31.16.129 salt.modules.layman

Support for Layman

salt.modules.layman.add(overlay)
Add the given overlay from the cached remote list to your locally installed overlays. Specify 'ALL' to add all overlays from the remote list.

Return a list of the new overlay(s) added:

CLI Example:

    salt '*' layman.add <overlay name>

salt.modules.layman.delete(overlay)
Remove the given overlay from your locally installed overlays. Specify 'ALL' to remove all overlays.

Return a list of the overlays(s) that were removed:

CLI Example:

    salt '*' layman.delete <overlay name>

salt.modules.layman.list_all()
List all overlays, including remote ones.

Return a list of available overlays:

CLI Example:

    salt '*' layman.list_all

salt.modules.layman.list_local()
List the locally installed overlays.

Return a list of installed overlays:

CLI Example:

    salt '*' layman.list_local

salt.modules.layman.sync(overlay='ALL')
Update the specified overlay. Use 'ALL' to synchronize all overlays. This is the default if no overlay is specified.

overlay Name of the overlay to sync. (Defaults to 'ALL')

CLI Example:

    salt '*' layman.sync

31.16.130 salt.modules.ldapmod

Salt interface to LDAP commands

depends

- ldap Python module

configuration In order to connect to LDAP, certain configuration is required in the minion config on the LDAP server. The minimum configuration items that must be set are:
ldap.basedn: dc=acme,dc=com (example values, adjust to suit)

If your LDAP server requires authentication then you must also set:

- ldap.anonymous: False
- ldap.binddn: admin
- ldap.bindpw: password

In addition, the following optional values may be set:

- ldap.server: localhost (default=localhost, see warning below)
- ldap.port: 389 (default=389, standard port)
- ldap.tls: False (default=False, no TLS)
- ldap.no_verify: False (default=False, verify TLS)
- ldap.anonymous: True (default=True, bind anonymous)
- ldap.scope: 2 (default=2, ldap.SCOPE_SUBTREE)
- ldap.attrs: [saltAttr] (default=None, return all attributes)

**Warning:** At the moment this module only recommends connection to LDAP services listening on localhost. This is deliberate to avoid the potentially dangerous situation of multiple minions sending identical update commands to the same LDAP server. It's easy enough to override this behavior, but badness may ensue - you have been warned.

```
salt.modules.ldapmod.search(filter, dn=None, scope=None, attrs=None, **kwargs)
```

Run an arbitrary LDAP query and return the results.

CLI Example:
```
salt 'ldaphost' ldap.search "filter=cn=myhost"
```

Return data:
```
{'myhost': {'count': 1,
            'results': [[[cn=myhost, ou=hosts, o=acme, c=gb],
                         {'saltKeyVal': ['ntpserver=ntp.acme.local',
                                         'foo=foo'],
                          'saltState': ['foo', 'bar']]),
            'time': {'human': '1.2ms', 'raw': '0.00123'}}}
```

Search and connection options can be overridden by specifying the relevant option as key=value pairs, for example:
```
salt 'ldaphost' ldap.search filter=cn=myhost dn=ou=hosts, o=acme, c=gb scope=1 attrs='' server='localhost' port='3793' tls=True bindpw='ssh'
```

31.16.131 salt.modules.linux_acl

Support for Linux File Access Control Lists

```
salt.modules.linux_acl.delfacl(acl_type, acl_name='', *args, **kwargs)
```

Remove specific FACL from the specified file(s)

CLI Examples:
```
salt '*' acl.delfacl user myuser /tmp/house/kitchen
salt '*' acl.delfacl default:group mygroup /tmp/house/kitchen
salt '*' acl.delfacl d:u myuser /tmp/house/kitchen
```
salt 'acl.delfacl g myuser /tmp/house/kitchen /tmp/house/livingroom
salt 'acl.delfacl user myuser /tmp/house/kitchen recursive=True

salt.modules.linux_acl.getfacl(*args, **kwargs)
    Return (extremely verbose) map of FACLS on specified file(s)

    CLI Examples:
    salt 'acl.getfacl /tmp/house/kitchen
    salt 'acl.getfacl /tmp/house/kitchen /tmp/house/livingroom
    salt 'acl.getfacl /tmp/house/kitchen /tmp/house/livingroom recursive=True

salt.modules.linux_acl.modfacl(acl_type, acl_name='`, perms='`, *args, **kwargs)
    Add or modify a FACL for the specified file(s)

    CLI Examples:
    salt 'acl.modfacl user myuser rwx /tmp/house/kitchen
    salt 'acl.modfacl default:group mygroup rx /tmp/house/kitchen
    salt 'acl.modfacl d:u myuser 7 /tmp/house/kitchen
    salt 'acl.modfacl g mygroup 0 /tmp/house/kitchen /tmp/house/livingroom
    salt 'acl.modfacl user myuser rwx /tmp/house/kitchen recursive=True

salt.modules.linux_acl.version()
    Return facl version from getfacl --version

    CLI Example:
    salt 'acl.version

salt.modules.linux_acl.wipefacls(*args, **kwargs)
    Remove all FACLS from the specified file(s)

    CLI Examples:
    salt 'acl.wipefacls /tmp/house/kitchen
    salt 'acl.wipefacls /tmp/house/kitchen /tmp/house/livingroom
    salt 'acl.wipefacls /tmp/house/kitchen /tmp/house/livingroom recursive=True

31.16.132 salt.modules.linux_lvm

Support for Linux LVM2

salt.modules.linux_lvm.fullversion()
    Return all version info from lvm version

    CLI Example:
    salt 'lvm.fullversion

salt.modules.linux_lvm.lvcreate(lvname, vgname, size=None, extents=None, snapshot=None, pv=None, **kwargs)
    Create a new logical volume, with option for which physical volume to be used

    CLI Examples:
    salt 'lvm.lvcreate new_volume_name vg_name size=10G
    salt 'lvm.lvcreate new_volume_name vg_name extents=100 pv=/dev/sdb
    salt 'lvm.lvcreate new_snapshot vg_name snapshot=volume_name size=36
salt.modules.linux_lvm.lvdisplay(lvname='')
    Return information about the logical volume(s)
    
    CLI Examples:
    
    salt '*' lvm.lvdisplay
    salt '*' lvm.lvdisplay /dev/vg_myserver/root

salt.modules.linux_lvm.lvremove(lvname, vgname)
    Remove a given existing logical volume from a named existing volume group
    
    CLI Example:
    
    salt '*' lvm.lvremove lvname vgname force=True

salt.modules.linux_lvm.lvresize(size, lvpath)
    Return information about the logical volume(s)
    
    CLI Examples:
    
    salt '*' lvm.lvresize +12M /dev/mapper/vg1-test

salt.modules.linux_lvm.pvcreate(devices, override=True, **kwargs)
    Set a physical device to be used as an LVM physical volume
    
    **override** Skip devices, if they are already an LVM physical volumes
    
    CLI Examples:
    
    salt mymachine lvm.pvcreate /dev/sdb1,/dev/sdb2
    salt mymachine lvm.pvcreate /dev/sdb1 dataalignmentoffset=7s

salt.modules.linux_lvm.pvdisplay(pvname='')
    Return information about the physical volume(s)
    
    CLI Examples:
    
    salt '*' lvm.pvdisplay
    salt '*' lvm.pvdisplay /dev/md0

salt.modules.linux_lvm.pvremove(devices, override=True)
    Remove a physical device being used as an LVM physical volume
    
    **override** Skip devices, if they are already not used as an LVM physical volumes
    
    CLI Examples:
    
    salt mymachine lvm.pvremove /dev/sdb1,/dev/sdb2

salt.modules.linux_lvm.version()
    Return LVM version from lvm version
    
    CLI Example:
    
    salt '*' lvm.version

salt.modules.linux_lvm.vgcreate(vgname, devices, **kwargs)
    Create an LVM volume group
    
    CLI Examples:
    
    salt mymachine lvm.vgcreate my_vg /dev/sdb1,/dev/sdb2
    salt mymachine lvm.vgcreate my_vg /dev/sdb1 clustered=y
salt.modules.linux_lvm.vgdisplay(vgname='')
    Return information about the volume group(s)

    CLI Examples:
    salt '*' lvm.vgdisplay
    salt '*' lvm.vgdisplay nova-volumes

salt.modules.linux_lvm.vgextend(vgname, devices)
    Add physical volumes to an LVM volume group

    CLI Examples:
    salt mymachine lvm.vgextend my_vg /dev/sdb1,/dev/sdb2
    salt mymachine lvm.vgextend my_vg /dev/sdb1

salt.modules.linux_lvm.vgremove(vgname)
    Remove an LVM volume group

    CLI Examples:
    salt mymachine lvm.vgremove vgname
    salt mymachine lvm.vgremove vgname force=True

31.16.133 salt.modules.linux_sysctl

Module for viewing and modifying sysctl parameters

salt.modules.linux_sysctl.assign(name, value)
    Assign a single sysctl parameter for this minion

    CLI Example:
    salt '*' sysctl.assign net.ipv4.ip_forward 1

salt.modules.linux_sysctl.default_config()
    Linux hosts using systemd 207 or later ignore /etc/sysctl.conf and only load from
    /etc/sysctl.d/*.conf. This function will do the proper checks and return a default config file which
    will be valid for the Minion. Hosts running systemd >= 207 will use /etc/sysctl.d/99-salt.conf.

    CLI Example:
    salt -G 'kernel:Linux' sysctl.default_config

salt.modules.linux_sysctl.get(name)
    Return a single sysctl parameter for this minion

    CLI Example:
    salt '*' sysctl.get net.ipv4.ip_forward

salt.modules.linux_sysctl.persist(name, value, config=None)
    Assign and persist a simple sysctl parameter for this minion. If config is not specified, a sensible default
    will be chosen using sysctl.default_config.

    CLI Example:
    salt '*' sysctl.persist net.ipv4.ip_forward 1
salt.modules.linux_sysctl.show(config_file=False)
   Return a list of sysctl parameters for this minion
   
   config: Pull the data from the system configuration file instead of the live data.
   
   CLI Example:
   
   ```
   salt '*' sysctl.show
   ```

31.16.134 salt.modules.localemod

Module for managing locales on POSIX-like systems.

salt.modules.localemod.avail(locale)
   Check if a locale is available.
   
   New in version 2014.7.0.
   
   CLI Example:
   
   ```
   salt '*' locale.avail 'en_US.UTF-8'
   ```

salt.modules.localemod.gen_locale(locale, **kwargs)
   Generate a locale. Options:
   
   New in version 2014.7.0.
   
   Parameters locale -- Any locale listed in /usr/share/i18n/locales or /usr/share/i18n/SUPPORTED for Debian and Gentoo based distributions, which require the charmap to be specified as part of the locale when generating it.

   verbose Show extra warnings about errors that are normally ignored.
   
   CLI Example:
   
   ```
   salt '*' locale.gen_locale en_US.UTF-8
   salt '*' locale.gen_locale 'en_IE.UTF-8 UTF-8' # Debian/Gentoo only
   ```

salt.modules.localemod.get_locale()
   Get the current system locale
   
   CLI Example:
   
   ```
   salt '*' locale.get_locale
   ```

salt.modules.localemod.list_avail()
   Lists available (compiled) locales
   
   CLI Example:
   
   ```
   salt '*' locale.list_avail
   ```

salt.modules.localemod.set_locale(locale)
   Sets the current system locale
   
   CLI Example:
   
   ```
   salt '*' locale.set_locale 'en_US.UTF-8'
   ```

31.16. Full list of builtin execution modules
31.16.135 salt.modules.locate

Module for using the locate utilities

salt.modules.locate.locate(pattern, database='`', limit=0, **kwargs)

Performs a file lookup. Valid options (and their defaults) are:

- basename=False
- count=False
- existing=False
- follow=True
- ignore=False
- nofollow=False
- wholename=True
- regex=False
- database=<locate's default database>
- limit=<integer, not set by default>

See the manpage for locate(1) for further explanation of these options.

CLI Example:

```
salt '*' locate.locate
```

salt.modules.locate.stats()

Returns statistics about the locate database

CLI Example:

```
salt '*' locate.stats
```

salt.modules.locate.updatedb()

Updates the locate database

CLI Example:

```
salt '*' locate.updatedb
```

salt.modules.locate.version()

Returns the version of locate

CLI Example:

```
salt '*' locate.version
```

31.16.136 salt.modules.logadm

Module for managing Solaris logadm based log rotations.

salt.modules.logadm.remove(name, conf_file='/etc/logadm.conf')

Remove log pattern from logadm

CLI Example:

```
salt '*' logadm.remove myapplog
```

salt.modules.logadm.rotate(name, pattern=False, count=False, age=False, size=False, copy=True, conf_file='/etc/logadm.conf')

Set up pattern for logging.

CLI Example:
Salt Modules

**logadm**

Logadm is used to rotate log files.

```python
salt '*' logadm.rotate myapplog pattern='*/var/log/myapp/*.log' count=7
```

**show_conf**

Show parsed configuration.

```python
salt.modules.logadm.show_conf(conf_file='/etc/logadm.conf')
```

**CLI Example:**

```bash
salt '*' logadm.show_conf
```

### 31.16.137 salt.modules.logrotate

Module for managing logrotate.

```python
salt.modules.logrotate.set(key, value, setting=None, conf_file='/etc/logrotate.conf')
```

Set a new value for a specific configuration line.

**CLI Example:**

```bash
salt '*' logrotate.set rotate 2
```

Can also be used to set a single value inside a multiline configuration block. For instance, to change rotate in the following block:

```ini
/var/log/wtmp {
    monthly
    create 0664 root root
    rotate 1
}
```

Use the following command:

```bash
salt '*' logrotate.set /var/log/wtmp rotate 2
```

This module also has the ability to scan files inside an include directory, and make changes in the appropriate file.

```python
salt.modules.logrotate.show_conf(conf_file='/etc/logrotate.conf')
```

**CLI Example:**

```bash
salt '*' logrotate.show_conf
```

### 31.16.138 salt.modules.lvs

Support for LVS (Linux Virtual Server)

```python
salt.modules.lvs.add_server(protocol=None, service_address=None, server_address=None, packet_forward_method='dr', weight=1, **kwargs)
```

Add a real server to a virtual service.

**protocol** The service protocol (only support tcp, udp and fwmark service).

**service_address** The LVS service address.

**server_address** The real server address.

**packet_forward_method** The LVS packet forwarding method (dr for direct routing, tunnel for tunneling, nat for network access translation).
weight  The capacity of a server relative to the others in the pool.

CLI Example:

```
salt '*' lvs.add_server tcp 1.1.1.1:80 192.168.0.11:8080 nat 1
```

```
salt.modules.lvs.add_service(protocol=None, service_address=None, scheduler='wlc')
```

Add a virtual service.

```
protocol  The service protocol (only support tcp, udp and fwmark service).
```

```
service_address  The LVS service address.
```

```
scheduler  Algorithm for allocating TCP connections and UDP datagrams to real servers.
```

CLI Example:

```
salt '*' lvs.add_service tcp 1.1.1.1:80 rr
```

```
salt.modules.lvs.check_server(protocol=None, service_address=None, server_address=None, **kwargs)
```

Check the real server exists in the specified service.

CLI Example:

```
salt '*' lvs.check_server tcp 1.1.1.1:80 192.168.0.11:8080
```

```
salt.modules.lvs.check_service(protocol=None, service_address=None, **kwargs)
```

Check the virtual service exists.

CLI Example:

```
salt '*' lvs.check_service tcp 1.1.1.1:80
```

```
salt.modules.lvs.clear()
```

Clear the virtual server table

CLI Example:

```
salt '*' lvs.clear
```

```
salt.modules.lvs.delete_server(protocol=None, service_address=None, server_address=None)
```

Delete the real server from the virtual service.

```
protocol  The service protocol (only support tcp, udp and fwmark service).
```

```
service_address  The LVS service address.
```

```
server_address  The real server address.
```

CLI Example:

```
salt '*' lvs.delete_server tcp 1.1.1.1:80 192.168.0.11:8080
```

```
salt.modules.lvs.delete_service(protocol=None, service_address=None)
```

Delete the virtual service.

```
protocol  The service protocol (only support tcp, udp and fwmark service).
```

```
service_address  The LVS service address.
```

CLI Example:

```
salt '*' lvs.delete_service tcp 1.1.1.1:80
```
salt.modules.lvs.edit_server(protocol=None, service_address=None, server_address=None, packet_forward_method=None, weight=None, **kwargs)

Edit a real server to a virtual service.

- **protocol** The service protocol (only support tcp, udp and fwmark service).
- **service_address** The LVS service address.
- **server_address** The real server address.
- **packet_forward_method** The LVS packet forwarding method (dr for direct routing, tunnel for tunneling, nat for network access translation).
- **weight** The capacity of a server relative to the others in the pool.

CLI Example:
```
salt '*' lvs.edit_server tcp 1.1.1.1:80 192.168.0.11:80080 nat 1
```

salt.modules.lvs.edit_service(protocol=None, service_address=None, scheduler=None)

Edit the virtual service.

- **protocol** The service protocol (only support tcp, udp and fwmark service).
- **service_address** The LVS service address.
- **scheduler** Algorithm for allocating TCP connections and UDP datagrams to real servers.

CLI Example:
```
salt '*' lvs.edit_service tcp 1.1.1.1:80 rr
```

salt.modules.lvs.get_rules()

Get the virtual server rules.

CLI Example:
```
salt '*' lvs.get_rules
```

salt.modules.lvs.list(protocol=None, service_address=None)

List the virtual server table if service_address is not specified. If a service_address is selected, list this service only.

CLI Example:
```
salt '*' lvs.list
```

salt.modules.lvs.zero(protocol=None, service_address=None)

Zero the packet, byte and rate counters in a service or all services.

CLI Example:
```
salt '*' lvs.zero
```

31.16.139 salt.modules.lxc

Control Linux Containers via Salt

- **depends** lxc package for distribution

lxc >= 1.0 (even beta alpha) is required
salt.modules.lxc.apply_network_profile(name, network_profile, nic_opts=None, path=None)

New in version 2015.5.0.

Apply a network profile to a container

network_profile profile name or default values (dict)
nic_opts values to override in defaults (dict) indexed by nic card names

path path to the container parent

New in version 2015.8.0.

CLI Examples:

```
salt 'minion' lxc.apply_network_profile web1 centos
salt 'minion' lxc.apply_network_profile web1 centos \n   nic_opts="{'eth0': {'mac': 'xx:xx:xx:xx:xx:xx'}}"
salt 'minion' lxc.apply_network_profile web1 \n   "{'eth0': {'mac': 'xx:xx:xx:xx:yy'}}" \n   nic_opts="{'eth0': {'mac': 'xx:xx:xx:xx:xx:xx'}}"
```

The special case to disable use of ethernet nics:

```
salt 'minion' lxc.apply_network_profile web1 centos \n   "{eth0: {disable: true}}"
```

salt.modules.lxc.attachable(name, path=None)

Return True if the named container can be attached to via the lxc-attach command

path path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

CLI Example:

```
salt 'minion' lxc.attachable ubuntu
```

salt.modules.lxc.bootstrap(name, config=None, approve_key=True, install=True, pub_key=None, priv_key=None, bootstrap_url=None, force_install=False, unconditional_install=False, path=None, bootstrap_delay=None, bootstrap_args=None, bootstrap_shell=None)

Install and configure salt in a container.

config Minion configuration options. By default, the master option is set to the target host's master.

approve_key Request a pre-approval of the generated minion key. Requires that the salt-master be configured to either auto-accept all keys or expect a signing request from the target host. Default: True

path path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

pub_key Explicit public key to pressed the minion with (optional). This can be either a filepath or a string representing the key

priv_key Explicit private key to pressed the minion with (optional). This can be either a filepath or a string representing the key
**bootstrap_delay** Delay in seconds between end of container creation and bootstrapping. Useful when waiting for container to obtain a DHCP lease.

    New in version 2015.5.0.

**bootstrap_url** url, content or filepath to the salt bootstrap script

**bootstrap_args** salt bootstrap script arguments

**bootstrap_shell** shell to execute the script into

**install** Whether to attempt a full installation of salt-minion if needed.

**force_install** Force installation even if salt-minion is detected, this is the way to run vendor bootstrap scripts even if a salt minion is already present in the container

**unconditional_install** Run the script even if the container seems seeded

CLI Examples:

```bash
salt 'minion' lxc.bootstrap container_name [config=config_data] \[approve_key=(True|False)] [install=(True|False)]
```

---

**salt.modules.lxc.clone**(name, orig, profile=None, network_profile=None, nic_opts=None, **kwargs)

Create a new container as a clone of another container

**name** Name of the container

**orig** Name of the original container to be cloned

**profile** Profile to use in container cloning (see `lxc.get_container_profile`). Values in a profile will be overridden by the Container Cloning Arguments listed below.

**path** path to the container parent directory default: /var/lib/lxc (system)

    New in version 2015.8.0.

**Container Cloning Arguments**

**snapshot** Use Copy On Write snapshots (LVM)

**size** [1G] Size of the volume to create. Only applicable if backing=lvm.

**backing** The type of storage to use. Set to lvm to use an LVM group. Defaults to filesystem within /var/lib/lxc.

**network_profile** Network profile to use for container

    New in version 2015.8.0.

**nic_opts** give extra opts overriding network profile values

    New in version 2015.8.0.

CLI Examples:

```bash
salt '*' lxc.clone myclone orig=orig_container
salt '*' lxc.clone myclone orig=orig_container snapshot=True
```

---

**salt.modules.lxc.cloud_init**(name, vm_=None, **kwargs)

Thin wrapper to lxc.init to be used from the saltcloud lxc driver

**name** Name of the container may be None and then guessed from saltcloud mapping

**vm_** saltcloud mapping defaults for the vm

CLI Example:

---

31.16. Full list of builtin execution modules
salt '*' lxc.cloud_init foo

salt.modules.lxc.cloud_init_interface(name, vm_=None, **kwargs)

Interface between salt.cloud.lxc driver and lxc.init vm_ is a mapping of vm opts in the salt.cloud format as documented for the lxc driver.

This can be used either:

- from the salt cloud driver
- because you find the argument to give easier here than using directly lxc.init

**Warning:** BE REALLY CAREFUL CHANGING DEFAULTS‼ IT'S A RETRO COMPATIBLE INTERFACE WITH THE SALT CLOUD DRIVER (ask kiorky).

- name: name of the lxc container to create
- pub_key: public key to preseed the minion with. Can be the key content or a filepath
- priv_key: private key to preseed the minion with. Can be the key content or a filepath
- path: path to the container parent directory (default: /var/lib/lxc)

  New in version 2015.8.0.

- profile: profile selection
- network_profile: network profile selection

- nic_opts: per interface settings compatibles with network profile (ipv4/ipv6/link/gateway/mac/netmask)

  eg:

  ```
  {'eth0': {'mac': '00:16:3e:01:29:40',
           'gateway': None, (default)
           'link': 'br0', (default)
           'gateway': None, (default)
           'netmask': '', (default)
           'ip': '22.1.4.25'}}
  ```

- unconditional_install: given to lxc.bootstrap (see relative doc)
- force_install: given to lxc.bootstrap (see relative doc)
- config: any extra argument for the salt minion config
- dnsservers: dns servers to set inside the container
- autostart: autostart the container at boot time
- password: administrative password for the container

**Warning:** Legacy but still supported options:

- from_container: which container we use as a template when running lxc.clone
- image: which template do we use when we are using lxc.create. This is the default mode unless you specify something in from_container
- backing: which backing store to use. Values can be: overlayfs, dir (default), lvm, zfs, btrfs
- fstype: When using a blockdevice level backing store, which filesystem to use on
- size: When using a blockdevice level backing store, which size for the filesystem to use on
**snapshot** Use snapshot when cloning the container source

**vgname** if using LVM: vname

**lvname** if using LVM: lvname

**ip** ip for the primary nic

**mac** mac address for the primary nic

**netmask** netmask for the primary nic (24) = vm_.get('netmask', '24')

**bridge** bridge for the primary nic (lxcbr0)

**gateway** network gateway for the container

**additional_ips** additional ips which will be wired on the main bridge (br0) which is connected to internet. Be aware that you may use manual virtual mac addresses provided by your provider (online, ovh, etc). This is a list of mappings [ip: '', mac: '', netmask: ''] Set gateway to None and an interface with a gateway to escape from another interface that eth0. eg:

```
- {'mac': '00:16:3e:01:29:40',
  'gateway': None, (default)
  'link': 'br0', (default)
  'netmask': '', (default)
  'ip': '22.1.4.25')
```

**users** administrative users for the container default: [root] and [root, ubuntu] on ubuntu

**default_nic** name of the first interface, you should really not override this

CLI Example:

```
salt '*' lxc.cloud_init_interface foo
```

salt.modules.lxc.copy_to(name, source, dest, overwrite=False, makedirs=False, path=No)

Changed in version 2015.8.0: Function renamed from lxc.cp to lxc.copy_to for consistency with other container types. lxc.cp will continue to work, however. For versions 2015.2.x and earlier, use lxc.cp.

Copy a file or directory from the host into a container

**name** Container name

**source** File to be copied to the container

**path** path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

**dest** Destination on the container. Must be an absolute path.

Changed in version 2015.5.0: If the destination is a directory, the file will be copied into that directory.

**overwrite** [False] Unless this option is set to True, then if a file exists at the location specified by the dest argument, an error will be raised.

New in version 2015.8.0.

**makedirs** False

Create the parent directory on the container if it does not already exist.

New in version 2015.5.0.

CLI Example:
salt 'minion' lxc.copy_to /tmp/foo /root/foo
salt 'minion' lxc.cp /tmp/foo /root/foo

salt.modules.lxc.create(name, config=None, profile=None, network_profile=None, nic_opts=None, **kwargs)

Create a new container.

name Name of the container
config The config file to use for the container. Defaults to system-wide config (usually in /etc/lxc/lxc.conf).
profile Profile to use in container creation (see lxc.get_container_profile). Values in a profile will be overridden by the Container Creation Arguments listed below.
network_profile Network profile to use for container

New in version 2015.5.0.

Container Creation Arguments

template The template to use. For example, ubuntu or fedora. Conflicts with the image argument.

Note: The download template requires the following three parameters to be defined in options:
- dist - The name of the distribution
- release - Release name/version
- arch - Architecture of the container

The available images can be listed using the lxc.images function.

options Template-specific options to pass to the lxc-create command. These correspond to the long options (ones beginning with two dashes) that the template script accepts. For example:

```python
options={"dist": "centos", "release": "6", "arch": "amd64"}
```

image A tar archive to use as the rootfs for the container. Conflicts with the template argument.
backing The type of storage to use. Set to lvm to use an LVM group. Defaults to filesystem within /var/lib/lxc.
fstype Filesystem type to use on LVM logical volume
size [1G] Size of the volume to create. Only applicable if backing=lvm.
vgname [lxc] Name of the LVM volume group in which to create the volume for this container. Only applicable if backing=lvm.
lnname Name of the LVM logical volume in which to create the volume for this container. Only applicable if backing=lvm.
nic_opts give extra opts overriding network profile values
path parent path for the container creation (default: /var/lib/lxc)

New in version 2015.8.0.

salt.modules.lxc.destroy(name, stop=False, path=None)

Destroy the named container.

Warning: Destroys all data associated with the container.

path path to the container parent directory (default: /var/lib/lxc)

New in version 2015.8.0.
**stop**  [False] If True, the container will be destroyed even if it is running/frozen.

Changed in version 2015.5.0: Default value changed to False. This more closely matches the behavior of `lxc-destroy(1)`, and also makes it less likely that an accidental command will destroy a running container that was being used for important things.

CLI Examples:

```bash
salt '*' lxc.destroy foo
salt '*' lxc.destroy foo stop=True
```

```python
salt.modules.lxc.edit_conf(conf_file, out_format='simple', read_only=False, lxc_config=None, **kwargs)
```

Edit an LXC configuration file. If a setting is already present inside the file, its value will be replaced. If it does not exist, it will be appended to the end of the file. Comments and blank lines will be kept in-tact if they already exist in the file.

- **out_format**: Set to simple if you need backward compatibility (multiple items for a simple key is not supported)
- **read_only**: return only the edited configuration without applying it to the underlying lxc configuration file
- **lxc_config**: List of dict containing lxc configuration items For network configuration, you also need to add the device it belongs to, otherwise it will default to eth0. Also, any change to a network parameter will result in the whole network reconfiguration to avoid mismatches, be aware of that!

After the file is edited, its contents will be returned. By default, it will be returned in simple format, meaning an unordered dict (which may not represent the actual file order). Passing in an out_format of commented will return a data structure which accurately represents the order and content of the file.

CLI Example:

```bash
salt 'minion' lxc.edit_conf /etc/lxc/mycontainer.conf \
    out_format=commented lxc.network.type=veth
salt 'minion' lxc.edit_conf /etc/lxc/mycontainer.conf \
    out_format=commented \
    lxc_config="[[{'lxc.network.name': 'eth0', \n        'lxc.network.ipv4': '1.2.3.4'}, \n        {'lxc.network.name': 'eth2', \n        'lxc.network.ipv4': '1.2.3.5'}, \n        {'lxc.network.name': 'eth3', \n        'lxc.network.gateway': '1.2.3.1'}]]"
```

```python
salt.modules.lxc.exists(name, path=None)
```

Returns whether the named container exists.

- **path**  path to the container parent directory (default: /var/lib/lxc)

New in version 2015.8.0.

CLI Example:

```bash
salt '*' lxc.exists name
```

```python
salt.modules.lxc.freeze(name, **kwargs)
```

Freeze the named container

- **path**  path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.

**start**  [False] If True and the container is stopped, the container will be started before attempting to freeze.

New in version 2015.5.0.
use_vt run the command through VT

New in version 2015.8.0.

CLI Example:

```
salt '*' lxc.freeze name
```

```
salt.modules.lxc.get_container_profile(name=None, **kwargs)
```

New in version 2015.5.0.

Gather a pre-configured set of container configuration parameters. If no arguments are passed, an empty profile is returned.

Profiles can be defined in the minion or master config files, or in pillar or grains, and are loaded using `config.get`. The key under which LXC profiles must be configured is `lxc.container_profile.profile_name`. An example container profile would be as follows:

```
lxc.container_profile:
  ubuntu:
    template: ubuntu
    backing: lvm
    vgname: lxc
    size: 1G
```

Parameters set in a profile can be overridden by passing additional container creation arguments (such as the ones passed to `lxc.create`) to this function.

A profile can be defined either as the name of the profile, or a dictionary of variable names and values. See the [LXC Tutorial] for more information on how to use LXC profiles.

CLI Example:

```
.. code-block:: bash

    salt-call lxc.get_container_profile centos salt-call lxc.get_container_profile ubuntu template=ubuntu backing=overlayfs
```

```
salt.modules.lxc.get_network_profile(name=None, **kwargs)
```

New in version 2015.5.0.

Gather a pre-configured set of network configuration parameters. If no arguments are passed, the following default profile is returned:

```
{ 'eth0': { 'link': 'br0', 'type': 'veth', 'flags': 'up' } }
```

Profiles can be defined in the minion or master config files, or in pillar or grains, and are loaded using `config.get`. The key under which LXC profiles must be configured is `lxc.network_profile`. An example network profile would be as follows:

```
lxc.network_profile.centos:
  eth0:
    link: br0
    type: veth
    flags: up
```

To disable networking entirely:

```
lxc.network_profile.centos:
  eth0:
    disable: true
```
Parameters set in a profile can be overridden by passing additional arguments to this function.

A profile can be passed either as the name of the profile, or a dictionary of variable names and values. See the LXCTutorial for more information on how to use network profiles.

**Warning:** The ipv4, ipv6, gateway, and link (bridge) settings in network profiles will only work if the container does not redefine the network configuration (for example in /etc/sysconfig/network-scripts/ifcfg-<interface_name> on RHEL/CentOS, or /etc/network/interfaces on Debian/Ubuntu/etc.)

CLI Example:

```bash
salt-call lxc.get_network_profile default
```

**salt.modules.lxc.get_parameter(name, parameter, path=None)**

Returns the value of a cgroup parameter for a container.

* path path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.

CLI Example:

```bash
salt '*' lxc.get_parameter container_name memory.limit_in_bytes
```

**salt.modules.lxc.get_root_path(path)**

Get the configured lxc root for containers.

New in version 2015.8.0.

CLI Example:

```bash
salt '*' lxc.get_root_path
```

**salt.modules.lxc.images(dist=None)**

List the available images for LXC's download template.

* dist [None] Filter results to a single Linux distribution

CLI Examples:

```bash
salt myminion lxc.images
salt myminion lxc.images dist=centos
```

**salt.modules.lxc.info(name, path=None)**

Returns information about a container.

* path path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.

CLI Example:

```bash
salt '*' lxc.info name
```
Initialize a new container.

This is a partial idempotent function as if it is already provisioned, we will reset a bit the lxc configuration file but much of the hard work will be escaped as markers will prevent re-execution of harmful tasks.

**name** Name of the container

**image** A tar archive to use as the rootfs for the container. Conflicts with the `template` argument.

**cpus** Select a random number of cpu cores and assign it to the cpuset, if the cpuset option is set then this option will be ignored

**cpuset** Explicitly define the cpus this container will be bound to

**cpushare** cgroups cpu shares

**autostart** autostart container on reboot

**memory** cgroups memory limit, in MB

Changed in version 2015.5.0: If no value is passed, no limit is set. In earlier Salt versions, not passing this value causes a 1024MB memory limit to be set, and it was necessary to pass `memory=0` to set no limit.

**gateway** the ipv4 gateway to use the default does nothing more than lxcutils does

**bridge** the bridge to use the default does nothing more than lxcutils does

**network_profile** Network profile to use for the container

New in version 2015.5.0.

**nic** Deprecated since version 2015.5.0: Use `network_profile` instead

**nic_opts** Extra options for network interfaces, will override

{"eth0": {"hwaddr": "aa:bb:cc:dd:ee:ff", "ipv4": "10.1.1.1", "ipv6": "2001:db8::ff00:42:8329"}}

or

{"eth0": {"hwaddr": "aa:bb:cc:dd:ee:ff", "ipv4": "10.1.1.1/24", "ipv6": "2001:db8::ff00:42:8329"}}

**users** Users for which the password defined in the `password` param should be set. Can be passed as a comma separated list or a python list. Defaults to just the root user.

**password** Set the initial password for the users defined in the `users` parameter

**password_encrypted** [False] Set to `True` to denote a password hash instead of a plaintext password

New in version 2015.5.0.

**profile** A LXC profile (defined in config or pillar). This can be either a real profile mapping or a string to retrieve it in configuration

**start** Start the newly-created container

**dnsservers** list of dns servers to set in the container, default `[]` (no setting)

**seed** Seed the container with the minion config. Default: True
install  If salt-minion is not already installed, install it. Default: True

config  Optional config parameters. By default, the id is set to the name of the container.

master  salt master (default to minion's master)

master_port  salt master port (default to minion's master port)

pub_key  Explicit public key to preseed the minion with (optional). This can be either a filepath or a string representing the key

priv_key  Explicit private key to preseed the minion with (optional). This can be either a filepath or a string representing the key

approve_key  If explicit preseeding is not used; Attempt to request key approval from the master. Default: True

path  path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.

close  Deprecated since version 2015.5.0: Use close_from instead

close_from  Original from which to use a clone operation to create the container. Default: None

bootstrap_delay  Delay in seconds between end of container creation and bootstrapping. Useful when waiting for container to obtain a DHCP lease.

New in version 2015.5.0.

bootstrap_url  See lxc.bootstrap

bootstrap_shell  See lxc.bootstrap

bootstrap_args  See lxc.bootstrap

force_install  Force installation even if salt-minion is detected, this is the way to run vendor bootstrap scripts even if a salt minion is already present in the container

unconditional_install  Run the script even if the container seems seeded

CLI Example:

```
salt 'minion' lxc.init name [cpuset=cgroups_cpuset] \n    [cpushare=cgroups_cpushare] [memory=cgroups_memory] \n    [nic=nic_profile] [profile=lxc_profile] \n    [nic_opts=nic_opts] [start=(True|False)] \n    [seed=(True|False)] [install=(True|False)] \n    [config=minion_config] [approve_key=(True|False)] \n    [clone_from=original] [autostart=True] \n    [priv_key=/path_or_content] [pub_key=/path_or_content] \n    [bridge=lxcbr0] [gateway=10.0.3.1] \n    [dnsservers=[dns1,dns2]] \n    [users=[foo]] [password='secret'] \n    [password_encrypted=(True|False)]
```

salt.modules.lxc.list(extra=False, limit=None, path=None)

List containers classified by state

extra  Also get per-container specific info. This will change the return data. Instead of returning a list of containers, a dictionary of containers and each container's output from lxc.info.

path  path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.
**limit**  Return output matching a specific state (frozen, running, or stopped).

New in version 2015.5.0.

CLI Examples:

salt `*` lxc.list
salt `*` lxc.list extra=True
salt `*` lxc.list limit=running

```
salt.modules.lxc.ls(active=None, cache=True, path=None)
```

Return a list of the containers available on the minion

- **path**  path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.

- **active**  If True, return only active (i.e. running) containers

New in version 2015.5.0.

CLI Example:

```
salt `*` lxc.ls
salt `*` lxc.ls active=True
```

```
salt.modules.lxc.read_conf(conf_file, out_format='simple')
```

Read in an LXC configuration file. By default returns a simple, unsorted dict, but can also return a more detailed structure including blank lines and comments.

- **out_format**:  set to 'simple' if you need the old and unsupported behavior. This wont support the multiple lxc values (eg: multiple network nics)

CLI Examples:

```
salt 'minion' lxc.read_conf /etc/lxc/mycontainer.conf
salt 'minion' lxc.read_conf /etc/lxc/mycontainer.conf out_format=commented
```

```
salt.modules.lxc.reboot(name, path=None)
```

Reboot a container.

- **path**  path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

CLI Examples:

```
salt 'minion' lxc.reboot myvm
```

```
salt.modules.lxc.reconfigure(name, cpu=None, cpuset=None, cpushare=None, memory=None, profile=None, network_profile=None, nic_opts=None, bridge=None, gateway=None, autostart=None, path=None, **kwargs)
```

Reconfigure a container.

This only applies to a few propert

- **name**  Name of the container.

- **cpu**  Select a random number of cpu cores and assign it to the cpuset, if the cpuset option is set then this option will be ignored

- **cpuset**  Explicitly define the cpus this container will be bound to

- **cpushare**  cgroups cpu shares.

- **autostart**  autostart container on reboot
memory  cgroups memory limit, in MB. (0 for nolimit, None for old default 1024MB)
gateway the ipv4 gateway to use the default does nothing more than lxcutils does
bridge  the bridge to use the default does nothing more than lxcutils does
nic  Network interfaces profile (defined in config or pillar).
nic_opts  Extra options for network interfaces, will override

    
    "eth0": {"mac": "aa:bb:cc:dd:ee:ff", "ipv4": "10.1.1.1", "ipv6": "2001:db8::ff00:42:8329"}

    or

    "eth0": {"mac": "aa:bb:cc:dd:ee:ff", "ipv4": "10.1.1.1/24", "ipv6": "2001:db8::ff00:42:8329"}

cpath  path to the container parent

    New in version 2015.8.0.

    CLI Example:

    salt-call -lall mc_lxc_fork.reconfigure foobar nic_opts="{'eth1': {'mac': '00:16:3e:dd:ee:44'}}"

salt.modules.lxc.restart(name, path=None, lxc_config=None, force=False)

    New in version 2015.5.0.

    Restart the named container. If the container was not running, the container will merely be started.

    name  The name of the container

    path  path to the container parent directory default: /var/lib/lxc (system)

        New in version 2015.8.0.

    lxc_config

        path to a lxc config file config file will be guessed from container name otherwise

        New in version 2015.8.0.

    force  [False] If True, the container will be force-stopped instead of gracefully shut down

    CLI Example:

    salt myminion lxc.restart name

salt.modules.lxc.retcodename, cmd, no_start=False, preserve_state=True, stdin=None,
python_shell=True, output_loglevel='debug', use_vt=False, path=None,
ignore_retcode=False, chroot_fallback=False, keep_env='http_proxy, https_proxy, no_proxy')

    New in version 2015.5.0.

    Run cmd.retcodename within a container

    Warning: Many shell builtins do not work, failing with stderr similar to the following:

    lxc_container: No such file or directory - failed to exec 'command'

    The same error will be displayed in stderr if the command being run does not exist. If the retcode is nonzero
    and not what was expected, try using lxc.run_stderr or lxc.run_all.

    name  Name of the container in which to run the command
cmd Command to run

no_start [False] If the container is not running, don’t start it

preserve_state [True] After running the command, return the container to its previous state

path path to the container parent default: /var/lib/lxc (system default)

    New in version 2015.8.0.

stdin [None] Standard input to be used for the command

output_loglevel [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

use_vt [False] Use SaltStack’s utils.vt to stream output to console output=all.

keep_env [http_proxy,https_proxy,no_proxy] A list of env vars to preserve. May be passed as comma-delimited list.

croot_fallback if the container is not running, try to run the command using chroot default: false

CLI Example:

    salt myminion lxc.retcode mycontainer 'ip addr show'

salt.modules.lxc.run(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, path=None, ignore_retcode=False, chroot_fallback=False, keep_env='http_proxy,https_proxy,no_proxy')

New in version 2015.8.0.

Run cmd.run within a container

Warning: Many shell builtins do not work, failing with stderr similar to the following:

    lxc_container: No such file or directory - failed to exec 'command'

The same error will be displayed in stderr if the command being run does not exist. If no output is returned using this function, try using lxc.run_stderr or lxc.run_all.

name Name of the container in which to run the command

cmd Command to run

path path to the container parent default: /var/lib/lxc (system default)

    New in version 2015.8.0.

no_start [False] If the container is not running, don’t start it

preserve_state [True] After running the command, return the container to its previous state

stdin [None] Standard input to be used for the command

output_loglevel [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

use_vt [False] Use SaltStack’s utils.vt to stream output to console. Assumes output=all.

croot_fallback if the container is not running, try to run the command using chroot default: false

keep_env [http_proxy,https_proxy,no_proxy] A list of env vars to preserve. May be passed as comma-delimited list.

CLI Example:
```
salt myminion lxc.run mycontainer 'ifconfig -a'
```

```python
salt.modules.lxc.run_all(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, path=None, ignore_retcode=False, chroot_fallback=False, keep_env='http_proxy, https_proxy, no_proxy')
```

New in version 2015.5.0.

Run `cmd.run_all` within a container

**Note:** While the command is run within the container, it is initiated from the host. Therefore, the PID in the return dict is from the host, not from the container.

**Warning:** Many shell builtins do not work, failing with stderr similar to the following:

```
lxc_container: No such file or directory - failed to exec 'command'
```

The same error will be displayed in stderr if the command being run does not exist.

- **name** Name of the container in which to run the command
- **path** path to the container parent default: /var/lib/lxc (system default)
  
  New in version 2015.8.0.
- **cmd** Command to run
- **no_start** [False] If the container is not running, don’t start it
- **preserve_state** [True] After running the command, return the container to its previous state
- **stdin** [None] Standard input to be used for the command
- **output_loglevel** [debug] Level at which to log the output from the command. Set to `quiet` to suppress logging.
- **use_vt** [False] Use SaltStack's `utils.vt` to stream output to console `output=all`.
- **keep_env** [http_proxy, https_proxy, no_proxy] A list of env vars to preserve. May be passed as comma-delimited list.
- **chroot_fallback** if the container is not running, try to run the command using chroot default: false

**CLI Example:**

```
salt myminion lxc.run_all mycontainer 'ip addr show'
```

```python
salt.modules.lxc.run_cmd(name, cmd, no_start=False, preserve_state=True, stdin=None, stdout=True, stderr=False, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, chroot_fallback=False, keep_env='http_proxy, https_proxy, no_proxy')
```

```
path path to the container parent default: /var/lib/lxc (system default)
  
  New in version 2015.8.0.
```

Deprecated since version 2015.5.0: Use `lxc.run` instead

```python
salt.modules.lxc.run_stderr(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, path=None, ignore_retcode=False, chroot_fallback=False, keep_env='http_proxy, https_proxy, no_proxy')
```

New in version 2015.5.0.

---

**31.16. Full list of builtin execution modules**

1005
Run `cmd.run_stderr` within a container

<table>
<thead>
<tr>
<th>Warning: Many shell builtins do not work, failing with stderr similar to the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>lxc_container: No such file or directory - failed to exec 'command'</td>
</tr>
<tr>
<td>The same error will be displayed if the command being run does not exist.</td>
</tr>
</tbody>
</table>

- **name** Name of the container in which to run the command
- **cmd** Command to run
- **path** path to the container parent default: /var/lib/lxc (system default)
  - New in version 2015.8.0.
- **no_start** [False] If the container is not running, don’t start it
- **preserve_state** [True] After running the command, return the container to its previous state
- **stdin** [None] Standard input to be used for the command
- **output_loglevel** [debug] Level at which to log the output from the command. Set to quiet to suppress logging.
- **use_vt** [False] Use SaltStack’s utils.vt to stream output to console output=all.
- **keep_env** [http_proxy,https_proxy,no_proxy] A list of env vars to preserve. May be passed as comma-delimited list.
- **chroot_fallback** if the container is not running, try to run the command using chroot default: false

**CLI Example:**

```bash
salt myminion lxc.run_stderr mycontainer 'ip addr show'
```

**salt.modules.lxc.run_stdout** *(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, path=None, ignore_retcode=False, chroot_fallback=False, keep_env='http_proxy, https_proxy, no_proxy')*

- New in version 2015.5.0.

Run `cmd.run_stdout` within a container

<table>
<thead>
<tr>
<th>Warning: Many shell builtins do not work, failing with stderr similar to the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>lxc_container: No such file or directory - failed to exec 'command'</td>
</tr>
</tbody>
</table>
| The same error will be displayed in stderr if the command being run does not exist. If no output is returned using this function, try using `lxc.run_stderr` or `lxc.run_all`.

- **name** Name of the container in which to run the command
- **cmd** Command to run
- **path** path to the container parent default: /var/lib/lxc (system default)
  - New in version 2015.8.0.
- **no_start** [False] If the container is not running, don’t start it
- **preserve_state** [True] After running the command, return the container to its previous state
- **stdin** [None] Standard input to be used for the command
```python
output_loglevel [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

use_vt [False] Use SaltStack's utils.vt to stream output to console output=all.

keep_env [http_proxy, https_proxy, no_proxy] A list of env vars to preserve. May be passed as comma-delimited list.

chrootFallback if the container is not running, try to run the command using chroot default: false

CLI Example:
salt myminion lxc.run_stdout mycontainer 'ifconfig -a'
```

```python
salt.modules.lxc.running_systemd(name, cache=True, path=None)
Determine if systemd is running

path path to the container parent

New in version 2015.8.0.

CLI Example:
salt '*' lxc.running_systemd ubuntu
```

```python
salt.modules.lxc.search_lxc_bridge()
Search the first bridge which is potentially available as LXC bridge

CLI Example:
salt '*' lxc.search_lxc_bridge
```

```python
salt.modules.lxc.search_lxc_bridges()
Search which bridges are potentially available as LXC bridges

CLI Example:
salt '*' lxc.search_lxc_bridges
```

```python
salt.modules.lxc.set_dns(name, dnsservers=None, searchdomains=None, path=None)
Changed in version 2015.5.0: The dnsservers and searchdomains parameters can now be passed as a comma-separated list.
Update /etc/resolv.conf

path

path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

CLI Example:
salt myminion lxc.set_dns ubuntu "['8.8.8.8', '4.4.4.4']"
```

```python
salt.modules.lxc.set_parameter(name, parameter, value, path=None)
Set the value of a cgroup parameter for a container.

path path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.

CLI Example:
```
salt 's' lxc.set_parameter name parameter value

salt.modules.lxc.set_password(name, users, password, encrypted=True, path=None)

Changed in version 2015.5.0: Function renamed from set_pass to set_password. Additionally, this function now supports (and defaults to using) a password hash instead of a plaintext password.

Set the password of one or more system users inside containers

users Comma-separated list (or python list) of users to change password

password Password to set for the specified user(s)

encrypted [True] If true, password must be a password hash. Set to False to set a plaintext password (not recommended).

path path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.

CLI Example:

salt 's' lxc.set_pass container-name root '$6$uJ2uAyLU$KoI67t8As/0fXtJ0PcHKGxUpcoYJcVR2K6x93walnShTCQvjRwq25yIkiCBOqgbfdKQSFnAo28/ek6716vEV1'
salt 's' lxc.set_pass container-name root foo encrypted=False

salt.modules.lxc.start(name, **kwargs)

Start the named container

restart [False] Deprecated since version 2015.5.0: Use lxc.restart

Restart the container if it is already running

path path to the container parent directory default: /var/lib/lxc (system)

New in version 2015.8.0.

lxc_config

path to a lxc config file config file will be guessed from container name otherwise

New in version 2015.8.0.

use_vt run the command through VT

New in version 2015.8.0.

CLI Example:

salt myminion lxc.start name

salt.modules.lxc.state(name, path=None)

Returns the state of a container.

path path to the container parent directory (default: /var/lib/lxc)

New in version 2015.8.0.

CLI Example:

salt 's' lxc.state name

salt.modules.lxc.stop(name, kill=False, path=None, use_vt=None)

Stop the named container
path path to the container parent directory default: /var/lib/lxc (system)
    New in version 2015.8.0.
kill: False Do not wait for the container to stop, kill all tasks in the container. Older LXC versions will stop
containers like this irrespective of this argument.
    Changed in version 2015.5.0: Default value changed to False
use_vt run the command through VT
    New in version 2015.8.0.
CLI Example:
    salt myminion lxc.stop name

salt.modules.lxc.systemd_running_state(name, path=\None)
Get the operational state of a systemd based container
path path to the container parent default: /var/lib/lxc (system default)
    New in version 2015.8.0.
CLI Example:
    salt myminion lxc.systemd_running_state ubuntu

salt.modules.lxc.templates()
List the available LXC template scripts installed on the minion
CLI Examples:
    salt myminion lxc.templates

salt.modules.lxc.test_bare_started_state(name, path=\None)
    Test if a non systemd container is fully started For now, it consists only to test if the container is attachable
path path to the container parent default: /var/lib/lxc (system default)
    New in version 2015.8.0.
CLI Example:
    salt myminion lxc.test_bare_started_state ubuntu

salt.modules.lxc.test_sd_started_state(name, path=\None)
    Test if a systemd container is fully started
path path to the container parent default: /var/lib/lxc (system default)
    New in version 2015.8.0.
CLI Example:
    salt myminion lxc.test_sd_started_state ubuntu

salt.modules.lxc.unfreeze(name, path=\None, use_vt=\None)
Unfreeze the named container.
path path to the container parent directory default: /var/lib/lxc (system)
    New in version 2015.8.0.
use_vt  run the command through VT

    New in version 2015.8.0.
    CLI Example:

    salt '*' lxc.unfreeze name

salt.modules.lxc.update_lxc_conf(name, lxc_conf, lxc_conf_unset, path=None)

    Edit LXC configuration options

    path

        path to the container parent default: /var/lib/lxc (system default)

        New in version 2015.8.0.
        CLI Example:

        salt myminion lxc.update_lxc_conf ubuntu
        lxc_conf="[{'network.ipv4.ip': '10.0.3.5'}]
        lxc_conf_unset=['lxc.utsname']"

salt.modules.lxc.version()

    Return the actual lxc client version

    New in version 2015.8.0.
    CLI Example:

    salt '*' lxc.version

salt.modules.lxc.wait_started(name, path=None, timeout=300)

    Check that the system has fully inited

    This is actually very important for systemd based containers

    see https://github.com/saltstack/salt/issues/23847

    path  path to the container parent default: /var/lib/lxc (system default)

    New in version 2015.8.0.
    CLI Example:

    salt myminion lxc.wait_started ubuntu

salt.modules.lxc.write_conf(conf_file, conf)

    Write out an LXC configuration file

    This is normally only used internally. The format of the data structure must match that which is returned from lxc.read_conf(), with out_format set to commented.

    An example might look like:

    ```
    [
        {'lxc.utsname': '$CONTAINER_NAME'},
        '# This is a commented line
        '
        {'lxc.mount': '$CONTAINER_FSTAB'},
        {'lxc.rootfs': {'comment': 'This is another test',
            'value': 'This is another test'}},
        '
        {'lxc.network.type': 'veth'},
        {'lxc.network.flags': 'up'},
    ```
{
    'lxc.network.link': 'br0',
    'lxc.network.mac': '${CONTAINER_MACADDR}',
    'lxc.network.ipv4': '${CONTAINER_IPADDR}',
    'lxc.network.name': '${CONTAINER_DEVICENAME}',
}

**CLI Example:**
```
salt 'minion' lxc.write_conf /etc/lxc/mycontainer.conf \
    out_format=commented
```

### 31.16.140 salt.modules.mac_group

Manage groups on Mac OS 10.7+

```python
salt.modules.mac_group.add(name, gid=None, **kwargs)
```
Add the specified group

**CLI Example:**
```
salt '*' group.add foo 3456
```

```python
salt.modules.mac_group.chgid(name, gid)
```
Change the gid for a named group

**CLI Example:**
```
salt '*' group.chgid foo 4376
```

```python
salt.modules.mac_group.delete(name)
```
Remove the named group

**CLI Example:**
```
salt '*' group.delete foo
```

```python
salt.modules.mac_group.getent(refresh=False)
```
Return info on all groups

**CLI Example:**
```
salt '*' group.getent
```

```python
salt.modules.mac_group.info(name)
```
Return information about a group

**CLI Example:**
```
salt '*' group.info foo
```

### 31.16.141 salt.modules.mac_user

Manage users on Mac OS 10.7+

```python
salt.modules.mac_user.add(name, uid=None, gid=None, groups=None, home=None, shell=None, fullname=None, createhome=True, **kwargs)
```
Add a user to the minion

**CLI Example:**
```
```
salt 'Ū' user.add name <uid> <gid> <groups> <home> <shell>

salt.modules.mac_user.chfullname(name, fullname)
    Change the user's Full Name
    CLI Example:
    salt 'Ū' user.chfullname foo 'Foo Bar'

salt.modules.mac_user.chgid(name, gid)
    Change the default group of the user
    CLI Example:
    salt 'Ū' user.chgid foo 4376

salt.modules.mac_user.chgroups(name, groups, append=False)
    Change the groups to which the user belongs. Note that the user's primary group does not have to be one of
    the groups passed, membership in the user's primary group is automatically assumed.
    groups  Groups to which the user should belong, can be passed either as a python list or a comma-separated
            string
    append  Instead of removing user from groups not included in the groups parameter, just add user to any
            groups for which they are not members
    CLI Example:
    salt 'Ū' user.chgroups foo wheel,root

salt.modules.mac_user.chhome(name, home)
    Change the home directory of the user
    CLI Example:
    salt 'Ū' user.chhome foo /Users/foo

salt.modules.mac_user.chshell(name, shell)
    Change the default shell of the user
    CLI Example:
    salt 'Ū' user.chshell foo /bin/zsh

salt.modules.mac_user.chuid(name, uid)
    Change the uid for a named user
    CLI Example:
    salt 'Ū' user.chuid foo 4376

salt.modules.mac_user.delete(name, 'args)
    Remove a user from the minion
    CLI Example:
    salt 'Ū' user.delete foo

salt.modules.mac_user.getent(refresh=False)
    Return the list of all info for all users
    CLI Example:
salt '*' user.getent

salt.modules.mac_user.info(name)
    Return user information
    CLI Example:
        salt '*' user.info root

salt.modules.mac_user.list_groups(name)
    Return a list of groups the named user belongs to
    CLI Example:
        salt '*' user.list_groups foo

salt.modules.mac_user.list_users()
    Return a list of all users
    CLI Example:
        salt '*' user.list_users

salt.modules.mac_user.rename(name, new_name)
    Change the username for a named user
    CLI Example:
        salt '*' user.rename name new_name


31.16.142 salt.modules.macports

Support for MacPorts under Mac OS X.

This module has some caveats.

1. Updating the database of available ports is quite resource-intensive. However, refresh=True is the default for all operations that need an up-to-date copy of available ports. Consider refresh=False when you are sure no db update is needed.

2. In some cases MacPorts doesn't always realize when another copy of itself is running and will gleefully trample all over the available ports database. This makes MacPorts behave in undefined ways until a fresh complete copy is retrieved.

Because of 1 and 2 it is possible to get the salt-minion into a state where salt mac-machine pkg./something/ won't want to return. Use

    salt-run jobs.active

on the master to check for potentially long-running calls to port.

Finally, ports database updates are always handled with port selfupdate as opposed to port sync. This makes sense in the MacPorts user community but may confuse experienced Linux admins as Linux package managers don't upgrade the packaging software when doing a package database update. In other words salt mac-machine pkg.refresh_db is more like apt-get update; apt-get upgrade dpkg apt-get than simply apt-get update.

salt.modules.macports.available_version(*names, **kwargs)
    Return the latest version of the named package available for upgrade or installation

Options:
    refresh Update ports with port selfupdate
CLI Example:

```bash
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package1> <package2> <package3>
```

```python
salt.modules.macports.install(name=None, refresh=False, pkgs=None, **kwargs)
```

Install the passed package(s) with `port install`

**name** The name of the formula to be installed. Note that this parameter is ignored if `"pkgs"` is passed.

CLI Example:

```bash
salt '*' pkg.install <package name>
```

**version** Specify a version to `pkg` to install. Ignored if `pkgs` is specified.

CLI Example:

```bash
salt '*' pkg.install <package name>
salt '*' pkg.install git-core version='1.8.5.5'
```

**variant** Specify a variant to `pkg` to install. Ignored if `pkgs` is specified.

CLI Example:

```bash
salt '*' pkg.install <package name>
salt '*' pkg.install git-core version='1.8.5.5' variant='+credential_osxkeychain+doc+pcre'
```

Multiple Package Installation Options:

**pkgs** A list of formulas to install. Must be passed as a python list.

CLI Example:

```bash
salt '*' pkg.install pkgs=['"foo","bar"]
salt '*' pkg.install pkgs=['"foo@1.2","bar"']
salt '*' pkg.install pkgs=['"foo@1.2+ssl","bar@2.3"]
```

Returns a dict containing the new package names and versions:

```python
{
'package': {
'old': '<old-version>',
'new': '<new-version>'
}}
```

CLI Example:

```bash
salt '*' pkg.install 'package package package'
```

```python
salt.modules.macports.latest_version("names", **kwargs)
```

Return the latest version of the named package available for upgrade or installation

Options:

**refresh** Update ports with `port selfupdate`

CLI Example:

```bash
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package1> <package2> <package3>
```

```python
salt.modules.macports.list_pkgs(versions_as_list=False, **kwargs)
```

List the packages currently installed in a dict:
{'<package_name>': '<version>'}

CLI Example:
salt '*' pkg.list_pkgs

salt.modules.macports.list_upgrades(refresh=True)
Check whether or not an upgrade is available for all packages

Options:
refresh Update ports with port selfupdate

CLI Example:
salt '*' pkg.list_upgrades

salt.modules.macports.refresh_db()
Update ports with port selfupdate

salt.modules.macports.remove(name=None, pkgs=None, **kwargs)
Removes packages with port uninstall.

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs=['foo', 'bar']

salt.modules.macports.upgrade(refresh=True)
Run a full upgrade using MacPorts 'port upgrade outdated'

Options:
refresh Update ports with port selfupdate

Return a dict containing the new package names and versions:

{'<package>': {'old': '<old-version>',
              'new': '<new-version>'}}

CLI Example:
salt '*' pkg.upgrade

salt.modules.macports.upgrade_available(pkg, refresh=True)
Check whether or not an upgrade is available for a given package

CLI Example:
salt '*' pkg.upgrade_available <package name>
salt.modules.macports.version(*names, **kwargs)
Returns a string representing the package version or an empty string if not installed. If more than one package name is specified, a dict of name/version pairs is returned.

CLI Example:

```
salt '*' pkg.version <package name>
salt '*' pkg.version <package1> <package2> <package3>
```

### 31.16.143 salt.modules.makeconf

Support for modifying make.conf under Gentoo

salt.modules.makeconf.append_cflags(value)
Add to or create a new CFLAGS in the make.conf
Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>',
               'new': '<new-value>'}}
```

CLI Example:

```
salt '*' makeconf.append_cflags '-pipe'
```

salt.modules.makeconf.append_cxxflags(value)
Add to or create a new CXXFLAGS in the make.conf
Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>',
                'new': '<new-value>'}}
```

CLI Example:

```
salt '*' makeconf.append_cxxflags '-pipe'
```

salt.modules.makeconf.append_emerge_default_opts(value)
Add to or create a new EMERGE_DEFAULT_OPTS in the make.conf
Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>',
                'new': '<new-value>'}}
```

CLI Example:

```
salt '*' makeconf.append_emerge_default_opts '--jobs'
```

salt.modules.makeconf.append_features(value)
Add to or create a new FEATURES in the make.conf
Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>',
                'new': '<new-value>'}}
```

CLI Example:
```python
salt '*' makeconf.append_features 'webrsync-gpg'
```

```python
salt.modules.makeconf.append_gentoo_mirrors(value)
    Add to or create a new GENTOO_MIRRORS in the make.conf
    Return a dict containing the new value for variable:
    ```
    {
        '<variable>': {
            'old': '<old-value>',
            'new': '<new-value>'
        }
    }
    ```
    CLI Example:
    ```
salt '*' makeconf.append_gentoo_mirrors 'http://distfiles.gentoo.org'
    ```
```

```python
salt.modules.makeconf.append_makeopts(value)
    Add to or create a new MAKEOPTS in the make.conf
    Return a dict containing the new value for variable:
    ```
    {
        '<variable>': {
            'old': '<old-value>',
            'new': '<new-value>'
        }
    }
    ```
    CLI Example:
    ```
salt '*' makeconf.append_makeopts '-j3'
    ```
```

```python
salt.modules.makeconf.append_var(var, value)
    Add to or create a new variable in the make.conf
    Return a dict containing the new value for variable:
    ```
    {
        '<variable>': {
            'old': '<old-value>',
            'new': '<new-value>'
        }
    }
    ```
    CLI Example:
    ```
salt '*' makeconf.append_var 'LINGUAS' 'en'
    ```
```

```python
salt.modules.makeconf.cflags_contains(value)
    Verify if CFLAGS variable contains a value in make.conf
    Return True if value is set for var
    CLI Example:
    ```
    salt '*' makeconf.cflags_contains '-pipe'
    ```
```

```python
salt.modules.makeconf.chost_contains(value)
    Verify if CHOST variable contains a value in make.conf
    Return True if value is set for var
    CLI Example:
    ```
    salt '*' makeconf.chost_contains 'x86_64-pc-linux-gnu'
    ```
```

```python
salt.modules.makeconf.cxxflags_contains(value)
    Verify if CXXFLAGS variable contains a value in make.conf
    Return True if value is set for var
    CLI Example:
    ```
salt '*' makeconf.cxxflags_contains '-pipe'

salt.modules.makeconf.emerge_default_opts_contains(value)
Verify if EMERGE_DEFAULT_OPTS variable contains a value in make.conf
Return True if value is set for var
CLI Example:
```
salt '*' makeconf.emerge_default_opts_contains '--jobs'
```

salt.modules.makeconf.features_contains(value)
Verify if FEATURES variable contains a value in make.conf
Return True if value is set for var
CLI Example:
```
salt '*' makeconf.features_contains 'webrsync-gpg'
```

salt.modules.makeconf.gentoo_mirrors_contains(value)
Verify if GENTOO_MIRRORS variable contains a value in make.conf
Return True if value is set for var
CLI Example:
```
salt '*' makeconf.gentoo_mirrors_contains 'http://distfiles.gentoo.org'
```

salt.modules.makeconf.get_cflags()
Get the value of CFLAGS variable in the make.conf
Return the value of the variable or None if the variable is not in the make.conf
CLI Example:
```
salt '*' makeconf.get_cflags
```

salt.modules.makeconf.get_chost()
Get the value of CHOST variable in the make.conf
Return the value of the variable or None if the variable is not in the make.conf
CLI Example:
```
salt '*' makeconf.get_chost
```

salt.modules.makeconf.get_cxxflags()
Get the value of CXXFLAGS variable in the make.conf
Return the value of the variable or None if the variable is not in the make.conf
CLI Example:
```
salt '*' makeconf.get_cxxflags
```

salt.modules.makeconf.get_emerge_default_opts()
Get the value of EMERGE_DEFAULT_OPTS variable in the make.conf
Return the value of the variable or None if the variable is not in the make.conf
CLI Example:
salt '*' makeconf.get_emerge_default_opts

salt.modules.makeconf.get_features()
   Get the value of FEATURES variable in the make.conf
   Return the value of the variable or None if the variable is not in the make.conf
   CLI Example:
   
   salt '*' makeconf.get_features

salt.modules.makeconf.get_gentoo_mirrors()
   Get the value of GENTOO_MIRRORS variable in the make.conf
   Return the value of the variable or None if the variable is not in the make.conf
   CLI Example:
   
   salt '*' makeconf.get_gentoo_mirrors

salt.modules.makeconf.get_makeopts()
   Get the value of MAKEOPTS variable in the make.conf
   Return the value of the variable or None if the variable is not in the make.conf
   CLI Example:
   
   salt '*' makeconf.get_makeopts

salt.modules.makeconf.get_sync()
   Get the value of SYNC variable in the make.conf
   Return the value of the variable or None if the variable is not in the make.conf
   CLI Example:
   
   salt '*' makeconf.get_sync

salt.modules.makeconf.get_var(var)
   Get the value of a variable in make.conf
   Return the value of the variable or None if the variable is not in make.conf
   CLI Example:
   
   salt '*' makeconf.get_var 'LINGUAS'

salt.modules.makeconf.makeopts_contains(value)
   Verify if MAKEOPTS variable contains a value in make.conf
   Return True if value is set for var
   CLI Example:
   
   salt '*' makeconf.makeopts_contains '-j3'

salt.modules.makeconf.remove_var(var)
   Remove a variable from the make.conf
   Return a dict containing the new value for the variable:
   
   {'<variable>': {'old': '<old-value>',
                'new': '<new-value>'}}
CLI Example:
```
salt '*' makeconf.remove_var 'LINGUAS'
```

```
salt.modules.makeconf.set_cflags(value)
Set the CFLAGS variable
Return a dict containing the new value for variable:
```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:
```
salt '*' makeconf.set_cflags '-march=native -O2 -pipe'
```

```
salt.modules.makeconf.set_chost(value)
Set the CHOST variable
Return a dict containing the new value for variable:
```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:
```
salt '*' makeconf.set_chost 'x86_64-pc-linux-gnu'
```

```
salt.modules.makeconf.set_cxxflags(value)
Set the CXXFLAGS variable
Return a dict containing the new value for variable:
```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:
```
salt '*' makeconf.set_cxxflags '-march=native -O2 -pipe'
```

```
salt.modules.makeconf.set_emerge_default_opts(value)
Set the EMERGE_DEFAULT_OPTS variable
Return a dict containing the new value for variable:
```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:
```
salt '*' makeconf.set_emerge_default_opts '--jobs'
```

```
salt.modules.makeconf.set_gentoo_mirrors(value)
Set the GENTOO_MIRRORS variable
Return a dict containing the new value for variable:
```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:
salt '*' makeconf.set_gentoo_mirrors 'http://distfiles.gentoo.org'  

```python
salt.modules.makeconf.set_makeopts(value)
    Set the MAKEOPTS variable
    Return a dict containing the new value for variable:
    ```
    ```json
    {'<variable>': {'old': '<old-value>',
                    'new': '<new-value>'}}
    ```
    
    CLI Example:
    ```bash
    salt '*' makeconf.set_makeopts '-j3'
    ```

salt.modules.makeconf.set_sync(value)
    Set the SYNC variable
    Return a dict containing the new value for variable:
    ```
    ```json
    {'<variable>': {'old': '<old-value>',
                    'new': '<new-value>'}}
    ```
    
    CLI Example:
    ```bash
    salt '*' makeconf.set_sync 'rsync://rsync.namerica.gentoo.org/gentoo-portage'
    ```

salt.modules.makeconf.set_var(var, value)
    Set a variable in the make.conf
    Return a dict containing the new value for variable:
    ```
    ```json
    {'<variable>': {'old': '<old-value>',
                    'new': '<new-value>'}}
    ```
    
    CLI Example:
    ```bash
    salt '*' makeconf.set_var 'LINGUAS' 'en'
    ```

salt.modules.makeconf.sync_contains(value)
    Verify if SYNC variable contains a value in make.conf
    Return True if value is set for var
    CLI Example:
    ```bash
    salt '*' makeconf.sync_contains 'rsync://rsync.namerica.gentoo.org/gentoo-portage'
    ```

salt.modules.makeconf.trim_cflags(value)
    Remove a value from CFLAGS variable in the make.conf
    Return a dict containing the new value for variable:
    ```
    ```json
    {'<variable>': {'old': '<old-value>',
                    'new': '<new-value>'}}
    ```
    
    CLI Example:
    ```bash
    salt '*' makeconf.trim_cflags '-pipe'
    ```

salt.modules.makeconf.trim_cxxflags(value)
    Remove a value from CXXFLAGS variable in the make.conf
Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:

```
salt '*' makeconf.trim_cxxflags '-pipe'
```

`salt.modules.makeconf.trim_emerge_default_opts(value)`
Remove a value from EMERGE_DEFAULT_OPTS variable in the make.conf

Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:

```
salt '*' makeconf.trim_emerge_default_opts '--jobs'
```

`salt.modules.makeconf.trim_features(value)`
Remove a value from FEATURES variable in the make.conf

Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:

```
salt '*' makeconf.trim_features 'webrsync-gpg'
```

`salt.modules.makeconf.trim_gentoo_mirrors(value)`
Remove a value from GENTOO_MIRRORS variable in the make.conf

Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:

```
salt '*' makeconf.trim_gentoo_mirrors 'http://distfiles.gentoo.org'
```

`salt.modules.makeconf.trim_makeopts(value)`
Remove a value from MAKEOPTS variable in the make.conf

Return a dict containing the new value for variable:

```
{'<variable>': {'old': '<old-value>', 'new': '<new-value>'}}
```

CLI Example:

```
salt '*' makeconf.trim_makeopts '-j3'
```

`salt.modules.makeconf.trim_var(var, value)`
Remove a value from a variable in the make.conf

Return a dict containing the new value for variable:
{'<variable>': {'old': '<old-value>',
    'new': '<new-value>'}}

CLI Example:
salt '*' makeconf.trim_var 'LINGUAS' 'en'

salt.modules.makeconf.var_contains(var, value)
Verify if variable contains a value in make.conf
Return True if value is set for var
CLI Example:
salt '*' makeconf.var_contains 'LINGUAS' 'en'

31.16.144 salt.modules.match

The match module allows for match routines to be run and determine target specs
salt.modules.match.compound(tgt, minion_id=None)
Return True if the minion ID matches the given compound target

minion_id Specify the minion ID to match against the target expression
  New in version 2014.7.0.
CLI Example:
salt '*' match.compound 'L@cheese,foo and *'

salt.modules.match.data(tgt)
Return True if the minion matches the given data target
CLI Example:
salt '*' match.data 'spam:eggs'

salt.modules.match.filter_by(lookup, expr_form='compound', minion_id=None)
Return the first match in a dictionary of target patterns
  New in version 2014.7.0.
CLI Example:
salt '*' match.filter_by '{foo*: Foo!, bar*: Bar!}' minion_id=bar03

Pillar Example:
{
    {% set roles = salt['match.filter_by']({'
        'web*': ['app', 'caching'],
        'db*': ['db'],
    }) %}
}

salt.modules.match.glob(tgt, minion_id=None)
Return True if the minion ID matches the given glob target

minion_id Specify the minion ID to match against the target expression
  New in version 2014.7.0.
CLI Example:

```
salt '*' match.glob '*'  
```

`salt.modules.match.grain(tgt, delimiter=':')`
Return True if the minion matches the given grain target. The `delimiter` argument can be used to specify a different delimiter.

CLI Example:

```
salt '*' match.grain 'os:Ubuntu'
salt '*' match.grain 'ipv6|2001:db8::ff00:42:8329' delimiter='|'
```

- `delimiter` Specify an alternate delimiter to use when traversing a nested dict
  - New in version 2014.7.0.
- `delim` Specify an alternate delimiter to use when traversing a nested dict
  - New in version 0.16.4.
  - Deprecated since version 2015.8.0.

`salt.modules.match.grain_pcre(tgt, delimiter=':')`
Return True if the minion matches the given grain_pcre target. The `delimiter` argument can be used to specify a different delimiter.

CLI Example:

```
salt '*' match.grain_pcre 'os:Fedo.*'
salt '*' match.grain_pcre 'ipv6|2001:.*' delimiter='|'
```

- `delimiter` Specify an alternate delimiter to use when traversing a nested dict
  - New in version 2014.7.0.
- `delim` Specify an alternate delimiter to use when traversing a nested dict
  - New in version 0.16.4.
  - Deprecated since version 2015.8.0.

`salt.modules.match.ipcidr(tgt)`
Return True if the minion matches the given ipcidr target

CLI Example:

```
salt '*' match.ipcidr '192.168.44.0/24'
```

delimiter Pillar Example:

```
'172.16.0.0/12':
  - match: ipcidr
  - nodeclass: internal
```

`salt.modules.match.list(tgt, minion_id=None)`
Return True if the minion ID matches the given list target

- `minion_id` Specify the minion ID to match against the target expression
  - New in version 2014.7.0.
CLI Example:

```bash
salt '*' match.list 'server1,server2'
```

salt.modules.match.pcre(tgt, minion_id=None)

Return True if the minion ID matches the given pcre target

- `minion_id`: Specify the minion ID to match against the target expression

  New in version 2014.7.0.

CLI Example:

```bash
salt '*' match.pcre '.*'
```

salt.modules.match.pillar(tgt, delimiter=': ')

Return True if the minion matches the given pillar target. The `delimiter` argument can be used to specify a different delimiter.

CLI Example:

```bash
salt '*' match.pillar 'cheese:foo'

salt '*' match.pillar 'clone_url|https://github.com/saltstack/salt.git' delimiter='|'
```

- `delimiter`: Specify an alternate delimiter to use when traversing a nested dict

  New in version 2014.7.0.

- `delim`: Specify an alternate delimiter to use when traversing a nested dict

  New in version 0.16.4.

  Deprecated since version 2015.8.0.

salt.modules.match.pillar_pcre(tgt, delimiter=': ')

Return True if the minion matches the given pillar_pcre target. The `delimiter` argument can be used to specify a different delimiter.

CLI Example:

```bash
salt '*' match.pillar_pcre 'cheese:(swiss|american)'

salt '*' match.pillar_pcre 'clone_url|https://github\.com/.*\.git' delimiter='|'
```

- `delimiter`: Specify an alternate delimiter to use when traversing a nested dict

  New in version 2014.7.0.

- `delim`: Specify an alternate delimiter to use when traversing a nested dict

  New in version 0.16.4.

  Deprecated since version 2015.8.0.

31.16.145 salt.modules.mdadm

Salt module to manage RAID arrays with mdadm

salt.modules.mdadm.assemble(name, devices, test_mode=False, **kwargs)

Assemble a RAID device.

CLI Examples:
raid.assemble

### Parameters

- **name**: The name of the array to assemble.
- **devices**: The list of devices comprising the array to assemble.
- **kwargs**: Optional arguments to be passed to mdadm.

### Returns

- **test_mode=True**: Prints out the full command.
- **test_mode=False (Default)**: Executes command on the host(s) and prints out the mdadm output.

For more info, read the `mdadm` manpage.

```python
salt.modules.mdadm.create(name, level, devices, metadata='default', test_mode=False, **kwargs)
```

Create a RAID device.

Changed in version 2014.7.0.

**Warning**: Use with CAUTION, as this function can be very destructive if not used properly!

### CLI Examples:

```bash
salt '*' raid.create /dev/md0 level=1 chunk=256 devices="['/dev/xvdd', '/dev/xvde']" test_mode=True
```

Note: Adding `test_mode=True` as an argument will print out the mdadm command that would have been run.

### Parameters

- **name**: The name of the array to create.
- **level**: The RAID level to use when creating the raid.
- **devices**: A list of devices used to build the array.
- **metadata**: Version of metadata to use when creating the array.
- **kwargs**: Optional arguments to be passed to mdadm.

### Returns

- **test_mode=True**: Prints out the full command.
- **test_mode=False (Default)**: Executes command on remote the host(s) and Prints out the mdadm output.

Note: It takes time to create a RAID array. You can check the progress in `resync_status:` field of the results from the following command:

```bash
salt '*' raid.detail /dev/md0
```

For more info, read the `mdadm(8)` manpage.
salt.modules.mdadm.destroy(device)
    Destroy a RAID device.
    WARNING: This will zero the superblock of all members of the RAID array.
    CLI Example:
    ```
    salt '*' raid.destroy /dev/md0
    ```

salt.modules.mdadm.detail(device='/dev/md0')
    Show detail for a specified RAID device
    CLI Example:
    ```
    salt '*' raid.detail '/dev/md0'
    ```

salt.modules.mdadm.list()
    List the RAID devices.
    CLI Example:
    ```
    salt '*' raid.list
    ```

salt.modules.mdadm.save_config()
    Save RAID configuration to config file.
    Same as: mdadm --detail --scan >> /etc/mdadm/mdadm.conf
    Fixes this issue with Ubuntu REF: http://askubuntu.com/questions/209702/why-is-my-raid-dev-md1-showing-up-as-dev-md126-is-mdadm-conf-being-ignored
    CLI Example:
    ```
    salt '*' raid.save_config
    ```

salt.modules.mdadm.stop()
    Shut down all arrays that can be shut down (i.e. are not currently in use).
    CLI Example:
    ```
    salt '*' raid.stop
    ```

31.16.146 salt.modules.memcached

Module for Management of Memcached Keys
New in version 2014.1.0.

salt.modules.memcached.add(key, value, host='127.0.0.1', port=11211, time=0, min_compress_len=0)
    Add a key to the memcached server, but only if it does not exist. Returns False if the key already exists.
    CLI Example:
    ```
    salt '*' memcached.add <key> <value>
    ```

salt.modules.memcached.decrement(key, delta=1, host='127.0.0.1', port=11211)
    Decrement the value of a key
    CLI Example:
    ```
    salt '*' memcached.decrement <key>
    ```
    ```
    salt '*' memcached.decrement <key> 2
    ```

31.16. Full list of builtin execution modules
salt.modules.memcached.delete(key, host='127.0.0.1', port=11211, time=0)
Delete a key from memcache server
   CLI Example:
   
   salt '*' memcached.delete <key>

salt.modules.memcached.get(key, host='127.0.0.1', port=11211)
Retrieve value for a key
   CLI Example:
   
   salt '*' memcached.get <key>

salt.modules.memcached.increment(key, delta=1, host='127.0.0.1', port=11211)
Increment the value of a key
   CLI Example:
   
   salt '*' memcached.increment <key>
salt '*' memcached.increment <key> 2

salt.modules.memcached.replace(key, value, host='127.0.0.1', port=11211, time=0, min_compress_len=0)
Replace a key on the memcached server. This only succeeds if the key already exists. This is the opposite of memcached.add
   CLI Example:
   
   salt '*' memcached.replace <key> <value>

salt.modules.memcached.set(key, value, host='127.0.0.1', port=11211, time=0, min_compress_len=0)
Set a key on the memcached server, overwriting the value if it exists.
   CLI Example:
   
   salt '*' memcached.set <key> <value>

salt.modules.memcached.status(host='127.0.0.1', port=11211)
Get memcached status
   CLI Example:
   
   salt '*' memcached.status

31.16.147 salt.modules.mine
The function cache system allows for data to be stored on the master so it can be easily read by other minions

salt.modules.mine.delete(fun)
Remove specific function contents of minion. Returns True on success.
   CLI Example:
   
   salt '*' mine.delete 'network.interfaces'

salt.modules.mine.flush()
Remove all mine contents of minion. Returns True on success.
   CLI Example:
salt '/*' mine.flush

salt.modules.mine.get(tgt, fun, expr_form='glob')
Get data from the mine based on the target, function and expr_form

Targets can be matched based on any standard matching system that can be matched on the master via these keywords:

- glob
- pcre
- grain
- grain_pcre
- compound
- pillar
- pillar_pcre

Note that all pillar matches, whether using the compound matching system or the pillar matching system, will be exact matches, with globbing disabled.

CLI Example:

salt '/*' mine.get '/*' network.interfaces
salt '/*' mine.get 'os:Fedora' network.interfaces grain
salt '/*' mine.get 'os:Fedora and S@192.168.5.0/24' network.ipaddrs compound

salt.modules.mine.get_docker(interfaces=None, cidrs=None)
Get all mine data for `docker.get_containers' and run an aggregation routine. The `interfaces' parameter allows for specifying which network interfaces to select ip addresses from. The `cidrs' parameter allows for specifying a list of cidrs which the ip address must match.

CLI Example:

salt '/*' mine.get_docker
salt '/*' mine.get_docker interfaces='eth0'
salt '/*' mine.get_docker interfaces=['eth0', 'eth1']
salt '/*' mine.get_docker cidrs='107.170.147.0/24'
salt '/*' mine.get_docker cidrs=['107.170.147.0/24', '172.17.42.0/24']
salt '/*' mine.get_docker interfaces=['eth0', 'eth1'] cidrs=['107.170.147.0/24', '172.17.42.0/24']

salt.modules.mine.send(func, *args, **kwargs)
Send a specific function to the mine.

CLI Example:

salt '/*' mine.send network.ip_addrs eth0
salt '/*' mine.send eth0_ip_addrs mine_function=network.ip_addrs eth0

salt.modules.mine.update(clear=False)
Execute the configured functions and send the data back up to the master. The functions to be executed are merged from the master config, pillar and minion config under the option `function_cache':

mine_functions:
  network.ip_addrs:
    - eth0
disk.usage: []

The function cache will be populated with information from executing these functions.

CLI Example:
31.16.148 salt.modules.mod_random

New in version 2014.7.0.
Provides access to randomness generators.

salt.modules.mod_random.get_str(length=20)
New in version 2014.7.0.
Returns a random string of the specified length.
length  [20] Any valid number of bytes.

CLI Example:
```
salt '*' random.get_str 128
```

salt.modules.mod_random.hash(value, algorithm='sha512')
New in version 2014.7.0.
Encodes a value with the specified encoder.
value  The value to be hashed.
algorithm  [sha512] The algorithm to use. May be any valid algorithm supported by hashlib.

CLI Example:
```
salt '*' random.hash 'I am a string' md5
```

salt.modules.mod_random.rand_int(start=1, end=10)
Returns a random integer number between the start and end number.
start  [1] Any valid integer number
end  [10] Any valid integer number

CLI Example:
```
salt '*' random.rand_int 1 10
```

salt.modules.mod_random.seed(range=10, hash=None)
Returns a random number within a range. Optional hash argument can be any hashable object. If hash is omitted or None, the id of the minion is used.
hash: None  Any hashable object.
range: 10  Any valid integer number

CLI Example:
```
salt '*' random.seed 10 hash=None
```

salt.modules.mod_random.shadow_hash(crypt_salt=None, password=None, algorithm='sha512')
Generates a salted hash suitable for /etc/shadow.
crypt_salt  [None] Salt to be used in the generation of the hash. If one is not provided, a random salt will be generated.
password  [None] Value to be salted and hashed. If one is not provided, a random password will be generated.
algorithm  [sha512] Hash algorithm to use.
CLI Example:

```python
salt '*' random.shadow_hash 'My5alt' 'MyP@sswd' md5
```

```python
salt.modules.mod_random.str_encode(value, encoder='base64')
```

New in version 2014.7.0.

```
value: The value to be encoded.
encoder: [base64] The encoder to use on the subsequent string.
```

CLI Example:

```python
salt '*' random.str_encode 'I am a new string' base64
```

### 31.16.149 salt.modules.modjk


Below is an example of the configuration needed for this module. This configuration data can be placed either in *grains* or *pillar*.

If using grains, this can be accomplished *statically* or via a *grain module*.

If using pillar, the yaml configuration can be placed directly into a pillar SLS file, making this both the easier and more dynamic method of configuring this module.

```yaml
modjk:
  default:
    url: http://localhost/jkstatus
    user: modjk
    pass: secret
    realm: authentication realm for digest passwords
    timeout: 5
  otherVhost:
    url: http://otherVhost/jkstatus
    user: modjk
    pass: secret2
    realm: authentication realm2 for digest passwords
    timeout: 600
```

```python
salt.modules.modjk.bulk_activate(workers, lb, profile='default')
```

Activate all the given workers in the specific load balancer

CLI Examples:

```python
salt '*' modjk.bulk_activate node1,node2,node3 loadbalancer1
salt '*' modjk.bulk_activate node1,node2,node3 loadbalancer1 other-profile
```

```python
salt '*' modjk.bulk_activate ["node1","node2","node3"] loadbalancer1
salt '*' modjk.bulk_activate ["node1","node2","node3"] loadbalancer1 other-profile
```

```python
salt.modules.modjk.bulk_disable(workers, lb, profile='default')
```

Disable all the given workers in the specific load balancer

CLI Examples:

```python
salt '*' modjk.bulk_disable node1,node2,node3 loadbalancer1
salt '*' modjk.bulk_disable node1,node2,node3 loadbalancer1 other-profile
```
salt '*/' modjk.bulk_disable "['node1','node2','node3']" loadbalancer1
salt '*/' modjk.bulk_disable "['node1','node2','node3']" loadbalancer1 other-profile

salt.modules.modjk.bulk_recover(\'workers, lbn, profile='default'\')
Recover all the given workers in the specific load balancer

CLI Examples:
salt '*/' modjk.bulk_recover node1,node2,node3 loadbalancer1
salt '*/' modjk.bulk_recover node1,node2,node3 loadbalancer1 other-profile
salt '*/' modjk.bulk_recover "['node1','node2','node3']" loadbalancer1
salt '*/' modjk.bulk_recover "['node1','node2','node3']" loadbalancer1 other-profile

salt.modules.modjk.bulk_stop(\'workers, lbn, profile='default'\')
Stop all the given workers in the specific load balancer

CLI Examples:
salt '*/' modjk.bulk_stop node1,node2,node3 loadbalancer1
salt '*/' modjk.bulk_stop node1,node2,node3 loadbalancer1 other-profile
salt '*/' modjk.bulk_stop "['node1','node2','node3']" loadbalancer1
salt '*/' modjk.bulk_stop "['node1','node2','node3']" loadbalancer1 other-profile

salt.modules.modjk.dump_config(\'profile='default'\')
Dump the original configuration that was loaded from disk

CLI Examples:
salt '*/' modjk.dump_config
salt '*/' modjk.dump_config other-profile

salt.modules.modjk.get_running(\'profile='default'\')
Get the current running config (not from disk)

CLI Examples:
salt '*/' modjk.get_running
salt '*/' modjk.get_running other-profile

salt.modules.modjk.lb_edit(\'lbn, settings, profile='default'\')
Edit the loadbalancer settings

Note: http://tomcat.apache.org/connectors-doc/reference/status.html Data Parameters for the standard Update Action

CLI Examples:
salt '*/' modjk.lb_edit loadbalancer1 "{"vlr": 1, 'vlt': 60}"s
alt '*/' modjk.lb_edit loadbalancer1 "{"vlr": 1, 'vlt': 60}" other-profile

salt.modules.modjk.list_configured_members(\'lbn, profile='default'\')
Return a list of member workers from the configuration files

CLI Examples:
salt '*/' modjk.list_configured_members loadbalancer1
salt '*/' modjk.list_configured_members loadbalancer1 other-profile
salt.modules.modjk.recover_all(lbn, profile='default')
Set the all the workers in lbn to recover and activate them if they are not

CLI Examples:
```
salt '*' modjk.recover_all loadbalancer1
salt '*' modjk.recover_all loadbalancer1 other-profile
```

salt.modules.modjk.reset_stats(lbn, profile='default')
Reset all runtime statistics for the load balancer

CLI Examples:
```
salt '*' modjk.reset_stats loadbalancer1
salt '*' modjk.reset_stats loadbalancer1 other-profile
```

salt.modules.modjk.version(profile='default')
Return the modjk version

CLI Examples:
```
salt '*' modjk.version
salt '*' modjk.version other-profile
```

salt.modules.modjk.worker_activate(worker, lbn, profile='default')
Set the worker to activate state in the lbn load balancer

CLI Examples:
```
salt '*' modjk.worker_activate node1 loadbalancer1
salt '*' modjk.worker_activate node1 loadbalancer1 other-profile
```

salt.modules.modjk.worker_disable(worker, lbn, profile='default')
Set the worker to disable state in the lbn load balancer

CLI Examples:
```
salt '*' modjk.worker_disable node1 loadbalancer1
salt '*' modjk.worker_disable node1 loadbalancer1 other-profile
```

salt.modules.modjk.worker_edit(worker, lbn, settings, profile='default')
Edit the worker settings


CLI Examples:
```
salt '*' modjk.worker_edit node1 loadbalancer1 '{vwf: 500, vwd: 60}'
salt '*' modjk.worker_edit node1 loadbalancer1 '{vwf: 500, vwd: 60}' other-profile
```

salt.modules.modjk.worker_recover(worker, lbn, profile='default')
Set the worker to recover this module will fail if it is in OK state

CLI Examples:
```
salt '*' modjk.worker_recover node1 loadbalancer1
salt '*' modjk.worker_recover node1 loadbalancer1 other-profile
```

salt.modules.modjk.worker_status(worker, profile='default')
Return the state of the worker

CLI Examples:
salt '*/' modjk.worker_status node1
salt '*/' modjk.worker_status node1 other-profile

salt.modules.modjk.worker_stop(worker, lbn, profile='default')
Set the worker to stopped state in the lbn load balancer

CLI Examples:
salt '*/' modjk.worker_activate node1 loadbalancer1
salt '*/' modjk.worker_activate node1 loadbalancer1 other-profile

salt.modules.modjk.workers(profile='default')
Return a list of member workers and their status

CLI Examples:
salt '*/' modjk.workers
salt '*/' modjk.workers other-profile

31.16.150 salt.modules.mongodb

Module to provide MongoDB functionality to Salt

**configuration** This module uses PyMongo, and accepts configuration details as parameters as well as
configuration settings:

- `mongodb.host`: 'localhost'
- `mongodb.port`: 27017
- `mongodb.user`: ''
- `mongodb.password`: ''

This data can also be passed into pillar. Options passed into opts will overwrite options passed into
pillar.

salt.modules.mongodb.db_exists(name, user=None, password=None, host=None, port=None)
Checks if a database exists in Mongodb

CLI Example:
salt '*/' mongodb.db_exists <name> <user> <password> <host> <port>

salt.modules.mongodb.db_list(user=None, password=None, host=None, port=None)
List all Mongodb databases

CLI Example:
salt '*/' mongodb.db_list <user> <password> <host> <port>

salt.modules.mongodb.db_remove(name, user=None, password=None, host=None, port=None)
Remove a Mongodb database

CLI Example:
salt '*/' mongodb.db_remove <name> <user> <password> <host> <port>

salt.modules.mongodb.find(collection, query=None, user=None, password=None, host=None, port=None, database='admin')
salt.modules.mongodb.insert(objects, collection, user=None, password=None, host=None, port=None, database='admin')

Insert an object or list of objects into a collection

CLI Example:

    salt '*' mongodb.insert '[["foo": "FOO", "bar": "BAR"], {"foo": "BAZ", "bar": "BAM"}]' mycollection

salt.modules.mongodb.remove(collection, query=None, user=None, password=None, host=None, port=None, database='admin', w=1)

Remove an object or list of objects into a collection

CLI Example:

    salt '*' mongodb.remove mycollection '[["foo": "FOO", "bar": "BAR"], {"foo": "BAZ", "bar": "BAM"}]

salt.modules.mongodb.user_create(name, passwd, user=None, password=None, host=None, port=None, database='admin')

Create a Mongodb user

CLI Example:

    salt '*' mongodb.user_create <name> <user> <password> <host> <port> <database>

salt.modules.mongodb.user_exists(name, user=None, password=None, host=None, port=None, database='admin')

Checks if a user exists in Mongodb

CLI Example:

    salt '*' mongodb.user_exists <name> <user> <password> <host> <port> <database>

salt.modules.mongodb.user_grant_roles(name, roles, database, user=None, password=None, host=None, port=None)

Grant one or many roles to a Mongodb user

CLI Examples:

    salt '*' mongodb.user_grant_roles johndoe ['"readWrite"'] dbname admin adminpwd localhost 27017
    salt '*' mongodb.user_grant_roles janedoe ['"role": "readWrite", "db": "dbname"'], {"role": "read", "db": "otherdb"} dbname admin adminpwd localhost 27017

salt.modules.mongodb.user_list(user=None, password=None, host=None, port=None, database='admin')

List users of a Mongodb database

CLI Example:

    salt '*' mongodb.user_list <user> <password> <host> <port> <database>

salt.modules.mongodb.user_remove(name, user=None, password=None, host=None, port=None, database='admin')

Remove a Mongodb user

CLI Example:

    salt '*' mongodb.user_remove <name> <user> <password> <host> <port> <database>

salt.modules.mongodb.user_revoke_roles(name, roles, database, user=None, password=None, host=None, port=None)

Revoke one or many roles to a Mongodb user

CLI Examples:
salt '*' mongodb.user_revoke_roles johndoe "["readWrite"]" dbname admin adminpwd localhost 27017
salt '*' mongodb.user_revoke_roles janedoe "{"role": "readWrite", "db": "dbname"}" dbname admin adminpwd localhost 27017

salt.modules.mongodb.user_roles_exists(name, roles, database, user=None, password=None, host=None, port=None)
Checks if a user of a Mongodbdatabase has specified roles

CLI Examples:
salt '*' mongodb.user_roles_exists johndoe "["readWrite"]" dbname admin adminpwd localhost 27017
salt '*' mongodb.user_roles_exists johndoe "{"role": "readWrite", "db": "dbname"}" dbname admin adminpwd localhost 27017

salt.modules.monit
Monit service module. This module will create a monit typeservicewatcher.
salt.modules.monit.monitor(name)
monitor service via monit

   CLI Example:
   salt '*' monit.monitor <service name>

salt.modules.monit.restart(name)
Restart service via monit

   CLI Example:
   salt '*' monit.restart <service name>

salt.modules.monit.start(name)

   CLI Example:
   salt '*' monit.start <service name>

salt.modules.monit.status(svc_name='')
Display a process status from monit

   CLI Example:
   salt '*' monit.status
salt '*' monit.status <service name>

salt.modules.monit.stop(name)
Stopsservice via monit

   CLI Example:
   salt '*' monit.stop <service name>

salt.modules.monit.summary(svc_name='')
Display a summary from monit

   CLI Example:
   salt '*' monit.summary
salt '*' monit.summary <service name>
s.a1.modules.moni1.unmon1i1or(name)
    Unmonitorserviceviamonit
    CLIExample:
        salt '* monit.unmonitor <service name>

31.16.152 salt.modules.moosefs
ModuleforgatheringandmanaginginformationaboutMooseFS
s.a1.modules.moosefs.dirinfo(path, opts=None)
    ReturninformationonadirectorylocatedontheMoose
    CLIExample:
        salt '*' moosefs.dirinfo /path/to/dir/ [-n][h|H]]

s.a1.modules.moosefs.fileinfo(path)
    ReturninformationonafilelocatedontheMoose
    CLIExample:
        salt '*' moosefs.fileinfo /path/to/dir/

s.a1.modules.moosefs.getgoal(path, opts=None)
    Returngoalsforafileordirectory
    CLIExample:
        salt '*' moosefs.getgoal /path/to/file [-n][h|H]]
        salt '*' moosefs.getgoal /path/to/dir/ [-n][h|H][r]

s.a1.modules.moosefs.mounts()
    ReturnalistofcurrentMooseFSmounts
    CLIExample:
        salt '*' moosefs.mounts

31.16.153 salt.modules.mount
SaltmoduletoManagunixmountsandthefstabfile
s.a1.modules.mount.active(extended=False)
    Listtheactivemounts.
    CLIExample:
        salt '*' mount.active

s.a1.modules.mount.automaster(config='/etc/auto_salt')
    Listthecontentsofthefstab
    CLIExample:
        salt '*' mount.fstab
salt.modules.mount.fstab(config='/etc/fstab')
   List the contents of the fstab
   CLI Example:
   ```python
   salt '*' mount.fstab
   ```

salt.modules.mount.is_fuse_exec(cmd)
   Returns true if the command passed is a fuse mountable application.
   CLI Example:
   ```python
   salt '*' mount.is_fuse_exec sshfs
   ```

salt.modules.mount.is_mounted(name)
   New in version 2014.7.0.
   Provide information if the path is mounted
   CLI Example:
   ```python
   salt '*' mount.is_mounted /mnt/share
   ```

salt.modules.mount.mount(name, device, mkmnt=False, fstype='*', opts='defaults', user=None)
   Mount a device
   CLI Example:
   ```python
   salt '*' mount.mount /mnt/foo /dev/sdz1 True
   ```

salt.modules.mount.remount(name, device, mkmnt=False, fstype='*', opts='defaults', user=None)
   Attempt to remount a device, if the device is not already mounted, mount is called
   CLI Example:
   ```python
   salt '*' mount.remount /mnt/foo /dev/sdz1 True
   ```

salt.modules.mount.rm_automaster(name, device, config='/etc/auto_salt')
   Remove the mount point from the auto_master
   CLI Example:
   ```python
   salt '*' mount.rm_automaster /mnt/foo
   ```

salt.modules.mount.rm_fstab(name, device, config='/etc/fstab')
   Remove the mount point from the fstab
   CLI Example:
   ```python
   salt '*' mount.rm_fstab /mnt/foo
   ```

salt.modules.mount.set_automaster(name, device, fstype, opts='*', config='/etc/auto_salt', test=False, **kwargs)
   Verify that this mount is represented in the auto_salt, change the mount to match the data passed, or add the mount if it is not present.
   CLI Example:
   ```python
   salt '*' mount.set_automaster /mnt/foo /dev/sdz1 ext4
   ```

salt.modules.mount.set_fstab(name, device, fstype, opts='defaults', dump=0, pass_num=0, config='/etc/fstab', test=False, match_on='auto', **kwargs)
   Verify that this mount is represented in the fstab, change the mount to match the data passed, or add the mount if it is not present.
CLI Example:
```
salt '*' mount.set_fstab /mnt/foo /dev/sdz1 ext4
```

```
salt.modules.mount.swapoff(name)
    Deactivate a named swap mount
```

CLI Example:
```
salt '*' mount.swapoff /root/swapfile
```

```
salt.modules.mount.swapon(name, priority=None)
    Activate a swap disk
```

CLI Example:
```
salt '*' mount.swapon /root/swapfile
```

```
salt.modules.mount.swaps()
    Return a dict containing information on active swap
```

CLI Example:
```
salt '*' mount.swaps
```

```
salt.modules.mount.umount(name, device=None, user=None)
    Attempt to umount a device by specifying the directory it is mounted on
```

CLI Example:
```
salt '*' mount.umount /mnt/foo
```

```
salt '*' mount.umount /mnt/foo /dev/xvdc1
```

---

31.16.154 salt.modules.mssql

Module to provide MS SQL Server compatibility to salt.

**depends**
- FreeTDS
- pymssql Python module

**configuration** In order to connect to MS SQL Server, certain configuration is required in minion configs/pillars on the relevant minions. Some sample pillars might look like:

```
mssql.server: 'localhost'
mssql.port: 1433
mssql.user: 'sysdba'
mssql.password: 'Some preferable complex password'
mssql.database: ''
```

The default for the port is `1433` and for the database is `''` (empty string); in most cases they can be left at the default setting. Options that are directly passed into functions will overwrite options from configs or pillars.
<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>CLI Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt.modules.mssql.db_exists(database_name, **kwargs)</td>
<td>Find if a specific database exists on the MS SQL server.</td>
<td><code>salt minion mssql.db_exists database_name='DBNAME'</code></td>
</tr>
<tr>
<td>salt.modules.mssql.db_list(**kwargs)</td>
<td>Return the database list created on a MS SQL server.</td>
<td><code>salt minion mssql.db_list</code></td>
</tr>
<tr>
<td>salt.modules.mssql.db_remove(database_name, **kwargs)</td>
<td>Drops a specific database from the MS SQL server. It will not drop any of 'master', 'model', 'msdb' or 'tempdb'.</td>
<td><code>salt minion mssql.db_remove database_name='DBNAME'</code></td>
</tr>
<tr>
<td>salt.modules.mssql.login_exists(login, **kwargs)</td>
<td>Find if a login exists in the MS SQL server.</td>
<td><code>salt minion mssql.login_exists 'LOGIN'</code></td>
</tr>
<tr>
<td>salt.modules.mssql.role_create(role, owner=None, **kwargs)</td>
<td>Creates a new database role. If no owner is specified, the role will be owned by the user that executes CREATE ROLE, which is the user argument or mssql.user option.</td>
<td><code>salt minion mssql.role_create role=product01 owner=sysdba</code></td>
</tr>
<tr>
<td>salt.modules.mssql.role_exists(role, **kwargs)</td>
<td>Checks if a role exists.</td>
<td><code>salt minion mssql.role_exists db_owner</code></td>
</tr>
<tr>
<td>salt.modules.mssql.role_list(**kwargs)</td>
<td>Lists database roles.</td>
<td><code>salt minion mssql.role_list</code></td>
</tr>
<tr>
<td>salt.modules.mssql.role_remove(role, **kwargs)</td>
<td>Remove a database role.</td>
<td><code>salt minion mssql.role_remove role=test_role01</code></td>
</tr>
<tr>
<td>salt.modules.mssql.tsql_query(query, **kwargs)</td>
<td>Run a SQL query and return query result as list of tuples, or a list of dictionaries if as_dict was passed, or an empty list if no data is available.</td>
<td><code>salt minion mssql.tsql_query</code></td>
</tr>
</tbody>
</table>
salt minion mssql.tsql_query 'SELECT @@version as version' as_dict=True

salt.modules.mssql.user_create(username, new_login_password=None, **kwargs)
    Creates a new user. If new_login_password is not specified, the user will be created without a login.
    CLI Example:
    salt minion mssql.user_create USERNAME database=DBNAME [new_login_password=PASSWORD]

salt.modules.mssql.user_exists(username, **kwargs)
    Find if an user exists in a specific database on the MS SQL server.
    Note: database argument is mandatory
    CLI Example:
    salt minion mssql.user_exists 'USERNAME' [database='DBNAME']

salt.modules.mssql.user_list(**kwargs)
    Get the user list for a specific database on the MS SQL server.
    CLI Example:
    salt minion mssql.user_list [database='DBNAME']

salt.modules.mssql.user_remove(username, **kwargs)
    Removes an user.
    CLI Example:
    salt minion mssql.user_remove USERNAME database=DBNAME

salt.modules.mssql.version(**kwargs)
    Return the version of a MS SQL server.
    CLI Example:
    salt minion mssql.version

31.16.155 salt.modules.munin

Run munin plugins/checks from salt and format the output as data.

salt.modules.munin.list_plugins()
    List all the munin plugins
    CLI Example:
    salt '*' munin.list_plugins

salt.modules.munin.run(plugins)
    Run one or more named munin plugins
    CLI Example:
    salt '*' munin.run uptime
    salt '*' munin.run uptime,cpu,load,memory

salt.modules.munin.run_all()
    Run all the munin plugins
CLI Example:
```
salt '*' munin.run_all
```

31.16.156 salt.modules.mysql

Module to provide MySQL compatibility to salt.

depends
- MySQLdb Python module

Note: On CentOS 5 (and possibly RHEL 5) both MySQL-python and python26-mysqldb need to be installed.

configuration

In order to connect to MySQL, certain configuration is required in /etc/salt/minion on the relevant minions. Some sample configs might look like:

```
mysql.host: 'localhost'
mysql.port: 3306
mysql.user: 'root'
mysql.pass: ''
mysql.db: 'mysql'
mysql.unix_socket: '/tmp/mysql.sock'
mysql.charset: 'utf8'
```

You can also use a defaults file:
```
mysql.default_file: '/etc/mysql/debian.cnf'
```

Changed in version 2014.1.0: charset connection argument added. This is a MySQL charset, not a python one

Changed in version 0.16.2: Connection arguments from the minion config file can be overridden on the CLI by using the arguments defined here. Additionally, it is now possible to setup a user with no password.

salt.modules.mysql.db_check(name, table=None, **connection_args)

Repairs the full database or just a given table

CLI Example:
```
salt '* mysql.db_check dbname
salt '* mysql.db_check dbname dbtable
```

salt.modules.mysql.db_create(name, character_set=None, collate=None, **connection_args)

Adds a databases to the MySQL server.

name  The name of the database to manage
character_set  The character set, if left empty the MySQL default will be used
collate  The collation, if left empty the MySQL default will be used

CLI Example:
```
salt '* mysql.db_create dbname
salt '* mysql.db_create dbname utf8 utf8_general_ci'
```

salt.modules.mysql.db_exists(name, **connection_args)

Checks if a database exists on the MySQL server.

CLI Example:
salt '(*' mysql.db_exists 'dbname'

salt.modules.mysql.db_list(**connection_args)
    Return a list of databases of a MySQL server using the output from the SHOW DATABASES query.
    CLI Example:
    salt '(*' mysql.db_list

salt.modules.mysql.db_optimize(name, table=none, **connection_args)
    Optimizes the full database or just a given table
    CLI Example:
    salt '(*' mysql.db_optimize dbname

salt.modules.mysql.db_remove(name, **connection_args)
    Removes a databases from the MySQL server.
    CLI Example:
    salt '(*' mysql.db_remove 'dbname'

salt.modules.mysql.db_repair(name, table=none, **connection_args)
    Repairs the full database or just a given table
    CLI Example:
    salt '(*' mysql.db_repair dbname

salt.modules.mysql.db_tables(name, **connection_args)
    Shows the tables in the given MySQL database (if exists)
    CLI Example:
    salt '(*' mysql.db_tables 'database'

salt.modules.mysql.free_slave(**connection_args)
    Frees a slave from its master. This is a WIP, do not use.
    CLI Example:
    salt '(*' mysql.free_slave

salt.modules.mysql.get_master_status(**connection_args)
    Retrieves the master status from the minion.
    Returns:
    {
    'host.domain.com': {
    'Binlog_Do_DB': '','',
    'Binlog_Ignore_DB': '',''
    'File': 'mysql-bin.000021','
    'Position': '107'}
    }
    CLI Example:
    salt '(*' mysql.get_master_status

salt.modules.mysql.get_slave_status(**connection_args)
    Retrieves the slave status from the minion.
    Returns:
CLI Example:
```
salt '*' mysql.get_slave_status
```

salt.modules.mysql.grant_add(grant, database, user, host='localhost', grant_option=False, escape=True, ssl_option=False, **connection_args)

Adds a grant to the MySQL server.

For database, make sure you specify database.table or database.*

CLI Example:
```
salt '*' mysql.grant_add  
SELECT,INSERT,UPDATE,...  'database.*'  'frank'  'localhost'
```

salt.modules.mysql.grant_exists(grant, database, user, host='localhost', grant_option=False, escape=True, **connection_args)

Checks to see if a grant exists in the database

CLI Example:
salt 'mysql.grant_exists' "SELECT,INSERT,UPDATE,...' 'database.*' 'frank' 'localhost'

salt.modules.mysql.grant_revoke(grant, database, user, host='localhost', grant_option=False, escape=True, **connection_args)

Removes a grant from the MySQL server.

CLI Example:
salt '*' mysql.grant_revoke 'SELECT,INSERT,UPDATE' 'database.*' 'frank' 'localhost'

salt.modules.mysql.processlist(**connection_args)
Retrieves the processlist from the MySQL server via `SHOW FULL PROCESSLIST`.

Returns: a list of dicts, with each dict representing a process:

```py
{
    'Command': 'Query',
    'Host': 'localhost',
    'Id': 39,
    'Info': 'SHOW FULL PROCESSLIST',
    'Rows_examined': 0,
    'Rows_read': 1,
    'Rows_sent': 0,
    'State': None,
    'Time': 0,
    'User': 'root',
    'db': 'mysql'
}
```

CLI Example:
salt '*' mysql.processlist

salt.modules.mysql.query(database, query, **connection_args)
Run an arbitrary SQL query and return the results or the number of affected rows.

CLI Example:
salt '*' mysql.query mydb "UPDATE mytable set myfield=1 limit 1"

Return data:

```json
{"query time": {"human": '39.0ms', 'raw': '0.03899'}, 'rows affected': 1L}
```

CLI Example:
salt '*' mysql.query mydb "SELECT id,name,cash from users limit 3"

Return data:

```json
{"columns": ('id', 'name', 'cash'),
 'query time': {"human": '1.0ms', 'raw': '0.001'},
 'results': ((1L, 'User 1', Decimal('110.000000')),
 (2L, 'User 2', Decimal('215.636756')),
 (3L, 'User 3', Decimal('0.040000'))),
 'rows returned': 3L}
```

CLI Example:
salt '*' mysql.query mydb 'INSERT into users values (null,"user 4", 5)'

Return data:

```json
{"query time": {"human": '25.6ms', 'raw': '0.02563'}, 'rows affected': 1L}
```

CLI Example:
salt '*' mysql.query mydb 'DELETE from users where id = 4 limit 1'

Return data:
{'query time': {'human': '39.0ms', 'raw': '0.03899'}, 'rows affected': 1L}

Jinja Example: Run a query on mydb and use row 0, column 0's data.

```{%
  salt['mysql.query']('mydb', 'SELECT info from mytable limit 1')['results'][0][0]
%
```

salt.modules.mysql.quote_identifier(identifier, for_grants=False)

Return an identifier name (column, table, database, etc) escaped for MySQL.

This means surrounded by ```'' character and escaping this character inside. It also means doubling the `%' character for MySQL db internal usage.

**Parameters**

- **identifier** -- the table, column or database identifier
- **for_grants** -- is False by default, when using database names on grant queries you should set it to True to also escape ````` and ```%``` characters as requested by MySQL. Note that these characters should only be escaped when requesting grants on the database level (`my_%db`) but not for table level grants (`my_%db.`foo`)

CLI Example:

```salt '*' mysql.quote_identifier 'foo`bar'
```

salt.modules.mysql.showglobal(**connection_args)**

Retrieves the show global variables from the minion.

**Returns**: show global variables full dict

CLI Example:

```salt '*' mysql.showglobal
```

salt.modules.mysql.showvariables(**connection_args)**

Retrieves the show variables from the minion.

**Returns**: show variables full dict

CLI Example:

```salt '*' mysql.showvariables
```

salt.modules.mysql.slave_lag(**connection_args)**

Return the number of seconds that a slave SQL server is lagging behind the master, if the host is not a slave it will return -1. If the server is configured to be a slave for replication but slave IO is not running then -2 will be returned. If there was an error connecting to the database or checking the slave status, -3 will be returned.

CLI Example:

```salt '*' mysql.slave_lag
```

salt.modules.mysql.status(**connection_args)**

Return the status of a MySQL server using the output from the SHOW STATUS query.

CLI Example:

```salt '*' mysql.status
```

salt.modules.mysql.tokenize_grant(grant)

External wrapper function :param grant: :return: dict

CLI Example:
salt 'localhost' mysql.tokenize_grant

```
GRANT SELECT, INSERT ON testdb.* TO 'testuser'@'localhost'
```

salt.modules.mysql.user_chpass(user, host='localhost', password=None, password_hash=None, allow_passwordless=False, unix_socket=None, **connection_args)

Change password for a MySQL user

host Host for which this user/password combo applies

password The password to set for the new user. Will take precedence over the password_hash option if both are specified.

password_hash The password in hashed form. Be sure to quote the password because YAML doesn’t like the `*`. A password hash can be obtained from the `mysql` command-line client like so:

```
mysql> SELECT PASSWORD('mypass');
+-------------------------------------------+
| PASSWORD('mypass')                     |
+-------------------------------------------+
| *6C8989366EAF75BB670AD8EA7A7FC1176A95CEF4 |
+-------------------------------------------+
1 row in set (0.00 sec)
```

allow_passwordless If True, then password and password_hash can be omitted (or set to None) to permit a passwordless login.

New in version 0.16.2: The allow_passwordless option was added.

CLI Examples:

```
salt 'localhost' mysql.user_chpass franks localhost newpassword
salt 'localhost' mysql.user_chpass franks localhost password_hash='hash'
salt 'localhost' mysql.user_chpass franks localhost allow_passwordless=True
```

salt.modules.mysql.user_create(user, host='localhost', password=None, password_hash=None, allow_passwordless=False, unix_socket=False, **connection_args)

Creates a MySQL user

host Host for which this user/password combo applies

password The password to use for the new user. Will take precedence over the password_hash option if both are specified.

password_hash The password in hashed form. Be sure to quote the password because YAML doesn’t like the `*`. A password hash can be obtained from the `mysql` command-line client like so:

```
mysql> SELECT PASSWORD('mypass');
+-------------------------------------------+
| PASSWORD('mypass')                     |
+-------------------------------------------+
| *6C8989366EAF75BB670AD8EA7A7FC1176A95CEF4 |
+-------------------------------------------+
1 row in set (0.00 sec)
```

allow_passwordless If True, then password and password_hash can be omitted (or set to None) to permit a passwordless login.

unix_socket If True and allow_passwordless is True then will be used unix_socket auth plugin.

New in version 0.16.2: The allow_passwordless option was added.

CLI Examples:
salt '*' mysql.user_create 'username' 'hostname' 'password'
salt '*' mysql.user_create 'username' 'hostname' password_hash='hash'
salt '*' mysql.user_create 'username' 'hostname' allow_passwordless=True

salt.modules.mysql.user_exists(user, host='localhost', password=None, password_hash=None, passwordless=False, **connection_args)

Checks if a user exists on the MySQL server. A login can be checked to see if passwordless login is permitted by omitting password and password_hash, and using passwordless=True.

New in version 0.16.2: The passwordless option was added.

CLI Example:

salt '*' mysql.user_exists 'username' 'hostname' 'password'
salt '*' mysql.user_exists 'username' 'hostname' password_hash='hash'
salt '*' mysql.user_exists 'username' passwordless=True

salt.modules.mysql.user_grants(user, host='localhost', **connection_args)

Shows the grants for the given MySQL user (if it exists)

CLI Example:
	salt '*' mysql.user_grants 'frank' 'localhost'

salt.modules.mysql.user_info(user, host='localhost', **connection_args)

Get full info on a MySQL user

CLI Example:
	salt '*' mysql.user_info root localhost

salt.modules.mysql.user_list(**connection_args)

Return a list of users on a MySQL server

CLI Example:
	salt '*' mysql.user_list

salt.modules.mysql.user_remove(user, host='localhost', **connection_args)

Delete MySQL user

CLI Example:
	salt '*' mysql.user_remove frank localhost

salt.modules.mysql.version(**connection_args)

Return the version of a MySQL server using the output from the SELECT VERSION() query.

CLI Example:
	salt '*' mysql.version

31.16.157 salt.modules.nacl

This module helps include encrypted passwords in pillars, grains and salt state files.

depends libnacl, https://github.com/saltstack/libnacl

This is often useful if you wish to store your pillars in source control or share your pillar data with others that you trust. I don’t advise making your pillars public regardless if they are encrypted or not.
When generating keys and encrypting passwords use --local when using salt-call for extra security. Also consider using just the salt runner nacl when encrypting pillar passwords.

The nacl lib uses 32byte keys, these keys are base64 encoded to make your life more simple. To generate your key or keyfile you can use:

```bash
salt-call --local nacl.keygen keyfile=/root/.nacl
```

Now with your key, you can encrypt some data:

```bash
salt-call --local nacl.enc mypass keyfile=/root/.nacl
DRB7Q6/X5gGSRCTpZyxS6hX05lnlJII34ivbmUlbWj0llUA+uaVyvou3vJ4=
```

To decrypt the data:

```bash
salt-call --local nacl.dec data='DRB7Q6/X5gGSRCTpZyxS6hX05lnlJII34ivbmUlbWj0llUA+uaVyvou3vJ4=' keyfile=/root/.nacl
mypass
```

The following optional configurations can be defined in the minion or master config. Avoid storing the config in pillars!

```bash
cat /etc/salt/master.d/nacl.conf
nacl.config:
  key: None
  keyfile: /root/.nacl
```

When the key is defined in the master config you can use it from the nacl runner:

```bash
salt-run nacl.enc 'myotherpass'
```

Now you can create a pillar with protected data like:

```bash
pillar example:
  user: root
  password: {{ salt.nacl.dec('DRB7Q6/X5gGSRCTpZyxS6hX05lnlJII34ivbmUlbWj0llUA+uaVyvou3vJ4=') }}
```

Or do something interesting with grains like:

```bash
salt-call nacl.enc minionname:dbrole
AL24Z2C50lkReer3DuQTFrNLchLuz3NGIhGjZkLtKRy/b/CksW809yskLwH2AGVLoEXISjAa
```

```bash
salt minionname grains.setval role 'AL24Z2C50lkReer3DuQTFrNLchLuz3NGIhGjZkLtKRy/b/CksW809yskLwH2AGVLoEXISjAa'
```

```bash
{%- set r = grains.get('role') %}
{%- set role = None %}
{%- if r and 'nacl.dec' in salt %}
  {%- set r = salt['nacl.dec'](r, keyfile='/root/.nacl').split(':') %}
  {%- if opts['id'] == r[0] %}
    {%- set role = r[1] %}
  {%- endif %}
{%- endif %}
{%- endif %}
base:
  {%- if role %}
    '{{ opts['id'] }}':
    - {{ role }}
  {%- endif %}
```

```bash
salt.modules.nacl.dec(data, **kwargs)
```
Takes a key generated from nacl.keygen and decrypt some data.

CLI Examples:
salt.call --local nacl.dec pEXHQM6cuaF7A=
salt-call --local nacl.dec data='pEXHQM6cuaF7A=' keyfile=/root/.nacl
salt-call --local nacl.dec data='pEXHQM6cuaF7A=' key='cKEzd4kXsbeCE7/nLTIqXwnUiD1ulg4NoeeYcCFpd9k='

salt.modules.nacl.enc(data, **kwargs)
    Takes a key generated from nacl.keygen and encrypt some data.

CLI Examples:
salt-call --local nacl.enc datatoenc
salt-call --local nacl.enc datatoenc keyfile=/root/.nacl
salt-call --local nacl.enc datatoenc key='cKEzd4kXsbeCE7/nLTIqXwnUiD1ulg4NoeeYcCFpd9k='

salt.modules.nacl.keygen(keyfile=None)
    Use libnacl to generate a private key

CLI Examples:
salt-call --local nacl.keygen
salt-call --local nacl.keygen keyfile=/root/.nacl
salt-call --local --out=newline_values_only nacl.keygen > /root/.nacl

31.16.158 salt.modules.nagios

Run nagios plugins/checks from salt and get the return as data.
salt.modules.nagios.list_plugins()
    List all the nagios plugins

CLI Example:
salt '*' nagios.list_plugins

salt.modules.nagios.retcode(plugin, args='`, key_name=None)
    Run one nagios plugin and return retcode of the execution

CLI Example:
salt '*' nagios.run check_apt
salt '*' nagios.run check_icmp '8.8.8.8'

salt.modules.nagios.retcode_pillar(pillar_name)
    Run one or more nagios plugins from pillar data and get the result of cmd.retcode The pillar have to be in this format:
    
    webserver:
        Ping_google:
            - check_icmp: 8.8.8.8
            - check_icmp: google.com
        Load:
            - check_load: -w 0.8 -c 1
        APT:
            - check_apt

    You must to group different checks(one o more) and always it will return the highest value of all the checks
CLI Example:

```bash
salt '*' nagios.retcode webserver
```

`salt.modules.nagios.run(plugin, args='')`

Run nagios plugin and return all the data execution with `cmd.run`

`salt.modules.nagios.run_all(plugin, args='')`

Run nagios plugin and return all the data execution with `cmd.run_all`

`salt.modules.nagios.run_all_pillar(pillar_name)`

Run one or more nagios plugins from pillar data and get the result of `cmd.run_all` The pillar have to be in this format:

```
-------
webserver:
  Ping_google:
    - check_icmp: 8.8.8.8
    - check_icmp: google.com
  Load:
    - check_load: -w 0.8 -c 1
  APT:
    - check_apt
-------
```

webserver is the role to check, the next keys are the group and the items the check with the arguments if needed

You have to group different checks in a group

CLI Example:

```bash
salt '*' nagios.run webserver
```

`salt.modules.nagios.run_pillar(pillar_name)`

Run one or more nagios plugins from pillar data and get the result of `cmd.run` The pillar have to be in this format:

```
-------
webserver:
  Ping_google:
    - check_icmp: 8.8.8.8
    - check_icmp: google.com
  Load:
    - check_load: -w 0.8 -c 1
  APT:
    - check_apt
-------
```

webserver is the role to check, the next keys are the group and the items the check with the arguments if needed

You have to group different checks in a group

CLI Example:

```bash
salt '*' nagios.run webserver
```

### 31.16.159 salt.modules.nagios_rpc

Check Host & Service status from Nagios via JSON RPC.

31.16. Full list of builtin execution modules
New in version 2015.8.0.

`salt.modules.nagios_rpc.host_status`(*hostname=None, **kwargs*)

Check status of a particular host. By default statuses are returned in a numeric format.

Parameters:

- **hostname** The hostname to check the status of the service in Nagios.
- **numeric** Turn to false in order to return status in text format (‘OK’ instead of 0, ‘Warning’ instead of 1 etc)

Returns status: ‘OK’, ‘Warning’, ‘Critical’ or ‘Unknown’

CLI Example:

```
salt '*' nagios_rpc.host_status hostname=webserver.domain.com
salt '*' nagios_rpc.host_status hostname=webserver.domain.com numeric=False
```

`salt.modules.nagios_rpc.service_status`(*hostname=None, service=None, **kwargs*)

Check status of a particular service on a host on it in Nagios. By default statuses are returned in a numeric format.

Parameters:

- **hostname** The hostname to check the status of the service in Nagios.
- **service** The service to check the status of in Nagios.
- **numeric** Turn to false in order to return status in text format (‘OK’ instead of 0, ‘Warning’ instead of 1 etc)

Returns status: ‘OK’, ‘Warning’, ‘Critical’ or ‘Unknown’

CLI Example:

```
salt '*' nagios_rpc.service_status hostname=webserver.domain.com service='HTTP'
salt '*' nagios_rpc.service_status hostname=webserver.domain.com service='HTTP' numeric=False
```

### 31.16.160 salt.modules.netbsd_sysctl

Module for viewing and modifying sysctl parameters

`salt.modules.netbsd_sysctl.assign(name, value)`

Assign a single sysctl parameter for this minion

CLI Example:

```
salt '*' sysctl.assign net.inet.icmp.icmplim 50
```

`salt.modules.netbsd_sysctl.get(name)`

Return a single sysctl parameter for this minion

CLI Example:

```
salt '*' sysctl.get hw.physmem
```

`salt.modules.netbsd_sysctl.persist(name, value, config='/etc/sysctl.conf')`

Assign and persist a simple sysctl parameter for this minion

CLI Example:
salt 'sysctl.persist net.inet.icmp.icmplim 50

salt.modules.netbsd_sysctl.show(config_file=False)
    Return a list of sysctl parameters for this minion
    CLI Example:
        salt '*' sysctl.show

### 31.16.161 salt.modules.netbsdservice

The service module for NetBSD

salt.modules.netbsdservice.available(name)
    Returns True if the specified service is available, otherwise returns False.
    CLI Example:
        salt '*' service.available sshd

salt.modules.netbsdservice.disable(name, **kwargs)
    Disable the named service to start at boot
    CLI Example:
        salt '*' service.disable <service name>

salt.modules.netbsdservice.disabled(name)
    Return True if the named service is enabled, false otherwise
    CLI Example:
        salt '*' service.disabled <service name>

salt.modules.netbsdservice.enable(name, **kwargs)
    Enable the named service to start at boot
    CLI Example:
        salt '*' service.enable <service name>

salt.modules.netbsdservice.enabled(name, **kwargs)
    Return True if the named service is enabled, false otherwise
    CLI Example:
        salt '*' service.enabled <service name>

salt.modules.netbsdservice.force_reload(name)
    Force-reload the named service
    CLI Example:
        salt '*' service.force_reload <service name>

salt.modules.netbsdservice.get_all()
    Return all available boot services
    CLI Example:
salt '*' service.get_all

salt.modules.netbsdservice.get_disabled()
    Return a set of services that are installed but disabled
    CLI Example:
        salt '*' service.get_disabled

salt.modules.netbsdservice.get_enabled()
    Return a list of service that are enabled on boot
    CLI Example:
        salt '*' service.get_enabled

salt.modules.netbsdservice.missing(name)
    The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.
    CLI Example:
        salt '*' service.missing sshd

salt.modules.netbsdservice.reload(name)
    Reload the named service
    CLI Example:
        salt '*' service.reload <service name>

salt.modules.netbsdservice.restart(name)
    Restart the named service
    CLI Example:
        salt '*' service.restart <service name>

salt.modules.netbsdservice.start(name)
    Start the specified service
    CLI Example:
        salt '*' service.start <service name>

salt.modules.netbsdservice.status(name, sig=None)
    Return the status for a service, returns a bool whether the service is running.
    CLI Example:
        salt '*' service.status <service name>

salt.modules.netbsdservice.stop(name)
    Stop the specified service
    CLI Example:
        salt '*' service.stop <service name>
31.16.162  salt.modules.netscaler

salt.modules.netscaler.server_add(s_name, s_ip, s_state=None, **connection_args)
    Add a server
    Note: The default server state is ENABLED

    CLI Example:
    salt '*' netscaler.server_add 'serverName' 'serverIpAddress'
    salt '*' netscaler.server_add 'serverName' 'serverIpAddress' 'serverState'

salt.modules.netscaler.server_delete(s_name, **connection_args)
    Delete a server

    CLI Example:
    salt '*' netscaler.server_delete 'serverName'

salt.modules.netscaler.server_disable(s_name, **connection_args)
    Disable a server globally

    CLI Example:
    salt '*' netscaler.server_disable 'serverName'

salt.modules.netscaler.server_enable(s_name, **connection_args)
    Enables a server globally

    CLI Example:
    salt '*' netscaler.server_enable 'serverName'

salt.modules.netscaler.server_enabled(s_name, **connection_args)
    Check if a server is enabled globally

    CLI Example:
    salt '*' netscaler.server_enabled 'serverName'

salt.modules.netscaler.server_exists(s_name, ip=None, s_state=None, **connection_args)
    Checks if a server exists

    CLI Example:
    salt '*' netscaler.server_exists 'serverName'

salt.modules.netscaler.server_update(s_name, s_ip, **connection_args)
    Update a server's attributes

    CLI Example:
    salt '*' netscaler.server_update 'serverName' 'serverIP'

salt.modules.netscaler.service_disable(s_name, s_delay=None, **connection_args)
    Disable a service

    CLI Example:
    salt '*' netscaler.service_disable 'serviceName'
    salt '*' netscaler.service_disable 'serviceName' 'delayInSeconds'

salt.modules.netscaler.service_enable(s_name, **connection_args)
    Enable a service
salt.modules.netscaler.service_enable

```
salt '*' netscaler.service_enable 'serviceName'
```

Checks if a service exists

CLI Example:
```
salt '*' netscaler.service_enable 'serviceName'
```

salt.modules.netscaler.service_exists

```
salt.modules.netscaler.service_exists(s_name, **connection_args)
```

Checks if a service exists

CLI Example:
```
salt '*' netscaler.service_exists 'serviceName'
```

salt.modules.netscaler.service_up

```
salt.modules.netscaler.service_up(s_name, **connection_args)
```

Checks if a service is UP

CLI Example:
```
salt '*' netscaler.service_up 'serviceName'
```

salt.modules.netscaler.servicegroup_add

```
salt.modules.netscaler.servicegroup_add(sg_name, sg_type='HTTP', **connection_args)
```

Add a new service group If no service type is specified, HTTP will be used. Most common service types: HTTP, SSL, and SSL_BRIDGE

CLI Example:
```
salt '*' netscaler.servicegroup_add 'serviceGroupName'
salt '*' netscaler.servicegroup_add 'serviceGroupName' 'serviceGroupType'
```

salt.modules.netscaler.servicegroup_delete

```
salt.modules.netscaler.servicegroup_delete(sg_name, **connection_args)
```

Delete a new service group

CLI Example:
```
salt '*' netscaler.servicegroup_delete 'serviceGroupName'
```

salt.modules.netscaler.servicegroup_exists

```
salt.modules.netscaler.servicegroup_exists(sg_name, sg_type=None, **connection_args)
```

Checks if a service group exists

CLI Example:
```
salt '*' netscaler.servicegroup_exists 'serviceGroupName'
```

salt.modules.netscaler.servicegroup_server_add

```
salt.modules.netscaler.servicegroup_server_add(sg_name, s_name, s_port, **connection_args)
```

Add a server:port member to a service group

CLI Example:
```
salt '*' netscaler.servicegroup_server_add 'serviceGroupName' 'serverName' 'serverPort'
```

salt.modules.netscaler.servicegroup_server_delete

```
salt.modules.netscaler.servicegroup_server_delete(sg_name, s_name, s_port, **connection_args)
```

Remove a server:port member from a service group

CLI Example:
```
salt '*' netscaler.servicegroup_server_delete 'serviceGroupName' 'serverName' 'serverPort'
```

salt.modules.netscaler.servicegroup_server_disable

```
salt.modules.netscaler.servicegroup_server_disable(sg_name, s_name, s_port, **connection_args)
```

Disable a server:port member of a service group

CLI Example:
salt '*' netscaler.servicegroup_server_disable 'serviceGroupName' 'serverName' 'serverPort'

salt.modules.netscaler.servicegroup_server_enable(sg_name, s_name, s_port, **connection_args)
   Enable a server:port member of a servicegroup
   CLI Example:
      salt '*' netscaler.servicegroup_server_enable 'serviceGroupName' 'serverName' 'serverPort'

salt.modules.netscaler.servicegroup_server_exists(sg_name, s_name, s_port=None, **connection_args)
   Check if a server:port combination is a member of a servicegroup
   CLI Example:
      salt '*' netscaler.servicegroup_server_exists 'serviceGroupName' 'serverName' 'serverPort'

salt.modules.netscaler.servicegroup_server_up(sg_name, s_name, s_port, **connection_args)
   Check if a server:port combination is in state UP in a servicegroup
   CLI Example:
      salt '*' netscaler.servicegroup_server_up 'serviceGroupName' 'serverName' 'serverPort'

salt.modules.netscaler.vserver_add(v_name, v_ip, v_port, v_type, **connection_args)
   Add a new lb vserver
   CLI Example:
      salt '*' netscaler.vserver_add 'vserverName' 'vserverIP' 'vserverPort' 'vserverType'
      salt '*' netscaler.vserver_add 'alex.patate.chaude.443' '1.2.3.4' '443' 'SSL'

salt.modules.netscaler.vserver_delete(v_name, **connection_args)
   Delete a lb vserver
   CLI Example:
      salt '*' netscaler.vserver_delete 'vserverName'

salt.modules.netscaler.vserver_exists(v_name, v_ip=None, v_port=None, v_type=None, **connection_args)
   Checks if a vserver exists
   CLI Example:
      salt '*' netscaler.vserver_exists 'vserverName'

salt.modules.netscaler.vserver_servicegroup_add(v_name, sg_name, **connection_args)
   Bind a servicegroup to a vserver
   CLI Example:
      salt '*' netscaler.vserver_servicegroup_add 'vserverName' 'serviceGroupName'

salt.modules.netscaler.vserver_servicegroup_delete(v_name, sg_name, **connection_args)
   Unbind a servicegroup from a vserver
   CLI Example:
salt '*' netscaler.vserver_servicegroup_delete 'vserverName' 'serviceGroupName'

```
salt.modules.netscaler.vserver_servicegroup_exists(v_name, sg_name, **connection_args)
```
Checks if a servicegroup is tied to a vserver

CLI Example:
```
salt '*' netscaler.vserver_servicegroup_exists 'vserverName' 'serviceGroupName'
```

```
salt.modules.netscaler.vserver_sslcert_add(v_name, sc_name, **connection_args)
```
Binds a SSL certificate to a vserver

CLI Example:
```
salt '*' netscaler.vserver_sslcert_add 'vserverName' 'sslCertificateName'
```

```
salt.modules.netscaler.vserver_sslcert_delete(v_name, sc_name, **connection_args)
```
Unbinds a SSL certificate from a vserver

CLI Example:
```
salt '*' netscaler.vserver_sslcert_delete 'vserverName' 'sslCertificateName'
```

```
salt.modules.netscaler.vserver_sslcert_exists(v_name, sc_name, **connection_args)
```
Checks if a SSL certificate is tied to a vserver

CLI Example:
```
salt '*' netscaler.vserver_sslcert_exists 'vserverName' 'sslCertificateName'
```

### 31.16.163 salt.modules.network

Module for gathering and managing network information

```
salt.modules.network.active_tcp()
```
Return a dict containing information on all of the running TCP connections

CLI Example:
```
salt '*' network.active_tcp
```

```
salt.modules.network.arp()
```
Return the arp table from the minion

Changed in version 2015.8.0: Added support for SunOS

CLI Example:
```
salt '*' network.arp
```

```
salt.modules.network.calc_net(ip_addr, netmask=None)
```
Returns the CIDR of a subnet based on an IP address (CIDR notation supported) and optional netmask.

CLI Example:
```
salt '*' network.calc_net 172.17.0.5 255.255.255.240
salt '*' network.calc_net 2a02:f6e:a000:80:84d8:8332:7866:4e07/64
```

New in version 2015.8.0.
salt.modules.network.connect(host, port=None, **kwargs)
Test connectivity to a host using a particular port from the minion.
New in version 2014.7.
CLI Example:
```
salt '*' network.connect archlinux.org 80
salt '*' network.connect archlinux.org 80 timeout=3
salt '*' network.connect archlinux.org 80 timeout=3 family=ipv4
salt '*' network.connect google-public-dns-a.google.com port=53 proto=udp timeout=3
```
salt.modules.network.default_route(family=None)
Return default route(s) from routing table
Changed in version 2015.8.0: Added support for SunOS (Solaris 10, Illumos, SmartOS)
CLI Example:
```
salt '*' network.default_route
```
salt.modules.network.dig(host)
Performs a DNS lookup with dig
CLI Example:
```
salt '*' network.dig archlinux.org
```
salt.modules.network.get_bufsize(iface)
Return network buffer sizes as a dict
CLI Example:
```
salt '*' network.getbufsize
```
salt.modules.network.get_hostname()
Get hostname
CLI Example:
```
salt '*' network.get_hostname
```
salt.modules.network.get_route(ip)
Return routing information for given destination ip
New in version 2015.5.3.
Changed in version 2015.8.0: Added support for SunOS (Solaris 10, Illumos, SmartOS) Added support for OpenBSD
CLI Example:
```
salt '*' network.get_route 10.10.10.10
```
salt.modules.network.hw_addr(iface)
Return the hardware address (a.k.a. MAC address) for a given interface
CLI Example:
salt '*' network.hw_addr eth0

```
salt.modules.network.hwaddr(_iface)
    Return the hardware address (a.k.a. MAC address) for a given interface
    CLI Example:
    salt '*' network.hw_addr eth0
```

salt.modules.network.in_subnet(_cidr)
    Returns True if host is within specified subnet, otherwise False.
    CLI Example:
    salt '*' network.in_subnet 10.0.0.0/16

salt.modules.network.interface(_iface)
    Return the inet address for a given interface
    New in version 2014.7.
    CLI Example:
    salt '*' network.interface eth0

salt.modules.network.interface_ip(_iface)
    Return the inet address for a given interface
    New in version 2014.7.
    CLI Example:
    salt '*' network.interface_ip eth0

salt.modules.network.interfaces()
    Return a dictionary of information about all the interfaces on the minion
    CLI Example:
    salt '*' network.interfaces

salt.modules.network.ip_addrs(_interface=None, include_loopback=False, _cidr=None)
    Returns a list of IPv4 addresses assigned to the host. 127.0.0.1 is ignored, unless `include_loopback=True` is indicated. If `interface` is provided, then only IP addresses from that interface will be returned. Providing a CIDR via `cidr="10.0.0.0/8"` will return only the addresses which are within that subnet.
    CLI Example:
    salt '*' network.ip_addrs

salt.modules.network.ip_addrs6(_interface=None, include_loopback=False, _cidr=None)
    Returns a list of IPv6 addresses assigned to the host. ::1 is ignored, unless `include_loopback=True` is indicated. If `interface` is provided, then only IP addresses from that interface will be returned. Providing a CIDR via `cidr="2000::/3"` will return only the addresses which are within that subnet.
    CLI Example:
    salt '*' network.ip_addrs6

salt.modules.network.ip_in_subnet(_ip_addr, _cidr)
    Returns True if given IP is within specified subnet, otherwise False.
    CLI Example:
salt.modules.network.ip_addrs(interface=None, include_loopback=False, cidr=None)

Returns a list of IPv4 addresses assigned to the host. 127.0.0.1 is ignored, unless `include_loopback=True' is indicated. If `interface' is provided, then only IP addresses from that interface will be returned. Providing a CIDR via `cidr="10.0.0.0/8"' will return only the addresses which are within that subnet.

CLI Example:
```
salt '*' network.ip_addrs
```

salt.modules.network.ip_addrs6(interface=None, include_loopback=False, cidr=None)

Returns a list of IPv6 addresses assigned to the host. ::1 is ignored, unless `include_loopback=True' is indicated. If `interface' is provided, then only IP addresses from that interface will be returned. Providing a CIDR via `cidr="2000::/3"' will return only the addresses which are within that subnet.

CLI Example:
```
salt '*' network.ip_addrs6
```

salt.modules.network.is_loopback(ip_addr)

Check if the given IP address is a loopback address

New in version 2014.7.0.

Changed in version 2015.8.0: IPv6 support

CLI Example:
```
salt '*' network.is_loopback 127.0.0.1
```

salt.modules.network.is_private(ip_addr)

Check if the given IP address is a private address

New in version 2014.7.0.

Changed in version 2015.8.0: IPv6 support

CLI Example:
```
salt '*' network.is_private 10.0.0.3
```

salt.modules.network.mod_bufsize(iface, *args, **kwargs)

Modify network interface buffers (currently linux only)

CLI Example:
```
salt '*' network.getBuffers
```

salt.modules.network.mod_hostname(hostname)

Modify hostname

Changed in version 2015.8.0: Added support for SunOS (Solaris 10, Illumos, SmartOS)

CLI Example:
```
salt '*' network.mod_hostname master.saltstack.com
```

salt.modules.network.netstat()

Return information on open ports and states

Note: On BSD minions, the output contains PID info (where available) for each netstat entry, fetched from
sockstat/fstat output.

Changed in version 2014.1.4: Added support for OpenBSD, FreeBSD, and NetBSD
Changed in version 2015.8.0: Added support for SunOS

CLI Example:
```
salt '*' network.netstat
```

```
salt.modules.network.ping( host, timeout=False, return_boolean=False)
```
Performs an ICMP ping to a host

Changed in version 2015.8.0: Added support for SunOS

CLI Example:
```
salt '*' network.ping archlinux.org
```

New in version 2015.5.0.
Return a True or False instead of ping output.

```
salt '*' network.ping archlinux.org return_boolean=True
```
Set the time to wait for a response in seconds.
```
salt '*' network.ping archlinux.org timeout=3
```

```
salt.modules.network.reverse_ip(ip_addr)
```
Returns the reversed IP address

Changed in version 2015.8.0: IPv6 support

CLI Example:
```
salt '*' network.reverse_ip 172.17.0.4
```

```
salt.modules.network.routes(family=None)
```
Return currently configured routes from routing table

Changed in version 2015.8.0: Added support for SunOS (Solaris 10, Illumos, SmartOS)

CLI Example:
```
salt '*' network.routes
```

```
salt.modules.network.subnets(interfaces=None)
```
Returns a list of IPv4 subnets to which the host belongs

CLI Example:
```
salt '*' network.subnets
salt '*' network.subnets interfaces=eth1
```

```
salt.modules.network.subnets6()
```
Returns a list of IPv6 subnets to which the host belongs

CLI Example:
```
salt '*' network.subnets
```
salt.modules.network.traceroute(host)
Perform a traceroute to a 3rd party host

Changed in version 2015.8.0: Added support for SunOS

CLI Example:

```
salt '*' network.traceroute archlinux.org
```

salt.modules.network.wol(mac, bcast='255.255.255.255', destport=9)
Send Wake On Lan packet to a host

CLI Example:

```
salt '*' network.wol 08-00-27-13-69-77
salt '*' network.wol 080027136977 255.255.255.255 7
salt '*' network.wol 08:00:27:13:69:77 255.255.255.255 7
```

31.16.164 salt.modules.neutron

Module for handling OpenStack Neutron calls

depends

- neutronclient Python module

configuration This module is not usable until the user, password, tenant, and auth URL are specified either in a pillar or in the minion's config file. For example:

```
keystone.user: 'admin'
keystone.password: 'password'
keystone.tenant: 'admin'
keystone.auth_url: 'http://127.0.0.1:5000/v2.0/
keystone.region_name: 'RegionOne'
keystone.service_type: 'network'
```

If configuration for multiple OpenStack accounts is required, they can be set up as different configuration profiles: For example:

```
openstack1:
  keystone.user: 'admin'
  keystone.password: 'password'
  keystone.tenant: 'admin'
  keystone.auth_url: 'http://127.0.0.1:5000/v2.0/
  keystone.region_name: 'RegionOne'
  keystone.service_type: 'network'

openstack2:
  keystone.user: 'admin'
  keystone.password: 'password'
  keystone.tenant: 'admin'
  keystone.auth_url: 'http://127.0.0.2:5000/v2.0/
  keystone.region_name: 'RegionOne'
  keystone.service_type: 'network'
```

With this configuration in place, any of the neutron functions can make use of a configuration profile by declaring it explicitly. For example:

```
salt '*' neutron.network_list profile=openstack1
```
salt.modules.neutron.add_gateway_router(router, ext_network, profile=None)
    Adds an external network gateway to the specified router

    CLI Example:
    ```
salt '*' neutron.add_gateway_router router-name ext-network-name
    ```

    Parameters
    • **router** -- ID or name of the router
    • **ext_network** -- ID or name of the external network the gateway
    • **profile** -- Profile to build on (Optional)

    Returns  Added Gateway router information

salt.modules.neutron.add_interface_router(router, subnet, profile=None)
    Adds an internal network interface to the specified router

    CLI Example:
    ```
salt '*' neutron.add_interface_router router-name subnet-name
    ```

    Parameters
    • **router** -- ID or name of the router
    • **subnet** -- ID or name of the subnet
    • **profile** -- Profile to build on (Optional)

    Returns  Added interface information

salt.modules.neutron.create_floatingip(floating_network, port=None, profile=None)
    Creates a new floatingIP

    CLI Example:
    ```
salt '*' neutron.create_floatingip network-name port-name
    ```

    Parameters
    • **floating_network** -- Network name or ID to allocate floatingIP from
    • **port** -- Of the port to be associated with the floatingIP (Optional)
    • **profile** -- Profile to build on (Optional)

    Returns  Created floatingIP information

salt.modules.neutron.create_ikepolicy(name, profile=None, **kwargs)
    Creates a new IKEPolicy

    CLI Example:
    ```
salt '*' neutron.create_ikepolicy ikepolicy-name
    phase1_negotiation_mode=main auth_algorithm=sha1
    encryption_algorithm=aes-128 pfs=group5
    ```

    Parameters
    • **name** -- Name of the IKE policy
• **phase1_negotiation_mode** -- IKE Phase1 negotiation mode in lowercase, default: main (Optional)

• **auth_algorithm** -- Authentication algorithm in lowercase, default: sha1 (Optional)

• **encryption_algorithm** -- Encryption algorithm in lowercase. default:aes-128 (Optional)

• **pfs** -- Prefect Forward Security in lowercase, default: group5 (Optional)

• **units** -- IKE lifetime attribute. default: seconds (Optional)

• **value** -- IKE lifetime attribute. default: 3600 (Optional)

• **ike_version** -- IKE version in lowercase, default: v1 (Optional)

• **profile** -- Profile to build on (Optional)

• **kwargs** --

Returns
Created IKE policy information

```
salt.modules.neutron.create_ipsec_site_connection(name, ipsecpolicy, ikepolicy, vpnservice, peer_cidrs, peer_address, peer_id, psk, admin_state_up=True, profile=None, **kwargs)
```

Creates a new IPsecSiteConnection

CLI Example:

```
salt '*' neutron.show_ipsec_site_connection connection-name ipsecpolicy-name ikepolicy-name vpnservice-name 192.168.XXX.XXX/24 192.168.XXX.XXX 192.168.XXX.XXX secret
```

Parameters

• **name** -- Set friendly name for the connection

• **ipsecpolicy** -- IPSec policy ID or name associated with this connection

• **ikepolicy** -- IKE policy ID or name associated with this connection

• **vpnservice** -- VPN service instance ID or name associated with this connection

• **peer_cidrs** -- Remote subnet(s) in CIDR format

• **peer_address** -- Peer gateway public IPv4/IPv6 address or FQDN

• **peer_id** -- Peer router identity for authentication Can be IPv4/IPv6 address, e-mail address, key id, or FQDN

• **psk** -- Pre-shared key string

• **initiator** -- Initiator state in lowercase, default:bi-directional

• **admin_state_up** -- Set admin state up to true or false, default: True (Optional)

• **mtu** -- size for the connection, default:1500 (Optional)

• **dpd_action** -- Dead Peer Detection attribute: hold/clear/disabled/ restart/restart-by-peer (Optional)

• **dpd_interval** -- Dead Peer Detection attribute (Optional)

• **dpd_timeout** -- Dead Peer Detection attribute (Optional)

• **profile** -- Profile to build on (Optional)
Returns  Created IPSec site connection information

salt.modules.neutron.create_ipsecpolicy(name, profile=None, **kwargs)

Creates a new IPsecPolicy

CLI Example:

```
salt '*' neutron.create_ipsecpolicy ipsecpolicy-name
    transform_protocol=esp auth_algorithm=sha1
    encapsulation_mode=tunnel encryption_algorithm=aes-128
```

Parameters

- **name** -- Name of the IPsec policy
- **transform_protocol** -- Transform protocol in lowercase, default: esp (Optional)
- **auth_algorithm** -- Authentication algorithm in lowercase, default: sha1 (Optional)
- **encapsulation_mode** -- Encapsulation mode in lowercase, default: tunnel (Optional)
- **encryption_algorithm** -- Encryption algorithm in lowercase, default: aes-128 (Optional)
- **pfs** -- Perfect Forward Security in lowercase, default: group5 (Optional)
- **units** -- IPSec lifetime attribute. default: seconds (Optional)
- **value** -- IPSec lifetime attribute. default: 3600 (Optional)
- **profile** -- Profile to build on (Optional)

Returns  Created IPSec policy information

salt.modules.neutron.create_network(name, router_ext=None, admin_state_up=True, network_type=None, physical_network=None, segmentation_id=None, shared=None, profile=None)

Creates a new network

CLI Example:

```
salt '*' neutron.create_network network-name
salt '*' neutron.create_network network-name profile=openstack1
```

Parameters

- **name** -- Name of network to create
- **admin_state_up** -- should the state of the network be up? default: True (Optional)
- **router_ext** -- True then if create the external network (Optional)
- **network_type** -- the Type of network that the provider is such as GRE, VXLAN, VLAN, FLAT, or LOCAL (Optional)
- **physical_network** -- the name of the physical network as neutron knows it (Optional)
- **segmentation_id** -- the vlan id or GRE id (Optional)
- **shared** -- is the network shared or not (Optional)
- **profile** -- Profile to build on (Optional)

Returns  Created network information
salt.modules.neutron.create_port(name, network, device_id=None, admin_state_up=True, profile=None)

Creates a new port

CLI Example:

```
salt '*' neutron.create_port network-name port-name
```

Parameters

- **name** -- Name of port to create
- **network** -- Network name or ID
- **device_id** -- ID of device (Optional)
- **admin_state_up** -- Set admin state up to true or false, default: true (Optional)
- **profile** -- Profile to build on (Optional)

Returns

Created port information

---

click.modules.neutron.create_router(name, ext_network=None, admin_state_up=True, profile=None)

Creates a new router

CLI Example:

```
salt '*' neutron.create_router new-router-name
```

Parameters

- **name** -- Name of router to create (must be first)
- **ext_network** -- ID or name of the external for the gateway (Optional)
- **admin_state_up** -- Set admin state up to true or false, default: true (Optional)
- **profile** -- Profile to build on (Optional)

Returns

Created router information

---

click.modules.neutron.create_security_group(name=None, description=None, profile=None)

Creates a new security group

CLI Example:

```
salt '*' neutron.create_security_group security-group-name description='Security group for servers'
```

Parameters

- **name** -- Name of security group (Optional)
- **description** -- Description of security group (Optional)
- **profile** -- Profile to build on (Optional)

Returns

Created security group information
salt.modules.neutron.create_security_group_rule(security_group, remote_group_id=None, direction='ingress', protocol=None, port_range_min=None, port_range_max=None, ethertype='IPv4', profile=None)

Creates a new security group rule

CLI Example:

```bash
salt '*' neutron.show_security_group_rule security-group-rule-id
```

Parameters

- **security_group** -- Security group name or ID to add rule
- **remote_group_id** -- Remote security group name or ID to apply rule (Optional)
- **direction** -- Direction of traffic: ingress/egress, default: ingress (Optional)
- **protocol** -- Protocol of packet: null/icmp/tcp/udp, default: null (Optional)
- **port_range_min** -- Starting port range (Optional)
- **port_range_max** -- Ending port range (Optional)
- **ethertype** -- IPv4/IPv6, default: IPv4 (Optional)
- **profile** -- Profile to build on (Optional)

Returns Created security group rule information

salt.modules.neutron.create_subnet(network, cidr, name=None, ip_version=4, profile=None)

Creates a new subnet

CLI Example:

```bash
salt '*' neutron.create_subnet network-name 192.168.1.0/24
```

Parameters

- **network** -- Network ID or name this subnet belongs to
- **cidr** -- CIDR of subnet to create (Ex. '192.168.1.0/24')
- **name** -- Name of the subnet to create (Optional)
- **ip_version** -- Version to use, default is 4(IPv4) (Optional)
- **profile** -- Profile to build on (Optional)

Returns Created subnet information

salt.modules.neutron.create_vpnservice(subnet, router, name, admin_state_up=True, profile=None)

Creates a new VPN service

CLI Example:

```bash
salt '*' neutron.create_vpnservice router-name name
```

Parameters

- **subnet** -- Subnet unique identifier for the VPN service deployment
- `router` -- Router unique identifier for the VPN service
- `name` -- Set a name for the VPN service
- `admin_state_up` -- Set admin state up to true or false, default: True (Optional)
- `profile` -- Profile to build on (Optional)

Returns

Created VPN service information

```
salt.modules.neutron.delete_floatingip(floatingip_id, profile=None)
```

Deletes the specified floating IP

CLI Example:
```
salt '*' neutron.delete_floatingip floatingip-id
```

Parameters

- `floatingip_id` -- ID of floating IP to delete
- `profile` -- Profile to build on (Optional)

Returns

True (Succeeded) or False

```
salt.modules.neutron.delete_ikepolicy(ikepolicy, profile=None)
```

Deletes the specified IKE Policy

CLI Example:
```
salt '*' neutron.delete_ikepolicy ikepolicy-name
```

Parameters

- `ikepolicy` -- ID or name of IKE policy to delete
- `profile` -- Profile to build on (Optional)

Returns

True (Succeeded) or False

```
salt.modules.neutron.delete_ipsec_site_connection(ipsec_site_connection, profile=None)
```

Deletes the specified IPsec Site Connection

CLI Example:
```
salt '*' neutron.delete_ipsec_site_connection connection-name
```

Parameters

- `ipsec_site_connection` -- ID or name of ipsec site connection to delete
- `profile` -- Profile to build on (Optional)

Returns

True (Succeeded) or False

```
salt.modules.neutron.delete_ipsecpolicy(ipsecpolicy, profile=None)
```

Deletes the specified IPsec Policy

CLI Example:
```
salt '*' neutron.delete_ipsecpolicy ipsecpolicy-name
```
Parameters

- **ipsecpolicy** -- ID or name of IPSec policy to delete
- **profile** -- Profile to build on (Optional)

**Returns**  True(Succeed) or False

```python
salt.modules.neutron.delete_network(network, profile=None)
```
Removes the specified network

**CLI Example:**
```
salt '*' neutron.delete_network network-name
salt '*' neutron.delete_network network-name profile=openstack1
```

Parameters

- **network** -- ID or name of network to delete
- **profile** -- Profile to build on (Optional)

**Returns**  True(Succeed) or False

```python
salt.modules.neutron.delete_port(port, profile=None)
```
Removes the specified port

**CLI Example:**
```
salt '*' neutron.delete_port port-name
salt '*' neutron.delete_port port-name profile=openstack1
```

Parameters

- **port** -- port name or ID
- **profile** -- Profile to build on (Optional)

**Returns**  True(Succeed) or False

```python
salt.modules.neutron.delete_quota(tenant_id, profile=None)
```
Removes the specified tenant's quota

**CLI Example:**
```
salt '*' neutron.delete_quota tenant-id
salt '*' neutron.delete_quota tenant-id profile=openstack1
```

Parameters

- **tenant_id** -- ID of tenant to quota delete
- **profile** -- Profile to build on (Optional)

**Returns**  True(Delete succeed) or False(Delete failed)

```python
salt.modules.neutron.delete_router(router, profile=None)
```
Removes the specified router

**CLI Example:**
```
```
salt '*' neutron.delete_router router-name

Parameters

- **router** -- ID or name of router to delete
- **profile** -- Profile to build on (Optional)

Returns  True(Succeed) or False

salt.modules.neutron.delete_security_group(security_group, profile=None)
Deletes the specified security group

CLI Example:

    salt '*' neutron.delete_security_group security-group-name

Parameters

- **security_group** -- ID or name of security group to delete
- **profile** -- Profile to build on (Optional)

Returns  True(Succeed) or False

salt.modules.neutron.delete_security_group_rule(security_group_rule_id, profile=None)
Deletes the specified security group rule

CLI Example:

    salt '*' neutron.delete_security_group_rule security-group-rule-id

Parameters

- **security_group_rule_id** -- ID of security group rule to delete
- **profile** -- Profile to build on (Optional)

Returns  True(Succeed) or False

salt.modules.neutron.delete_subnet(subnet, profile=None)
Deletes the specified subnet

CLI Example:

    salt '*' neutron.delete_subnet subnet-name
    salt '*' neutron.delete_subnet subnet-name profile=openstack1

Parameters

- **subnet** -- ID or name of subnet to delete
- **profile** -- Profile to build on (Optional)

Returns  True(Succeed) or False

salt.modules.neutron.delete_vpnservice(vpn_service, profile=None)
Deletes the specified VPN service

CLI Example:
salt '*' neutron.delete_vpnservice vpnservice-name

Parameters

- **vpnservice** -- ID or name of vpn service to delete
- **profile** -- Profile to build on (Optional)

Returns True(Succeed) or False

salt.modules.neutron.get_quotas_tenant(profile=None)
Fetches tenant info in server's context for following quota operation

CLI Example:

```
salt '*' neutron.get_quotas_tenant
salt '*' neutron.get_quotas_tenant profile=openstack1
```

Parameters **profile** -- Profile to build on (Optional)

Returns Quotas information

salt.modules.neutron.list_extensions(profile=None)
Fetches a list of all extensions on server side

CLI Example:

```
salt '*' neutron.list_extensions
salt '*' neutron.list_extensions profile=openstack1
```

Parameters **profile** -- Profile to build on (Optional)

Returns List of extensions

salt.modules.neutron.list_floatingips(profile=None)
Fetch a list of all floatingIPs for a tenant

CLI Example:

```
salt '*' neutron.list_floatingips
salt '*' neutron.list_floatingips profile=openstack1
```

Parameters **profile** -- Profile to build on (Optional)

Returns List of floatingIP

salt.modules.neutron.list_ikepolicies(profile=None)
Fetches a list of all configured IKEPolicies for a tenant

CLI Example:

```
salt '*' neutron.list_ikepolicies
salt '*' neutron.list_ikepolicies profile=openstack1
```

Parameters **profile** -- Profile to build on (Optional)

Returns List of IKE policy
```python
salt.modules.neutron.list_ipsec_site_connections(profile=None)
    Fetches all configured IPsec Site Connections for a tenant
    CLI Example:
    
    salt '*' neutron.list_ipsec_site_connections
    salt '*' neutron.list_ipsec_site_connections profile=openstack1

    Parameters profile -- Profile to build on (Optional)
    Returns List of IPsec site connection

salt.modules.neutron.list_ipsecpolicies(profile=None)
    Fetches a list of all configured IPsecPolicies for a tenant
    CLI Example:
    
    salt '*' neutron.list_ipsecpolicies ipsecpolicy-name
    salt '*' neutron.list_ipsecpolicies ipsecpolicy-name profile=openstack1

    Parameters profile -- Profile to build on (Optional)
    Returns List of IPSec policy

salt.modules.neutron.list_networks(profile=None)
    Fetches a list of all networks for a tenant
    CLI Example:
    
    salt '*' neutron.list_networks
    salt '*' neutron.list_networks profile=openstack1

    Parameters profile -- Profile to build on (Optional)
    Returns List of network

salt.modules.neutron.list_ports(profile=None)
    Fetches a list of all networks for a tenant
    CLI Example:
    
    salt '*' neutron.list_ports
    salt '*' neutron.list_ports profile=openstack1

    Parameters profile -- Profile to build on (Optional)
    Returns List of port

salt.modules.neutron.list_quotas(profile=None)
    Fetches all tenants quotas
    CLI Example:
    
    salt '*' neutron.list_quotas
    salt '*' neutron.list_quotas profile=openstack1

    Parameters profile -- Profile to build on (Optional)
    Returns List of quotas
```
salt.modules.neutron.list_routers(profile=None)
Fetches a list of all routers for a tenant

CLI Example:
```
salt '*' neutron.list_routers
salt '*' neutron.list_routers profile=openstack1
```

**Parameters**  
**profile** -- Profile to build on (Optional)

**Returns**  
List of router

salt.modules.neutron.list_security_group_rules(profile=None)
Fetches a list of all security group rules for a tenant

CLI Example:
```
salt '*' neutron.list_security_group_rules
salt '*' neutron.list_security_group_rules profile=openstack1
```

**Parameters**  
**profile** -- Profile to build on (Optional)

**Returns**  
List of security group rule

salt.modules.neutron.list_security_groups(profile=None)
Fetches a list of all security groups for a tenant

CLI Example:
```
salt '*' neutron.list_security_groups
salt '*' neutron.list_security_groups profile=openstack1
```

**Parameters**  
**profile** -- Profile to build on (Optional)

**Returns**  
List of security group

salt.modules.neutron.list_subnets(profile=None)
Fetches a list of all networks for a tenant

CLI Example:
```
salt '*' neutron.list_subnets
salt '*' neutron.list_subnets profile=openstack1
```

**Parameters**  
**profile** -- Profile to build on (Optional)

**Returns**  
List of subnet

salt.modules.neutron.list_vpnservices(retrieve_all=True, profile=None, **kwargs)
Fetches a list of all configured VPN services for a tenant

CLI Example:
```
salt '*' neutron.list_vpnservices
```

**Parameters**

- **retrieve_all** -- True or False, default: True (Optional)
- **profile** -- Profile to build on (Optional)
Returns  List of VPN service

```
salt.modules.neutron.remove_gateway_router(router, profile=None)
```
Removes an external network gateway from the specified router

CLI Example:
```
salt '*' neutron.remove_gateway_router router-name
```

Parameters
- `router` -- ID or name of router
- `profile` -- Profile to build on (Optional)

Returns  True(Succeed) or False

```
salt.modules.neutron.remove_interface_router(router, subnet, profile=None)
```
Removes an internal network interface from the specified router

CLI Example:
```
salt '*' neutron.remove_interface_router router-name subnet-name
```

Parameters
- `router` -- ID or name of the router
- `subnet` -- ID or name of the subnet
- `profile` -- Profile to build on (Optional)

Returns  True(Succeed) or False

```
salt.modules.neutron.show_floatingip(floatingip_id, profile=None)
```
Fetches information of a certain floatingIP

CLI Example:
```
salt '*' neutron.show_floatingip floatingip-id
```

Parameters
- `floatingip_id` -- ID of floatingIP to look up
- `profile` -- Profile to build on (Optional)

Returns  Floating IP information

```
salt.modules.neutron.show_ikepolicy(ikepolicy, profile=None)
```
Fetches information of a specific IKEPolicy

CLI Example:
```
salt '*' neutron.show_ikepolicy ikepolicy-name
```

Parameters
- `ikepolicy` -- ID or name of ikepolicy to look up
- `profile` -- Profile to build on (Optional)
Returns IKE policy information

salt.modules.neutron.show_ipsec_site_connection(ipsec_site_connection, profile=None)
Fetches information of a specific IPsecSiteConnection

CLI Example:

```
salt '*' neutron.show_ipsec_site_connection connection-name
```

Parameters

- **ipsec_site_connection** -- ID or name of ipsec site connection to look up
- **profile** -- Profile to build on (Optional)

Returns IPsec site connection information

salt.modules.neutron.show_ipsecpolicy(ipsecpolicy, profile=None)
Fetches information of a specific IPsecPolicy

CLI Example:

```
salt '*' neutron.show_ipsecpolicy ipsecpolicy-name
```

Parameters

- **ipsecpolicy** -- ID or name of IPSec policy to look up
- **profile** -- Profile to build on (Optional)

Returns IPSec policy information

salt.modules.neutron.show_network(network, profile=None)
Fetches information of a certain network

CLI Example:

```
salt '*' neutron.show_network network-name
salt '*' neutron.show_network network-name profile=openstack1
```

Parameters

- **network** -- ID or name of network to look up
- **profile** -- Profile to build on (Optional)

Returns Network information

salt.modules.neutron.show_port(port, profile=None)
Fetches information of a certain port

CLI Example:

```
salt '*' neutron.show_port port-id
salt '*' neutron.show_port port-id profile=openstack1
```

Parameters

- **port** -- ID or name of port to look up
- **profile** -- Profile to build on (Optional)
Returns Port information

```
salt.modules.neutron.show_quota(tenant_id, profile=None)
```

Fetches information of a certain tenant's quotas

CLI Example:
```
salt '*' neutron.show_quota tenant-id
salt '*' neutron.show_quota tenant-id profile=openstack1
```

Parameters

- `tenant_id` -- ID of tenant
- `profile` -- Profile to build on (Optional)

Returns Quota information

```
salt.modules.neutron.show_router(router, profile=None)
```

Fetches information of a certain router

CLI Example:
```
salt '*' neutron.show_router router-name
```

Parameters

- `router` -- ID or name of router to look up
- `profile` -- Profile to build on (Optional)

Returns Router information

```
salt.modules.neutron.show_security_group(security_group, profile=None)
```

Fetches information of a certain security group

CLI Example:
```
salt '*' neutron.show_security_group security-group-name
```

Parameters

- `security_group` -- ID or name of security group to look up
- `profile` -- Profile to build on (Optional)

Returns Security group information

```
salt.modules.neutron.show_security_group_rule(security_group_rule_id, profile=None)
```

Fetches information of a certain security group rule

CLI Example:
```
salt '*' neutron.show_security_group_rule security-group-rule-id
```

Parameters

- `security_group_rule_id` -- ID of security group rule to look up
- `profile` -- Profile to build on (Optional)

Returns Security group rule information
salt.modules.neutron.show_subnet(subnet, profile=None)
    Fetches information of a certain subnet
    
    CLI Example:
    
    salt '*' neutron.show_subnet subnet-name

    Parameters
    • subnet -- ID or name of subnet to look up
    • profile -- Profile to build on (Optional)

    Returns Subnet information

salt.modules.neutron.show_vpnservice(vpnservice, profile=None, **kwargs)
    Fetches information of a specific VPN service
    
    CLI Example:
    
    salt '*' neutron.show_vpnservice vpnservice-name

    Parameters
    • vpnservice -- ID or name of vpn service to look up
    • profile -- Profile to build on (Optional)

    Returns VPN service information

salt.modules.neutron.update_floatingip(floatingip_id, port, profile=None)
    Updates a floatingIP
    
    CLI Example:
    
    salt '*' neutron.update_floatingip network-name port-name

    Parameters
    • floatingip_id -- ID of floatingIP
    • port -- ID or name of port
    • profile -- Profile to build on (Optional)

    Returns Value of updated floating IP information

salt.modules.neutron.update_network(network, name, profile=None)
    Updates a network
    
    CLI Example:
    
    salt '*' neutron.update_network network-name new-network-name

    Parameters
    • network -- ID or name of network to update
    • name -- Name of this network
    • profile -- Profile to build on (Optional)

    Returns Value of updated network information
**salt.modules.neutron.update_port** *(port, name, admin_state_up=True, profile=None)*

Updates a port

**CLI Example:**

```
salt '*' neutron.update_port port-name network-name new-port-name
```

**Parameters**

- **port** -- Port name or ID
- **name** -- Name of this port
- **admin_state_up** -- Set admin state up to true or false, default: true (Optional)
- **profile** -- Profile to build on (Optional)

**Returns**

Value of updated port information

**salt.modules.neutron.update_quota** *(tenant_id, subnet=None, router=None, network=None, floatingip=None, port=None, security_group=None, security_group_rule=None, profile=None)*

Update a tenant’s quota

**CLI Example:**

```
salt '*' neutron.update_quota tenant-id subnet=40 router=50 network=10 floatingip=30 port=30
```

**Parameters**

- **tenant_id** -- ID of tenant
- **subnet** -- Value of subnet quota (Optional)
- **router** -- Value of router quota (Optional)
- **network** -- Value of network quota (Optional)
- **floatingip** -- Value of floatingip quota (Optional)
- **port** -- Value of port quota (Optional)
- **security_group** -- Value of security group (Optional)
- **security_group_rule** -- Value of security group rule (Optional)
- **profile** -- Profile to build on (Optional)

**Returns**

Value of updated quota

**salt.modules.neutron.update_router** *(router, name=None, admin_state_up=None, profile=None, **kwargs)*

Updates a router

**CLI Example:**

```
salt '*' neutron.update_router router_id name=new-router-name admin_state_up=1
```

**Parameters**

- **router** -- ID or name of router to update
- **name** -- Name of this router
- **ext_network** -- ID or name of the external for the gateway (Optional)
- **admin_state_up** -- Set admin state up to true or false, default: true (Optional)
- **profile** -- Profile to build on (Optional)
- **kwargs** --

Returns Value of updated router information

```python
salt.modules.neutron.update_security_group(security_group, name=None, description=None, profile=None)
```

Updates a security group

CLI Example:

```
salt '*' neutron.update_security_group security-group-name new-security-group-name
```

Parameters

- **security_group** -- ID or name of security group to update
- **name** -- Name of this security group (Optional)
- **description** -- Description of security group (Optional)
- **profile** -- Profile to build on (Optional)

Returns Value of updated security group information

```python
salt.modules.neutron.update_subnet(subnet, name, profile=None)
```

Updates a subnet

CLI Example:

```
salt '*' neutron.update_subnet subnet-name new-subnet-name
```

Parameters

- **subnet** -- ID or name of subnet to update
- **name** -- Name of this subnet
- **profile** -- Profile to build on (Optional)

Returns Value of updated subnet information

```python
salt.modules.neutron.update_vpnservice(vpnservice, desc, profile=None)
```

Updates a VPN service

CLI Example:

```
salt '*' neutron.update_vpnservice vpnservice-name desc='VPN Service1'
```

Parameters

- **vpnservice** -- ID or name of vpn service to update
- **desc** -- Set a description for the VPN service
- **profile** -- Profile to build on (Optional)

Returns Value of updated VPN service information
31.16.165 salt.modules.nfs3

Module for managing NFS version 3.

`salt.modules.nfs3.del_export`(*exports="/etc/exports", path=None*)

Remove an export

CLI Example:

```
salt '*' nfs.del_export /media/storage
```

`salt.modules.nfs3.list_exports`(*exports="/etc/exports")

List configured exports

CLI Example:

```
salt '*' nfs.list_exports
```

31.16.166 salt.modules.nftables

Support for nftables

`salt.modules.nftables.append`(*table='filter', chain=None, rule=None, family='ipv4')

Append a rule to the specified table & chain.

This function accepts a rule in a standard nftables command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.

CLI Example:

```
salt '*' nftables.append filter input \n  rule='input tcp dport 22 log accept'
```

IPv6:

```
salt '*' nftables.append filter input \n  rule='input tcp dport 22 log accept' \n  family=ipv6
```

`salt.modules.nftables.build_rule`(*table=None, chain=None, command=None, position=None, full=None, family='ipv4', **kwargs*)

Build a well-formatted nftables rule based on kwargs. A table and chain are not required, unless full is True.

If full is True, then table, chain and command are required. command may be specified as either insert, append, or delete. This will return the nftables command, exactly as it would be used from the command line.

If a position is required (as with insert or delete), it may be specified as position. This will only be useful if full is True.

If connstate is passed in, it will automatically be changed to state.

CLI Examples:

```
salt '*' nftables.build_rule match=state \n  connstate=RELATED,ESTABLISHED jump=ACCEPT
salt '*' nftables.build_rule filter input command=insert position=3 \n  full=True match=state state=related,established jump=accept
```

IPv6:

```
salt '*' nftables.build_rule match=state \n```

31.16. Full list of builtin execution modules
connstate\nfamily=ipv6
salt '*' nftables.build_rule filter input command=insert position=3 \n    full=True match=state state=related,established jump=accept \n    family=ipv6

salt.modules.nftables.check(table='filter', chain=None, rule=None, family='ipv4')
Check for the existence of a rule in the table and chain

This function accepts a rule in a standard nftables command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.

CLI Example:
salt '*' nftables.check filter input \n    rule='input tcp dport 22 log accept'
IPv6:
salt '*' nftables.check filter input \n    rule='input tcp dport 22 log accept' \n    family=ipv6

salt.modules.nftables.check_chain(table='filter', chain=None, family='ipv4')
New in version 2014.7.0.
Check for the existence of a chain in the table

CLI Example:
salt '*' nftables.check_chain filter input
IPv6:
salt '*' nftables.check_chain filter input family=ipv6

salt.modules.nftables.check_table(table=None, family='ipv4')
Check for the existence of a table

CLI Example:
salt '*' nftables.check_table nat

salt.modules.nftables.delete(table, chain=None, position=None, rule=None, family='ipv4')
Delete a rule from the specified table & chain, specifying either the rule in its entirety, or the rule’s position in the chain.

This function accepts a rule in a standard nftables command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.

CLI Examples:
salt '*' nftables.delete filter input position=3
salt '*' nftables.delete filter input \n    rule='input tcp dport 22 log accept'
IPv6:
salt '*' nftables.delete filter input position=3 family=ipv6
salt '*(snftables.delete filter input \
 rule='input tcp dport 22 log accept' \n family=ipv6

salt.modules.nftables.delete_chain(table='filter', chain=None, family='ipv4')
New in version 2014.7.0.
Delete the chain from the specified table.

CLI Example:
salt '* nftables.delete_chain filter input
salt '* nftables.delete_chain filter foo

IPv6:
salt '* nftables.delete_chain filter input family=ipv6
salt '* nftables.delete_chain filter foo family=ipv6

salt.modules.nftables.delete_table(table, family='ipv4')
New in version 2014.7.0.
Create new custom table.

CLI Example:
salt '* nftables.delete_table filter

IPv6:
salt '* nftables.delete_table filter family=ipv6

salt.modules.nftables.flush(table='filter', chain='*', family='ipv4')
Flush the chain in the specified table, flush all chains in the specified table if chain is not specified.

CLI Example:
salt '* nftables.flush filter
salt '* nftables.flush filter input
IPv6:
salt '* nftables.flush filter input family=ipv6

salt.modules.nftables.get_rule_handle(table='filter', chain=None, rule=None, family='ipv4')
Get the handle for a particular rule

This function accepts a rule in a standard nftables command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.

CLI Example:
salt '* nftables.get_rule_handle filter input \
 rule='input tcp dport 22 log accept'

IPv6:
salt '* nftables.get_rule_handle filter input \
 rule='input tcp dport 22 log accept' \
 family=ipv6
salt.modules.nftables.get_rules(family='ipv4')
Return a data structure of the current, in-memory rules

CLI Example:

```
salt '*' nftables.get_rules
salt '*' nftables.get_rules family=ipv6
```

salt.modules.nftables.get_saved_rules(conf_file=None, family='ipv4')
Return a data structure of the rules in the conf file

CLI Example:

```
salt '*' nftables.get_saved_rules
```

salt.modules.nftables.insert(table='filter', chain=None, position=None, rule=None, family='ipv4')
Insert a rule into the specified table & chain, at the specified position.

If position is not specified, rule will be inserted in first position.

This function accepts a rule in a standard nftables command format, starting with the chain. Trying to force users to adapt to a new method of creating rules would be irritating at best, and we already have a parser that can handle it.

CLI Examples:

```
salt '*' nftables.insert filter input \   
  rule='input tcp dport 22 log accept'
salt '*' nftables.insert filter input position=3 \   
  rule='input tcp dport 22 log accept'

IPv6:
salt '*' nftables.insert filter input \   
  rule='input tcp dport 22 log accept' \   
  family=ipv6
salt '*' nftables.insert filter input position=3 \   
  rule='input tcp dport 22 log accept' \   
  family=ipv6
```

salt.modules.nftables.new_chain(table='filter', chain=None, table_type=None, hook=None, priority=None, family='ipv4')
New in version 2014.7.0.
Create new chain to the specified table.

CLI Example:

```
salt '*' nftables.new_chain filter input
salt '*' nftables.new_chain filter input \   
  table_type=filter hook=input priority=0
salt '*' nftables.new_chain filter foo
IPv6:
salt '*' nftables.new_chain filter input family=ipv6
salt '*' nftables.new_chain filter input \
```
table_type=filter hook=input priority=0 family=ipv6
salt '*' nftables.new_chain filter foo family=ipv6

salt.modules.nftables.new_table(table, family='ipv4')
New in version 2014.7.0.
Create new custom table.
CLI Example:
salt '*' nftables.new_table filter
IPv6:
salt '*' nftables.new_table filter family=ipv6

salt.modules.nftables.save(filename=None, family='ipv4')
Save the current in-memory rules to disk
CLI Example:
salt '*' nftables.save /etc/nftables

salt.modules.nftables.version()
Return version from nftables --version
CLI Example:
salt '*' nftables.version

31.16.167 salt.modules.nginx

Support for nginx
salt.modules.nginx.build_info()
Return server and build arguments
CLI Example:
salt '*' nginx.build_info

salt.modules.nginx.configtest()
test configuration and exit
CLI Example:
salt '*' nginx.configtest

salt.modules.nginx.signal(signal=None)
Signals nginx to start, reload, reopen or stop.
CLI Example:
salt '*' nginx.signal reload

salt.modules.nginx.status(url='http://127.0.0.1/status')
Return the data from an Nginx status page as a dictionary. http://wiki.nginx.org/HttpStubStatusModule
url The URL of the status page. Defaults to 'http://127.0.0.1/status'
CLI Example:
salt ' '* nginx.status

salt.modules.nginx.version()
    Return server version from nginx -v
    CLI Example:
    salt ' '* nginx.version

31.16.168 salt.modules.node

Module for full system inspection.

salt.modules.node.inspect(mode='all', priority=19, **kwargs)
    Start node inspection and save the data to the database for further query.
    Parameters:
    • mode: Clarify inspection mode: configuration, payload, all (default)
    payload
    - filter: Comma-separated directories to track payload.
    • priority: (advanced) Set priority of the inspection. Default is low priority.
    CLI Example:
    salt ' '* node.inspect
    salt ' '* node.inspect configuration
    salt ' '* node.inspect payload filter=/opt,,/ext/oracle

salt.modules.node.query(scope, **kwargs)
    Query the node for specific information.
    Parameters:
    • scope: Specify scope of the query.
    - System: Return system data.
    - Software: Return software information.
    - Services: Return known services.
    - Identity: Return user accounts information for this system.
        accounts Can be either 'local', 'remote' or 'all' (equal to ```local,remote```). Remote accounts cannot be resolved on all systems, but only those, which supports `passwd -S -a`.
        disabled True (or False, default) to return only disabled accounts.
    - payload: Payload scope parameters:
        filter Include only results which path starts from the filter string.
        time Display time in Unix ticks or format according to the configured TZ (default) Values: ticks, tz (default)
        size Format size. Values: B, KB, MB, GB
        type Include payload type. Values (comma-separated): directory (or dir), link, file (default)
        Example (returns everything): type=directory,link,file
owners  Resolve UID/GID to an actual names or leave them numeric (default). Values: name (default), id

brief  Return just a list of payload elements, if True. Default: False.

—all: Return all information (default).

CLI Example:

```
salt '*' node.query scope=os
salt '*' node.query payload type=file,link filter=/etc size=Kb brief=False
```

### 31.16.169 salt.modules.nova

Module for handling OpenStack Nova calls

**depends**

- novaclient Python module

**configuration**  This module is not usable until the user, password, tenant, and auth URL are specified either in a pillar or in the minion's config file. For example:

```
keystone.user: admin
keystone.password: verybadpass
keystone.tenant: admin
keystone.auth_url: 'http://127.0.0.1:5000/v2.0/'
# Optional
keystone.region_name: 'regionOne'
```

If configuration for multiple OpenStack accounts is required, they can be set up as different configuration profiles: For example:

```
openstack1:
  keystone.user: admin
  keystone.password: verybadpass
  keystone.tenant: admin
  keystone.auth_url: 'http://127.0.0.1:5000/v2.0/'

openstack2:
  keystone.user: admin
  keystone.password: verybadpass
  keystone.tenant: admin
  keystone.auth_url: 'http://127.0.0.2:5000/v2.0/'
```

With this configuration in place, any of the nova functions can make use of a configuration profile by declaring it explicitly. For example:

```
salt '*' nova.flavor_list profile=openstack1
```

**salt.modules.nova.boot(name, flavor_id=0, image_id=0, profile=None, timeout=300)**

Boot (create) a new instance

**name**  Name of the new instance (must be first)

**flavor_id**  Unique integer ID for the flavor

**image_id**  Unique integer ID for the image

**timeout**  How long to wait, after creating the instance, for the provider to return information about it (default 300 seconds).
New in version 2014.1.0.

CLI Example:

```
salt '*' nova.boot myinstance flavor_id=4596 image_id=2
```

The flavor_id and image_id are obtained from `nova.flavor_list` and `nova.image_list`

```
salt '*' nova.flavor_list
salt '*' nova.image_list
```

```text
class modules.nova.delete

Delete an instance

- instance_id: ID of the instance to be deleted

CLI Example:

```
salt '*' nova.delete 1138
```
```
class modules.nova.flavor_create

Add a flavor to nova (nova flavor-create). The following parameters are required:

- name: Name of the new flavor (must be first)
- flavor_id: Unique integer ID for the new flavor
- ram: Memory size in MB
- disk: Disk size in GB
- vcpus: Number of vcpus

CLI Example:

```
salt '*' nova.flavor_create myflavor flavor_id=6 ram=4096 disk=10 vcpus=1
```
```
class modules.nova.flavor_delete

Delete a flavor from nova by id (nova flavor-delete)

CLI Example:

```
salt '*' nova.flavor_delete 7
```
```
class modules.nova.flavor_list

Return a list of available flavors (nova flavor-list)

CLI Example:

```
salt '*' nova.flavor_list
```
```
class modules.nova.image_list

Return a list of available images (nova images-list + nova image-show) If a name is provided, only that image will be displayed.

CLI Examples:

```
salt '*' nova.image_list
salt '*' nova.image_list myimage
```
```
class modules.nova.image_meta_delete

Delete a key=value pair from the metadata for an image (nova image-meta set)

CLI Examples:

```
Salt Documentation, Release 2015.8.0

salt 'localhost' nova.image_meta_delete 6f52b2ff-0b31-4d84-8fd1-af45b84824f6 keys=cheese
salt 'localhost' nova.image_meta_delete name=myimage keys=salad,beans

salt.modules.nova.image_meta_set(image_id=None, name=None, profile=None, **kwargs)
Sets a key=value pair in the metadata for an image (nova image-meta set)

CLI Examples:
salt 'localhost' nova.image_meta_set 6f52b2ff-0b31-4d84-8fd1-af45b84824f6 cheese=gruyere
salt 'localhost' nova.image_meta_set name=myimage salad=pasta beans=baked

salt.modules.nova.keypair_add(name, pubfile=None, pubkey=None, profile=None)
Add a keypair to nova (nova keypair-add)

CLI Examples:
salt 'localhost' nova.keypair_add mykey pubfile='/home/myuser/.ssh/id_rsa.pub'
salt 'localhost' nova.keypair_add mykey pubkey='ssh-rsa <key> myuser@mybox'

salt.modules.nova.keypair_delete(name, profile=None)
Add a keypair to nova (nova keypair-delete)

CLI Example:
salt 'localhost' nova.keypair_delete mykey

salt.modules.nova.keypair_list(profile=None)
Return a list of available keypairs (nova keypair-list)

CLI Example:
salt 'localhost' nova.keypair_list

salt.modules.nova.list(profile=None)
To maintain the feel of the nova command line, this function simply calls the server_list function.

salt.modules.nova.lock(instance_id, profile=None)
Lock an instance

instance_id ID of the instance to be locked

CLI Example:
salt 'localhost' nova.lock 1138

salt.modules.nova.resume(instance_id, profile=None)
Resume an instance

instance_id ID of the instance to be resumed

CLI Example:
salt 'localhost' nova.resume 1138

salt.modules.nova.secgroup_create(name, description, profile=None)
Add a secgroup to nova (nova secgroup-create)

CLI Example:
salt 'localhost' nova.secgroup_create mygroup 'This is my security group'
### salt.modules.nova.secgroup_delete(name, profile=None)
Delete a secgrouptonova (nova segroup-delete)

**CLI Example:**
```
salt '*' nova.secgroup_delete mygroup
```

### salt.modules.nova.secgroup_list(profile=None)
Return a list of available security groups (nova items-list)

**CLI Example:**
```
salt '*' nova.secgroup_list
```

### salt.modules.nova.server_by_name(name, profile=None)
Return information about a server

**name** Server Name

**CLI Example:**
```
salt '*' nova.server_by_name myserver profile=openstack
```

### salt.modules.nova.server_list(profile=None)
Return list of active servers

**CLI Example:**
```
salt '*' nova.show
```

### salt.modules.nova.server_list_detailed(profile=None)
Return detailed list of active servers

**CLI Example:**
```
salt '*' nova.server_list_detailed
```

### salt.modules.nova.server_show(server_id, profile=None)
Return detailed information for an active server

**CLI Example:**
```
salt '*' nova.server_show <server_id>
```

### salt.modules.nova.show(server_id, profile=None)
To maintain the feel of the nova command line, this function simply calls the server_show function.

**CLI Example:**
```
salt '*' nova.show
```

### salt.modules.nova.suspend(instance_id, profile=None)
Suspend an instance

**instance_id** ID of the instance to be suspended

**CLI Example:**
```
salt '*' nova.suspend 1138
```

### salt.modules.nova.volume_attach(name, server_name, device='/dev/xvdb', profile=None, timeout=300)
Attach a block storage volume
name Name of the new volume to attach
server_name Name of the server to attach to
device Name of the device on the server
profile Profile to build on

CLI Example:

```
salt '*' nova.volume_attach myblock slice.example.com profile=openstack
dsalt '*' nova.volume_attach myblock server.example.com device='/dev/xvdb' profile=openstack
```

```
salt.modules.nova.volume_create(name=name, size=100, snapshot=None, voltype=None, profile=None)
  Create a block storage volume
  name Name of the new volume (must be first)
  size Volume size
  snapshot Block storage snapshot id
  voltype Type of storage
  profile Profile to build on
  CLI Example:
  salt '*' nova.volume_create myblock size=300 profile=openstack
```

```
salt.modules.nova.volume_delete(name, profile=None)
  Destroy the volume
  name Name of the volume
  profile Profile to build on
  CLI Example:
  salt '*' nova.volume_delete myblock profile=openstack
```

```
salt.modules.nova.volume_detach(name, profile=None, timeout=300)
  Attach a block storage volume
  name Name of the new volume to attach
  server_name Name of the server to detach from
  profile Profile to build on
  CLI Example:
  salt '*' nova.volume_detach myblock profile=openstack
```

```
salt.modules.nova.volume_list(search_opts=None, profile=None)
  List storage volumes
  search_opts Dictionary of search options
  profile Profile to use
  CLI Example:
  salt '*' nova.volume_list search_opts='{"display_name": "myblock"}''
```

```
salt.modules.nova.volume_show(name, profile=None)
  Create a block storage volume
```

31.16. Full list of builtin execution modules
name  Name of the volume
profile  Profile to use

CLI Example:

```bash
salt '*' nova.volume_show myblock profile=openstack
```

### 31.16.170 salt.modules.npm

Manage and query NPM packages.

**salt.modules.npm.install** *(pkg=None, pkgs=None, dir=None, runas=None, registry=None, env=None)*

Install an NPM package.

If no directory is specified, the package will be installed globally. If no package is specified, the dependencies (from package.json) of the package in the given directory will be installed.

- **pkg** A package name in any format accepted by NPM, including a version identifier
- **pkgs** A list of package names in the same format as the name parameter

New in version 2014.7.0.

- **dir** The target directory in which to install the package, or None for global installation
- **runas** The user to run NPM with
- **registry** The NPM registry to install the package from.

New in version 2014.7.0.

- **env** Environment variables to set when invoking npm. Uses the same env format as the cmd.run execution function.

New in version 2014.7.0.

CLI Example:

```bash
salt '*' npm.install coffee-script
```

```bash
salt '*' npm.install coffee-script@1.0.1
```

**salt.modules.npm.list** *(pkg=None, dir=None, runas=None, registry=None, env=None)*

List installed NPM packages.

If no directory is specified, this will return the list of globally-installed packages.

- **pkg** Limit package listing by name
- **dir** The directory whose packages will be listed, or None for global installation
- **runas** The user to run NPM with

New in version 2014.7.0.

- **env** Environment variables to set when invoking npm. Uses the same env format as the cmd.run execution function.

New in version 2014.7.0.

CLI Example:

```bash
salt '*' npm.list
```
salt.modules.npm.uninstall(pkg, dir=None, runas=None, env=None)

Uninstall an NPM package.

pkg  A package name in any format accepted by NPM

dir  The target directory from which to uninstall the package, or None for global installation

runas  The user to run NPM with

env  Environment variables to set when invoking npm. Uses the same env format as the cmd.run execution function.

New in version 2015.5.3.

CLI Example:

```
salt '*' npm.uninstall coffee-script
```

### 31.16.171 salt.modules.nspawn

Manage nspawn containers

New in version 2015.8.0.

systemd-nspawn(1) is a tool used to manage lightweight namespace containers. This execution module provides several functions to help manage these containers.

Minions running systemd >= 219 will place new containers in /var/lib/machines, while those running systemd < 219 will place them in /var/lib/container.

salt.modules.nspawn.bootstrap_container(name, dist=None, version=None)

Bootstrap a container from package servers, if dist is None the os the minion is running as will be created, otherwise the needed bootstrapping tools will need to be available on the host.

CLI Example:

```
salt myminion nspawn.bootstrap_container <name>
```

salt.modules.nspawn.bootstrap_salt(name, config=None, approve_key=True, install=True, pub_key=None, priv_key=None, bootstrap_url=None, force_install=False, unconditional_install=False, bootstrap_delay=None, bootstrap_args=None, bootstrap_shell=None)

Bootstrap a container from package servers, if dist is None the os the minion is running as will be created, otherwise the needed bootstrapping tools will need to be available on the host.

CLI Example:

```
salt '*' nspawn.bootstrap_salt arch1
```

salt.modules.nspawn.copy_to(name, *args, **kwargs)

Copy a file from the host into a container

name  Container name

source  File to be copied to the container

dest  Destination on the container. Must be an absolute path.

overwrite  [False] Unless this option is set to True, then if a file exists at the location specified by the dest argument, an error will be raised.
makedirs: False

Create the parent directory on the container if it does not already exist.

CLI Example:

```bash
salt 'minion' nspawn.copy_to /tmp/foo /root/foo
```

salt.modules.nspawn.disable(name, *args, **kwargs)
Set the named container to not be launched at boot

CLI Example:

```bash
salt myminion nspawn.enable <name>
```

salt.modules.nspawn.enable(name, *args, **kwargs)
Set the named container to be launched at boot

CLI Example:

```bash
salt myminion nspawn.enable <name>
```

salt.modules.nspawn.exists(name)
Returns true if the named container exists

CLI Example:

```bash
salt myminion nspawn.exists <name>
```

salt.modules.nspawn.info(name, **kwargs)
Return info about a container

**Note:** The container must be running for machinectl to gather information about it. If the container is stopped, then this function will start it.

```bash
start [False] If True, then the container will be started to retrieve the info. A Started key will be in the return data if the container was started.
```

CLI Example:

```bash
salt myminion nspawn.info arch1
salt myminion nspawn.info arch1 force_start=True
```

salt.modules.nspawn.list_all()
Lists all nspawn containers

CLI Example:

```bash
salt myminion nspawn.list_all
```

salt.modules.nspawn.list_running()
Lists running nspawn containers

**Note:** nspawn.list also works to list running containers

CLI Example:

```bash
salt myminion nspawn.list_running
salt myminion nspawn.list
```
salt.modules.nspawn.list_stopped()

Lists stopped nspawn containers

CLI Example:
salt myminion nspawn.list_stopped

salt.modules.nspawn.pid(name, *args, **kwargs)

Returns the PID of a container

name Container name

CLI Example:
salt myminion nspawn.pid arch1

salt.modules.nspawn.poweroff(name)

Issue a clean shutdown to the container. Equivalent to running `machinectl poweroff` on the named container.

For convenience, running `nspawn.stop` (as shown in the CLI examples below) is equivalent to running `nspawn.poweroff`.

Note: `machinectl poweroff` is only supported in systemd >= 219. On earlier systemd versions, running this function will simply issue a clean shutdown via `systemctl`.

CLI Examples:
salt myminion nspawn.poweroff arch1
salt myminion nspawn.stop arch1

salt.modules.nspawn.pull_dkr(url, name, index)

Execute a `machinectl pull-dkr` to download a docker image and add it to `/var/lib/machines` as a new container.

Note: Requires systemd >= 219

url URL from which to download the container
name Name for the new container
index URL of the Docker index server from which to pull (must be an `http://` or `https://` URL).

CLI Examples:
salt myminion nspawn.pull_dkr centos/centos6 cent6 index=https://get.docker.com
salt myminion nspawn.pull_docker centos/centos6 cent6 index=https://get.docker.com

salt.modules.nspawn.pull_raw(url, name, verify=False)

Execute a `machinectl pull-raw` to download a `.qcow2` or raw disk image, and add it to `/var/lib/machines` as a new container.

Note: Requires systemd >= 219

url URL from which to download the container
name Name for the new container
**verify** [False] Perform signature or checksum verification on the container. See the machinectl(1) man page (section titled `Image Transfer Commands`) for more information on requirements for image verification. To perform signature verification, use `verify=signature`. For checksum verification, use `verify=checksum`. By default, no verification will be performed.

CLI Examples:

```
```

**salt.modules.nspawn.pull_tar**(url, name, verify=False)

Execute a machinectl pull-raw to download a .tar container image, and add it to /var/lib/machines as a new container.

**Note:** Requires systemd >= 219

- **url** URL from which to download the container
- **name** Name for the new container
- **verify** [False] Perform signature or checksum verification on the container. See the machinectl(1) man page (section titled `Image Transfer Commands`) for more information on requirements for image verification. To perform signature verification, use `verify=signature`. For checksum verification, use `verify=checksum`. By default, no verification will be performed.

CLI Examples:

```
salt myminion nspawn.pull_tar http://foo.domain.tld/containers/archlinux-2015.02.01.tar.gz arch2
```

**salt.modules.nspawn.reboot**(name, *args, **kwargs)

Reboot the container by sending a SIGINT to its init process. Equivalent to running machinectl reboot on the named container.

For convenience, running `nspawn.restart` (as shown in the CLI examples below) is equivalent to running `nspawn.reboot`.

**Note:** machinectl reboot is only supported in systemd >= 219. On earlier systemd versions, running this function will instead restart the container via systemctl.

CLI Examples:

```
salt myminion nspawn.reboot arch1
salt myminion nspawn.restart arch1
```

**salt.modules.nspawn.remove**(name, *args, **kwargs)

Remove the named container

**Warning:** This function will remove all data associated with the container. It will not, however, remove the btrfs subvolumes created by pulling container images (`nspawn.pull_raw`, `nspawn.pull_tar`, `nspawn.pull_dkr`).

- **stop** [False] If True, the container will be destroyed even if it is running/frozen.

CLI Examples:

```
salt '*' nspawn.remove foo
salt '*' nspawn.remove foo stop=True
```
salt.modules.nspawn.retcode(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, keep_env=None)

Run cmd.retcode within a container

- **name**  Name of the container in which to run the command
- **cmd**  Command to run
- **no_start**  [False] If the container is not running, don’t start it
- **preserve_state**  [True] After running the command, return the container to its previous state
- **stdin**  [None] Standard input to be used for the command
- **output_loglevel**  [debug] Level at which to log the output from the command. Set to quiet to suppress logging.
- **use_vt**  [False] Use SaltStack’s utils.vt to stream output to console. Assumes output=all.
- **keep_env**  [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container’s host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:
```
salt myminion nspawn.retcode mycontainer 'ip addr show'
```

salt.modules.nspawn.run(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, keep_env=None)

Run cmd.run within a container

- **name**  Name of the container in which to run the command
- **cmd**  Command to run
- **no_start**  [False] If the container is not running, don’t start it
- **preserve_state**  [True] After running the command, return the container to its previous state
- **stdin**  [None] Standard input to be used for the command
- **output_loglevel**  [debug] Level at which to log the output from the command. Set to quiet to suppress logging.
- **use_vt**  [False] Use SaltStack’s utils.vt to stream output to console.
- **keep_env**  [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container’s host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:
```
salt myminion nspawn.run mycontainer 'ifconfig -a'
```

salt.modules.nspawn.run_all(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, keep_env=None)

Run cmd.run_all within a container

**Note:** While the command is run within the container, it is initiated from the host. Therefore, the PID in the return dict is from the host, not from the container.
**name** Name of the container in which to run the command

**cmd** Command to run

**no_start** [False] If the container is not running, don’t start it

**preserve_state** [True] After running the command, return the container to its previous state

**stdin** [None] Standard input to be used for the command

**output_loglevel** [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

**use_vt** [False] Use SaltStack’s utils.vtt to stream output to console. Assumes output=all.

**keep_env** [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container’s host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:

```bash
salt myminion nspawn.run_all mycontainer 'ip addr show'
```

**salt.modules.nspawn.run_stderr**

```python
salt.modules.nspawn.run_stderr(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, keep_env=None)
```

Run `cmd.run_stderr` within a container

**name** Name of the container in which to run the command

**cmd** Command to run

**no_start** [False] If the container is not running, don’t start it

**preserve_state** [True] After running the command, return the container to its previous state

**stdin** [None] Standard input to be used for the command

**output_loglevel** [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

**use_vt** [False] Use SaltStack’s utils.vtt to stream output to console. Assumes output=all.

**keep_env** [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container’s host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

CLI Example:

```bash
salt myminion nspawn.run_stderr mycontainer 'ip addr show'
```

**salt.modules.nspawn.run_stdout**

```python
salt.modules.nspawn.run_stdout(name, cmd, no_start=False, preserve_state=True, stdin=None, python_shell=True, output_loglevel='debug', use_vt=False, ignore_retcode=False, keep_env=None)
```

Run `cmd.run_stdout` within a container

**name** Name of the container in which to run the command

**cmd** Command to run

**no_start** [False] If the container is not running, don’t start it

**preserve_state** [True] After running the command, return the container to its previous state

**stdin** [None] Standard input to be used for the command
**output_loglevel** [debug] Level at which to log the output from the command. Set to quiet to suppress logging.

**use_vt** [False] Use SaltStack’s utils.vt to stream output to console. Assumes output=all.

**keep_env** [None] If not passed, only a sane default PATH environment variable will be set. If True, all environment variables from the container’s host will be kept. Otherwise, a comma-separated list (or Python list) of environment variable names can be passed, and those environment variables will be kept.

**CLI Example:**

```
salt myminion nspawn.run_stdout mycontainer 'ifconfig -a'
```

**salt.modules.nspawn.start**(name, *args, **kwargs)
Start the named container

**CLI Example:**

```
salt myminion nspawn.start <name>
```

**salt.modules.nspawn.state**(name, *args, **kwargs)
Return state of container (running or stopped)

**CLI Example:**

```
salt myminion nspawn.state <name>
```

**salt.modules.nspawn.terminate**(name)
Kill all processes in the container without issuing a clean shutdown. Equivalent to running `machinectl terminate` on the named container.

For convenience, running `nspawn.stop` and passing `kill=True` (as shown in the CLI examples below) is equivalent to running `nspawn.terminate`.

**Note:** `machinectl terminate` is only supported in systemd >= 219. On earlier systemd versions, running this function will simply issue a clean shutdown via `systemctl`.

**CLI Examples:**

```
salt myminion nspawn.terminate arch1
salt myminion nspawn.stop arch1 kill=True
```

### 31.16.172 salt.modules.omapi

This module interacts with an ISC DHCP Server via OMAPI. `server_ip` and `server_port` params may be set in the minion config or pillar:

```
omapi.server_ip: 127.0.0.1
omapi.server_port: 7991
```

**depends** pypureomapi Python module

**salt.modules.omapi.add_host**(mac, name=None, ip=None, ddns=False, group=None, supersede_host=False)
Add a host object for the given mac.

**CLI Example:**

```
```
salt dhcp-server omapi.add_host ab:ab:ab:ab:ab name=host1

Add ddns-hostname and a fixed-ip statements:

salt dhcp-server omapi.add_host ab:ab:ab:ab:ab name=host1 ip=10.1.1.1 ddns=true

salt.modules.omapi.delete_host(mac=None, name=None)
Delete the host with the given mac or name.

CLI Examples:

salt dhcp-server omapi.delete_host name=host1
salt dhcp-server omapi.delete_host mac=ab:ab:ab:ab:ab

31.16.173 salt.modules.openbsd_sysctl

Module for viewing and modifying OpenBSD sysctl parameters

salt.modules.openbsd_sysctl.assign(name, value)
Assign a single sysctl parameter for this minion

CLI Example:

salt '*' sysctl.assign net.inet.ip.forwarding 1

salt.modules.openbsd_sysctl.get(name)
Return a single sysctl parameter for this minion

CLI Example:

salt '*' sysctl.get hw.physmem

salt.modules.openbsd_sysctl.persist(name, value, config='/etc/sysctl.conf')
Assign and persist a simple sysctl parameter for this minion

CLI Example:

salt '*' sysctl.persist net.inet.ip.forwarding 1

salt.modules.openbsd_sysctl.show(config_file=False)
Return a list of sysctl parameters for this minion

CLI Example:

salt '*' sysctl.show

31.16.174 salt.modules.openbsdpkg

Package support for OpenBSD

salt.modules.openbsdpkg.install(name=None, pkgs=None, sources=None, **kwargs)
Install the passed package

Return a dict containing the new package names and versions:

{'<package>': {'old': '<old-version>', 'new': '<new-version>'}}
CLI Example, Install one package:
```
salt '*' pkg.install <package name>
```

CLI Example, Install more than one package:
```
salt '*' pkg.install pkgs='["<package name">", "<package name">"]'
```

CLI Example, Install more than one package from an alternate source (e.g. salt file-server, HTTP, FTP, local filesystem):
```
salt '*' pkg.install sources='[{"<pkg name>": "salt://pkgs/<pkg filename>"}]'
```

salt.modules.openbsdpkg.latest_version(*names, **kwargs)
The available version of the package in the repository
CLI Example:
```
salt '*' pkg.latest_version <package name>
```

salt.modules.openbsdpkg.list_pkgs(versions_as_list=False, **kwargs)
List the packages currently installed as a dict:
```
{'<package_name>': '<version>'}
```

CLI Example:
```
salt '*' pkg.list_pkgs
```

salt.modules.openbsdpkg.purge(name=None, pkgs=None, **kwargs)
Package purges are not supported, this function is identical to remove().

- **name**: The name of the package to be deleted.
  
  Multiple Package Options:
  
- **pkgs**: A list of packages to delete. Must be passed as a python list. The `name` parameter will be ignored if this option is passed.

  New in version 0.16.0.

  Returns a dict containing the changes.

  CLI Example:
  
  ```
salt '*' pkg.purge <package name>
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs='["foo", "bar"]'
```

salt.modules.openbsdpkg.remove(name=None, pkgs=None, **kwargs)
Remove a single package with pkg_delete

Multiple Package Options:

- **pkgs**: A list of packages to delete. Must be passed as a python list. The `name` parameter will be ignored if this option is passed.

  New in version 0.16.0.

  Returns a dict containing the changes.

  CLI Example:
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs=['"foo", "bar"]'

salt.modules.openbsdpkg.version('names', **kwargs)
Returns a string representing the package version or an empty string if not installed. If more than one package
name is specified, a dict of name/version pairs is returned.

CLI Example:
salt '*' pkg.version <package name>
salt '*' pkg.version <package1> <package2> <package3> ...

31.16.175 salt.modules.openbsdrcctl

The rcctl service module for OpenBSD

salt.modules.openbsdrcctl.available(name)
Return True if the named service is available.

CLI Example:
salt '*' service.available ssdh

salt.modules.openbsdrcctl.disable(name, **kwargs)
Disable the named service to not start at boot.

CLI Example:
salt '*' service.disable <service name>

salt.modules.openbsdrcctl.disabled(name)
Return True if the named service is disabled at boot, False otherwise.

CLI Example:
salt '*' service.disabled <service name>

salt.modules.openbsdrcctl.enable(name, **kwargs)
Enable the named service to start at boot.
flags [None] Set optional flags to run the service with.
service.flags can be used to change the default flags.

CLI Example:
salt '*' service.enable <service name>
salt '*' service.enable <service name> flags=<flags>

salt.modules.openbsdrcctl.enabled(name, **kwargs)
Return True if the named service is enabled at boot and the provided flags match the configured ones (if any).
Return False otherwise.

name Service name

CLI Example:
salt '*' service.enabled <service name>
salt '*' service.enabled <service name> flags=<flags>
salt.modules.openbsdrcctl.get_all()
Return all installed services.
CLI Example:
salt '*' service.get_all

salt.modules.openbsdrcctl.get_disabled()
Return what services are available but not enabled to start at boot.
CLI Example:
salt '*' service.get_disabled

salt.modules.openbsdrcctl.get_enabled()
Return what services are set to run on boot.
CLI Example:
salt '*' service.get_enabled

salt.modules.openbsdrcctl.missing(name)
The inverse of service.available. Return True if the named service is not available.
CLI Example:
salt '*' service.missing sshd

salt.modules.openbsdrcctl.reload(name)
Reload the named service.
CLI Example:
salt '*' service.reload <service name>

salt.modules.openbsdrcctl.restart(name)
Restart the named service.
CLI Example:
    salt '*' service.restart <service name>

salt.modules.openbsdrcctl.start(name)
Start the named service.
CLI Example:
    salt '*' service.start <service name>

salt.modules.openbsdrcctl.status(name, sig=None)
Return the status for a service, returns a bool whether the service is running.
CLI Example:
    salt '*' service.status <service name>

salt.modules.openbsdrcctl.stop(name)
Stop the named service.
CLI Example:
    salt '*' service.stop <service name>
31.16.176 salt.modules.openbsdservice

The service module for OpenBSD

salt.modules.openbsdservice.available(name)
  New in version 2014.7.0.
  Returns True if the specified service is available, otherwise returns False.
  CLI Example:
  ```
  salt '*' service.available sshd
  ```

salt.modules.openbsdservice.disabled(name)
  New in version 2014.7.0.
  Return True if the named service is disabled, false otherwise
  CLI Example:
  ```
  salt '*' service.disabled <service name>
  ```

salt.modules.openbsdservice.enabled(name, **kwargs)
  New in version 2014.7.0.
  Return True if the named service is enabled, false otherwise
  CLI Example:
  ```
  salt '*' service.enabled <service name>
  ```

salt.modules.openbsdservice.get_all()
  New in version 2014.7.0.
  Return all available boot services
  CLI Example:
  ```
  salt '*' service.get_all
  ```

salt.modules.openbsdservice.get_disabled()
  New in version 2014.7.0.
  Return a set of services that are installed but disabled
  CLI Example:
  ```
  salt '*' service.get_disabled
  ```

salt.modules.openbsdservice.get_enabled()
  New in version 2014.7.0.
  Return a list of service that are enabled on boot
  CLI Example:
  ```
  salt '*' service.get_enabled
  ```

salt.modules.openbsdservice.missing(name)
  New in version 2014.7.0.
  The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.
  CLI Example:
salt '*' service.missing sshd

salt.modules.openbsdservice.reload(name)
    New in version 2014.7.0.
    Reload the named service
    CLI Example:
    ```
salt '*' service.reload <service name>
```

salt.modules.openbsdservice.restart(name)
    Restart the named service
    CLI Example:
    ```
salt '*' service.restart <service name>
```

salt.modules.openbsdservice.start(name)
    Start the specified service
    CLI Example:
    ```
salt '*' service.start <service name>
```

salt.modules.openbsdservice.status(name, sig=None)
    Return the status for a service, returns a bool whether the service is running.
    CLI Example:
    ```
salt '*' service.status <service name>
```

salt.modules.openbsdservice.stop(name)
    Stop the specified service
    CLI Example:
    ```
salt '*' service.stop <service name>
```

31.16.177 salt.modules.openstack_config

Modify, retrieve, or delete values from OpenStack configuration files.

    maintainer  Jeffrey C. Ollie <jeff@ocjtech.us>
    maturity    new
    depends
    platform    linux

salt.modules.openstack_config.delete(filename, section, parameter)
    Delete a value from an OpenStack configuration file.

    filename    The full path to the configuration file
    section     The section from which to delete the parameter
    parameter   The parameter to delete
    CLI Example:
salt-call openstack_config.delete /etc/keystone/keystone.conf sql connection

salt.modules.openstack_config.get(filename, section, parameter)
Get a value from an OpenStack configuration file.

filename The full path to the configuration file
section The section from which to search for the parameter
parameter The parameter to return

CLI Example:

```
salt-call openstack_config.get /etc/keystone/keystone.conf sql connection
```

salt.modules.openstack_config.set(filename, section, parameter, value)
Set a value in an OpenStack configuration file.

filename The full path to the configuration file
section The section in which the parameter will be set
parameter The parameter to change
value The value to set

CLI Example:

```
salt-call openstack_config.set /etc/keystone/keystone.conf sql connection foo
```

31.16.178 salt.modules.oracle

Oracle DataBase connection module

maintainer Vladimir Bormotov <bormotov@gmail.com>
maturity new
depends cx_Oracle
platform all
configuration module provide connections for multiple Oracle DB instances.

OS Environment

```
ORACLE_HOME: path to oracle product
PATH: path to Oracle Client libs need to be in PATH
```

pillar

```
oracle.dbs: list of known based
oracle.dbs.<db>.uri: connection credentials in format:
    user/password@host[:port]/sid[ as {sysdba|sysoper}]
```

salt.modules.oracle.client_version()
Oracle Client Version

CLI Example:

```
salt '*' oracle.client_version
```

1106 Chapter 31. Reference
salt.modules.oracle.run_query(db, query)
   Run SQL query and return result
   CLI Example:
   salt '*' oracle.run_query my_db "select * from my_table"

salt.modules.oracle.show_dbs(*dbs)
   Show databases configuration from pillar. Filter by *args
   CLI Example:
   salt '*' oracle.show_dbs
   salt '*' oracle.show_dbs my_db

salt.modules.oracle.show_env()
   Show Environment used by Oracle Client
   CLI Example:
   salt '*' oracle.show_env

   Note: at first _connect() NLS_LANG will forced to `.AL32UTF8`

salt.modules.oracle.show_pillar(item=None)
   Show Pillar segment oracle:* and subitem with notation ``item:subitem``
   CLI Example:
   salt '*' oracle.show_pillar
   salt '*' oracle.show_pillar dbs:my_db

salt.modules.oracle.version(*dbs)
   Server Version (select banner from v$version)
   CLI Example:
   salt '*' oracle.version
   salt '*' oracle.version my_db

31.16.179 salt.modules.osquery

New in version 2015.8.0.

salt.modules.osquery.acpi_tables(attrs=None, where=None)
   Return acpi_tables information from osquery
   CLI Example:
   salt '*' osquery.acpi_tables

salt.modules.osquery.alf(attrs=None, where=None)
   Return alf information from osquery
   CLI Example:
   salt '*' osquery.alf
```

salt.modules.osquery.alf_exceptions(attrs=None, where=None)
    Return alf_exceptions information from osquery
    CLI Example:
    ```
    salt '*' osquery.alf_exceptions
    ```

salt.modules.osquery.alf_explicit_auths(attrs=None, where=None)
    Return alf_explicit_auths information from osquery
    CLI Example:
    ```
    salt '*' osquery.alf_explicit_auths
    ```

salt.modules.osquery.alf_services(attrs=None, where=None)
    Return alf_services information from osquery
    CLI Example:
    ```
    salt '*' osquery.alf_services
    ```

salt.modules.osquery.apps(attrs=None, where=None)
    Return apps information from osquery
    CLI Example:
    ```
    salt '*' osquery.apps
    ```

salt.modules.osquery.apt_sources(attrs=None, where=None)
    Return apt_sources information from osquery
    CLI Example:
    ```
    salt '*' osquery.apt_sources
    ```

salt.modules.osquery.arp_cache(attrs=None, where=None)
    Return arp_cache information from osquery
    CLI Example:
    ```
    salt '*' osquery.arp_cache
    ```

salt.modules.osquery.block_devices(attrs=None, where=None)
    Return block_devices information from osquery
    CLI Example:
    ```
    salt '*' osquery.block_devices
    ```

salt.modules.osquery.certificates(attrs=None, where=None)
    Return certificates information from osquery
    CLI Example:
    ```
    salt '*' osquery.certificates
    ```

salt.modules.osquery.chrome_extensions(attrs=None, where=None)
    Return chrome_extensions information from osquery
    CLI Example:
    ```
    salt '*' osquery.chrome_extensions
    ```
```
salt.modules.osquery.cpuid(**attrs=None**, **where=None**)  
Return cpuid information from osquery  

CLI Example:
```
salt '*' osquery.cpuid
```

salt.modules.osquery.crontab(**attrs=None**, **where=None**)  
Return crontab information from osquery  

CLI Example:
```
salt '*' osquery.crontab
```

salt.modules.osquery.deb_packages(**attrs=None**, **where=None**)  
Return deb_packages information from osquery  

CLI Example:
```
salt '*' osquery.deb_packages
```

salt.modules.osquery.etc_hosts(**attrs=None**, **where=None**)  
Return etc_hosts information from osquery  

CLI Example:
```
salt '*' osquery.etc_hosts
```

salt.modules.osquery.etc_services(**attrs=None**, **where=None**)  
Return etc_services information from osquery  

CLI Example:
```
salt '*' osquery.etc_services
```

salt.modules.osquery.file(**attrs=None**, **where=None**)  
Return file information from osquery  

CLI Example:
```
salt '*' osquery.file
```

salt.modules.osquery.file_changes(**attrs=None**, **where=None**)  
Return file_changes information from osquery  

CLI Example:
```
salt '*' osquery.file_changes
```

salt.modules.osquery.firefox_addons(**attrs=None**, **where=None**)  
Return firefox_addons information from osquery  

CLI Example:
```
salt '*' osquery.firefox_addons
```

salt.modules.osquery.groups(**attrs=None**, **where=None**)  
Return groups information from osquery  

CLI Example:
```
salt '*' osquery.groups
```

31.16. Full list of builtin execution modules
salt.modules.osquery.hardware_events(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return hardware\_events information from osquery

CLI Example:

\texttt{salt '*/ osquery.hardware_events}

salt.modules.osquery.hash(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return hash information from osquery

CLI Example:

\texttt{salt '*/ osquery.hash}

salt.modules.osquery.homebrew_packages(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return homebrew\_packages information from osquery

CLI Example:

\texttt{salt '*/ osquery.homebrew_packages}

salt.modules.osquery.interface_addresses(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return interface\_addresses information from osquery

CLI Example:

\texttt{salt '*/ osquery.interface_addresses}

salt.modules.osquery.interface_details(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return interface\_details information from osquery

CLI Example:

\texttt{salt '*/ osquery.interface_details}

salt.modules.osquery.iokit_devicetree(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return iokit\_devicetree information from osquery

CLI Example:

\texttt{salt '*/ osquery.iokit_devicetree}

salt.modules.osquery.iokit_registry(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return iokit\_registry information from osquery

CLI Example:

\texttt{salt '*/ osquery.iokit_registry}

salt.modules.osquery.kernel_extensions(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return kernel\_extensions information from osquery

CLI Example:

\texttt{salt '*/ osquery.kernel_extensions}

salt.modules.osquery.kernel_info(\textit{attrs=}\textit{None}, \textit{where=}\textit{None})

Return kernel\_info information from osquery

CLI Example:

\texttt{salt '*/ osquery.kernel_info}
The code block contains descriptions of various functions from the `salt.modules.osquery` module, which are used to retrieve different types of information from the system. Here's a breakdown of each function and its corresponding description:

- **kernel_integrity**: Returns kernel integrity information from `osquery`.
  - CLI Example: `salt '*' osquery.kernel_integrity`

- **kernel_modules**: Returns kernel modules information from `osquery`.
  - CLI Example: `salt '*' osquery.kernel_modules`

- **keychain_items**: Returns keychain items information from `osquery`.
  - CLI Example: `salt '*' osquery.keychain_items`

- **last**: Returns last information from `osquery`.
  - CLI Example: `salt '*' osquery.last`

- **launchd**: Returns launchd information from `osquery`.
  - CLI Example: `salt '*' osquery.launchd`

- **listening_ports**: Returns listening ports information from `osquery`.
  - CLI Example: `salt '*' osquery.listening_ports`

- **logged_in_users**: Returns logged in users information from `osquery`.
  - CLI Example: `salt '*' osquery.logged_in_users`

- **memory_map**: Returns memory map information from `osquery`.
  - CLI Example: `salt '*' osquery.memory_map`

- **mounts**: Returns mounts information from `osquery`.
  - CLI Example: `salt '*' osquery.mounts`

These functions are part of the `osquery` module in Salt, a popular open-source software for distributed server management.
salt.modules.osquery.nfs_shares(attrs=None, where=None)
    Return nfs_shares information from osquery
    CLI Example:
    
    ```
salt '*' osquery.nfs_shares
    ```

salt.modules.osquery.nvram(attrs=None, where=None)
    Return nvram information from osquery
    CLI Example:
    
    ```
salt '*' osquery.nvram
    ```

salt.modules.osquery.os_version(attrs=None, where=None)
    Return os_version information from osquery
    CLI Example:
    
    ```
salt '*' osquery.os_version
    ```

salt.modules.osquery.osquery_extensions(attrs=None, where=None)
    Return osquery_extensions information from osquery
    CLI Example:
    
    ```
salt '*' osquery.osquery_extensions
    ```

salt.modules.osquery.osquery_flags(attrs=None, where=None)
    Return osquery_flags information from osquery
    CLI Example:
    
    ```
salt '*' osquery.osquery_flags
    ```

salt.modules.osquery.osquery_info(attrs=None, where=None)
    Return osquery_info information from osquery
    CLI Example:
    
    ```
salt '*' osquery.osquery_info
    ```

salt.modules.osquery.osquery_registry(attrs=None, where=None)
    Return osquery_registry information from osquery
    CLI Example:
    
    ```
salt '*' osquery.osquery_registry
    ```

salt.modules.osquerypasswd_changes(attrs=None, where=None)
    Return passwd_changes information from osquery
    CLI Example:
    
    ```
salt '*' osquery.passwd_changes
    ```

salt.modules.osquery.pci_devices(attrs=None, where=None)
    Return pci_devices information from osquery
    CLI Example:
Salt Documentation, Release 2015.8.0

```
salt '*' osquery.pci_devices

salt.modules.osquery.preferences
    (attrs=None, where=None)
    Return preferences information from osquery
    CLI Example:
    salt '*' osquery.preferences

salt.modules.osquery.process_envs
    (attrs=None, where=None)
    Return process_envs information from osquery
    CLI Example:
    salt '*' osquery.process_envs

salt.modules.osquery.process_memory_map
    (attrs=None, where=None)
    Return process_memory_map information from osquery
    CLI Example:
    salt '*' osquery.process_memory_map

salt.modules.osquery.process_open_files
    (attrs=None, where=None)
    Return process_open_files information from osquery
    CLI Example:
    salt '*' osquery.process_open_files

salt.modules.osquery.process_open_sockets
    (attrs=None, where=None)
    Return process_open_sockets information from osquery
    CLI Example:
    salt '*' osquery.process_open_sockets

salt.modules.osquery_processes
    (attrs=None, where=None)
    Return processes information from osquery
    CLI Example:
    salt '*' osquery.processes

salt.modules.osquery.quarantine
    (attrs=None, where=None)
    Return quarantine information from osquery
    CLI Example:
    salt '*' osquery.quarantine

salt.modules.osquery.query
    (sql=None)
    Return time information from osquery
    CLI Example:
    salt '*' osquery.query "select * from users;"

salt.modules.osquery.routes
    (attrs=None, where=None)
    Return routes information from osquery
    CLI Example:
```

31.16. Full list of builtin execution modules
salt '*' osquery.routes

salt.modules.osquery.rpm_packages(attrs=None, where=None)
  Return cpuid information from osquery
  CLI Example:
  
salt '*' osquery.rpm_packages

salt.modules.osquery.safari_extensions(attrs=None, where=None)
  Return safari_extensions information from osquery
  CLI Example:
  
salt '*' osquery.safari_extensions

salt.modules.osquery.shared_memory(attrs=None, where=None)
  Return shared_memory information from osquery
  CLI Example:
  
salt '*' osquery.shared_memory

salt.modules.osquery.shell_history(attrs=None, where=None)
  Return shell_history information from osquery
  CLI Example:
  
salt '*' osquery.shell_history

salt.modules.osquery.smbios_tables(attrs=None, where=None)
  Return smbios_tables information from osquery
  CLI Example:
  
salt '*' osquery.smbios_tables

salt.modules.osquery.startup_items(attrs=None, where=None)
  Return startup_items information from osquery
  CLI Example:
  
salt '*' osquery.startup_items

salt.modules.osquery.suid_bin(attrs=None, where=None)
  Return suid_bin information from osquery
  CLI Example:
  
salt '*' osquery.suid_bin

salt.modules.osquery.system_controls(attrs=None, where=None)
  Return system_controls information from osquery
  CLI Example:
  
salt '*' osquery.system_controls

salt.modules.osquery.time(attrs=None)
  Return time information from osquery
  CLI Example:
salt '*' osquery.time

salt.modules.osquery.usb_devices
    ( attrs=None, where=None )
    Return usb_devices information from osquery
    CLI Example:
        salt '*' osquery.usb_devices

salt.modules.osquery.users
    ( attrs=None, where=None )
    Return users information from osquery
    CLI Example:
        salt '*' osquery.users

salt.modules.osquery.version()
    Return version of osquery
    CLI Example:
        salt '*' osquery.version

salt.modules.osquery.xattr_where_from
    ( attrs=None, where=None )
    Return xattr_where_from information from osquery
    CLI Example:
        salt '*' osquery.xattr_where_from

salt.modules.osquery.xprotect_entries
    ( attrs=None, where=None )
    Return xprotect_entries information from osquery
    CLI Example:
        salt '*' osquery.xprotect_entries

salt.modules.osquery.xprotect_reports
    ( attrs=None, where=None )
    Return xprotect_reports information from osquery
    CLI Example:
        salt '*' osquery.xprotect_reports

31.16.180 salt.modules.osxdesktop

Mac OS X implementations of various commands in the ``desktop'' interface

salt.modules.osxdesktop.get_output_volume()
    Get the output volume (range 0 to 100)
    CLI Example:
        salt '*' desktop.get_output_volume

salt.modules.osxdesktop.lock()
    Lock the desktop session
    CLI Example:
```
salt '*' desktop.lock
```

salt.modules.osxdesktop.say('words')

Say some words.

CLI Example:
```
salt '*' desktop.say <word0> <word1> ... <wordN>
```

```
salt.modules.osxdesktop.screensaver()
```

Launch the screensaver

CLI Example:
```
salt '*' desktop.screensaver
```

```
salt.modules.osxdesktop.set_output_volume(volume)
```

Set the volume of sound (range 0 to 100)

CLI Example:
```
salt '*' desktop.set_output_volume <volume>
```

### 31.16.181 salt.modules.pacman

A module to wrap pacman calls, since Arch is the best (https://wiki.archlinux.org/index.php/Arch_is_the_best)

salt.modules.pacman.file_dict(*packages)

List the files that belong to a package, grouped by package. Not specifying any packages will return a list of _every_ file on the system's package database (not generally recommended).

CLI Examples:
```
salt '*' pkg.file_list httpd
salt '*' pkg.file_list httpd postfix
salt '*' pkg.file_list
```

salt.modules.pacman.file_list(*packages)

List the files that belong to a package. Not specifying any packages will return a list of _every_ file on the system's package database (not generally recommended).

CLI Examples:
```
salt '*' pkg.file_list httpd
salt '*' pkg.file_list httpd postfix
salt '*' pkg.file_list
```

salt.modules.pacman.install(name=None, refresh=False, sysupgrade=False, pkgs=None, sources=None, **kwargs)

Install (pacman -S) the passed package, add refresh=True to install with -y, add sysupgrade=True to install with -u.

**name** The name of the package to be installed. Note that this parameter is ignored if either ``pkgs`` or ``sources`` is passed. Additionally, please note that this option can only be used to install packages from a software repository. To install a package file manually, use the ``sources`` option.

CLI Example:
salt '*' pkg.install <package name>

**refresh** Whether or not to refresh the package database before installing.

**sysupgrade** Whether or not to upgrade the system packages before installing.

Multiple Package Installation Options:

**pkgs** A list of packages to install from a software repository. Must be passed as a python list. A specific version number can be specified by using a single-element dict representing the package and its version. As with the **version** parameter above, comparison operators can be used to target a specific version of a package.

CLI Examples:

```sh
salt '*' pkg.install pkgs='["foo", "bar"]'
salt '*' pkg.install pkgs='["foo", {"bar": "1.2.3-4"}]'
salt '*' pkg.install pkgs='["foo", {"bar": ":1.2.3-4"}]'
```

**sources** A list of packages to install. Must be passed as a list of dicts, with the keys being package names, and the values being the source URI or local path to the package.

CLI Example:

```sh
salt '*' pkg.install sources='[{"foo": "salt://foo.pkg.tar.xz"}]
```

Returns a dict containing the new package names and versions:

```json
{
'foo': { 'old': '1.0.0-1', 'new': '1.1.0-1' }
}
```

**salt.modules.pacman.latest_version(names, **kwargs)**

Return the latest version of the named package available for upgrade or installation. If more than one package name is specified, a dict of name/version pairs is returned.

If the latest version of a given package is already installed, an empty string will be returned for that package.

CLI Example:

```sh
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package1> <package2> <package3> ...
```

**salt.modules.pacman.list_pkgs(versions_as_list=False, **kwargs)**

List the packages currently installed as a dict:

```json
{
'<package_name>': '<version>'
}
```

CLI Example:

```sh
salt '*' pkg.list_pkgs
```

**salt.modules.pacman.list_upgrades(refresh=False)**

List all available package upgrades on this system.

CLI Example:

```sh
salt '*' pkg.list_upgrades
```

**salt.modules.pacman.owner(paths)**

New in version 2014.7.0.
Return the name of the package that owns the file. Multiple file paths can be passed. Like `pkg.version <salt.modules.yumpkg.version`, if a single path is passed, a string will be returned, and if multiple paths are passed, a dictionary of file/package name pairs will be returned.

If the file is not owned by a package, or is not present on the minion, then an empty string will be returned for that path.

**CLI Example:**

```bash
salt '*' pkg.owner /usr/bin/apachectl salt '*' pkg.owner /usr/bin/apachectl /usr/bin/zsh
```

**salt.modules.pacman.purge(name=None, pkgs=None, **kwargs)**

Recursively remove a package and all dependencies which were installed with it, this will call a `pacman -Rsc`

- `name`: The name of the package to be deleted.
- `pkgs`: A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

**CLI Example:**

```bash
salt '*' pkg.purge <package name>
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs=["foo", "bar"]
```

**salt.modules.pacman.refresh_db()**

Just run a `pacman -Sy`, return a dict:

```python
{'<database name>': Bool}
```

**CLI Example:**

```bash
salt '*' pkg.refresh_db
```

**salt.modules.pacman.remove(name=None, pkgs=None, **kwargs)**

Remove packages with `pacman -R`.

- `name`: The name of the package to be deleted.
- `pkgs`: A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

**CLI Example:**

```bash
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs=["foo", "bar"]
```

**salt.modules.pacman.upgrade(refresh=False)**

Run a full system upgrade, a `pacman -Sy`

- `refresh`: Whether or not to refresh the package database before installing.
Return a dict containing the new package names and versions:

```
{'<package>': {'old': '<old-version>',
               'new': '<new-version>'}}
```

**CLI Example:**

```
salt '*' pkg.upgrade
```

**salt.modules.pacman.upgrade_available** *(name)*

Check whether or not an upgrade is available for a given package

**CLI Example:**

```
salt '*' pkg.upgrade_available <package name>
```

**salt.modules.pacman.version** *(names, **kwargs)*

Returns a string representing the package version or an empty string if not installed. If more than one package name is specified, a dict of name/version pairs is returned.

**CLI Example:**

```
salt '*' pkg.version <package name>
salt '*' pkg.version <package1> <package2> <package3> ...
```

### 31.16.182 salt.modules.pagerduty

Module for Firing Events via PagerDuty

New in version 2014.1.0.

**configuration** This module can be used by specifying the name of a configuration profile in the minion config, minion pillar, or master config.

For example:

```
my-pagerduty-account:
pagerduty.api_key: F3Rbyjbe43rfFw2214
pagerduty.subdomain: mysubdomain
```

**salt.modules.pagerduty.create_event** *(service_key=None, description=None, details=None, incident_key=None, profile=None)*

Create an event in PagerDuty. Designed for use in states.

**CLI Example:**

```
salt myminion pagerduty.create_event <service_key> <description> <details>
```

The following parameters are required:

**service_key** This key can be found by using pagerduty.list_services.

**description** This is a short description of the event.

**details** This can be a more detailed description of the event.

**profile** This refers to the configuration profile to use to connect to the PagerDuty service.

**salt.modules.pagerduty.list_escalation_policies** *(profile=None, api_key=None)*

List escalation policies belonging to this account

**CLI Example:**
salt myminion pagerduty.list_policies my-pagerduty-account
salt myminion pagerduty.list_escalation_policies my-pagerduty-account

salt.modules.pagerduty.list_incidents(profile=None, api_key=None)
List incidents belonging to this account

CLI Example:
salt myminion pagerduty.list_incidents my-pagerduty-account

salt.modules.pagerduty.list_maintenance_windows(profile=None, api_key=None)
List maintenance windows belonging to this account

CLI Example:
salt myminion pagerduty.list_windows my-pagerduty-account salt myminion pagerduty.list_maintenance_windows my-pagerduty-account

salt.modules.pagerduty.list_policies(profile=None, api_key=None)
List escalation policies belonging to this account

CLI Example:
salt myminion pagerduty.list_policies my-pagerduty-account salt myminion pagerduty.list_escalation_policies my-pagerduty-account

salt.modules.pagerduty.list_schedules(profile=None, api_key=None)
List schedules belonging to this account

CLI Example:
salt myminion pagerduty.list_schedules my-pagerduty-account

salt.modules.pagerduty.list_services(profile=None, api_key=None)
List services belonging to this account

CLI Example:
salt myminion pagerduty.list_services my-pagerduty-account

salt.modules.pagerduty.list_users(profile=None, api_key=None)
List users belonging to this account

CLI Example:
salt myminion pagerduty.list_users my-pagerduty-account

salt.modules.pagerduty.list_windows(profile=None, api_key=None)
List maintenance windows belonging to this account

CLI Example:
salt myminion pagerduty.list_windows my-pagerduty-account salt myminion pagerduty.list_maintenance_windows my-pagerduty-account

31.16.183 salt.modules.pagerduty_util

Module for managing PagerDuty resource

configuration This module can be used by specifying the name of a configuration profile in the minion
config, minion pillar, or master config. The default configuration profile name is `pagerduty`.

For example:
For PagerDuty API details, see https://developer.pagerduty.com/documentation/rest

salt.modules.pagerduty_util.create_or_update_resource(resource_name, identifier_fields, data, diff=None, profile='pagerduty', subdomain=None, api_key=None)

create or update any pagerduty resource Helper method for present().

Determining if two resources are the same is different for different PD resource, so this method accepts a
diff function. The diff function will be invoked as 
diff(state_information, object_returned_from_pagerduty),
and should return a dict of data to pass to the PagerDuty update API method, or None if no update is to be
performed. If no diff method is provided, the default behavior is to scan the keys in the state_information,
comparing the matching values in the object_returned_from_pagerduty, and update any values that differ.

examples:
create_or_update_resource(¨user¨, [¨id¨,¨name¨,¨email¨])
create_or_update_resource(¨escalation_policies¨, [¨id¨,¨name¨], diff=my_diff_function)

salt.modules.pagerduty_util.delete_resource(resource_name, key, identifier_fields, profile='pagerduty', subdomain=None, api_key=None)

delete any pagerduty resource

Helper method for absent()

example:
delete_resource(¨users¨, key, [¨id¨,¨name¨,¨email¨]) # delete by id or name or email

salt.modules.pagerduty_util.get_escalation_policies(profile='pagerduty', subdomain=None, api_key=None)

List escalation_policies belonging to this account

CLI Example:
salt myminion pagerduty.get_escalation_policies

salt.modules.pagerduty_util.get_resource(resource_name, key, identifier_fields, profile='pagerduty', subdomain=None, api_key=None)

Get any single pagerduty resource by key.

We allow flexible lookup by any of a list of identifier_fields. So, for example, you can look up users by email
address or name by calling:

get_resource(¨users¨, key, [¨name¨,¨email¨], ...)

This method is mainly used to translate state sls into pagerduty id's for dependent objects. For example, a
pagerduty escalation policy contains one or more schedules, which must be passed by their pagerduty id. We
look up the schedules by name (using this method), and then translate the names into id's.

This method is implemented by getting all objects of the resource type (cached into __context__), then brute
force searching through the list and trying to match any of the identifier_fields. The __context__ cache is
purged after any create, update or delete to the resource.

salt.modules.pagerduty_util.get_schedules(profile='pagerduty', subdomain=None, api_key=None)

List schedules belonging to this account

CLI Example:
salt myminion pagerduty.get_schedules
salt.modules.pagerduty_util.get_services(profile='pagerduty', subdomain=None, api_key=None)

List services belonging to this account

CLI Example:
salt myminion pagerduty.get_services

salt.modules.pagerduty_util.get_users(profile='pagerduty', subdomain=None, api_key=None)

List users belonging to this account

CLI Example:
salt myminion pagerduty.get_users

salt.modules.pagerduty_util.resource_absent(resource, identifier_fields, profile='pagerduty', subdomain=None, api_key=None, **kwargs)

Generic resource.absent state method. Pagerduty state modules should be a thin wrapper over this method, with a custom diff function.

This method calls delete_resource() and formats the result as a salt state return value.

example: resource_absent(``users'', [``id'',``name'',``email''])

salt.modules.pagerduty_util.resource_present(resource, identifier_fields, diff=None, profile='pagerduty', subdomain=None, api_key=None, **kwargs)

Generic resource.present state method. Pagerduty state modules should be a thin wrapper over this method, with a custom diff function.

This method calls create_or_update_resource() and formats the result as a salt state return value.

example: resource_present(``users'', [``id'',``name'',``email''])

31.16.184 salt.modules.pam

Support for pam

salt.modules.pam.read_file(file_name)

This is just a test function, to make sure parsing works

CLI Example:

salt '*' pam.read_file /etc/pam.d/login

31.16.185 salt.modules.parted

Module for managing partitions on POSIX-like systems.

depends

- parted, partprobe, lsblk (usually parted and util-linux packages)

Some functions may not be available, depending on your version of parted.

Check the manpage for parted(8) for more information, or the online docs at:

In light of parted not directly supporting partition IDs, some of this module has been written to utilize sfdisk instead. For further information, please reference the man page for sfdisk(8).
salt.modules.parted.align_check(device, part_type, partition)
  partition.align_check device part_type partition
  Check if partition satisfies the alignment constraint of part_type. Type must be 'minimal' or 'optimal'.
  CLI Example:
  ```
  salt '*' partition.align_check /dev/sda minimal 1
  ```

salt.modules.parted.check(device, minor)
  partition.check device minor
  Checks if the file system on partition <minor> has any errors.
  CLI Example:
  ```
  salt '*' partition.check 1
  ```

salt.modules.parted.cp(device, from_minor, to_minor)
  partition.check device from_minor to_minor
  Copies the file system on the partition <from-minor> to partition <to-minor>, deleting the original contents of the destination partition.
  CLI Example:
  ```
  salt '*' partition.cp /dev/sda 2 3
  ```

salt.modules.parted.exists(device='')
  partition.exists device
  Check to see if the partition exists
  CLI Example:
  ```
  salt '*' partition.exists /dev/sdb1
  ```

salt.modules.parted.get_block_device()
  Retrieve a list of disk devices
  New in version 2014.7.0.
  CLI Example:
  ```
  salt '*' partition.get_block_device
  ```

salt.modules.parted.get_id(device, minor)
  Prints the system ID for the partition. Some typical values are:
  ```
  b:  FAT32 (vfat)
  7:  HPFS/NTFS
  82: Linux Swap
  83: Linux
  8e: Linux LVM
  fd: Linux RAID Auto
  ```
  CLI Example:
  ```
  salt '*' partition.get_id /dev/sda 1
  ```

salt.modules.parted.list(device, unit=None)
  partition.list device unit
  Prints partition information of given <device>
salt.modules.parted.mkfs(device, fs_type)

Makes a file system `<fs_type>` on partition `<device>`, destroying all data that resides on that partition. `<fs_type>` must be one of ``ext2'', ``fat32'', ``fat16'', ``linux-swap'' or ``reiserfs'' (if `libreiserfs` is installed)

CLI Example:
```
salt '*' partition.mkfs /dev/sda2 fat32
```

salt.modules.parted.mklabel(device, label_type)

Create a new disklabel (partition table) of label_type. Type should be one of ``aix'', ``amiga'', ``bsd'', ``dvh'', ``gpt'', ``loop'', ``mac'', ``msdos'', ``pc98'', or ``sun''.

CLI Example:
```
salt '*' partition.mklabel /dev/sda msdos
```

salt.modules.parted.mkpart(device, part_type, fs_type=None, start=None, end=None)

Make a `<part_type>` partition for filesystem `<fs_type>`, beginning at `<start>` and ending at `<end>` (by default in megabytes). `<part_type>` should be one of ``primary'', ``logical'', or ``extended''.

CLI Examples:
```
salt '*' partition.mkpart /dev/sda primary fs_type=fat32 start=0 end=639
salt '*' partition.mkpart /dev/sda primary start=0 end=639
```

salt.modules.parted.mkpartfs(device, part_type, fs_type, start, end)

Make a `<part_type>` partition with a new filesystem of `<fs_type>`, beginning at `<start>` and ending at `<end>` (by default in megabytes). `<part_type>` should be one of ``primary'', ``logical'', or ``extended''. `<fs_type>` must be one of ``ext2'', ``fat32'', ``fat16'', ``linux-swap'' or ``reiserfs'' (if `libreiserfs` is installed)

CLI Example:
```
salt '*' partition.mkpartfs /dev/sda logical ext2 440 670
```

salt.modules.parted.name(device, partition, name)

Set the name of partition to name. This option works only on Mac, PC98, and GPT disklabels. The name can be placed in quotes, if necessary.

CLI Example:
```
salt '*' partition.name /dev/sda 1 'My Documents'
```

salt.modules.parted.probe(*devices)

Ask the kernel to update its local partition data. When no args are specified all block devices are tried.

Caution: Generally only works on devices with no mounted partitions and may take a long time to return if specified devices are in use.
CLI Examples:

```python
salt '*' partition.probe
salt '*' partition.probe /dev/sda
salt '*' partition.probe /dev/sda /dev/sdb
```

**salt.modules.parted.rescue**(device, start, end)

- `rescue` device start end

Rescue a lost partition that was located somewhere between start and end. If a partition is found, parted will ask if you want to create an entry for it in the partition table.

CLI Example:

```python
salt '*' partition.rescue /dev/sda 0 8056
```

**salt.modules.parted.resize**(device, minor, start, end)

- `resize` device minor, start, end

Resizes the partition with number <minor>. The partition will start <start> from the beginning of the disk, and end <end> from the beginning of the disk. resize never changes the minor number. Extended partitions can be resized, so long as the new extended partition completely contains all logical partitions.

CLI Example:

```python
salt '*' partition.resize /dev/sda 3 200 850
```

**salt.modules.parted.rm**(device, minor)

- `rm` device minor

Removes the partition with number <minor>.

CLI Example:

```python
salt '*' partition.rm /dev/sda 5
```

**salt.modules.parted.set**(device, minor, flag, state)

- `set` device minor flag state

Changes a flag on the partition with number <minor>. A flag can be either `on` or `off`. Some or all of these flags will be available, depending on what disk label you are using.

CLI Example:

```python
salt '*' partition.set /dev/sda 1 boot on
```

**salt.modules.parted.set_id**(device, minor, system_id)

Sets the system ID for the partition. Some typical values are:

- `b`: FAT32 (vfat)
- `7`: HPFS/NTFS
- `82`: Linux Swap
- `83`: Linux
- `8e`: Linux LVM
- `fd`: Linux RAID Auto

CLI Example:

```python
salt '*' partition.set_id /dev/sda 1 83
```

**salt.modules.parted.system_types()**

List the parted system types that are supported by the installed version of sfdisk
CLI Example:

```python
salt '*' partition.system_types
```

```python
taxt.modules.parted.toggle(device, partition, flag)
    partition.toggle device partition flag
    Toggle the state of <flag> on <partition>
CLI Example:
    salt '*' partition.name /dev/sda 1 boot
```

### 31.16.186 salt.modules.pecl

Manage PHP pecl extensions.

```python
taxt.modules.pecl.install(pecls, defaults=False, force=False, preferred_state='stable')
    New in version 0.17.0.
    Installs one or several pecl extensions.
    pecls The pecl extensions to install.
    defaults Use default answers for extensions such as pecl_http which ask questions before installation. Without this option, the pecl.installed state will hang indefinitely when trying to install these extensions.
    force Whether to force the installed version or not
CLI Example:
    salt '*' pecl.install fuse
```

```python
taxt.modules.pecl.list(channel=None)
    List installed pecl extensions.
CLI Example:
    salt '*' pecl.list
```

```python
taxt.modules.pecl.uninstall(pecls)
    Uninstall one or several pecl extensions.
    pecls The pecl extensions to uninstall.
CLI Example:
    salt '*' pecl.uninstall fuse
```

```python
taxt.modules.pecl.update(pecls)
    Update one or several pecl extensions.
    pecls The pecl extensions to update.
CLI Example:
    salt '*' pecl.update fuse
```
31.16.187 salt.modules.pillar

Extract the pillar data for this minion

```python
salt.modules.pillar.ext(external, pillar=None)
```

Generate the pillar and apply an explicit external pillar

CLI Example:

```bash
salt '*' pillar.ext '{libvirt: _}'
```

```python
salt.modules.pillar.get(key, default=<type`exceptions.KeyError'>, merge=False, delimiter=':')
```

New in version 0.14.

Attempt to retrieve the named value from pillar, if the named value is not available return the passed default. The default return is an empty string except __opts__['pillar_raise_on_missing'] is set to True, in which case a KeyError will be raised.

If the merge parameter is set to True, the default will be recursively merged into the returned pillar data.

The value can also represent a value in a nested dict using a "::" delimiter for the dict. This means that if a dict in pillar looks like this:

```python
{'pkg': {'apache': 'httpd'}}
```

To retrieve the value associated with the apache key in the pkg dict this key can be passed:

```bash
pkg:apache
```

**merge** Specify whether or not the retrieved values should be recursively merged into the passed default.

New in version 2014.7.0.

**delimiter** Specify an alternate delimiter to use when traversing a nested dict

New in version 2014.7.0.

CLI Example:

```bash
salt '*' pillar.get pkg:apache
```

```python
salt.modules.pillar.item(*args, **kwargs)
```

New in version 0.16.2.

Return one or more pillar entries

**pillar** [none] if specified, allows for a dictionary of pillar data to be made available to pillar and ext_pillar rendering. These pillar variables will also override any variables of the same name in pillar or ext_pillar.

New in version 2015.5.0.

CLI Examples:

```bash
salt '*' pillar.item foo
salt '*' pillar.item foo bar baz
```
salt.modules.pillar.items(*args, **kwargs)
Calls the master for a fresh pillar and generates the pillar data on the fly
Contrast with raw() which returns the pillar data that is currently loaded into the minion.

pillar [none] if specified, allows for a dictionary of pillar data to be made available to pillar and ext_pillar rendering. these pillar variables will also override any variables of the same name in pillar or ext_pillar.

New in version 2015.5.0.

CLI Example:
```
salt '*' pillar.items
```

salt.modules.pillar.keys(key, delimiter=': ')
New in version 2015.8.0.
Attempt to retrieve a list of keys from the named value from the pillar.
The value can also represent a value in a nested dict using a ":" delimiter for the dict, similar to how pillar.get works.
delimiter Specify an alternate delimiter to use when traversing a nested dict

CLI Example:
```
salt '*' pillar.keys web:sites
```

salt.modules.pillar.ls(*args)
New in version 2015.8.0.
Calls the master for a fresh pillar, generates the pillar data on the fly (same as items()), but only shows the available main keys.

CLI Examples:
```
salt '*' pillar.ls
```

salt.modules.pillar.obfuscate(*args)
Same as items(), but replace pillar values with a simple type indication.
New in version 2015.8.0.
This is useful to avoid displaying sensitive information on console or flooding the console with long output, such as certificates. For many debug or control purposes, the stakes lie more in dispatching than in actual values.
In case the value is itself a collection type, obfuscation occurs within the value. For mapping types, keys are not obfuscated. Here are some examples:

- 'secret password' becomes '<str>'
- ['secret', 1] becomes ['<str>', '<int>']
- {'login': 'somalgin', 'pwd': 'secret'} becomes {'login': '<str>', 'pwd': '<str>'}

CLI Examples:
```
salt '*' pillar.obfuscate
```

salt.modules.pillar.raw(key=None)
Return the raw pillar data that is currently loaded into the minion.
Contrast with items() which calls the master to fetch the most up-to-date Pillar.
CLI Example:

```
salt '*' pillar.raw
```

With the optional key argument, you can select a subtree of the pillar raw data:

```
salt '*' pillar.raw key='roles'
```

### 31.16.188 salt.modules.pip

Install Python packages with pip to either the system or a virtualenv

**Windows Support**

New in version 2014.7.4.

Salt now uses a portable python. As a result the entire pip module is now functional on the salt installation itself. You can pip install dependencies for your custom modules. You can even upgrade salt itself using pip. For this to work properly, you must specify the Current Working Directory (`cwd`) and the Pip Binary (`bin_env`) salt should use. The variable `pip_bin` can be either a virtualenv path or the path to the pip binary itself.

For example, the following command will list all software installed using pip to your current salt environment:

```
salt <minion> pip.list cwd='C:\salt\bin\Scripts' bin_env='C:\salt\bin\Scripts\pip.exe'
```

Specifying the `cwd` and `bin_env` options ensures you're modifying the salt environment. If these are omitted, it will default to the local installation of python. If python is not installed locally it will fail saying it couldn't find pip.

**State File Support**

This functionality works in states as well. If you need to pip install colorama with a state, for example, the following will work:

```
install_colorama:
  pip.installed:
    - name: colorama
    - cwd: 'C:\salt\bin\Scripts'
    - bin_env: 'C:\salt\bin\Scripts\pip.exe'
    - upgrade: True
```

**Upgrading Salt using Pip**

You can now update salt using pip to any version from the 2014.7 branch forward. Previous versions require recompiling some of the dependencies which is painful in windows.

To do this you just use pip with git to update to the version you want and then restart the service. Here is a sample state file that upgrades salt to the head of the 2015.5 branch:

```
install_salt:
  pip.installed:
    - cwd: 'C:\salt\bin\Scripts'
    - bin_env: 'C:\salt\bin\Scripts\pip.exe'
    - editable: git+https://github.com/saltstack/salt@2015.5#egg=salt
    - upgrade: True
```
restart_service:
  service.running:
    - name: salt-minion
    - enable: True
    - watch:
      - pip: install_salt

Note: If you’re having problems, you might try doubling the back slashes. For example, cwd: `C:salt\bin\scripts`. Sometimes python thinks the single back slash is an escape character.

salt.modules.pip.freeze

Return a list of installed packages either globally or in the specified virtualenv

bin_env path to pip bin or path to virtualenv. If doing an uninstall from the system python and want to use a specific pip bin (pip-2.7, pip-2.6, etc.) just specify the pip bin you want. If uninstalling from a virtualenv, just use the path to the virtualenv (/home/code/path/to/virtualenv/)

user The user under which to run pip

cwd Current working directory to run pip from

CLI Example:

    salt '*' pip.freeze /home/code/path/to/virtualenv/

salt.modules.pip.install

Install packages with pip

Install packages individually or from a pip requirements file. Install packages globally or to a virtualenv.

pkgs Comma separated list of packages to install

requirements Path to requirements

bin_env Path to pip bin or path to virtualenv. If doing a system install, and want to use a specific pip bin (pip-2.7, pip-2.6, etc..) just specify the pip bin you want.

Note: If installing into a virtualenv, just use the path to the virtualenv (e.g. /home/code/path/to/virtualenv/)

ev Deprecated, use bin_env now

use_wheel Prefer wheel archives (requires pip>=1.4)

no_use_wheel Force to not use wheel archives (requires pip>=1.4)

log Log file where a complete (maximum verbosity) record will be kept
proxy Specify a proxy in the form `user:passwd@proxy.server:port`. Note that the `user:password@` is optional and required only if you are behind an authenticated proxy. If you provide `user@proxy.server:port` then you will be prompted for a password.

timeout Set the socket timeout (default 15 seconds)

editable install something editable (e.g. `git+https://github.com/worldcompany/djangoembed.git#egg=djangoembed`)

find_links URL to search for packages

index_url Base URL of Python Package Index

extra_index_url Extra URLs of package indexes to use in addition to `index_url`

no_index Ignore package index

mirrors Specific mirror URL(s) to query (automatically adds `--use-mirrors`)

build Unpack packages into build dir

target Install packages into target dir

download Download packages into download instead of installing them

download_cache Cache downloaded packages in download_cache dir

source Checkout editable packages into source dir

upgrade Upgrade all packages to the newest available version

force_reinstall When upgrading, reinstall all packages even if they are already up-to-date.

ignore_installed Ignore the installed packages (reinstalling instead)

exists_action Default action when a path already exists: (s)witch, (i)gnore, (w)ipe, (b)ackup

no_deps Ignore package dependencies

no_install Download and unpack all packages, but don't actually install them

no_download Don't download any packages, just install the ones already downloaded (completes an install run with `--no-install`)

install_options Extra arguments to be supplied to the setup.py install command (e.g. like `--install-option='--install-scripts=/usr/local/bin'`). Use multiple `--install-option` options to pass multiple options to setup.py install. If you are using an option with a directory path, be sure to use absolute path.

global_options Extra global options to be supplied to the setup.py call before the install command.

user The user under which to run pip

no_chown When user is given, do not attempt to copy and chown a requirements file

cwd Current working directory to run pip from

activate Activates the virtual environment, if given via `bin_env`, before running install.

    Deprecated since version 2014.7.2: If `bin_env` is given, pip will already be sourced from that virtualenv, making `activate` effectively a noop.

pre_releases Include pre-releases in the available versions

cert Provide a path to an alternate CA bundle

allow_all_external Allow the installation of all externally hosted files

allow_external Allow the installation of externally hosted files (comma separated list)

31.16. Full list of builtin execution modules
allow_unverified  Allow the installation of insecure and unverifiable files (comma separated list)

process_dependency_links  Enable the processing of dependency links

use_vt  Use VT terminal emulation (see output while installing)

env_vars  Set environment variables that some builds will depend on. For example, a Python C-module may have a Makefile that needs INCLUDE_PATH set to pick up a header file while compiling.

trusted_host  Mark this host as trusted, even though it does not have valid or any HTTPS.

CLI Example:

```
salt '*' pip.install <package name>,<package2 name>
salt '*' pip.install requirements=/path/to/requirements.txt
salt '*' pip.install <package name> bin_env=/path/to/virtualenv
salt '*' pip.install <package name> bin_env=/path/to/pip_bin
```

Complicated CLI example:

```
salt '*' pip.install markdown,django editable=git+https://github.com/worldcompany/djangoembed.git#egg=djangoembed upgrade=True no_deps=True
```

salt.modules.pip.list(prefix=None, bin_env=None, user=None, cwd=None)

Filter list of installed apps from freeze and check to see if prefix exists in the list of packages installed.

CLI Example:

```
salt '*' pip.list salt
```

salt.modules.pip.list_upgrades(bin_env=None, user=None, cwd=None)

Check whether or not an upgrade is available for all packages.

CLI Example:

```
salt '*' pip.list_upgrades
```

salt.modules.pip.uninstall(pkgs=None, requirements=None, bin_env=None, log=None, proxy=None, timeout=None, user=None, no_chown=False, cwd=None, __env__=None, saltenv='base', use_vt=False)

Uninstall packages with pip

Uninstall packages individually or from a pip requirements file. Uninstall packages globally or from a virtualenv.

pkgs  comma separated list of packages to install

requirements  path to requirements.

bin_env  path to pip bin or path to virtualenv. If doing an uninstall from the system python and want to use a specific pip bin (pip-2.7, pip-2.6, etc..) just specify the pip bin you want. If uninstalling from a virtualenv, just use the path to the virtualenv (/home/code/path/to/virtualenv/)

log  Log file where a complete (maximum verbosity) record will be kept

proxy  Specify a proxy in the form user:passwd@proxy.server:port. Note that the user:password@ is optional and required only if you are behind an authenticated proxy. If you provide user@proxy.server:port then you will be prompted for a password.

timeout  Set the socket timeout (default 15 seconds)

user  The user under which to run pip

no_chown  When user is given, do not attempt to copy and chown a requirements file (needed if the requirements file refers to other files via relative paths, as the copy-and-chown procedure does not account for such files)
cwd  Current working directory to run pip from

use_vt  Use VT terminal emulation (see output while installing)

CLI Example:

```
salt '*' pip.uninstall <package name>,<package2 name>
salt '*' pip.uninstall requirements=/path/to/requirements.txt
salt '*' pip.uninstall <package name> bin_env=/path/to/virtualenv
salt '*' pip.uninstall <package name> bin_env=/path/to/pip_bin
```

cwd

```
salt.modules.pip.upgrade(bin_env=None, user=None, cwd=None, use_vt=False)
```

New in version 2015.5.0.

Upgrades outdated pip packages

Returns a dict containing the changes.

```
{`<package>`: `{old': `<old-version>', 
`new': `<new-version>'}`}
```

CLI Example:

```
salt '*' pip.upgrade
```

cwd

```
salt.modules.pip.upgrade_available(pkg, bin_env=None, user=None, cwd=None)
```

New in version 2015.5.0.

Check whether or not an upgrade is available for a given package

CLI Example:

```
salt '*' pip.upgrade_available <package name>
```

cwd

```
salt.modules.pip.version(bin_env=None)
```

New in version 0.17.0.

Returns the version of pip. Use bin_env to specify the path to a virtualenv and get the version of pip in that virtualenv.

If unable to detect the pip version, returns None.

CLI Example:

```
salt '*' pip.version
```

cwd

**31.16.189  salt.modules.pkg_resource**

Resources needed by pkg providers

```
salt.modules.pkg_resource.add_pkg(pkgs, name, pkgver)
```

Add a package to a dict of installed packages.

CLI Example:

```
salt '*' pkg_resource.add_pkg '{}' bind 9
```

cwd

```
salt.modules.pkg_resource.check_extra_requirements(pkgsname, pkgver)
```

Check if the installed package already has the given requirements. This function will return the result of pkg.check_extra_requirements if this function exists for the minion, otherwise it will return True.

CLI Example:
salt.modules.pkg_resource.pack_sources(sources, normalize=True)
Accepts list of dicts (or a string representing a list of dicts) and packs the key/value pairs into a single dict.

'[["foo": "salt://foo.rpm"], {"bar": "salt://bar.rpm"}]]' would become {"foo": "salt://foo.rpm", "bar": "salt://bar.rpm"}

normalize [True] Normalize the package name by removing the architecture, if the architecture of the package is different from the architecture of the operating system. The ability to disable this behavior is useful for poorly-created packages which include the architecture as an actual part of the name, such as kernel modules which match a specific kernel version.

New in version 2015.8.0.

CLI Example:
salt '*' pkg_resource.pack_sources '[["foo": "salt://foo.rpm"], {"bar": "salt://bar.rpm"}]]'

salt.modules.pkg_resource.parse_targets(name=None, pkgs=None, sources=None, saltenv='base', normalize=True, **kwargs)
Parses the input to pkg.install and returns back the package(s) to be installed. Returns a list of packages, as well as a string noting whether the packages are to come from a repository or a binary package.

CLI Example:
salt '*' pkg_resource.parse_targets

salt.modules.pkg_resource.sort_pkglist(pkgs)
Accepts a dict obtained from pkg.list_pkgs() and sorts in place the list of versions for any packages that have multiple versions installed, so that two package lists can be compared to one another.

CLI Example:
salt '*' pkg_resource.sort_pkglist '[["3.45", "2.13"]'

salt.modules.pkg_resource.stringify(pkgs)
Takes a dict of package name/version information and joins each list of installed versions into a string.

CLI Example:
salt '*' pkg_resource.stringify 'vim: 7.127'

salt.modules.pkg_resource.version(*names, **kwargs)
Common interface for obtaining the version of installed packages.

CLI Example:
salt '*' pkg_resource.version vim
salt '*' pkg_resource.version foo bar baz
salt '*' pkg_resource.version 'python*'

salt.modules.pkg_resource.version_clean(verstr)
Clean the version string removing extra data. This function will simply try to call pkg.version_clean.

CLI Example:
salt '*' pkg_resource.version_clean <version_string>
### 31.16.190 salt.modules.pkgin

Package support for pkgin based systems, inspired from freebsd-pkg module

**salt.modules.pkgin.available_version(names, **kwargs)**

Return the latest version of the named package available for upgrade or installation.

If the latest version of a given package is already installed, an empty string will be returned for that package.

**CLI Example:**

```bash
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package1> <package2> ...
```

**salt.modules.pkgin.file_dict(package)**

List the files that belong to a package.

**CLI Examples:**

```bash
salt '*' pkg.file_list nginx
```

**salt.modules.pkgin.file_list(package)**

List the files that belong to a package.

**CLI Examples:**

```bash
salt '*' pkg.file_list nginx
```

**salt.modules.pkgin.install(name=None, refresh=False, fromrepo=None, pkgs=None, sources=None, **kwargs)**

Install the passed package

- **name**  The name of the package to be installed.
- **refresh**  Whether or not to refresh the package database before installing.
- **fromrepo**  Specify a package repository to install from.

**Multiple Package Installation Options:**

- **pkgs**  A list of packages to install from a software repository. Must be passed as a python list.

  **CLI Example:**

  ```bash
  salt '*' pkg.install pkgs='["foo","bar"]'
  ```

- **sources**  A list of packages to install. Must be passed as a list of dicts, with the keys being package names, and the values being the source URI or local path to the package.

  **CLI Example:**

  ```bash
  salt '*' pkg.install sources=[{"foo": "salt://foo.deb"},{"bar": "salt://bar.deb"}]'
  ```

Return a dict containing the new package names and versions:

```json
{ '<package>': { 'old': '<old-version>', 'new': '<new-version>' }}
```

**CLI Example:**

```bash
salt '*' pkg.install <package name>
```
salt.modules.pkgin.latest_version(*names, **kwargs)
Return the latest version of the named package available for upgrade or installation.

If the latest version of a given package is already installed, an empty string will be returned for that package.

CLI Example:

```
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package1> <package2> ...
```

salt.modules.pkgin.list_pkgs(versions_as_list=False, **kwargs)
List the packages currently installed as a dict:

```
{'<package_name>': '<version>'}
```

CLI Example:

```
salt '*' pkg.list_pkgs
```

class purge(name=None, pkgs=None, **kwargs)
Package purges are not supported, this function is identical to remove().

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

```
salt '*' pkg.purge <package name>
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs=('["foo", "bar"]')
```

class refresh_db()
Use pkg update to get latest pkg_summary

CLI Example:

```
salt '*' pkg.refresh_db
```

class remove(name=None, pkgs=None, **kwargs)

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a list containing the removed packages.

CLI Example:

```
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs=('["foo", "bar"]')
```
salt.modules.pkgin.search(pkg_name)
    Searches for an exact match using pkgin `package$

    CLI Example:
    ```
salt '*' pkg.search 'mysql-server'
    ```

salt.modules.pkgin.upgrade()
    Run pkg upgrade, if pkgin used. Otherwise do nothing.
    Return a dict containing the new package names and versions:

    ```
    {'<package>': {'old': '<old-version>',
                   'new': '<new-version>'}}
    ```

    CLI Example:
    ```
salt '*' pkg.upgrade
    ```

salt.modules.pkgin.version(*names, **kwargs)
    Returns a string representing the package version or an empty string if not installed. If more than one package
    name is specified, a dict of name/version pairs is returned.

    CLI Example:
    ```
salt '*' pkg.version <package name>
salt '*' pkg.version <package1> <package2> <package3> ...
    ```

31.16.191 salt.modules.pkgng

Support for pkgng, the new package manager for FreeBSD

**Warning:** This module has been completely rewritten. Up to and including version 0.17.x, it was available as the
pkgng module, (pkgng.install, pkgng.delete, etc.), but moving forward this module will no longer be
available as pkgng, as it will behave like a normal Salt pkg provider. The documentation below should not be
considered to apply to this module in versions <= 0.17.x. If your minion is running a 0.17.x release or older, then
the documentation for this module can be viewed using the sys.doc function:

```
salt bsdminion sys.doc pkgng
```

This module provides an interface to pkg(8). It acts as the default package provider for FreeBSD 10 and newer. For
FreeBSD hosts which have been upgraded to use pkgng, you will need to override the pkg provider by setting the
providers parameter in your Minion config file, in order to use this module to manage packages, like so:

```
providers:
    pkg: pkgng
```

salt.modules.pkgng.audit(jail=None, chroot=None)
    Audits installed packages against known vulnerabilities

    CLI Example:
    ```
salt '*' pkg.audit
    ```

    ```
    jail  Audit packages within the specified jail
    ```

    CLI Example:
salt 'x' pkg.audit jail=<jail name or id>

**chroot** Audit packages within the specified chroot (ignored if jail is specified)

CLI Example:
```
salt 'x' pkg.audit chroot=/path/to/chroot
```

salt.modules.pkgng.autoremove(*jail=None, chroot=None, dryrun=False*)
Delete packages which were automatically installed as dependencies and are not required anymore.

**dryrun** Dry-run mode. The list of changes to packages is always printed, but no changes are actually made.

CLI Example:
```
salt 'x' pkg.autoremove
salt 'x' pkg.autoremove jail=<jail name or id>
salt 'x' pkg.autoremove dryrun=True
salt 'x' pkg.autoremove jail=<jail name or id> dryrun=True
```

salt.modules.pkgng.backup(*file_name, jail=None, chroot=None*)
Export installed packages into yaml+mtree file

CLI Example:
```
salt 'x' pkg.backup /tmp/pkg
```

**jail** Backup packages from the specified jail. Note that this will run the command within the jail, and so the path to the backup file will be relative to the root of the jail

CLI Example:
```
salt 'x' pkg.backup /tmp/pkg jail=<jail name or id>
```

**chroot** Backup packages from the specified chroot (ignored if jail is specified). Note that this will run the command within the chroot, and so the path to the backup file will be relative to the root of the chroot.

CLI Example:
```
salt 'x' pkg.backup /tmp/pkg chroot=/path/to/chroot
```

salt.modules.pkgng.check(*jail=None, chroot=None, depends=False, recompute=False, checksum=False*)
Sanity checks installed packages

**jail** Perform the sanity check in the specified jail

CLI Example:
```
salt 'x' pkg.check jail=<jail name or id>
```

**chroot** Perform the sanity check in the specified chroot (ignored if jail is specified)

CLI Example:
```
salt 'x' pkg.check chroot=/path/to/chroot
```

Of the below, at least one must be set to True.
depends  Check for and install missing dependencies.
   CLI Example:
   salt '*' pkg.check recompute=True

recompute  Recompute sizes and checksums of installed packages.
   CLI Example:
   salt '*' pkg.check depends=True

checksum  Find invalid checksums for installed packages.
   CLI Example:
   salt '*' pkg.check checksum=True

salt.modules.pkgng.clean(jail=None, chroot=None)
   Cleans the local cache of fetched remote packages
   CLI Example:
   salt '*' pkg.clean
   salt '*' pkg.clean jail=<jail name or id>
   salt '*' pkg.clean chroot=/path/to/chroot

salt.modules.pkgng.fetch(name, jail=None, chroot=None, fetch_all=False, quiet=False, fromrepo=None, glob=True, regex=False, pcre=False, local=False, depends=False)
   Fetches remote packages
   CLI Example:
   salt '*' pkg.fetch <package name>

   jail  Fetch package in the specified jail
   CLI Example:
   salt '*' pkg.fetch <package name> jail=<jail name or id>

   chroot  Fetch package in the specified chroot (ignored if jail is specified)
   CLI Example:
   salt '*' pkg.fetch <package name> chroot=/path/to/chroot

   fetch_all  Fetch all packages.
   CLI Example:
   salt '*' pkg.fetch <package name> fetch_all=True

   quiet  Quiet mode. Show less output.
   CLI Example:
   salt '*' pkg.fetch <package name> quiet=True

   fromrepo  Fetches packages from the given repo if multiple repo support is enabled. See pkg.conf(5).
   CLI Example:
```
salt '*' pkg.fetch <package name> fromrepo=repo
```

**glob**  Treat `pkg_name` as a shell glob pattern.

CLI Example:
```
salt '*' pkg.fetch <package name> glob=True
```

**regex**  Treat `pkg_name` as a regular expression.

CLI Example:
```
salt '*' pkg.fetch <regular expression> regex=True
```

**pcre**  Treat `pkg_name` as an extended regular expression.

CLI Example:
```
salt '*' pkg.fetch <extended regular expression> pcre=True
```

**local**  Skip updating the repository catalogs with `pkg-update(8)`. Use the local cache only.

CLI Example:
```
salt '*' pkg.fetch <package name> local=True
```

**depends**  Fetch the package and its dependencies as well.

CLI Example:
```
salt '*' pkg.fetch <package name> depends=True
```

```
salt.modules.pkgng.install(name=None, fromrepo=None, pkgs=None, sources=None, jail=None, chroot=None, orphan=False, force=False, glob=False, local=False, dryrun=False, quiet=False, reinstall_requires=False, regex=False, pcre=False, **kwargs)
```

Install package(s) from a repository

**name**  The name of the package to install

CLI Example:
```
salt '*' pkg.install <package name>
```

**jail**  Install the package into the specified jail

**chroot**  Install the package into the specified chroot (ignored if `jail` is specified)

**orphan**  Mark the installed package as orphan. Will be automatically removed if no other packages depend on them. For more information please refer to `pkg-autoremove(8)`.

CLI Example:
```
salt '*' pkg.install <package name> orphan=True
```

**force**  Force the reinstallation of the package if already installed.

CLI Example:
```
salt '*' pkg.install <package name> force=True
```
glob  Treat the package names as shell glob patterns.

   CLI Example:
   
   salt '*' pkg.install <package name> glob=True

local  Do not update the repository catalogs with pkg-update(8). A value of True here is equivalent to
       using the -U flag with pkg install.

   CLI Example:
   
   salt '*' pkg.install <package name> local=True

dryrun  Dry-run mode. The list of changes to packages is always printed, but no changes are actually made.

   CLI Example:
   
   salt '*' pkg.install <package name> dryrun=True

quiet  Force quiet output, except when dryrun is used, where pkg install will always show packages to be
       installed, upgraded or deleted.

   CLI Example:
   
   salt '*' pkg.install <package name> quiet=True

reinstall_requires  When used with force, reinstalls any packages that require the given package.

   CLI Example:
   
   salt '*' pkg.install <package name> reinstall_requires=True force=True

   Changed in version 2014.7.0: require kwarg renamed to reinstall_requires

fromrepo  In multi-repo mode, override the pkg.conf ordering and only attempt to download packages from
       the named repository.

   CLI Example:
   
   salt '*' pkg.install <package name> fromrepo=repo

regex  Treat the package names as a regular expression

   CLI Example:
   
   salt '*' pkg.install <regular expression> regex=True

pcre  Treat the package names as extended regular expressions.

   CLI Example:
   
   salt '*' pkg.install <extended regular expression> pcre=True

salt.modules.pkgng.latest_version(*names, **kwargs)
Return the latest version of the named package available for upgrade or installation. If more than one package
name is specified, a dict of name/version pairs is returned.
If the latest version of a given package is already installed, an empty string will be returned for that package.

   CLI Example:
   
   salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package name> jail=<jail name or id>
salt '*' pkg.latest_version <package name> chroot=/path/to/chroot
salt.modules.pkgng.list_pkgs(versions_as_list=False, jail=None, chroot=None, with_origin=False, **kwargs)

List the packages currently installed as a dict:

```python
{'<package_name>': '<version>'}
```

- **jail** List the packages in the specified jail
- **chroot** List the packages in the specified chroot (ignored if **jail** is specified)
- **with_origin** [False] Return a nested dictionary containing both the origin name and version for each installed package.
  
  New in version 2014.1.0.

CLI Example:

```
salt '*' pkg.list_pkgs
salt '*' pkg.list_pkgs jail=<jail name or id>
salt '*' pkg.list_pkgs chroot=/path/to/chroot
```

salt.modules.pkgng.parse_config(file_name='/usr/local/etc/pkg.conf')

Return dict of uncommented global variables.

CLI Example:

```
salt '*' pkg.parse_config
```

**NOTE:** not working properly right now

salt.modules.pkgng.refresh_db(jail=None, chroot=None, force=False)

Refresh PACKAGESITE contents

**Note:** This function can accessed using pkg.update in addition to pkg.refresh_db, to more closely match the CLI usage of pkg(8).

CLI Example:

```
salt '*' pkg.refresh_db
```

- **jail** Refresh the pkg database within the specified jail
- **chroot** Refresh the pkg database within the specified chroot (ignored if **jail** is specified)
- **force** Force a full download of the repository catalog without regard to the respective ages of the local and remote copies of the catalog.

CLI Example:

```
salt '*' pkg.refresh_db force=True
```

salt.modules.pkgng.remove(name=None, pkgs=None, jail=None, chroot=None, all_installed=False, force=False, glob=False, dryrun=False, recurse=False, regex=False, pcre=False, **kwargs)

Remove a package from the database and system

**Note:** This function can accessed using pkg.delete in addition to pkg.remove, to more closely match the CLI usage of pkg(8).
**name**  The package to remove

CLI Example:

```
salt '*' pkg.remove <package name>
```

**jail**  Delete the package from the specified jail

**chroot**  Delete the package from the specified chroot (ignored if jail is specified)

**all_installed**  Deletes all installed packages from the system and empties the database. use with caution!

CLI Example:

```
salt '*' pkg.remove all all_installed=True force=True
```

**force**  Forces packages to be removed despite leaving unresolved dependencies. 

CLI Example:

```
salt '*' pkg.remove <package name> force=True
```

**glob**  Treat the package names as shell glob patterns.

CLI Example:

```
salt '*' pkg.remove <package name> glob=True
```

**dryrun**  Dry run mode. The list of packages to delete is always printed, but no packages are actually deleted. 

CLI Example:

```
salt '*' pkg.remove <package name> dryrun=True
```

**recurse**  Delete all packages that require the listed package as well.

CLI Example:

```
salt '*' pkg.remove <package name> recurse=True
```

**regex**  Treat the package names as regular expressions.

CLI Example:

```
salt '*' pkg.remove <regular expression> regex=True
```

**pcre**  Treat the package names as extended regular expressions.

CLI Example:

```
salt '*' pkg.remove <extended regular expression> pcre=True
```

salt.modules.pkgng.restore(file_name, jail=None, chroot=None)

Reads archive created by pkg backup -d and recreates the database.

CLI Example:

```
salt '*' pkg.restore /tmp/pkg
```

**jail**  Restore database to the specified jail. Note that this will run the command within the jail, and so the path to the file from which the pkg database will be restored is relative to the root of the jail.

CLI Example:
salt 'x' pkg.restore /tmp/pkg jail=<jail name or id>

chroot  Restore database to the specified chroot (ignored if jail is specified). Note that this will run the command within the chroot, and so the path to the file from which the pkg database will be restored is relative to the root of the chroot.

CLI Example:

salt 'x' pkg.restore /tmp/pkg chroot=/path/to/chroot

salt.modules.pkgng.search(name, jail=None, chroot=None, exact=False, glob=False, regex=False, pcre=False, comment=False, desc=False, full=False, depends=False, size=False, quiet=False, origin=False, prefix=False)

Searches in remote package repositories

CLI Example:

salt 'x' pkg.search pattern

jail  Perform the search using the pkg.conf(5) from the specified jail

CLI Example:

salt 'x' pkg.search pattern jail=<jail name or id>

chroot  Perform the search using the pkg.conf(5) from the specified chroot (ignored if jail is specified)

CLI Example:

salt 'x' pkg.search pattern chroot=/path/to/chroot

effect  Treat pattern as exact pattern.

CLI Example:

salt 'x' pkg.search pattern exact=True

glob  Treat pattern as a shell glob pattern.

CLI Example:

salt 'x' pkg.search pattern glob=True

regex  Treat pattern as a regular expression.

CLI Example:

salt 'x' pkg.search pattern regex=True

pcre  Treat pattern as an extended regular expression.

CLI Example:

salt 'x' pkg.search pattern pcre=True

comment  Search for pattern in the package comment one-line description.

CLI Example:

salt 'x' pkg.search pattern comment=True
**desc**  Search for pattern in the package description.

   CLI Example:

   ```
salt '*' pkg.search pattern desc=True
   ```

**full**  Displays full information about the matching packages.

   CLI Example:

   ```
salt '*' pkg.search pattern full=True
   ```

**depends**  Displays the dependencies of pattern.

   CLI Example:

   ```
salt '*' pkg.search pattern depends=True
   ```

**size**  Displays the size of the package

   CLI Example:

   ```
salt '*' pkg.search pattern size=True
   ```

**quiet**  Be quiet. Prints only the requested information without displaying many hints.

   CLI Example:

   ```
salt '*' pkg.search pattern quiet=True
   ```

**origin**  Displays pattern origin.

   CLI Example:

   ```
salt '*' pkg.search pattern origin=True
   ```

**prefix**  Displays the installation prefix for each package matching pattern.

   CLI Example:

   ```
salt '*' pkg.search pattern prefix=True
   ```

salt.modules.pkgng.stats(**local=False, remote=False, jail=None, chroot=None**)  Return pkgng stats.

   CLI Example:

   ```
salt '*' pkg.stats
   ```

**local**  Display stats only for the local package database.

   CLI Example:

   ```
salt '*' pkg.stats local=True
   ```

**remote**  Display stats only for the remote package database(s).

   CLI Example:

   ```
salt '*' pkg.stats remote=True
   ```
**jail**  Retrieve stats from the specified jail.

CLI Example:

```bash
salt '*' pkg.stats jail=<jail name or id>
salt '*' pkg.stats jail=<jail name or id> local=True
salt '*' pkg.stats jail=<jail name or id> remote=True
```

**chroot**  Retrieve stats from the specified chroot (ignored if jail is specified).

CLI Example:

```bash
salt '*' pkg.stats chroot=/path/to/chroot
salt '*' pkg.stats chroot=/path/to/chroot local=True
salt '*' pkg.stats chroot=/path/to/chroot remote=True
```

---

salt.modules.pkgng.update_package_site(*new_url*)

Updates remote package repo URL, PACKAGESITE var to be exact.

Must use http://, ftp://, or https:// protocol

CLI Example:

```bash
salt '*' pkg.update_package_site http://127.0.0.1/
```

salt.modules.pkgng.updating(*name*, jail=None, chroot=None, filedate=None, filename=None)

`Displays UPDATING entries of software packages`

CLI Example:

```bash
salt '*' pkg.updating foo
```

**jail**  Perform the action in the specified jail

CLI Example:

```bash
salt '*' pkg.updating foo jail=<jail name or id>
```

**chroot**  Perform the action in the specified chroot (ignored if jail is specified)

CLI Example:

```bash
salt '*' pkg.updating foo chroot=/path/to/chroot
```

**filedate**  Only entries newer than date are shown. Use a YYYYMMDD date format.

CLI Example:

```bash
salt '*' pkg.updating foo filedate=20130101
```

**filename**  Defines an alternative location of the UPDATING file.

CLI Example:

```bash
salt '*' pkg.updating foo filename=/tmp/UPDATING
```

salt.modules.pkgng.upgrade(*names*, **kwargs)

Upgrade named or all packages (run a pkg upgrade). If <package name> is ommitted, the operation is executed on all packages.

CLI Example:
salt 'x' pkg.upgrade <package name>

jail Audit packages within the specified jail
   CLI Example:
   salt 'x' pkg.upgrade <package name> jail=<jail name or id>

chroot Audit packages within the specified chroot (ignored if jail is specified)
   CLI Example:
   salt 'x' pkg.upgrade <package name> chroot=/path/to/chroot

Any of the below options can also be used with jail or chroot.

force Force reinstalling/upgrading the whole set of packages.
   CLI Example:
   salt 'x' pkg.upgrade <package name> force=True

local Do not update the repository catalogs with pkg-update(8). A value of True here is equivalent to using the -U flag with pkg upgrade.
   CLI Example:
   salt 'x' pkg.upgrade <package name> local=True

dryrun Dry-run mode: show what packages have updates available, but do not perform any upgrades. Repository catalogs will be updated as usual unless the local option is also given.
   CLI Example:
   salt 'x' pkg.upgrade <package name> dryrun=True

salt.modules.pkgng.version(*names, **kwargs)

Returns a string representing the package version or an empty string if not installed. If more than one package name is specified, a dict of name/version pairs is returned.

Note: This function can accessed using pkg.info in addition to pkg.version, to more closely match the CLI usage of pkg(8).

jail Get package version information for the specified jail

chroot Get package version information for the specified chroot (ignored if jail is specified)

with_origin [False] Return a nested dictionary containing both the origin name and version for each specified package.
   New in version 2014.1.0.

   CLI Example:
   salt 'x' pkg.version <package name>
salt 'x' pkg.version <package name> jail=<jail name or id>
salt 'x' pkg.version <package1> <package2> <package3> ...
salt.modules.pkgng.which  
\([\text{path}, \text{jail=None, chroot=None, origin=False, quiet=False}]\)

Displays which package installed a specific file

CLI Example:
```
salt '*' pkg.which <file name>
```

jail  Perform the check in the specified jail

CLI Example:
```
salt '*' pkg.which <file name> jail=<jail name or id>
```

chroot  Perform the check in the specified chroot (ignored if jail is specified)

CLI Example:
```
salt '*' pkg.which <file name> chroot=/path/to/chroot
```

origin  Shows the origin of the package instead of name-version.

CLI Example:
```
salt '*' pkg.which <file name> origin=True
```

quiet  Quiet output.

CLI Example:
```
salt '*' pkg.which <file name> quiet=True
```

31.16.192 salt.modules.pkgutil

Pkgutil support for Solaris

salt.modules.pkgutil.install  
\([\text{name=None, refresh=False, version=None, pkgs=None, **kwargs}]\)

Install packages using the pkgutil tool.

CLI Example:
```
salt '*' pkg.install <package_name>
salt '*' pkg.install SMClgcc346
```

Multiple Package Installation Options:

pkgs  A list of packages to install from OpenCSW. Must be passed as a python list.

CLI Example:
```
salt '*' pkg.install pkgs='["foo", "bar"]'
salt '*' pkg.install pkgs='["foo", {"bar": "1.2.3"}]'
```

Returns a dict containing the new package names and versions:

```
{"<package>": {"old": '<old-version>',
              "new": '<new-version>'}}
```

salt.modules.pkgutil.latest_version  
\([\text{names, **kwargs}]\)

Return the latest version of the named package available for upgrade or installation. If more than one package name is specified, a dict of name/version pairs is returned.
If the latest version of a given package is already installed, an empty string will be returned for that package.

CLI Example:

```
salt '*' pkgutil.latest_version CSWpython
salt '*' pkgutil.latest_version <package1> <package2> <package3> ...
```

```
salt.modules.pkgutil.list_pkgs(versions_as_list=False, **kwargs)
```

List the packages currently installed as a dict:

```
{'<package_name>': '<version>'}
```

CLI Example:

```
salt '*' pkg.list_pkgs
salt '*' pkg.list_pkgs versions_as_list=True
```

```
salt.modules.pkgutil.list_upgrades(refresh=True)
```

List all available package upgrades on this system

CLI Example:

```
salt '*' pkgutil.list_upgrades
```

```
salt.modules.pkgutil.purge(name=None, pkgs=None, **kwargs)
```

Package purges are not supported, this function is identical to `remove()`.

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

```
salt '*' pkg.purge <package name>
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs='["foo", "bar"]'
```

```
salt.modules.pkgutil.refresh_db()
```

Updates the pkgutil repo database (pkgutil -U)

CLI Example:

```
salt '*' pkgutil.refresh_db
```

```
salt.modules.pkgutil.remove(name=None, pkgs=None, **kwargs)
```

Remove a package and all its dependencies which are not in use by other packages.

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.
CLI Example:

```
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs='["foo", "bar"]'
```

`salt.modules.pkgutil.upgrade(refresh=True)`

Upgrade all of the packages to the latest available version.

Returns a dict containing the changes:

```
{'<package>': {'old': '<old-version>',
              'new': '<new-version>'}}
```

CLI Example:

```
salt '*' pkgutil.upgrade
```

`salt.modules.pkgutil.upgrade_available(name)`

Check if there is an upgrade available for a certain package

CLI Example:

```
salt '*' pkgutil.upgrade_available CSWpython
```

`salt.modules.pkgutil.version(*names, **kwargs)`

Returns a version if the package is installed, else returns an empty string

CLI Example:

```
salt '*' pkgutil.version CSWpython
```

### 31.16.193 salt.modules.portage_config

Configure `portage(5)`

`salt.modules.portage_config.append_to_package_conf(conf, atom='', flags=None, string='', overwrite=False)`

Append a string or a list of flags for a given package or DEPEND atom to a given configuration file.

CLI Example:

```
salt '*' portage_config.append_to_package_conf use string="app-admin/salt ldap -libvirt"
salt '*' portage_config.append_to_package_conf use atom="> = app-admin/salt-0.14.1" flags='["ldap", '-libvirt"]'
```

`salt.modules.portage_config.append_use_flags(atom, uses=None, overwrite=False)`

Append a list of use flags for a given package or DEPEND atom

CLI Example:

```
salt '*' portage_config.append_use_flags "app-admin/salt[ldap, -libvirt]"
salt '*' portage_config.append_use_flags ">=app-admin/salt-0.14.1" ['ldap', '-libvirt']"
```

`salt.modules.portage_config.enforce_nice_config()`

Enforce a nice tree structure for `/etc/portage/package.*` configuration files.

See also:

`salt.modules.ebuild.ex_mod_init()` for information on automatically running this when pkg is used.
CLI Example:

```bash
salt '*/' portage_config.enforce_nice_config
```

```
salt.modules.portage_config.filter_flags(use, use_expand_hidden, usemasked, useforced)
    New in version 2015.8.0.
    Filter function to remove hidden or otherwise not normally visible USE flags from a list.
    @type use: list @param use: the USE flag list to be filtered. @type use_expand_hidden: list @param
    use_expand_hidden: list of flags hidden. @type usemasked: list @param usemasked: list of masked USE
    flags. @type useforced: list @param useforced: the forced USE flags. @rtype: list @return the filtered USE
    flags.
```

```
salt.modules.portage_config.get_all_cpv_use(cp)
    New in version 2015.8.0.
    Uses portage to determine final USE flags and settings for an emerge.
    @type cp: string @param cp: eg cat/pkg @rtype: list @return use, use_expand_hidden, usemask, useforce
```

```
salt.modules.portage_config.get_cleared_flags(cp)
    New in version 2015.8.0.
    Uses portage for compare use flags which is used for installing package and use flags which now exist int
    /etc/portage/package.use/
    @type cp: string @param cp: eg cat/pkg @rtype: tuple @return: tuple with two lists - list of used flags and
    list of flags which will be used
```

```
salt.modules.portage_config.get_flags_from_package_conf(conf, atom)
    Get flags for a given package or DEPEND atom. Warning: This only works if the configuration files tree is in
    the correct format (the one enforced by enforce_nice_config)
    CLI Example:
    ```bash
    salt '*/' portage_config.get_flags_from_package_conf license salt
    ```
```

```
salt.modules.portage_config.get_installed_use(cp, use='USE')
    New in version 2015.8.0.
    Gets the installed USE flags from the VARDB.
    @type cp: string @param cp: cat/pkg @type use: string @param use: 1 of ['USE', `PKGUSE`] @rtype list
    @returns [] or the list of IUSE flags
```

```
salt.modules.portage_config.get_iuse(cp)
    New in version 2015.8.0.
    Gets the current IUSE flags from the tree.
    @type cpv: string @param cpv: cat/pkg @rtype list @returns [] or the list of IUSE flags
```

```
salt.modules.portage_config.get_missing_flags(conf, atom, flags)
    Find out which of the given flags are currently not set. CLI Example:
    ```bash
    salt '*/' portage_config.get_missing_flags use salt [['ldap', '-libvirt', 'openssl']]''
    ```
```

```
salt.modules.portage_config.has_flag(conf, atom, flag)
    Verify if the given package or DEPEND atom has the given flag. Warning: This only works if the configuration
    files tree is in the correct format (the one enforced by enforce_nice_config)
    CLI Example:
```

31.16. Full list of builtin execution modules

1151
salt '海报' portage_config.has_flag license salt Apache-2.0

salt.modules.portage_config.has_use(atom, use)
    Verify if the given package or DEPEND atom has the given use flag. Warning: This only works if the configuration files tree is in the correct format (the one enforced by enforce_nice_config)

    CLI Example:
    salt '海报' portage_config.has_use salt libvirt

salt.modules.portage_config.is_changed_uses(cp)
    New in version 2015.8.0.
    Uses portage to determine if the use flags of installed package is compatible with use flags in portage configs.

    @type cp: string
    @param cp: eg cat/pkg

salt.modules.portage_config.is_present(conf, atom)
    Tell if a given package or DEPEND atom is present in the configuration files tree. Warning: This only works if the configuration files tree is in the correct format (the one enforced by enforce_nice_config)

    CLI Example:
    salt '海报' portage_config.is_present unmask salt

### 31.16.194 salt.modules.postfix

Support for Postfix

This module is currently little more than a config file viewer and editor. It is able to read the master.cf file (which is one style) and files in the style of main.cf (which is a different style, that is used in multiple postfix configuration files).

The design of this module is such that when files are edited, a minimum of changes are made to them. Each file should look as if it has been edited by hand; order, comments and whitespace are all preserved.

salt.modules.postfix.delete(queue_id)
    Delete message(s) from the mail queue

    CLI Example:
    salt '海报' postfix.delete 5C33CA0DEA
    salt '海报' postfix.delete ALL

salt.modules.postfix.hold(queue_id)
    Put message(s) on hold from the mail queue

    CLI Example:
    salt '海报' postfix.hold 5C33CA0DEA
    salt '海报' postfix.hold ALL

salt.modules.postfix.requeue(queue_id)
    Requeue message(s) in the mail queue

    CLI Example:
salt.modules.postfix.set_main(key, value, path="/etc/postfix/main.cf")
Set a single config value in the main.cf file. If the value does not already exist, it will be appended to the end.

CLI Example:

```
salt <minion> postfix.set_main mailq_path /usr/bin/mailq
```

salt.modules.postfix.set_master(service, conn_type, private='y', unpriv='y', chroot='y',
                                 wakeup='n', maxproc='100', command='', write_conf=True,
                                 path="/etc/postfix/master.cf")
Set a single config value in the master.cf file. If the value does not already exist, it will be appended to the end.

Because of shell parsing issues, `-` cannot be set as a value, as is normal in the master.cf file; either `y`, `n` or a number should be used when calling this function from the command line. If the value used matches the default, it will internally be converted to a `-`. Calling this function from the Python API is not affected by this limitation.

The settings and their default values, in order, are: service (required), conn_type (required), private (y), unpriv (y), chroot (y), wakeup (n), maxproc (100), command (required).

By default, this function will write out the changes to the master.cf file, and then returns the full contents of the file. By setting the write_conf option to False, it will skip writing the file.

CLI Example:

```
salt <minion> postfix.set_master smtp inet n y n n 100 smtpd
```

salt.modules.postfix.show_main(path="/etc/postfix/main.cf")
Return a dict of active config values. This does not include comments, spacing or order. Bear in mind that order is functionally important in the main.cf file, since keys can be referred to as variables. This means that the data returned from this function should not be used for direct modification of the main.cf file; other functions are available for that.

CLI Examples:

```
salt <minion> postfix.show_main	salt <minion> postfix.show_main path=/path/to/main.cf
```

salt.modules.postfix.show_master(path="/etc/postfix/master.cf")
Return a dict of active config values. This does not include comments, spacing or order.

The data returned from this function should not be used for direct modification of the main.cf file; other functions are available for that.

CLI Examples:

```
salt <minion> postfix.show_master	salt <minion> postfix.show_master path=/path/to/master.cf
```

salt.modules.postfix.show_queue()
Show contents of the mail queue

CLI Example:

```
salt '*' postfix.show_queue
```

salt.modules.postfix.unhold(queue_id)
Set held message(s) in the mail queue to unheld

CLI Example:
31.16.195 salt.modules.postgres

Module to provide Postgres compatibility to salt.

**configuration** In order to connect to Postgres, certain configuration is required in /etc/salt/minion on the relevant minions. Some sample configs might look like:

```
postgres.host: 'localhost'
postgres.port: '5432'
postgres.user: 'postgres' -> db user
postgres.pass: ''
postgres.maintenance_db: 'postgres'
```

The default for the maintenance_db is 'postgres' and in most cases it can be left at the default setting. This data can also be passed into pillar. Options passed into opts will overwrite options passed into pillar

**note** This module uses MD5 hashing which may not be compliant with certain security audits.

```python
salt.modules.postgres.available_extensions(user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)
```

List available postgresql extensions

CLI Example:

```
salt '*' postgres.available_extensions
```

```python
salt.modules.postgres.create_extension(name, if_not_exists=None, schema=None, ext_version=None, from_version=None, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)
```

Install a postgresql extension

CLI Example:

```
salt '*' postgres.create_extension 'adminpack'
```

```python
salt.modules.postgres.create_metadata(name, ext_version=None, schema=None, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)
```

Get lifecycle information about an extension

CLI Example:

```
salt '*' postgres.create_metadata adminpack
```

```python
salt.modules.postgres.db_alter(name, user=None, host=None, port=None, maintenance_db=None, password=None, tablespace=None, owner=None, owner_recurse=False, runas=None)
```

Change tablespace or/and owner of database.

CLI Example:
salt.modules.postgres.db_create(name, user=None, host=None, port=None, maintenance_db=None, password=None, tablespace=None, encoding=None, lc_collate=None, lc_ctype=None, owner=None, template=None, runas=None)

Adds a database to the Postgres server.

CLI Example:

```
salt '*' postgres.db_create 'dbname'
```

```
salt '*' postgres.db_create 'dbname' template=template_postgis
```

salt.modules.postgres.db_exists(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Checks if a database exists on the Postgres server.

CLI Example:

```
salt '*' postgres.db_exists 'dbname'
```

salt.modules.postgres.db_list(user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Return dictionary with information about databases of a Postgres server.

CLI Example:

```
salt '*' postgres.db_list
```

salt.modules.postgres.db_remove(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Removes a database from the Postgres server.

CLI Example:

```
salt '*' postgres.db_remove 'dbname'
```

salt.modules.postgres.drop_extension(name, if_exists=None, restrict=None, cascade=None, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Drop an installed postgresql extension

CLI Example:

```
salt '*' postgres.drop_extension 'adminpack'
```

salt.modules.postgres.get_available_extension(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Get information about an available postgresql extension

CLI Example:

```
salt '*' postgres.get_available_extension plpgsql
```

salt.modules.postgres.get_installed_extension(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Get information about an installed postgresql extension

CLI Example:
salt '*' postgres.get_installed_extension plpgsql

**salt.modules.postgres.group_create**(groupname, user=None, host=None, port=None, maintenance_db=None, password=None, createdb=None, createuser=None, createdbroles=None, encrypted=None, login=None, inherit=None, superuser=None, replication=None, rolepassword=None, groups=None, runas=None)

Creates a Postgres group. A group is postgres is similar to a user, but cannot login.

CLI Example:

```
salt '*' postgres.group_create 'groupname' user='user' \ 
    host='hostname' port='port' password='password' \ 
    rolepassword='rolepassword'
```

**salt.modules.postgres.group_remove**(groupname, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Removes a group from the Postgres server.

CLI Example:

```
salt '*' postgres.group_remove 'groupname'
```

**salt.modules.postgres.group_update**(groupname, user=None, host=None, port=None, maintenance_db=None, password=None, createdb=None, createuser=None, createroles=None, createuser=None, encrypted=None, login=None, inherit=None, superuser=None, replication=None, rolepassword=None, groups=None, runas=None)

Updates a postgres group

CLI Examples:

```
salt '*' postgres.group_update 'username' user='user' \ 
    host='hostname' port='port' password='password' \ 
    rolepassword='rolepassword'
```

**salt.modules.postgres.installed_extensions**(user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

List installed postgresql extensions

CLI Example:

```
salt '*' postgres.installed_extensions
```

**salt.modules.postgres.is_available_extension**(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Test if a specific extension is available

CLI Example:

```
salt '*' postgres.is_available_extension
```

**salt.modules.postgres.is_installed_extension**(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Test if a specific extension is installed

CLI Example:
salt 'postgres.is_installed_extension

salt.modules.postgres.owner_to(dbname, ownername, user=None, host=None, port=None, password=None, runas=None)
Set the owner of all schemas, functions, tables, views and sequences to the given username.
CLI Example:
salt '*' postgres.owner_to 'dbname' 'username'

salt.modules.postgres.psql_query(query, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)
Run an SQL-Query and return the results as a list. This command only supports SELECT statements. This limitation can be worked around with a query like this:
WITH updated AS (UPDATE pg_authid SET rolconnlimit = 2000 WHERE rolnname = 'rolename' RETURNING rolconnlimit) SELECT * FROM updated;
CLI Example:
salt '*' postgres.psql_query 'select * from pg_stat_activity'

salt.modules.postgres.role_get(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None, return_password=False)
Return a dict with information about users of a Postgres server.
Set return_password to True to get password hash in the result.
CLI Example:
salt '*' postgres.role_get postgres

salt.modules.postgres.schema_create(dbname, name, owner=None, user=None, db_user=None, db_password=None, db_host=None, db_port=None)
Creates a Postgres schema.
CLI Example:
salt '*' postgres.schema_create dbname name owner='owner' \
user='user' \ 
db_user='user' db_password='password' \
db_host='hostname' db_port='port'

salt.modules.postgres.schema_exists(dbname, name, db_user=None, db_password=None, db_host=None, db_port=None)
Checks if a schema exists on the Postgres server.
CLI Example:
salt '*' postgres.schema_exists dbname schemaname

dbname Database name we query on
name Schema name we look for
db_user database username if different from config or default
db_password user password if any password for a specified user
db_host Database host if different from config or default
db_port Database port if different from config or default
salt.modules.postgres.schema_get(dbname, name, db_user=None, db_password=None, 
                              db_host=None, db_port=None)

Return a dict with information about schemas in a database.

CLI Example:

```
salt '*' postgres.schema_get dbname name
```

- **dbname** Database name we query on
- **name** Schema name we look for
- **db_user** database username if different from config or default
- **db_password** user password if any password for a specified user
- **db_host** Database host if different from config or default
- **db_port** Database port if different from config or default

salt.modules.postgres.schema_list(dbname, db_user=None, db_password=None, db_host=None, 
                                   db_port=None)

Return a dict with information about schemas in a Postgres database.

CLI Example:

```
salt '*' postgres.schema_list dbname
```

- **dbname** Database name we query on
- **db_user** database username if different from config or default
- **db_password** user password if any password for a specified user
- **db_host** Database host if different from config or default
- **db_port** Database port if different from config or default

salt.modules.postgres.schema_remove(dbname, name, user=None, 
                                      db_user=None, db_password=None, 
                                      db_host=None, db_port=None)

Removes a schema from the Postgres server.

CLI Example:

```
salt '*' postgres.schema_remove dbname schemaname
```

- **dbname** Database name we work on
- **schemaname** The schema’s name we’ll remove
- **user** System user all operations should be performed on behalf of
- **db_user** database username if different from config or default
- **db_password** user password if any password for a specified user
- **db_host** Database host if different from config or default
- **db_port** Database port if different from config or default
salt.modules.postgres.tablespace_alter(name, user=None, host=None, port=None, maintenance_db=None, password=None, new_name=None, new_owner=None, set_option=None, reset_option=None, runas=None)

Change tablespace name, owner, or options.

CLI Example:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt '*' postgres.tablespace_alter tsname new_owner=otheruser</td>
<td>Change tablespace owner</td>
</tr>
<tr>
<td>salt '*' postgres.tablespace_alter index_space new_name=fast_raid</td>
<td>Change tablespace name</td>
</tr>
<tr>
<td>salt '*' postgres.tablespace_alter test set_option='{seq_page_cost': '1.1'}&quot;</td>
<td>Change tablespace option</td>
</tr>
<tr>
<td>salt '*' postgres.tablespace_alter tsname reset_option=seq_page_cost</td>
<td>Reset tablespace option</td>
</tr>
</tbody>
</table>

New in version 2015.8.0.

salt.modules.postgres.tablespace_create(name, location, options=None, owner=None, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Adds a tablespace to the Postgres server.

CLI Example:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt '*' postgres.tablespace_create /path/datadir</td>
<td>Create a new tablespace</td>
</tr>
</tbody>
</table>

New in version 2015.8.0.

salt.modules.postgres.tablespace_exists(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Checks if a tablespace exists on the Postgres server.

CLI Example:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt '*' postgres.tablespace_exists 'dbname'</td>
<td>Check if a tablespace exists</td>
</tr>
</tbody>
</table>

New in version 2015.8.0.

salt.modules.postgres.tablespace_list(user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Return dictionary with information about tablespaces of a Postgres server.

CLI Example:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt '*' postgres.tablespace_list</td>
<td>List all tablespaces</td>
</tr>
</tbody>
</table>

New in version 2015.8.0.

salt.modules.postgres.tablespace_remove(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)

Removes a tablespace from the Postgres server.

CLI Example:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt '*' postgres.tablespace_remove tsname</td>
<td>Remove a tablespace</td>
</tr>
</tbody>
</table>

New in version 2015.8.0.

salt.modules.postgres.user_create(username, user=None, host=None, port=None, maintenance_db=None, password=None, createdb=None, createuser=None, createroles=None, inherit=None, login=None, connlimit=None, encrypted=None, superuser=None, replication=None, rolepassword=None, groups=None, runas=None)

Creates a Postgres user.
CLI Examples:

salt '*' postgres.user_create 'username' user='user' \ 
    host='hostname' port='port' password='password' \ 
    rolepassword='rolepassword'

salt.modules.postgres.user_exists(name, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)
Checks if a user exists on the Postgres server.

CLI Example:

salt '*' postgres.user_exists 'username'

salt.modules.postgres.user_list(user=None, host=None, port=None, maintenance_db=None, password=None, runas=None, return_password=False)
Return a dict with information about users of a Postgres server.
Set return_password to True to get password hash in the result.

CLI Example:

salt '*' postgres.user_list

salt.modules.postgres.user_remove(username, user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)
Removes a user from the Postgres server.

CLI Example:

salt '*' postgres.user_remove 'username'

salt.modules.postgres.user_update(username, user=None, host=None, port=None, maintenance_db=None, password=None, createdb=None, createdb=None, createuser=None, createdb=None, encrypted=None, superuser=None, inherit=None, login=None, connlimit=None, replication=None, rolepassword=None, groups=None, runas=None)
Updates a Postgres user.

CLI Examples:

salt '*' postgres.user_update 'username' user='user' \ 
    host='hostname' port='port' password='password' \ 
    rolepassword='rolepassword'

salt.modules.postgres.version(user=None, host=None, port=None, maintenance_db=None, password=None, runas=None)
Return the version of a Postgres server.

CLI Example:

salt '*' postgres.version

31.16.196 salt.modules.poudriere

Support for poudriere

salt.modules.poudriere.bulk_build(jail, pkg_file, keep=False)
Run bulk build on poudriere server.
Return number of pkg builds, failures, and errors, on error dump to CLI

CLI Example:
```
salt -N buildbox_group poudriere.bulk_build 90amd64 /root/pkg_list
```

salt.modules.poudriere.create_jail(name, arch, version='9.0-RELEASE')
Creates a new poudriere jail if one does not exist

NOTE creating a new jail will take some time the master is not hanging

CLI Example:
```
salt '*' poudriere.create_jail 90amd64 amd64
```

salt.modules.poudriere.create_ports_tree()
Not working need to run portfetch non interactive

salt.modules.poudriere.delete_jail(name)
Deletes poudriere jail with name

CLI Example:
```
salt '*' poudriere.delete_jail 90amd64
```

salt.modules.poudriere.is_jail(name)
Return True if jail exists False if not

CLI Example:
```
salt '*' poudriere.is_jail <jail name>
```

salt.modules.poudriere.list_jails()
Return a list of current jails managed by poudriere

CLI Example:
```
salt '*' poudriere.list_jails
```

salt.modules.poudriere.list_ports()
Return a list of current port trees managed by poudriere

CLI Example:
```
salt '*' poudriere.list_ports
```

salt.modules.poudriere.make_pkgng_aware(jname)
Make jail jname pkgng aware

CLI Example:
```
salt '*' poudriere.make_pkgng_aware <jail name>
```

salt.modules.poudriere.parse_config(config_file=None)
Returns a dict of poudriere main configuration definitions

CLI Example:
```
salt '*' poudriere.parse_config
```

salt.modules.poudriere.update_jail(name)
Run freebsd-update on name poudriere jail
CLI Example:
```
salt '*' poudriere.update_jail freebsd:10:x86:64
```

```
salt.modules.poudriere.update_ports_tree(ports_tree)
    Updates the ports tree, either the default or the ports_tree specified
```

CLI Example:
```
salt '*' poudriere.update_ports_tree staging
```

```
salt.modules.poudriere.version()
    Return poudriere version
```

CLI Example:
```
salt '*' poudriere.version
```

### 31.16.197 salt.modules.powerpath

powerpath support.

Assumes RedHat

```
salt.modules.powerpath.add_license(key)
    Add a license
```

```
salt.modules.powerpath.has_powerpath()
```

```
salt.modules.powerpath.list_licenses()
    returns a list of applied powerpath license keys
```

```
salt.modules.powerpath.remove_license(key)
    Remove a license
```

### 31.16.198 salt.modules.publish

Publish a command from a minion to a target

```
salt.modules.publish.full_data(tgt, fun, arg=None, expr_form='glob'; returner='', timeout=5)
    Return the full data about the publication, this is invoked in the same way as the publish function
```

CLI Example:
```
salt system.example.com publish.full_data '*' cmd.run 'ls -la /tmp'
```

**Attention**

If you need to pass a value to a function argument and that value contains an equal sign, you **must** include the argument name. For example:
```
salt '*' publish.full_data test.kwarg arg='cheese=spam'
```

```
salt.modules.publish.publish(tgt, fun, arg=None, expr_form='glob'; returner='', timeout=5)
    Publish a command from the minion out to other minions.
```

Publications need to be enabled on the Salt master and the minion needs to have permission to publish the command. The Salt master will also prevent a recursive publication loop, this means that a minion cannot command another minion to command another minion as that would create an infinite command loop.
The expr_form argument is used to pass a target other than a glob into the execution, the available options are:

- glob
- pcre
- grain
- grain_pcre
- pillar
- pillar_pcre
- ipcidr
- range
- compound

Note that for pillar matches must be exact, both in the pillar matcher and the compound matcher. No globbing is supported.

The arguments sent to the minion publish function are separated with commas. This means that for a minion executing a command with multiple args it will look like this:

```
salt system.example.com publish.publish '*'
user.add 'foo,1020,1020'
```

```
salt system.example.com publish.publish 'os:Fedora'
 network.interfaces '' grain
```

**CLI Example:**
```
salt system.example.com publish.publish '*'
cmd.run 'ls -la /tmp'
```

**Attention**
If you need to pass a value to a function argument and that value contains an equal sign, you must include the argument name. For example:
```
salt '*' publish.publish test.kwarg arg='cheese=spam'
```

Multiple keyword arguments should be passed as a list.
```
salt '*' publish.publish test.kwarg arg="['cheese=spam','spam=cheese']"
```

```
salt.modules.publish.runner(fun, arg=None, timeout=5)
```
Execute a runner on the master and return the data from the runner function

**CLI Example:**
```
salt publish.runner manage.down
```

**31.16.199 salt.modules.puppet**
Execute puppet routines
```
salt.modules.puppet.disable(message=None)
```
New in version 2014.7.0.
Disable the puppet agent
message  New in version 2015.5.2.

Disables message to send to puppet

CLI Example:

```bash
salt '*' puppet.disable
salt '*' puppet.disable 'disabled for a good reason'
```

`salt.modules.puppet.enable()`

New in version 2014.7.0.

Enable the puppet agent

CLI Example:

```bash
salt '*' puppet.enable
```

`salt.modules.puppet.fact(name, puppet=False)`

Run facter for a specific fact

CLI Example:

```bash
salt '*' puppet.fact kernel
```

`salt.modules.puppet.facts(puppet=False)`

Run facter and return the results

CLI Example:

```bash
salt '*' puppet.facts
```

`salt.modules.puppet.noop(*args, **kwargs)`

Execute a puppet noop run and return a dict with the stderr, stdout, return code, etc. Usage is the same as for `puppet.run`.

CLI Example:

```bash
salt '*' puppet.noop
salt '*' puppet.noop tags=basefiles::edit,apache::server
salt '*' puppet.noop debug
salt '*' puppet.noop apply /a/b/manifest.pp modulepath=/a/b/modules tags=basefiles::edit,apache::server
```

`salt.modules.puppet.plugin_sync()`

Runs a plugin sync between the puppet master and agent

CLI Example: .. code-block:: bash

```bash
salt '*' puppet.plugin_sync
```

`salt.modules.puppet.run(*args, **kwargs)`

Execute a puppet run and return a dict with the stderr, stdout, return code, etc. The first positional argument given is checked as a subcommand. Following positional arguments should be ordered with arguments required by the subcommand first, followed by non-keyword arguments. Tags are specified by a tag keyword and comma separated list of values. -- http://docs.puppetlabs.com/puppet/latest/reference/lang_tags.html

CLI Examples:

```bash
salt '*' puppet.run
salt '*' puppet.run tags=basefiles::edit,apache::server
salt '*' puppet.run agent onetime no-daemonize no-usecacheonfailure no-splay ignorecache
salt '*' puppet.run debug
salt '*' puppet.run apply /a/b/manifest.pp modulepath=/a/b/modules tags=basefiles::edit,apache::server
```
salt.modules.puppet.status()
    New in version 2014.7.0.
    Display puppet agent status
    CLI Example:
        salt '*' puppet.status

salt.modules.puppet.summary()
    New in version 2014.7.0.
    Show a summary of the last puppet agent run
    CLI Example:
        salt '*' puppet.summary

31.16.200  salt.modules.pushover_notify

Module for sending messages to Pushover (https://www.pushover.net)
New in version Boron.

    configuration  This module can be used by either passing an api key and version directly or by specifying
                    both in a configuration profile in the salt master/minion config.
                    For example:
                        pushover:
                            token: abAHuZyCLtdH8P4zhmFZmgUHUsv1ei8

salt.modules.pushover_notify.post_message(user=None, device=None, message=None, title=None, priority=None, expire=None, retry=None, sound=None, api_version=1, token=None)

    Send a message to a Pushover user or group.

    Parameters
    • user -- The user or group to send to, must be key of user or group not email address.
    • message -- The message to send to the PushOver user or group.
    • title -- Specify who the message is from.
    • priority -- The priority of the message, defaults to 0.
    • expire -- The message should expire after N number of seconds.
    • retry -- The number of times the message should be retried.
    • sound -- The sound to associate with the message.
    • api_version -- The PushOver API version, if not specified in the configuration.
    • token -- The PushOver token, if not specified in the configuration.

    Returns  Boolean if message was sent successfully.

    CLI Example:
**salt.modules.pw_group**

Manage groups on FreeBSD

salt.modules.pw_group.add(name, gid=None, **kwargs)

Add the specified group

CLI Example:

```
salt '*' group.add foo 3456
```

salt.modules.pw_group.chgid(name, gid)

Change the gid for a named group

CLI Example:

```
salt '*' group.chgid foo 4376
```

salt.modules.pw_group.delete(name)

Remove the named group

CLI Example:

```
salt '*' group.delete foo
```

salt.modules.pw_group.getent(refresh=False)

Return info on all groups

CLI Example:

```
salt '*' group.getent
```

salt.modules.pw_group.info(name)

Return information about a group

CLI Example:

```
salt '*' group.info foo
```

salt.modules.pw_group.members(name, members_list)

Replaces members of the group with a provided list.

New in version 2015.5.4.

CLI Example:

```
salt '*' group.members foo `user1,user2,user3,...`
```

Replaces a membership list for a local group `foo`. foo:x:1234:user1,user2,user3,...

**salt.modules.pw_user**

Manage users with the useradd command
salt.modules.pw_user.add(name, uid=None, gid=None, groups=None, home=None, shell=None, unique=True, fullname='', roomnumber='', workphone='', homephone='', createhome=True, **kwargs)

Add a user to the minion

CLI Example:
```
salt '*' user.add name <uid> <gid> <groups> <home> <shell>
```

salt.modules.pw_user.chfullname(name, fullname)

Change the user's Full Name

CLI Example:
```
salt '*' user.chfullname foo "Foo Bar"
```

salt.modules.pw_user.chgid(name, gid)

Change the default group of the user

CLI Example:
```
salt '*' user.chgid foo 4376
```

salt.modules.pw_user.chgroups(name, groups, append=False)

Change the groups this user belongs to, add append to append the specified groups

CLI Example:
```
salt '*' user.chgroups foo wheel,root True
```

salt.modules.pw_user.chhome(name, home, persist=False)

Change the home directory of the user, pass true for persist to copy files to the new home dir

CLI Example:
```
salt '*' user.chhome foo /home/users/foo True
```

salt.modules.pw_user.chhomephone(name, homephone)

Change the user's Home Phone

CLI Example:
```
salt '*' user.chhomephone foo "7735551234"
```

salt.modules.pw_user.chroomnumber(name, roomnumber)

Change the user's Room Number

CLI Example:
```
salt '*' user.chroomnumber foo 123
```

salt.modules.pw_user.chshell(name, shell)

Change the default shell of the user

CLI Example:
```
salt '*' user.chshell foo /bin/zsh
```

salt.modules.pw_user.chuid(name, uid)

Change the uid for a named user

CLI Example:
salt '*' user.chuid foo 4376

salt.modules.pw_user.\texttt{chworkphone}(name, workphone)
Change the user's Work Phone
CLI Example:

    salt '*' user.chworkphone foo "7735550123"

salt.modules.pw_user.\texttt{delete}(name, remove=False, force=False)
Remove a user from the minion
CLI Example:

    salt '*' user.delete name remove=True force=True

salt.modules.pw_user.\texttt{getent}(refresh=False)
Return the list of all info for all users
CLI Example:

    salt '*' user.getent

salt.modules.pw_user.\texttt{info}(name)
Return user information
CLI Example:

    salt '*' user.info root

salt.modules.pw_user.\texttt{list_groups}(name)
Return a list of groups the named user belongs to
CLI Example:

    salt '*' user.list_groups foo

salt.modules.pw_user.\texttt{list_users}()
Return a list of all users
CLI Example:

    salt '*' user.list_users

salt.modules.pw_user.\texttt{rename}(name, new_name)
Change the username for a named user
CLI Example:

    salt '*' user.rename name new_name

\section*{31.16.203 \texttt{salt.modules.pyenv}}

Manage python installations with \texttt{pyenv}.

New in version v2014.04.

\begin{verbatim}
salt.modules.pyenv.default(\texttt{python=None, runas=None})
Returns or sets the currently defined default python.

    python=\texttt{None} The version to set as the default. Should match one of the versions listed by \texttt{pyenv.versions}. Leave blank to return the current default.
\end{verbatim}
CLI Example:
```
salt '*' pyenv.default
salt '*' pyenv.default 2.0.0-p0
```

`salt.modules.pyenv.do(cmdline=None, runas=None)`
Execute a python command with pyenv's shims from the user or the system.

CLI Example:
```
salt '*' pyenv.do 'gem list bundler'
salt '*' pyenv.do 'gem list bundler' deploy
```

`salt.modules.pyenv.do_with_python python, cmdline, runas=None)`
Execute a python command with pyenv's shims using a specific python version.

CLI Example:
```
salt '*' pyenv.do_with_python 2.0.0-p0 'gem list bundler'
salt '*' pyenv.do_with_python 2.0.0-p0 'gem list bundler' deploy
```

`salt.modules.pyenv.install(runas=None, path=None)`
Install pyenv systemwide

CLI Example:
```
salt '*' pyenv.install
```

`salt.modules.pyenv.install_python python, runas=None)`
Install a python implementation.

CLI Example:
```
salt '*' pyenv.install_python 2.0.0-p0
```

`salt.modules.pyenv.is_installed(runas=None)`
Check if pyenv is installed.

CLI Example:
```
salt '*' pyenv.is_installed
```

`salt.modules.pyenv.list(runas=None)`
List the installable versions of python.

CLI Example:
```
salt '*' pyenv.list
```

`salt.modules.pyenv.rehash(runas=None)`
Run pyenv rehash to update the installed shims.

CLI Example:
```
salt '*' pyenv.rehash
```

`salt.modules.pyenv.uninstall_python python, runas=None)`
Uninstall a python implementation.

CLI Example:
```
salt '*' pyenv.uninstall_python 2.0.0-p0
```
CLI Example:

```
salt '*' pyenv.uninstall_python 2.0.0-p0
```

```python
salt.modules.pyenv.update(runas=None, path=None)
```

Updates the current versions of pyenv and python-Build

CLI Example:

```
salt '*' pyenv.update
```

```python
salt.modules.pyenv.versions(runas=None)
```

List the installed versions of python.

CLI Example:

```
salt '*' pyenv.versions
```

### 31.16.204 `salt.modules.qemu_img`

**Qemu-img Command Wrapper**

The qemu img command is wrapped for specific functions

```python
depends qemu-img
```

```python
salt.modules.qemu_img.make_image(location, size, fmt)
```

Create a blank virtual machine image file of the specified size in megabytes. The image can be created in any format supported by qemu

CLI Example:

```
salt '*' qemu_img.make_image /tmp/image.qcow 2048 qcow2
salt '*' qemu_img.make_image /tmp/image.raw 10240 raw
```

### 31.16.205 `salt.modules.qemu_nbd`

**Qemu Command Wrapper**

The qemu system comes with powerful tools, such as qemu-img and qemu-nbd which are used here to build up kvm images.

```python
salt.modules.qemu_nbd.clear(mnt)
```

Pass in the mnt dict returned from nbd_mount to unmount and disconnect the image from nbd. If all of the partitions are unmounted return an empty dict, otherwise return a dict containing the still mounted partitions

CLI Example:

```
salt '*' qemu_nbd.clear '{"/mnt/foo": "/dev/nbd0p1"}"
```

```python
salt.modules.qemu_nbd.connect(image)
```

Activate nbd for an image file.

CLI Example:

```
salt '*' qemu_nbd.connect /tmp/image.raw
```
salt.modules.qemu_nbd.init(image)
    Mount the named image via qemu-nbd and return the mounted roots
    CLI Example:
    ```
salt '*' qemu_nbd.init /srv/image.qcow2
    ```

salt.modules.qemu_nbd.mount(nbd)
    Pass in the nbd connection device location, mount all partitions and return a dict of mount points
    CLI Example:
    ```
salt '*' qemu_nbd.mount /dev/nbd0
    ```

31.16.206 salt.modules.quota

Module for managing quotas on POSIX-like systems.
salt.modules.quota.get_mode(device)
    Report whether the quota system for this device is on or off
    CLI Example:
    ```
salt '*' quota.get_mode
    ```

salt.modules.quota.off(device)
    Turns off the quota system
    CLI Example:
    ```
salt '*' quota.off
    ```

salt.modules.quota.on(device)
    Turns on the quota system
    CLI Example:
    ```
salt '*' quota.on
    ```

salt.modules.quota.report(mount)
    Report on quotas for a specific volume
    CLI Example:
    ```
salt '*' quota.report /media/data
    ```

salt.modules.quota.set(device, **kwargs)
    Calls out to setquota, for a specific user or group
    CLI Example:
    ```
salt '*' quota.set /media/data user=larry block-soft-limit=1048576
group=painters file-hard-limit=1000
    ```

salt.modules.quota.stats()
    Runs the quotastats command, and returns the parsed output
    CLI Example:
    ```
salt '*' quota.stats
    ```
salt.modules.quota.warn()
    Runs the warnquota command, to send warning emails to users who are over their quota limit.

    CLI Example:
    
    ```
    salt '*' quota.warn
    ```

31.16.207 salt.modules.rabbitmq

Module to provide RabbitMQ compatibility to Salt. Todo: A lot, need to add cluster support, logging, and minion configuration data.

salt.modules.rabbitmq.add_user(name, password=None, runas=None)
    Add a rabbitMQ user via rabbitmqctl user_add <user> <password>

    CLI Example:
    
    ```
    salt '*' rabbitmq.add_user rabbit_user password
    ```

salt.modules.rabbitmq.add_vhost(vhost, runas=None)
    Adds a vhost via rabbitmqctl add_vhost.

    CLI Example:
    
    ```
    salt '*' rabbitmq add_vhost '<vhost_name>'
    ```

salt.modules.rabbitmq.change_password(name, password, runas=None)
    Changes a user's password.

    CLI Example:
    
    ```
    salt '*' rabbitmq.change_password rabbit_user password
    ```

salt.modules.rabbitmq.clear_password(name, runas=None)
    Removes a user's password.

    CLI Example:
    
    ```
    salt '*' rabbitmq.clear_password rabbit_user
    ```

salt.modules.rabbitmq.cluster_status(runas=None)
    return rabbitmq cluster_status

    CLI Example:
    
    ```
    salt '*' rabbitmq.cluster_status
    ```

salt.modules.rabbitmq.delete_policy(vhost, name, runas=None)
    Delete a policy based on rabbitmqctl clear_policy.


    CLI Example:
    
    ```
    salt '*' rabbitmq.delete_policy / HA'
    ```

salt.modules.rabbitmq.delete_user(name, runas=None)
    Deletes a user via rabbitmqctl delete_user.

    CLI Example:
salt '!' rabbitmq.delete_user rabbit_user

salt.modules.rabbitmq.delete_vhost(vhost, runas=None)
    Deletes a vhost rabbitmqctl delete_vhost.
    CLI Example:
    
    salt '!' rabbitmq.delete_vhost '<vhost_name>'

salt.modules.rabbitmq.disable_plugin(name, runas=None)
    Disable a RabbitMQ plugin via the rabbitmq-plugins command.
    CLI Example:
    
    salt '!' rabbitmq.disable_plugin foo

salt.modules.rabbitmq.enable_plugin(name, runas=None)
    Enable a RabbitMQ plugin via the rabbitmq-plugins command.
    CLI Example:
    
    salt '!' rabbitmq.enable_plugin foo

salt.modules.rabbitmq.force_reset(runas=None)
    Forcefully Return a RabbitMQ node to its virgin state
    CLI Example:
    
    salt '!' rabbitmq.force_reset

salt.modules.rabbitmq.join_cluster(host, user='rabbit', ram_node=None, runas=None)
    Join a rabbit cluster
    CLI Example:
    
    salt '!' rabbitmq.join_cluster 'rabbit.example.com' 'rabbit'

salt.modules.rabbitmq.list_permissions(vhost, runas=None)
    Lists permissions for vhost via rabbitmqctl list_permissions
    CLI Example:
    
    salt '!' rabbitmq.list_permissions '/myvhost'

salt.modules.rabbitmq.list_policies(vhost='/', runas=None)
    Return a dictionary of policies nested by vhost and name based on the data returned from rabbitmqctl list_policies.
    Reference: http://www.rabbitmq.com/ha.html
    CLI Example:
    
    salt '!' rabbitmq.list_policies'

salt.modules.rabbitmq.list_queues(runas=None, **kwargs)
    Returns queue details of the / virtual host
    CLI Example:
    
    salt '!' rabbitmq.list_queues messages consumers
salt.modules.rabbitmq.list_queues_vhost

Returns queue details of specified virtual host. This command will consider first parameter as the vhost name and rest will be treated as queue info item. For getting details on vhost /, use list_queues instead.

CLI Example:

```
salt '*' rabbitmq.list_queues messages consumers
```

salt.modules.rabbitmq.list_user_permissions

List permissions for a user via rabbitmqctl list_user_permissions

CLI Example:

```
salt '*' rabbitmq.list_user_permissions 'user'.
```

salt.modules.rabbitmq.list_users

Return a list of users based off of rabbitmqctl user_list.

CLI Example:

```
salt '*' rabbitmq.list_users
```

salt.modules.rabbitmq.list_vhosts

Return a list of vhost based on rabbitmqctl list_vhosts.

CLI Example:

```
salt '*' rabbitmq.list_vhosts
```

salt.modules.rabbitmq.plugin_is_enabled

Return whether the plugin is enabled.

CLI Example:

```
salt '*' rabbitmq.plugin_is_enabled foo
```

salt.modules.rabbitmq.policy_exists

Return whether the policy exists based on rabbitmqctl list_policies.

Reference: http://www.rabbitmq.com/ha.html

CLI Example:

```
salt '*' rabbitmq.policy_exists / HA
```

salt.modules.rabbitmq.reset

Return a RabbitMQ node to its virgin state

CLI Example:

```
salt '*' rabbitmq.reset
```

salt.modules.rabbitmq.set_permissions

Sets permissions for vhost via rabbitmqctl set_permissions

CLI Example:

```
salt '*' rabbitmq.set_permissions 'myvhost' 'myuser'
```

salt.modules.rabbitmq.set_policy

Set a policy based on rabbitmqctl set_policy.

Reference: http://www.rabbitmq.com/ha.html
CLI Example:
```
salt '*' rabbitmq.set_policy / HA '*' '{"ha-mode":"all"}'
```

```
salt.modules.rabbitmq.set_user_tags(name, tags, runas=None)
   Add user tags via rabbitmqctl set_user_tags
   CLI Example:
   salt '*' rabbitmq.set_user_tags 'myadmin' 'administrator'
```

```
salt.modules.rabbitmq.start_app(runas=None)
   Start the RabbitMQ application.
   CLI Example:
   salt '*' rabbitmq.start_app
```

```
salt.modules.rabbitmq.status(runas=None)
   return rabbitmq status
   CLI Example:
   salt '*' rabbitmq.status
```

```
salt.modules.rabbitmq.stop_app(runas=None)
   Stops the RabbitMQ application, leaving the Erlang node running.
   CLI Example:
   salt '*' rabbitmq.stop_app
```

```
salt.modules.rabbitmq.user_exists(name, runas=None)
   Return whether the user exists based on rabbitmqctl list_users.
   CLI Example:
   salt '*' rabbitmq.user_exists rabbit_user
```

```
salt.modules.rabbitmq.vhost_exists(name, runas=None)
   Return whether the vhost exists based on rabbitmqctl list_vhosts.
   CLI Example:
   salt '*' rabbitmq.vhost_exists rabbit_host
```

### 31.16.208 salt.modules.raet_publish

Publish a command from a minion to a target

```
salt.modules.raet_publish.full_data(tgt, fun, arg=None, expr_form='glob', returner='`, timeout=5)
   Return the full data about the publication, this is invoked in the same way as the publish function
   CLI Example:
   salt system.example.com publish.full_data '*' cmd.run 'ls -la /tmp'
```

Attention
If you need to pass a value to a function argument and that value contains an equal sign, you must include the argument name. For example:

```bash
salt '*' publish.full_data test.kwarg arg='cheese=spam'
```

salt.modules.raet_publish.publish(tgt, fun, arg=None, expr_form='glob', returner='.', timeout=5)

Publish a command from the minion out to other minions.

Publications need to be enabled on the Salt master and the minion needs to have permission to publish the command. The Salt master will also prevent a recursive publication loop, this means that a minion cannot command another minion to command another minion as that would create an infinite command loop.

The expr_form argument is used to pass a target other than a glob into the execution, the available options are:

- glob
- pcre
- grain
- grain_pcre
- pillar
- pillar_pcre
- ipcidr
- range
- compound

The arguments sent to the minion publish function are separated with commas. This means that for a minion executing a command with multiple args it will look like this:

```bash
salt system.example.com publish.publish '*' user.add 'foo,1020,1020'
salt system.example.com publish.publish 'os:Fedora' network.interfaces '' grain
```

CLI Example:

```bash
salt system.example.com publish.publish '*' cmd.run 'ls -la /tmp'
```

Attention

If you need to pass a value to a function argument and that value contains an equal sign, you must include the argument name. For example:

```bash
salt '*' publish.publish test.kwarg arg='cheese=spam'
```

salt.modules.raet_publish.runner(fun, arg=None, timeout=5)

Execute a runner on the master and return the data from the runner function

CLI Example:

```bash
salt publish.runner manage.down
```

31.16.209 salt.modules.rallydev

Support for RallyDev
New in version 2015.8.0.

Requires a username and a password in /etc/salt/minion:

```python
salt.modules.rallydev.list_items(name)
```
List items of a particular type

CLI Examples:

```bash
salt myminion rallydev.list_<item name>s
salt myminion rallydev.list_users
salt myminion rallydev.list_artifacts
```

```python
salt.modules.rallydev.list_users()
```
List the users

CLI Example:

```bash
salt myminion rallydev.list_users
```

```python
salt.modules.rallydev.query_item(name, query_string, order='Rank')
```
Query a type of record for one or more items. Requires a valid query string. See https://rally1.rallydev.com/slm/doc/webservice/introduction.jsp for information on query syntax.

CLI Example:

```bash
salt myminion rallydev.query_<item name> <query string> [order]
salt myminion rallydev.query_task '(Name contains github)'
salt myminion rallydev.query_task '(Name contains reactor)' Rank
```

```python
salt.modules.rallydev.query_user(query_string, order='UserName')
```
Update a user

CLI Example:

```bash
salt myminion rallydev.query_user '(Name contains Jo)'
```

```python
salt.modules.rallydev.show_artifact(id_)
```
Show an artifact

CLI Example:

```bash
salt myminion rallydev.show_artifact <artifact id>
```

```python
salt.modules.rallydev.show_item(name, id_)
```
Show an item

CLI Example:

```bash
salt myminion rallydev.show_<item name> <item id>
```

```python
salt.modules.rallydev.show_user(id_)
```
Show a user

CLI Example:

```bash
salt myminion rallydev.show_user <user id>
```

```python
salt.modules.rallydev.update_item(name, id_, field=None, value=None, postdata=None)
```
Update an item. Either a field and a value, or a chunk of POST data, may be used, but not both.

CLI Example:
31.16.210 salt.modules.random_org

Module for retrieving random information from Random.org

New in version 2015.5.0.

classification This module can be used by either passing an api key and version directly or by specifying both in a configuration profile in the salt master/minion config.

For example:

```
random_org:
  api_key: 7be1402d-5719-5bd3-a306-3def9f135da5
  api_version: 1
```

```
salt.modules.random_org.generateBlobs(api_key=None, api_version=None, **kwargs)
```

List all Slack users.

**Parameters**

- `api_key` -- The Random.org api key.
- `api_version` -- The Random.org api version.
- `format` -- Specifies the format in which the blobs will be returned. Values allowed are base64 and hex.

**Returns** The user list.

CLI Example:

```
salt '*' get_integers number=5 min=1 max=6
salt '*' get_integers number=5 min=1 max=6
```

```
salt.modules.random_org.generateDecimalFractions(api_key=None, api_version=None, **kwargs)
```

Generates true random decimal fractions

**Parameters**

- `api_key` -- The Random.org api key.
- `api_version` -- The Random.org api version.
- `number` -- How many random decimal fractions you need. Must be within the [1,1e4] range.
- `decimalPlaces` -- The number of decimal places to use. Must be within the [1,20] range.
- `replacement` -- Specifies whether the random numbers should be picked with replacement. The default (true) will cause the numbers to be picked with replacement, i.e., the
resulting numbers may contain duplicate values (like a series of dice rolls). If you want the
numbers picked to be unique (like raffle tickets drawn from a container), set this value to
false.

Returns  A list of decimal fraction

CLI Example:

```
salt '*' random_org.generateDecimalFractions number=10 decimalPlaces=4
```

```
salt '*' random_org.generateDecimalFractions number=10 decimalPlaces=4 replacement=True
```

```
salt.modules.random_org.generateGaussians(api_key=None, api_version=None, **kwargs)
```

This method generates true random numbers from a Gaussian distribution (also known as a normal distribu-
tion).

Parameters

- `api_key` -- The Random.org api key.
- `api_version` -- The Random.org api version.
- `number` -- How many random numbers you need. Must be within the [1,1e4] range.
- `mean` -- The distribution’s mean. Must be within the [-1e6,1e6] range.
- `standardDeviation` -- The distribution’s standard deviation. Must be within the 
[-1e6,1e6] range.
- `significantDigits` -- The number of significant digits to use. Must be within the 

Returns  The user list.

CLI Example:

```
salt '*' random_org.generateGaussians number=10 mean=0.0 standardDeviation=1.0 significantDigits=8
```

```
salt.modules.random_org.generateIntegers(api_key=None, api_version=None, **kwargs)
```

Generate random integers

Parameters

- `api_key` -- The Random.org api key.
- `api_version` -- The Random.org api version.
- `number` -- The number of integers to generate
- `minimum` -- The lower boundary for the range from which the random numbers will be
picked. Must be within the [-1e9,1e9] range.
- `maximum` -- The upper boundary for the range from which the random numbers will be
picked. Must be within the [-1e9,1e9] range.
- `replacement` -- Specifies whether the random numbers should be picked with replace-
ment. The default (true) will cause the numbers to be picked with replacement, i.e., the
resulting numbers may contain duplicate values (like a series of dice rolls). If you want the
numbers picked to be unique (like raffle tickets drawn from a container), set this value to
false.
- `base` -- Specifies the base that will be used to display the numbers. Values allowed are 2,
8, 10 and 16. This affects the JSON types and formatting of the resulting data as discussed
below.
Returns  A list of integers.

CLI Example:

```
salt '*' random_org.generateIntegers number=5 minimum=1 maximum=6
salt '*' random_org.generateIntegers number=5 minimum=2 maximum=255 base=2
```

```
salt.modules.random_org.generateStrings (api_key=None, api_version=None, **kwargs)
  Generate random strings.

Parameters

- **api_key** -- The Random.org api key.
- **api_version** -- The Random.org api version.
- **number** -- The number of strings to generate.
- **length** -- The length of each string. Must be within the [1,20] range. All strings will be of the same length
- **characters** -- A string that contains the set of characters that are allowed to occur in the random strings. The maximum number of characters is 80.
- **replacement** -- Specifies whether the random strings should be picked with replacement. The default (true) will cause the strings to be picked with replacement, i.e., the resulting list of strings may contain duplicates (like a series of dice rolls). If you want the strings to be unique (like raffle tickets drawn from a container), set this value to false.

Returns  A list of strings.

CLI Example:

```
salt '*' random_org.generateStrings number=5 length=8 characters='abcdefghijklmnopqrstuvwxyz'
salt '*' random_org.generateStrings number=10 length=16 characters='abcdefghijklmnopqrstuvwxyz'
```

salt.modules.random_org.generateUUIDs (api_key=None, api_version=None, **kwargs)
  Generate a list of random UUIDs

Parameters

- **api_key** -- The Random.org api key.
- **api_version** -- The Random.org api version.
- **number** -- How many random UUIDs you need. Must be within the [1,1e3] range.

Returns  A list of UUIDs

CLI Example:

```
salt '*' random_org.generateUUIDs number=5
```

salt.modules.random_org.getUsage (api_key=None, api_version=None)

Show current usages statistics

Parameters

- **api_key** -- The Random.org api key.
- **api_version** -- The Random.org api version.

Returns  The current usage statistics.
CLI Example:

```
salt '*' random_org.getUsage

salt '*' random_org.getUsage api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15 api_version=1
```

### 31.16.211 salt.modules.rbenv

Manage ruby installations with rbenv. Rbenv is supported on Linux and Mac OS X. Rbenv doesn't work on Windows (and isn't really necessary on Windows as there is no system Ruby on Windows). On Windows, the RubyInstaller and/or Pik are both good alternatives to work with multiple versions of Ruby on the same box.

http://misheska.com/blog/2013/06/15/using-rbenv-to-manage-multiple-versions-of-ruby/

New in version 0.16.0.

**salt.modules.rbenv.default**(ruby=None, runas=None)

Returns or sets the currently defined default ruby.

- `ruby=None` The version to set as the default. Should match one of the versions listed by `rbenv.versions`.
  
  Leave blank to return the current default.

**CLI Example:**

```
salt '*' rbenv.default
salt '*' rbenv.default 2.0.0-p0
```

**salt.modules.rbenv.do**(cmdline=None, runas=None)

Execute a ruby command with rbenv's shims from the user or the system.

**CLI Example:**

```
salt '*' rbenv.do 'gem list bundler'
salt '*' rbenv.do 'gem list bundler' deploy
```

**salt.modules.rbenv.do_with_ruby**(ruby, cmdline, runas=None)

Execute a ruby command with rbenv's shims using a specific ruby version.

**CLI Example:**

```
salt '*' rbenv.do_with_ruby 2.0.0-p0 'gem list bundler'
salt '*' rbenv.do_with_ruby 2.0.0-p0 'gem list bundler' deploy
```

**salt.modules.rbenv.install**(runas=None, path=None)

Install Rbenv systemwide

**CLI Example:**

```
salt '*' rbenv.install
```

**salt.modules.rbenv.install_ruby**(ruby, runas=None)

Install a ruby implementation.

- `ruby` The version of Ruby to install, should match one of the versions listed by `rbenv.list`

Additional environment variables can be configured in pillar / grains / master:

- `rbenv`
  
  `build_env` : 'CONFIGURE_OPTS="--no-tcmalloc" CFLAGS="-fno-tree-dce"'

**CLI Example:**
salt 'x' rbenv.install_ruby 2.0.0-p0

salt.modules.rbenv.is_installed\(runas=None\)
Check if Rbenv is installed.
CLI Example:

```
salt '*' rbenv.is_installed
```

salt.modules.rbenv.list\(runas=None\)
List the installable versions of ruby.
CLI Example:

```
salt '*' rbenv.list
```

salt.modules.rbenv.rehash\(runas=None\)
Run rbenv rehash to update the installed shims.
CLI Example:

```
salt '*' rbenv.rehash
```

salt.modules.rbenv.uninstall_ruby\(ruby, runas=None\)
Uninstall a ruby implementation.
\- ruby The version of ruby to uninstall. Should match one of the versions listed by \code{rbenv.versions}
CLI Example:

```
salt '*' rbenv.uninstall_ruby 2.0.0-p0
```

salt.modules.rbenv.update\(runas=None, path=None\)
Updates the current versions of Rbenv and Ruby-Build
CLI Example:

```
salt '*' rbenv.update
```

salt.modules.rbenv.versions\(runas=None\)
List the installed versions of ruby.
CLI Example:

```
salt '*' rbenv.versions
```

### 31.16.212 salt.modules.rdp

Manage RDP Service on Windows servers

salt.modules.rdp.disable()
Disable RDP the service on the server
CLI Example:

```
salt '*' rdp.disable
```

salt.modules.rdp.enable()
Enable RDP the service on the server
CLI Example:
salt '*' rdp.enable

salt.modules.rdp.status()
    Show if rdp is enabled on the server
    CLI Example:
        salt '*' rdp.status

31.16.213 salt.modules.redis

Module to provide redis functionality to Salt
New in version 2014.7.0.

configuration This module requires the redis python module and uses the following defaults which may be overridden in the minion configuration:

    redis.host: 'localhost'
    redis.port: 6379
    redis.db: 0
    redis.password: None

salt.modules.redismod.bgrewriteaof(host=None, port=None, db=None, password=None)
    Asynchronously rewrite the append-only file
    CLI Example:
        salt '*' redis.bgrewriteaof

salt.modules.redismod.bgsave(host=None, port=None, db=None, password=None)
    Asynchronously save the dataset to disk
    CLI Example:
        salt '*' redis.bgsave

salt.modules.redismod.config_get(pattern='*', host=None, port=None, db=None, password=None)
    Get redis server configuration values
    CLI Example:
        salt '*' redis.config_get
        salt '*' redis.config_get port

salt.modules.redismod.config_set(name, value, host=None, port=None, db=None, password=None)
    Set redis server configuration values
    CLI Example:
        salt '*' redis.config_set masterauth luv_kittens

salt.modules.redismod.dbsize(host=None, port=None, db=None, password=None)
    Return the number of keys in the selected database
    CLI Example:
        salt '*' redis.dbsize
salt.modules.redismod.delete(*keys, **connection_args)
    Deletes the keys from redis, returns number of keys deleted
    CLI Example:
    salt '*' redis.delete foo

salt.modules.redismod.exists(key, host=None, port=None, db=None, password=None)
    Return true if the key exists in redis
    CLI Example:
    salt '*' redis.exists foo

salt.modules.redismod.expire(key, seconds, host=None, port=None, db=None, password=None)
    Set a keys time to live in seconds
    CLI Example:
    salt '*' redis.expire foo 300

salt.modules.redismod.expireat(key, timestamp, host=None, port=None, db=None, password=None)
    Set a keys expire at given UNIX time
    CLI Example:
    salt '*' redis.expireat foo 1400000000

salt.modules.redismod.flushall(host=None, port=None, db=None, password=None)
    Remove all keys from all databases
    CLI Example:
    salt '*' redis.flushall

salt.modules.redismod.flushdb(host=None, port=None, db=None, password=None)
    Remove all keys from the selected database
    CLI Example:
    salt '*' redis.flushdb

salt.modules.redismod.get_key(key, host=None, port=None, db=None, password=None)
    Get redis key value
    CLI Example:
    salt '*' redis.get_key foo

salt.modules.redismod.hget(key, field, host=None, port=None, db=None, password=None)
    Get specific field value from a redis hash, returns dict
    CLI Example:
    salt '*' redis.hget foo_hash bar_field

salt.modules.redismod.hgetall(key, host=None, port=None, db=None, password=None)
    Get all fields and values from a redis hash, returns dict
    CLI Example:
```python
salt '*' redis.hgetall foo_hash

salt.modules.redismod.info(host=None, port=None, db=None, password=None)
    Get information and statistics about the server
    CLI Example:
    salt '*' redis.info

salt.modules.redismod.key_type(key, host=None, port=None, db=None, password=None)
    Get redis key type
    CLI Example:
    salt '*' redis.type foo

salt.modules.redismod.keys(pattern='*', host=None, port=None, db=None, password=None)
    Get redis keys, supports glob style patterns
    CLI Example:
    salt '*' redis.keys
    salt '*' redis.keys test*

salt.modules.redismod.lrange(key, start, stop, host=None, port=None, db=None, password=None)
    Get a range of values from a list in Redis
    CLI Example:
    salt '*' redis.lrange foo_list 0 10

salt.modules.redismod.ping(host=None, port=None, db=None, password=None)
    Ping the server, returns False on connection errors
    CLI Example:
    salt '*' redis.ping

salt.modules.redismod.save(host=None, port=None, db=None, password=None)
    Synchronously save the dataset to disk
    CLI Example:
    salt '*' redis.save

salt.modules.redismod.set_key(key, value, host=None, port=None, db=None, password=None)
    Set redis key value
    CLI Example:
```

31.16. Full list of builtin execution modules
Synchronously save the dataset to disk and then shut down the server

CLI Example:

    salt '*' redis.shutdown

Make the server a slave of another instance, or promote it as master

CLI Example:

    # Become slave of redis-n01.example.com:6379
    salt '*' redis.slaveof redis-n01.example.com 6379
    salt '*' redis.slaveof redis-n01.example.com
    # Become master
    salt '*' redis.slaveof

Get members in a Redis set

CLI Example:

    salt '*' redis.smembers foo_set

Return the current server UNIX time in seconds

CLI Example:

    salt '*' redis.time

Get the length of a sorted set in Redis

CLI Example:

    salt '*' redis.zcard foo_sorted

Get a range of values from a sorted set in Redis by index

CLI Example:

    salt '*' redis.zrange foo_sorted 0 10

31.16.214 salt.modules.reg

Manage the Windows registry

The read_key and set_key functions will be updated in Boron to reflect proper registry usage. The registry has three main components. Hives, Keys, and Values.
Hives

Hives are the main sections of the registry and all begin with the word HKEY. - HKEY_LOCAL_MACHINE - HKEY_CURRENT_USER - HKEY_USER

Keys

Keys are the folders in the registry. Keys can have many nested subkeys. Keys can have a value assigned to them under the (Default)

Values or Entries

Values/Entries are name/data pairs. There can be many values in a key. The (Default) value corresponds to the Key, the rest are their own value pairs.

depends

• winreg Python module

class salt.modules.reg.Registry

Delay `\_winreg` usage until this module is used

salt.modules.reg.create_key(hkey, path, key=None, value=None, reflection=True)

**Important**: The name of this function is misleading and will be changed to reflect proper usage in the Boron release of Salt. The path option will be removed and the key will be the actual key. See the following issue:

https://github.com/saltstack/salt/issues/25618

In order to not break existing state files this function will call the set_value function if key is passed. Key will be passed as the value name. If key is not passed, this function will return the default value for the key.

In the Boron release path will be removed and key will be the path. You will not pass value.

Create a registry key

CLI Example:

```
salt '*' reg.create_key HKEY_CURRENT_USER 'SOFTWARE\Salt' 'version' '0.97'
```

salt.modules.reg.delete_key(hkey, path, key=None, reflection=True, force=False)

**Important**: The name of this function is misleading and will be changed to reflect proper usage in the Boron release of Salt. The path option will be removed and the key will be the actual key. See the following issue:

https://github.com/saltstack/salt/issues/25618

In order to not break existing state files this function will call the delete_value function if a key is passed. Key will be passed as the value name. If key is not passed, this function will return the default value for the key.

In the Boron release path will be removed and key will be the path. reflection will also be removed.

Delete a registry key

CLI Example:
salt 'salt' reg.delete_key HKEY_CURRENT_USER 'SOFTWARE\Salt'

Parameters

- **hkey** *(str)* -- (will be changed to hive) The name of the hive. Can be one of the following - HKEY_LOCAL_MACHINE or HKLM - HKEY_CURRENT_USER or HKCU - HKEY_USER or HKU

- **path** *(str)* -- (will be changed to key) The key (looks like a path) to remove.

- **key** *(str)* -- (used incorrectly) Will be removed in Boron

- **reflection** *(bool)* -- A boolean value indicating that the value should also be removed from the Wow6432Node portion of the registry. Only applies to 64 bit Windows. This setting is ignored for 32 bit Windows.

  Only applies to delete value. If the key parameter is passed, this function calls delete_value instead. Will be changed in Boron.

- **force** *(bool)* -- A boolean value indicating that all subkeys should be removed as well. If this is set to False (default) and there are subkeys, the delete_key function will fail.

Returns Returns True if successful, False if not If force=True, the results of delete_key_recursive are returned.

Return type bool

salt.modules.reg.delete_key_recursive(hive, key)

New in version 2015.5.4.

Delete a registry key to include all subkeys.

Parameters

- **hive** -- The name of the hive. Can be one of the following - HKEY_LOCAL_MACHINE or HKLM - HKEY_CURRENT_USER or HKCU - HKEY_USER or HKU

- **key** -- The key to remove (looks like a path)

Returns A dictionary listing the keys that deleted successfully as well as those that failed to delete.

Return type dict

The following example will remove salt and all its subkeys from the SOFTWARE key in HKEY_LOCAL_MACHINE:

CLI Example:

```
salt '*' reg.delete_key_recursive HKLM SOFTWARE\salt
```

salt.modules.reg.delete_value(hive, key, vname=None, reflection=True)

Delete a registry value entry or the default value for a key.

Parameters

- **hive** *(str)* -- The name of the hive. Can be one of the following - HKEY_LOCAL_MACHINE or HKLM - HKEY_CURRENT_USER or HKCU - HKEY_USER or HKU

- **key** *(str)* -- The key (looks like a path) to the value name.

- **vname** *(str)* -- The value name. These are the individual name/data pairs under the key. If not passed, the key (Default) value will be deleted.
- **reflection** *(bool)* -- A boolean value indicating that the value should also be set in the Wow6432Node portion of the registry. Only applies to 64 bit Windows. This setting is ignored for 32 bit Windows.

**Returns**  Returns True if successful, False if not

**Return type**  bool

CLI Example:

```bash
salt '*' reg.delete_value HKEY_CURRENT_USER 'SOFTWARE\Salt' 'version'
```

salt.modules.reg.read_key *(hkey, path, key=None)*

**Important:** The name of this function is misleading and will be changed to reflect proper usage in the Boron release of Salt. The path option will be removed and the key will be the actual key. See the following issue:

https://github.com/saltstack/salt/issues/25618

In order to not break existing state files this function will call the read_value function if a key is passed. Key will be passed as the value name. If key is not passed, this function will return the default value for the key.

In the Boron release this function will be removed in favor of read_value.

Read registry key value

Returns the first unnamed value (Default) as a string. Returns none if first unnamed value is empty. Returns False if key not found.

CLI Example:

```bash
salt '*' reg.read_key HKEY_LOCAL_MACHINE 'SOFTWARE\Salt' 'version'
```

salt.modules.reg.read_value *(hive, key, vname=None)*

Reads a registry value entry or the default value for a key.

**Parameters**

- **hive** *(str)* -- The name of the hive. Can be one of the following - HKEY_LOCAL_MACHINE or HKLM - HKEY_CURRENT_USER or HKCU - HKEY_USER or HKU

- **key** *(str)* -- The key (looks like a path) to the value name.

- **vname** *(str)* -- The value name. These are the individual name/data pairs under the key. If not passed, the key (Default) value will be returned

**Returns**

A dictionary containing the passed settings as well as the value_data if successful. If unsuccessful, sets success to False

If vname is not passed: - Returns the first unnamed value (Default) as a string. - Returns none if first unnamed value is empty. - Returns False if key not found.

**Return type**  dict

CLI Example:

```bash
salt '*' reg.read_value HKEY_LOCAL_MACHINE 'SOFTWARE\Salt' 'version'
```
salt.modules.reg.set_key(hkey, path, value, key=None, vtype='REG_DWORD', reflection=True)

**Important:** The name of this function is misleading and will be changed to reflect proper usage in the Boron release of Salt. The path option will be removed and the key will be the actual key. See the following issue:

https://github.com/saltstack/salt/issues/25618

In order to not break existing state files this function will call the set_value function if a key is passed. Key will be passed as the value name. If key is not passed, this function will return the default value for the key. In the Boron release this function will be removed in favor of set_value.

Set a registry key

vtype: [http://docs.python.org/2/library/_winreg.html#value-types](http://docs.python.org/2/library/_winreg.html#value-types)

CLI Example:

```python
salt '*' reg.set_key HKEY_CURRENT_USER 'SOFTWARE\Salt' 'version' '0.97' REG_DWORD
```

salt.modules.reg.set_value(hive, key, vname=None, vdata=None, vtype='REG_SZ', reflection=True)

Sets a registry value entry or the default value for a key.

**Parameters**

- **hive (str)** -- The name of the hive. Can be one of the following - HKEY_LOCAL_MACHINE or HKLM - HKEY_CURRENT_USER or HKCU - HKEY_USER or HKU
- **key (str)** -- The key (looks like a path) to the value name.
- **vname (str)** -- The value name. These are the individual name/data pairs under the key. If not passed, the key (Default) value will be set.
- **vdata (str)** -- The value data to be set.
- **vtype (str)** -- The value type. Can be one of the following: - REG_BINARY - REG_DWORD - REG_EXPAND_SZ - REG_MULTI_SZ - REG_SZ
- **reflection (bool)** -- A boolean value indicating that the value should also be set in the Wow6432Node portion of the registry. Only applies to 64 bit Windows. This setting is ignored for 32 bit Windows.

**Returns** Returns True if successful, False if not

**Return type** bool

CLI Example:

```python
salt '*' reg.set_value HKEY_LOCAL_MACHINE 'SOFTWARE\Salt' 'version' '2015.5.2'
```

31.16.215 salt.modules.rest_package

Service support for the REST example

salt.modules.rest_package.install(name=None, refresh=False, fromrepo=None, pkgs=None, **kwargs)

salt.modules.rest_package.installed(name, version=None, refresh=False, fromrepo=None, skip_verify=False, pkgs=None, sources=None, **kwargs)

salt.modules.rest_package.list_pkgs(versions_as_list=False, **kwargs)
salt.modules.rest_package.remove(name=None, pkgs=None, **kwargs)

salt.modules.rest_package.version(*names, **kwargs)
    Returns a string representing the package version or an empty string if not installed. If more than one package name is specified, a dict of name/version pairs is returned.

    CLI Example:
    salt '*' pkg.version <package name>
    salt '***' pkg.version <package1> <package2> <package3> ...

31.16.216 salt.modules.rest_sample

Module for interfacing to the REST example
pre-pre-ALPHA QUALITY code.

salt.modules.rest_sample.grains_refresh()
    Refresh the cache.

salt.modules.rest_sample.ping()

31.16.217 salt.modules.rest_service

Service support for the REST example

salt.modules.rest_service.list()
    List services.

    CLI Example:
    salt '*' rest_service.list <service name>

salt.modules.rest_service.restart(name)
    Restart the named service

    CLI Example:
    salt '*' rest_service.restart <service name>

salt.modules.rest_service.start(name)
    Start the specified service

    CLI Example:
    salt '*' rest_service.start <service name>

salt.modules.rest_service.status(name)
    Return the status for a service, returns a bool whether the service is running.

    CLI Example:
    salt '*' rest_service.status <service name>

salt.modules.rest_service.stop(name)
    Stop the specified service

    CLI Example:
```bash
salt '*' rest_service.stop <service name>
```

### 31.16.218 salt.modules.ret

Module to integrate with the returner system and retrieve data sent to a salt returner.

```python
salt.modules.ret.get_fun(retuner, fun)
```

Return info about last time fun was called on each minion.

CLI Example:

```bash
salt '*' ret.get_fun mysql network.interfaces
```

```python
salt.modules.ret.get_jid(retuner, jid)
```

Return the information for a specified job id.

CLI Example:

```bash
salt '*' ret.get_jid redis 20421104181954700505
```

```python
salt.modules.ret.get_jids(retuner)
```

Return a list of all job ids.

CLI Example:

```bash
salt '*' ret.get_jids mysql
```

```python
salt.modules.ret.get_minions(retuner)
```

Return a list of all minions.

CLI Example:

```bash
salt '*' ret.get_minions mysql
```

### 31.16.219 salt.modules.rh_ip

The networking module for RHEL/Fedora based distros.

```python
salt.modules.rh_ip.apply_network_settings(**settings)
```

Apply global network configuration.

CLI Example:

```bash
salt '*' ip.apply_network_settings
```

```python
salt.modules.rh_ip.build_bond(iface, **settings)
```

Create a bond script in /etc/modprobe.d with the passed settings and load the bonding kernel module.

CLI Example:

```bash
salt '*' ip.build_bond bond0 mode=balance-alb
```

```python
salt.modules.rh_ip.build_interface(iface, iface_type, enabled, **settings)
```

Build an interfacescript for a network interface.

CLI Example:

```bash
salt '*' ip.build_interface eth0 eth <settings>
```
salt.modules.rh_ip.build_network_settings(**settings)
    Build the global network script.
    CLI Example:
    ```
    salt '*' ip.build_network_settings <settings>
    ```

salt.modules.rh_ip.build_routes(iface, **settings)
    Build a route script for a network interface.
    CLI Example:
    ```
    salt '*' ip.build_routes eth0 <settings>
    ```

salt.modules.rh_ip.down(iface, iface_type)
    Shutdown a network interface
    CLI Example:
    ```
    salt '*' ip.down eth0
    ```

salt.modules.rh_ip.get_bond(iface)
    Return the content of a bond script
    CLI Example:
    ```
    salt '*' ip.get_bond bond0
    ```

salt.modules.rh_ip.get_interface(iface)
    Return the contents of an interface script
    CLI Example:
    ```
    salt '*' ip.get_interface eth0
    ```

salt.modules.rh_ip.get_network_settings()
    Return the contents of the global network script.
    CLI Example:
    ```
    salt '*' ip.get_network_settings
    ```

salt.modules.rh_ip.get_routes(iface)
    Return the contents of the interface routes script.
    CLI Example:
    ```
    salt '*' ip.get_routes eth0
    ```

salt.modules.rh_ip.up(iface, iface_type)
    Start up a network interface
    CLI Example:
    ```
    salt '*' ip.up eth0
    ```

31.16.220 salt.modules.rh_service

Service support for RHEL-based systems, including support for both upstart and sysvinit
salt.modules.rh_service.available(name, limit="")
Return True if the named service is available. Use the limit param to restrict results to services of that type.

CLI Examples:
```
salt '*' service.available sshd
salt '*' service.available sshd limit=upstart
salt '*' service.available sshd limit=sysvinit
```

salt.modules.rh_service.disable(name, **kwargs)
Disable the named service to start at boot

CLI Example:
```
salt '*' service.disable <service name>
```

salt.modules.rh_service.disabled(name)
Check to see if the named service is disabled to start on boot

CLI Example:
```
salt '*' service.disabled <service name>
```

salt.modules.rh_service.enable(name, **kwargs)
Enable the named service to start at boot

CLI Example:
```
salt '*' service.enable <service name>
```

salt.modules.rh_service.enabled(name, **kwargs)
Check to see if the named service is enabled to start on boot

CLI Example:
```
salt '*' service.enabled <service name>
```

salt.modules.rh_service.get_all(limit="")
Return all installed services. Use the limit param to restrict results to services of that type.

CLI Example:
```
salt '*' service.get_all
salt '*' service.get_all limit=upstart
salt '*' service.get_all limit=sysvinit
```

salt.modules.rh_service.get_disabled(limit="")
Return the disabled services. Use the limit param to restrict results to services of that type.

CLI Example:
```
salt '*' service.get_disabled
salt '*' service.get_disabled limit=upstart
salt '*' service.get_disabled limit=sysvinit
```

salt.modules.rh_service.get_enabled(limit="")
Return the enabled services. Use the limit param to restrict results to services of that type.

CLI Examples:
```
salt '*' service.get_enabled
salt '*' service.get_enabled limit=upstart
salt '*' service.get_enabled limit=sysvinit
```
salt.modules.rh_service.missing(name, limit='')
The inverse of service.available. Return True if the named service is not available. Use the limit param to restrict results to services of that type.

CLI Examples:
```
salt '*' service.missing sshd
salt '*' service.missing sshd limit=upstart
salt '*' service.missing sshd limit=sysvinit
```

salt.modules.rh_service.reload(name)
Reload the named service

CLI Example:
```
salt '*' service.reload <service name>
```

salt.modules.rh_service.restart(name)
Restart the named service

CLI Example:
```
salt '*' service.restart <service name>
```

salt.modules.rh_service.start(name)
Start the specified service

CLI Example:
```
salt '*' service.start <service name>
```

salt.modules.rh_service.status(name, sig=None)
Return the status for a service, returns a bool whether the service is running.

CLI Example:
```
salt '*' service.status <service name>
```

salt.modules.rh_service.stop(name)
Stop the specified service

CLI Example:
```
salt '*' service.stop <service name>
```

31.16.221 salt.modules.riak

Riak Salt Module

salt.modules.riak.cluster_commit()
Commit Cluster Changes

Changed in version 2015.8.0.

CLI Example:
```
salt '*' riak.cluster_commit
```

salt.modules.riak.cluster_join(username, hostname)
Join a Riak cluster

Changed in version 2015.8.0.
CLI Example:

```bash
salt '*' riak.cluster_join <user> <host>
```

*username* - The riak username to join the cluster
*hostname* - The riak hostname you are connecting to

**salt.modules.riak.cluster_leave**(*username*, *hostname*)
Leave a Riak cluster
New in version 2015.8.0.

CLI Example:

```bash
salt '*' riak.cluster_leave <username> <host>
```

*username* - The riak username to join the cluster
*hostname* - The riak hostname you are connecting to

**salt.modules.riak.cluster_plan()**
Review Cluster Plan
Changed in version 2015.8.0.

CLI Example:

```bash
salt '*' riak.cluster_plan
```

**salt.modules.riak.member_status()**
Get cluster member status
Changed in version 2015.8.0.

CLI Example:

```bash
salt '*' riak.member_status
```

**salt.modules.riak.services()**
List available services on a node
New in version 2015.8.0.

CLI Example:

```bash
salt '*' riak.services
```

**salt.modules.riak.start()**
Start Riak

CLI Example:

```bash
salt '*' riak.start
```

**salt.modules.riak.status()**
Current node status
New in version 2015.8.0.

CLI Example:

```bash
salt '*' riak.status
```

**salt.modules.riak.stop()**
Stop Riak
Changed in version 2015.8.0.

CLI Example:
salt '*' riak.stop

salt.modules.riak.test()
    Runs a test of a few standard Riak operations
    New in version 2015.8.0.
    CLI Example:

        salt '*' riak.test

31.16.222 salt.modules.rpm

Support for rpm

salt.modules.rpm.bin_pkg_info(path, saltenv='base')
    New in version 2015.8.0.
    Parses RPM metadata and returns a dictionary of information about the package (name, version, etc.).
    path Path to the file. Can either be an absolute path to a file on the minion, or a salt fileserver URL (e.g. salt://path/to/file.rpm). If a salt fileserver URL is passed, the file will be cached to the minion so that it can be examined.
    saltenv [base] Salt fileserver environment from which to retrieve the package. Ignored if path is a local file path on the minion.
    CLI Example:

        salt '*' lowpkg.bin_pkg_info /root/salt-2015.5.1-2.el7.noarch.rpm
        salt '*' lowpkg.bin_pkg_info salt://salt-2015.5.1-2.el7.noarch.rpm

salt.modules.rpm.diff(package, path)
    Return a formatted diff between current file and original in a package. NOTE: this function includes all files (configuration and not), but does not work on binary content.
    Parameters
    • package -- The name of the package
    • path -- Full path to the installed file
    Returns Difference or empty string. For binary files only a notification.
    CLI example:

        salt '*' lowpkg.diff apache2 /etc/apache2/httpd.conf

salt.modules.rpm.file_dict(*packages)
    List the files that belong to a package, sorted by group. Not specifying any packages will return a list of _every_ file on the system's rpm database (not generally recommended).
    CLI Examples:

        salt '*' lowpkg.file_dict httpd
        salt '*' lowpkg.file_dict httpd postfix
        salt '*' lowpkg.file_dict

salt.modules.rpm.file_list(*packages)
    List the files that belong to a package. Not specifying any packages will return a list of _every_ file on the system's rpm database (not generally recommended).
CLI Examples:

```bash
salt '*' lowpkg.file_list httpd
salt '*' lowpkg.file_list httpd postfix
salt '*' lowpkg.file_list
```

salt.modules.rpm.info('packages')

Return a detailed package(s) summary information. If no packages specified, all packages will be returned.

**Parameters** packages --

**Returns**

**CLI example:**

```bash
salt '*' lowpkg.info apache2 bash
```

salt.modules.rpm.list_pkgs('packages')

List the packages currently installed in a dict:

```yaml
{'<package_name>': '<version>'
```

**CLI Example:**

```bash
salt '*' lowpkg.list_pkgs
```

salt.modules.rpm.modified('packages', 'flags')

List the modified files that belong to a package. Not specifying any packages will return a list of all modified files on the system's RPM database.

New in version 2015.5.0.

**CLI examples:**

```bash
salt '*' lowpkg.modified httpd
salt '*' lowpkg.modified httpd postfix
salt '*' lowpkg.modified
```

salt.modules.rpm.owner('paths')

Return the name of the package that owns the file. Multiple file paths can be passed. If a single path is passed, a string will be returned, and if multiple paths are passed, a dictionary of file/package name pairs will be returned.

If the file is not owned by a package, or is not present on the minion, then an empty string will be returned for that path.

**CLI Examples:**

```bash
salt '*' lowpkg.owner /usr/bin/apachectl
salt '*' lowpkg.owner /usr/bin/apachectl /etc/httpd/conf/httpd.conf
```

salt.modules.rpm.verify('package', **kwargs)

Runs an rpm -Va on a system, and returns the results in a dict

Files with an attribute of config, doc, ghost, license or readme in the package header can be ignored using the ignore_types keyword argument

**CLI Example:**

```bash
salt '*' lowpkg.verify
salt '*' lowpkg.verify httpd
```
31.16.223 salt.modules.rpmbuild

RPM Package builder system

New in version 2015.8.0.

This system allows for all of the components to build rpms safely in chrooted environments. This also provides a function to generate yum repositories

This module implements the pkgbuild interface

```
salt.modules.rpmbuild.build(runas, tgt, dest_dir, spec, sources, deps, env, template, saltenv='base')
```

Given the package destination directory, the spec file source and package sources, use mock to safely build the rpm defined in the spec file

CLI Example:
```
```

This example command should build the libnacl package for rhel 7 using user mock and place it in /var/www/html/ on the minion

```
salt.modules.rpmbuild.make_repo(repodir, keyid=None, env=None)
```

Given the repodir, create a yum repository out of the rpms therein

CLI Example:
```
salt '*' pkgbuild.make_repo /var/www/html/
```

```
salt.modules.rpmbuild.make_src_pkg(dest_dir, spec, sources, env=None, template=None, saltenv='base')
```

Create a source rpm from the given spec file and sources

CLI Example:
```
```

This example command should build the libnacl SOURCE package and place it in /var/www/html/ on the minion

31.16.224 salt.modules.rsync

Wrapper for rsync

New in version 2014.1.0.

This data can also be passed into pillar. Options passed into opts will overwrite options passed into pillar.

```
salt.modules.rsync.config(confile='/etc/rsyncd.conf')
```

Return rsync config

CLI Example:
```
salt '*' rsync.config
```
salt.modules.rsync.rsync(src, dst, delete=False, force=False, update=False, passwordfile=None, exclude=None, excludefrom=None)

Rsync files from src to dst

CLI Example:

salt '*' rsync.rsync {src} {dst} {delete=True} {update=True} {passwordfile=/etc/pass.crt} {exclude=xx} {excludefrom=/xx.ini}

salt.modules.rsync.version()

Return rsync version

CLI Example:

salt '*' rsync.version

31.16.225 salt.modules.runit

runit service module

This module is compatible with the service states, so it can be used to maintain services using the provider argument:

myservice:
  service:
    - running
    - provider: runit

Note that the enabled argument is not available with this provider.

salt.modules.runit.available(name)

Returns True if the specified service is available, otherwise returns False.

CLI Example:

salt '*' runit.available foo

salt.modules.runit.full_restart(name)

Calls runit.restart() function

CLI Example:

salt '*' runit.full_restart <service name>

salt.modules.runit.get_all()

Return a list of all available services

CLI Example:

salt '*' runit.get_all

salt.modules.runit.missing(name)

The inverse of runit.available. Returns True if the specified service is not available, otherwise returns False.

CLI Example:

salt '*' runit.missing foo

salt.modules.runit.reload(name)

Send a HUP to service via runit
**CLI Example:**

```
salt '*' runit.reload <service name>
```

### salt.modules.runit.restart(name)

Restart service via runit. This will stop/start service

**CLI Example:**

```
salt '*' runit.restart <service name>
```

### salt.modules.runit.start(name)

Starts service via runit

**CLI Example:**

```
salt '*' runit.start <service name>
```

### salt.modules.runit.status(name, sig=None)

Return the status for a service via runit, return pid if running

**CLI Example:**

```
salt '*' runit.status <service name>
```

### salt.modules.runit.stop(name)

Stops service via runit

**CLI Example:**

```
salt '*' runit.stop <service name>
```

### salt.modules.runit.term(name)

Send a TERM to service via runit

**CLI Example:**

```
salt '*' runit.term <service name>
```

---

**31.16.226 salt.modules.rvm**

Manage ruby installations and gemsets with RVM, the Ruby Version Manager.

### salt.modules.rvm.do(ruby, command, runas=None, cwd=None)

Execute a command in an RVM controlled environment.

- **ruby:** The ruby to use.
- **command:** The command to execute.
- **runas** [None] The user to run rvm as.
- **cwd** [None] The current working directory.

**CLI Example:**

```
salt '*' rvm.do 2.0.0 <command>
```

### salt.modules.rvm.gemset_copy(source, destination, runas=None)

Copy all gems from one gemset to another.

- **source** The name of the gemset to copy, complete with ruby version.
- **destination** The destination gemset.

---

**31.16. Full list of builtin execution modules**

1201
runas [None] The user to run rvm as.

CLI Example:

```bash
salt '*' rvm.gemset_copy foobar bazquo
```

```bash
salt.modules.rvm.gemset_create(ruby, gemset, runas=None)
```

Creates a gemset.

ruby The ruby version to create the gemset for.

gemset The name of the gemset to create.

runas [None] The user to run rvm as.

CLI Example:

```bash
salt '*' rvm.gemset_create 2.0.0 foobar
```

```bash
salt.modules.rvm.gemset_delete(ruby, gemset, runas=None)
```

Deletes a gemset.

ruby The ruby version the gemset belongs to.

gemset The gemset to delete.

runas [None] The user to run rvm as.

CLI Example:

```bash
salt '*' rvm.gemset_delete 2.0.0 foobar
```

```bash
salt.modules.rvm.gemset_empty(ruby, gemset, runas=None)
```

Remove all gems from a gemset.

ruby The ruby version the gemset belongs to.

gemset The gemset to empty.

runas [None] The user to run rvm as.

CLI Example:

```bash
salt '*' rvm.gemset_empty 2.0.0 foobar
```

```bash
salt.modules.rvm.gemset_list(ruby='default', runas=None)
```

List all gemsets for the given ruby.

ruby [default] The ruby version to list the gemsets for

runas [None] The user to run rvm as.

CLI Example:

```bash
salt '*' rvm.gemset_list
```

```bash
salt.modules.rvm.gemset_list_all(runas=None)
```

List all gemsets for all installed rubies.

Note that you must have set a default ruby before this can work.

runas [None] The user to run rvm as.

CLI Example:
salt '*' rvm.gemset_list_all

salt.modules.rvm.get(version='stable', runas=None)
    Update RVM.
    version  [stable] Which version of RVM to install, e.g. stable or head.
    ruby     The version of ruby to reinstall.
    CLI Example:
    salt '*' rvm.get

salt.modules.rvm.install(runas=None)
    Install RVM system wide.
    CLI Example:
    salt '*' rvm.install

salt.modules.rvm.install_ruby(ruby, runas=None)
    Install a ruby implementation.
    ruby     The version of ruby to install.
    runas    [None] The user to run rvm as.
    CLI Example:
    salt '*' rvm.install_ruby 1.9.3-p385

salt.modules.rvm.is_installed(runas=None)
    Check if RVM is installed.
    CLI Example:
    salt '*' rvm.is_installed

salt.modules.rvm.list(runas=None)
    List all rvm installed rubies.
    runas    [None] The user to run rvm as.
    CLI Example:
    salt '*' rvm.list

salt.modules.rvm.reinstall_ruby(ruby, runas=None)
    Reinstall a ruby implementation.
    ruby     The version of ruby to reinstall.
    runas    [None] The user to run rvm as.
    CLI Example:
    salt '*' rvm.reinstall_ruby 1.9.3-p385

salt.modules.rvm.rubygems(ruby, version, runas=None)
    Installs a specific rubygems version in the given ruby.
    ruby     The ruby to install rubygems for.
    version   The version of rubygems to install or `remove` to use the version that ships with 1.9
runas [None] The user to run rvm as.

CLI Example:
```
salt '*' rvm.rubygems 2.0.0 1.8.24
```

salt.modules.rvm.set_default(ruby, runas=None)
Set the default ruby.

- ruby The version of ruby to make the default.
- runas [None] The user to run rvm as.

CLI Example:
```
salt '*' rvm.set_default 2.0.0
```

salt.modules.rvm.wrapper(ruby_string, wrapper_prefix, runas=None, *binaries)
Install RVM wrapper scripts.

- ruby_string Ruby/gemset to install wrappers for.
- wrapper_prefix What to prepend to the name of the generated wrapper binaries.
- runas [None] The user to run rvm as.
- binaries [None] The names of the binaries to create wrappers for. When nothing is given, wrappers for ruby, gem, rake, irb, rdoc, ri and testrb are generated.

CLI Example:
```
salt '*' rvm.wrapper <ruby_string> <wrapper_prefix>
```

31.16.227 salt.modules.s3

Connection module for Amazon S3

**configuration** This module accepts explicit s3 credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```
s3.keyid: GKTADJGHEIQSXMKKRBJ08H
s3.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

A service_url may also be specified in the configuration:

```
s3.service_url: s3.amazonaws.com
```

If a service_url is not specified, the default is s3.amazonaws.com. This may appear in various documentation as an "endpoint". A comprehensive list for Amazon S3 may be found at:

$$http://docs.aws.amazon.com/general/latest/gr/rande.html#s3_region$$

The service_url will form the basis for the final endpoint that is used to query the service.

SSL verification may also be turned off in the configuration:

```
s3.verify_ssl: False
```
This is required if using S3 bucket names that contain a period, as these will not match Amazon's S3 wildcard certificates. Certificate verification is enabled by default.

AWS region may be specified in the configuration:

s3.location: eu-central-1

Default is us-east-1.

This module should be usable to query other S3-like services, such as Eucalyptus.

depends  requests

salt.modules.s3.delete(bucket, path=None, action=None, key=None, keyid=None, service_url=None, verify_ssl=None, location=None)

Delete a bucket, or delete an object from a bucket.

CLI Example to delete a bucket:

```bash
salt myminion s3.delete mybucket
```

CLI Example to delete an object from a bucket:

```bash
salt myminion s3.delete mybucket remoteobject
```

salt.modules.s3.get(bucket=None, path=None, return_bin=False, action=None, local_file=None, key=None, keyid=None, service_url=None, verify_ssl=None, location=None)

List the contents of a bucket, or return an object from a bucket. Set return_bin to True in order to retrieve an object wholesale. Otherwise, Salt will attempt to parse an XML response.

CLI Example to list buckets:

```bash
salt myminion s3.get
```

CLI Example to list the contents of a bucket:

```bash
salt myminion s3.get mybucket
```

CLI Example to return the binary contents of an object:

```bash
salt myminion s3.get mybucket myfile.png return_bin=True
```

CLI Example to save the binary contents of an object to a local file:

```bash
salt myminion s3.get mybucket myfile.png local_file=/tmp/myfile.png
```

It is also possible to perform an action on a bucket. Currently, S3 supports the following actions:

- acl
- cors
- lifecycle
- policy
- location
- logging
- notification
- tagging
- versions
- requestPayment
- versioning
- website

To perform an action on a bucket:
```
salt myminion s3.get mybucket myfile.png  action=acl

salt.modules.s3.head(bucket, path=None, key=None, keyid=None, service_url=None, verify_ssl=None, location=None)

    Return the metadata for a bucket, or an object in a bucket.

    CLI Examples:
    salt myminion s3.head mybucket
    salt myminion s3.head mybucket myfile.png

salt.modules.s3.put(bucket, path=None, return_bin=False, action=None, local_file=None, key=None, keyid=None, service_url=None, verify_ssl=None, location=None)

    Create a new bucket, or upload an object to a bucket.

    CLI Example to create a bucket:
    salt myminion s3.put mybucket

    CLI Example to upload an object to a bucket:
    salt myminion s3.put mybucket remotepath local_file=/path/to/file
```

### 31.16.228 salt.modules.saltcloudmod

Control a salt cloud system

```
salt.modules.saltcloudmod.create(name, profile)

    Create the named vm

    CLI Example:
    salt <minion-id> saltcloud.create webserver rackspace_centos_512
```

### 31.16.229 salt.modules.saltutil

The Saltutil module is used to manage the state of the salt minion itself. It is used to manage minion modules as well as automate updates to the salt minion.

```
depends
    
    * esky Python module for update functionality

salt.modules.saltutil.clear_cache()

    Forcibly removes all caches on a minion.

    New in version 2014.7.0.

    WARNING: The safest way to clear a minion cache is by first stopping the minion and then deleting the cache files before restarting it.

    CLI Example:
    salt '*' saltutil.clear_cache

salt.modules.saltutil.cmd(tgt, fun, arg=(), timeout=None, expr_form='glob', ret='*', kwarg=None, ssh=False, **kwargs)

    Assuming this minion is a master, execute a salt command

    CLI Example:
```
salt '*' saltutil.cmd

salt.modules.saltutil.cmd_iter(tgt, fun, arg=(), timeout=None, expr_form='glob', ret='`, kwarg=None, ssh=False, **kwargs)

Assuming this minion is a master, execute a salt command

CLI Example:

salt '*' saltutil.cmd_iter

salt.modules.saltutil.find_cached_job(jid)

Return the data for a specific cached job id

CLI Example:

salt '*' saltutil.find_cached_job <job id>

salt.modules.saltutil.find_job(jid)

Return the data for a specific job id

CLI Example:

salt '*' saltutil.find_job <job id>

salt.modules.saltutil.is_running(fun)

If the named function is running return the data associated with it/them. The argument can be a glob

CLI Example:

salt '*' saltutil.is_running state.highstate

salt.modules.saltutil.kill_job(jid)

Sends a kill signal (SIGKILL 9) to the named salt job's process

CLI Example:

salt '*' saltutil.kill_job <job id>

salt.modules.saltutil.mmodule(saltenv, fun, *args, **kwargs)

Loads minion modules from an environment so that they can be used in pillars for that environment

CLI Example:

salt '*' saltutil.mmodule base test.ping

salt.modules.saltutil.refresh_beacons()

Signal the minion to refresh the beacons.

CLI Example:

salt '*' saltutil.refresh_beacons

salt.modules.saltutil.refresh_modules(async=True)

Signal the minion to refresh the module and grain data

The default is to refresh module asynchronously. To block until the module refresh is complete, set the 'async' flag to False.

CLI Example:

salt '*' saltutil.refresh_modules
salt.modules.saltutil.refreshpillar()
   Signal the minion to refresh the pillar data.
   CLI Example:
   salt '*' saltutil.refreshpillar

salt.modules.saltutil.regen_keys()
   Used to regenerate the minion keys.
   CLI Example:
   salt '*' saltutil.regen_keys

salt.modules.saltutil.revoke_auth(preserve_minion_cache=False)
   The minion sends a request to the master to revoke its own key. Note that the minion session will be revoked and
   the minion may not be able to return the result of this command back to the master.
   If the 'preserve_minion_cache' flag is set to True, the master cache for this minion will not be removed.
   CLI Example:
   salt '*' saltutil.revoke_auth

salt.modules.saltutil.runner(_fun, **kwargs)
   Execute a runner module (this function must be run on the master)
   New in version 2014.7.
   name The name of the function to run
   kwargs Any keyword arguments to pass to the runner function
   CLI Example:
   salt '*' saltutil.runner jobs.list_jobs

salt.modules.saltutil.running()
   Return the data on all running salt processes on the minion
   CLI Example:
   salt '*' saltutil.running

salt.modules.saltutil.signal_job(jid, sig)
   Sends a signal to the named salt job's process
   CLI Example:
   salt '*' saltutil.signal_job <job id> 15

salt.modules.saltutil.sync_all(saltenv=None, refresh=True)
   Sync down all of the dynamic modules from the file server for a specific environment
   refresh [True] Also refresh the execution modules available to the minion.
   Important: If this function is executed using a module.run state, the SLS file will not have access to newly
   synced execution modules unless a refresh argument is added to the state, like so:
   load_my_custom_module:
      module.run:
         - name: saltutil.sync_all
         - refresh: True
See [here](#) for a more detailed explanation of why this is necessary.

**CLI Example:**

```bash
salt '*' saltutil.sync_all
```

**salt.modules.saltutil.sync_beacons** *(saltenv=None, refresh=True)*

Sync the beacons from the _beacons directory on the salt master file server. This function is environment aware, pass the desired environment to grab the contents of the _beacons directory, base is the default environment.

New in version 2015.5.1.

**CLI Example:**

```bash
salt '*' saltutil.sync_beacons
```

**salt.modules.saltutil.sync_grains** *(saltenv=None, refresh=True)*

Sync the grains from the _grains directory on the salt master file server. This function is environment aware, pass the desired environment to grab the contents of the _grains directory, base is the default environment.

**CLI Example:**

```bash
salt '*' saltutil.sync_grains
```

**salt.modules.saltutil.sync_log_handlers** *(saltenv=None, refresh=True)*

New in version 2015.8.0.

Sync utility source files from the _log_handlers directory on the salt master file server. This function is environment aware, pass the desired environment to grab the contents of the _log_handlers directory, base is the default environment.

**CLI Example:**

```bash
salt '*' saltutil.sync_log_handlers
```

**salt.modules.saltutil.sync_modules** *(saltenv=None, refresh=True)*

Sync the modules from the _modules directory on the salt master file server. This function is environment aware, pass the desired environment to grab the contents of the _modules directory, base is the default environment.

**Important:** If this function is executed using a `module.run` state, the SLS file will not have access to newly synced execution modules unless a `refresh` argument is added to the state, like so:

```yaml
load_my_custom_module:
  module.run:
    - name: saltutil.sync_modules
      refresh: True
```

See [here](#) for a more detailed explanation of why this is necessary.

New in version 2015.5.1.

**CLI Example:**

```bash
salt '*' saltutil.sync_modules
```

**salt.modules.saltutil.sync_outputters** *(saltenv=None, refresh=True)*

Sync the outputters from the _outputters directory on the salt master file server. This function is environment
aware, pass the desired environment to grab the contents of the _outputters directory, base is the default environment.

CLI Example:
```
salt '*' saltutil.sync_outputters
```

```
salt.modules.saltutil.sync_renderers(saltenv=None, refresh=True)
Sync the renderers from the _renderers directory on the salt master file server. This function is environment aware, pass the desired environment to grab the contents of the _renderers directory, base is the default environment.

CLI Example:
```
salt '*' saltutil.sync_renderers
```

```
salt.modules.saltutil.sync_returners(saltenv=None, refresh=True)
Sync the returners from the _returners directory on the salt master file server. This function is environment aware, pass the desired environment to grab the contents of the _returners directory, base is the default environment.

CLI Example:
```
salt '*' saltutil.sync_returners
```

```
salt.modules.saltutil.sync_states(saltenv=None, refresh=True)
Sync the states from the _states directory on the salt master file server. This function is environment aware, pass the desired environment to grab the contents of the _states directory, base is the default environment.

CLI Example:
```
salt '*' saltutil.sync_states
```

```
salt.modules.saltutil.sync_utils(saltenv=None, refresh=True)
Sync utility source files from the _utils directory on the salt master file server. This function is environment aware, pass the desired environment to grab the contents of the _utils directory, base is the default environment.

CLI Example:
```
salt '*' saltutil.sync_utils
```

```
salt.modules.saltutil.term_job(jid)
Sends a termination signal (SIGTERM 15) to the named salt job’s process

CLI Example:
```
salt '*' saltutil.term_job <job id>
```

```
salt.modules.saltutil.update(version=None)
Update the salt minion from the URL defined in opts['update_url'] SaltStack, Inc provides the latest builds here: update_url: https://repo.saltstack.com/windows/

Be aware that as of 2014-8-11 there's a bug in esky such that only the latest version available in the update_url can be downloaded and installed.

This feature requires the minion to be running a bdist_esky build.

The version number is optional and will default to the most recent version available at opts['update_url'].

Returns details about the transaction upon completion.

CLI Example:
```
salt 'saltutil.update
salt 'saltutil.update 0.10.3

salt.modules.saltutil.wheel(_fun, **kwargs)
  Execute a wheel module (this function must be run on the master)
  New in version 2014.7.
  name  The name of the function to run
  kwargs  Any keyword arguments to pass to the wheel function
  CLI Example:
  salt 'saltutil.wheel key.accept match=jerry

31.16.230  salt.modules.schedule

Module for managing the Salt schedule on a minion
New in version 2014.7.0.
salt.modules.schedule.add(name, **kwargs)
  Add a job to the schedule
  CLI Example:
  
  salt 'schedule.add job1 function='test.ping' seconds=3600
  # If function have some arguments, use job_args
  salt 'schedule.add job2 function='cmd.run' job_args=['date >> /tmp/date.log']' seconds=60

salt.modules.schedule.build_schedule_item(name, **kwargs)
  Build a schedule job
  CLI Example:
  salt 'schedule.build_schedule_item job1 function='test.ping' seconds=3600

salt.modules.schedule.copy(name, target, **kwargs)
  Copy scheduled job to another minion or minions.
  CLI Example:
  salt 'schedule.copy jobname target

salt.modules.schedule.delete(name, **kwargs)
  Delete a job from the minion's schedule
  CLI Example:
  salt 'schedule.delete job1

salt.modules.schedule.disable(**kwargs)
  Disable all scheduled jobs on the minion
  CLI Example:
  salt 'schedule.disable

31.16.  Full list of builtin execution modules
salt.modules.schedule.disable_job(name, **kwargs)
    Disable a job in the minion's schedule
    CLI Example:
    ```
salt '*' schedule.disable_job job1
    ```

salt.modules.schedule.enable(**kwargs)
    Enable all scheduled jobs on the minion
    CLI Example:
    ```
salt '*' schedule.enable
    ```

salt.modules.schedule.enable_job(name, **kwargs)
    Enable a job in the minion's schedule
    CLI Example:
    ```
salt '*' schedule.enable_job job1
    ```

salt.modules.schedule.is_enabled(name)
    List a Job only if its enabled
    New in version 2015.5.3.
    CLI Example:
    ```
salt '*' schedule.is_enabled name=job_name
    ```

salt.modules.schedule.list(show_all=False, where=None, return_yaml=True)
    List the jobs currently scheduled on the minion
    CLI Example:
    ```
salt '*' schedule.list
salt '*' schedule.list show_all=True
    ```

salt.modules.schedule.modify(name, **kwargs)
    Modify an existing job in the schedule
    CLI Example:
    ```
salt '*' schedule.modify job1 function='test.ping' seconds=3600
    ```

salt.modules.schedule.move(name, target, **kwargs)
    Move scheduled job to another minion or minions.
    CLI Example:
    ```
salt '*' schedule.move jobname target
    ```

salt.modules.schedule.purge(**kwargs)
    Purge all the jobs currently scheduled on the minion
    CLI Example:
    ```
salt '*' schedule.purge
    ```

salt.modules.schedule.reload()
    Reload saved scheduled jobs on the minion
CLI Example:
```bash
salt '*' schedule.reload
```

`salt.modules.schedule.run_job(name, force=False)`
Run a scheduled job on the minion immediately

CLI Example:
```bash
salt '*' schedule.run_job job1
salt '*' schedule.run_job job1 force=True
```
Force the job to run even if it is disabled.

`salt.modules.schedule.save(**kwargs)`
Save all scheduled jobs on the minion

CLI Example:
```bash
salt '*' schedule.save
```

### 31.16.231 `salt.modules.scsi`

SCSI administration module

`salt.modules.scsi.ls()`
List SCSI devices, with details

CLI Example:
```bash
salt '*' scsi.ls
```

`salt.modules.scsi.rescan_all(host)`
List scsi devices

CLI Example:
```bash
salt '*' scsi.rescan_all(0)
```

### 31.16.232 `salt.modules.sdb`

Module for Manipulating Data via the Salt DB API

`salt.modules.sdb.get(uri)`
Get a value from a db, using a uri in the form of sdb://<profile>/<key>. If the uri provided does not start with sdb://, then it will be returned as-is.

CLI Example:
```bash
salt '*' sdb.get sdb://mymemcached/foo
```

`salt.modules.sdb.set(uri, value)`
Set a value in a db, using a uri in the form of sdb://<profile>/<key>. If the uri provided does not start with sdb:// or the value is not successfully set, return False.

CLI Example:
31.16.233 salt.modules.seed

Virtual machine image management tools

salt.modules.seed.apply(path, id_=None, config=None, approve_key=True, install=True, prep_install=False)

Seed a location (disk image, directory, or block device) with the minion config, approve the minion's key, and/or install salt-minion.

CLI Example:

```bash
salt '*' seed.apply path id [config=config_data] \[gen_key=(true|false)] [approve_key=(true|false)] \[install=(true|false)]
```

**path**  Full path to the directory, device, or disk image on the target minion's file system.

**id**  Minion id with which to seed the path.

**config**  Minion configuration options. By default, the `master` option is set to the target host's `master`.

**approve_key**  Request a pre-approval of the generated minion key. Requires that the salt-master be configured to either auto-accept all keys or expect a signing request from the target host. Default: true.

**install**  Install salt-minion, if absent. Default: true.

**prep_install**  Prepare the bootstrap script, but don't run it. Default: false

salt.modules.seed.mkconfig(config=None, tmp=None, id_=None, approve_key=True, pub_key=None, priv_key=None)

Generate keys and config and put them in a tmp directory.

**pub_key**  absolute path or file content of an optional preseeded salt key

**priv_key**  absolute path or file content of an optional preseeded salt key

CLI Example:

```bash
salt '*' seed.mkconfig [config=config_data] [tmp=tmp_dir] \[id=minion_id] [approve_key=(true|false)]
```

salt.modules.seed.prep_bootstrap(mpt)

Update and get the random script to a random place

CLI Example:

```bash
salt '*' seed.prep_bootstrap /tmp
```

31.16.234 salt.modules.selinux

Execute calls on selinux

Note: This module requires the `semanage` and `setsebool` commands to be available on the minion. On RHEL-based distros, this means that the `policycoreutils` and `policycoreutils-python` packages must be installed. If not on a RHEL-based distribution, consult the selinux documentation for your distro to ensure that the proper packages are installed.
salt.modules.selinux.getenforce()
  Return the mode selinux is running in
  CLI Example:
  ```
salt '*' selinux.getenforce
  ```

salt.modules.selinux.getsebool(boolean)
  Return the information on a specific selinux boolean
  CLI Example:
  ```
salt '*' selinux.getsebool virt_use_usb
  ```

salt.modules.selinux.list_sebool()
  Return a structure listing all of the selinux booleans on the system and what state they are in
  CLI Example:
  ```
salt '*' selinux.list_sebool
  ```

salt.modules.selinux.selinux_fs_path(args)
  Return the location of the SELinux VFS directory
  CLI Example:
  ```
salt '*' selinux.selinux_fs_path
  ```

salt.modules.selinux.setenforce(mode)
  Set the SELinux enforcing mode
  CLI Example:
  ```
salt '*' selinux.setenforce enforcing
  ```

salt.modules.selinux.setsebool(boolean, value, persist=False)
  Set the value for a boolean
  CLI Example:
  ```
salt '*' selinux.setsebool virt_use_usb off
  ```

salt.modules.selinux.setsebools(pairs, persist=False)
  Set the value of multiple booleans
  CLI Example:
  ```
salt '*' selinux.setsebools '{virt_use_usb: on, squid_use_tproxy: off}'
  ```

31.16.235  salt.modules.sensors

Read lm-sensors
New in version 2014.1.3.

salt.modules.sensors.sense(chip, fahrenheit=False)
  Gather lm-sensors data from a given chip
  To determine the chip to query, use the `sensors` command and see the leading line in the block.
Example:

/usr/bin/sensors

coretemp-isa-0000 Adapter: ISA adapter Physical id 0: +56.0°C (high = +87.0°C, crit = +105.0°C) Core 0: +52.0°C (high = +87.0°C, crit = +105.0°C) Core 1: +50.0°C (high = +87.0°C, crit = +105.0°C) Core 2: +56.0°C (high = +87.0°C, crit = +105.0°C) Core 3: +53.0°C (high = +87.0°C, crit = +105.0°C)

Given the above, the chip is `coretemp-isa-0000'.

31.16.236 salt.modules.serverdensity_device

Wrapper around Server Density API

New in version 2014.7.0.

salt.modules.serverdensity_device.create(name, **params)

Function to create device in Server Density. For more info, see the API docs.

CLI Example:

salt '*' serverdensity_device.create lama
salt '*' serverdensity_device.create rich_lama group=lama_band installedRAM=32768

salt.modules.serverdensity_device.delete(device_id)

Delete a device from Server Density. For more information, see the API docs.

CLI Example:

salt '*' serverdensity_device.delete 51f7eafcdba4bb235e000ae4

salt.modules.serverdensity_device.get_sd_auth(val, sd_auth_pillar_name='serverdensity')

Returns requested Server Density authentication value from pillar.

CLI Example:

salt '*' serverdensity_device.get_sd_auth <val>

salt.modules.serverdensity_device.install_agent(agent_key)

Function downloads Server Density installation agent, and installs sd-agent with agent_key.

CLI Example:

salt '*' serverdensity_device.install_agent c2bbdd6689ff46282bd0a07555641498

salt.modules.serverdensity_device.ls(**params)

List devices in Server Density

Results will be filtered by any params passed to this function. For more information, see the API docs on listing and searching.

CLI Example:

salt '*' serverdensity_device.ls
salt '*' serverdensity_device.ls name=lama
salt '*' serverdensity_device.ls name=lama group=lama_band installedRAM=32768

salt.modules.serverdensity_device.update(device_id, **params)

Updates device information in Server Density. For more information see the API docs.

CLI Example:
31.16.237 salt.modules.service

The default service module, if not otherwise specified salt will fall back to this basic module

```python
salt.modules.service.available(name)
    Returns True if the specified service is available, otherwise returns False.
    CLI Example:
    salt '*' service.available sshd
```

```python
data.modules.service.get_all()
    Return a list of all available services
    CLI Example:
    salt '*' service.get_all
```

```python
data.modules.service.missing(name)
    The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.
    CLI Example:
    salt '*' service.missing sshd
```

```python
data.modules.service.reload(name)
    Refreshes config files by calling service reload. Does not perform a full restart.
    CLI Example:
    salt '*' service.reload <service name>
```

```python
data.modules.service.restart(name)
    Restart the specified service
    CLI Example:
    salt '*' service.restart <service name>
```

```python
data.modules.service.start(name)
    Start the specified service
    CLI Example:
    salt '*' service.start <service name>
```

```python
data.modules.service.status(name, sig=None)
    Return the status for a service, returns the PID or an empty string if the service is running or not, pass a signature to use to find the service via ps
    CLI Example:
    salt '*' service.status <service name> [service signature]
```

```python
data.modules.service.stop(name)
    Stop the specified service
```

31.16. Full list of builtin execution modules
31.16.238 salt.modules.shadow

Manage the shadow file

salt.modules.shadow.default_hash()
  Returns the default hash used for unset passwords
  CLI Example:
  salt '*' shadow.default_hash

salt.modules.shadow.del_password(name)
  New in version 2014.7.0.
  Delete the password from name user
  CLI Example:
  salt '*' shadow.del_password username

salt.modules.shadow.gen_password(password, crypt_salt=None, algorithm='sha512')
  New in version 2014.7.0.
  Generate hashed password
  password  Plaintext password to be hashed.
  crypt_salt  Cryptographic salt. If not given, a random 8-character salt will be generated.
  algorithm  The following hash algorithms are supported:
    • md5
    • blowfish (not in mainline glibc, only available in distros that add it)
    • sha256
    • sha512 (default)
  CLI Example:
  salt '*' shadow.gen_password 'I_am_password'
  salt '*' shadow.gen_password 'I_am_password' crypt_salt='I_am_salt' algorithm=sha256

salt.modules.shadow.info(name)
  Return information for the specified user
  CLI Example:
  salt '*' shadow.info root

salt.modules.shadow.set_date(name, date)
  Sets the value for the date the password was last changed to days since the epoch (January 1, 1970). See man chage.
  CLI Example:
  salt '*' shadow.set_date username 0
salt.modules.shadow.set_expire(name, expire)
   Changed in version 2014.7.0.
   Sets the value for the date the account expires as days since the epoch (January 1, 1970). Using a value of -1 will clear expiration. See man chage.
   CLI Example:
   ```
salt '*' shadow.set_expire username -1
   ```

salt.modules.shadow.set_inactdays(name, inactdays)
   Set the number of days of inactivity after a password has expired before the account is locked. See man chage.
   CLI Example:
   ```
salt '*' shadow.set_inactdays username 7
   ```

salt.modules.shadow.set_maxdays(name, maxdays)
   Set the maximum number of days during which a password is valid. See man chage.
   CLI Example:
   ```
salt '*' shadow.set_maxdays username 90
   ```

salt.modules.shadow.set_mindays(name, mindays)
   Set the minimum number of days between password changes. See man chage.
   CLI Example:
   ```
salt '*' shadow.set_mindays username 7
   ```

salt.modules.shadow.set_password(name, password, use_usermod=False)
   Set the password for a named user. The password must be a properly defined hash. The password hash can be generated with this command:
   ```python
   python -c "import crypt; print crypt.crypt('password', '\$6\$SALTsalt\$')"
   ```
   SALTsalt is the 8-character crpytographic salt. Valid characters in the salt are ../, and any alphanumeric character.
   Keep in mind that the $6 represents a sha512 hash, if your OS is using a different hashing algorithm this needs to be changed accordingly
   CLI Example:
   ```
salt '*' shadow.set_password root '$1$UYCIxa628.9qXjpQcJ4a..' 
   ```

salt.modules.shadow.set_warndays(name, warnadays)
   Set the number of days of warning before a password change is required. See man chage.
   CLI Example:
   ```
salt '*' shadow.set_warndays username 7
   ```

31.16.239 salt.modules.slack_notify

Module for sending messages to Slack
New in version 2015.5.0.
configuration  This module can be used by either passing an api key and version directly or by specifying
both in a configuration profile in the salt master/minion config.
For example:

```
slack:
  api_key: peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

```
salt.modules.slack_notify.find_room(name, api_key=None)
  Find a room by name and return it.  :param name: The room name.  :param api_key: The Slack admin api key.
  :return: The room object.

  CLI Example:
  
  salt '*' slack.find_room name="random"

  salt '*' slack.find_room name="random" api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

```
salt.modules.slack_notify.find_user(name, api_key=None)
  Find a user by name and return it.  :param name: The user name.  :param api_key: The Slack admin api key.
  :return: The user object.

  CLI Example:
  
  salt '*' slack.find_user name="ThomasHatch"

  salt '*' slack.find_user name="ThomasHatch" api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

```
salt.modules.slack_notify.list_rooms(api_key=None)
  List all Slack rooms.
  Parameters api_key -- The Slack admin api key.

  Returns  The room list.

  CLI Example:
  
  salt '*' slack.list_rooms

  salt '*' slack.list_rooms api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

```
salt.modules.slack_notify.list_users(api_key=None)
  List all Slack users.  :param api_key: The Slack admin api key.  :return: The user list.

  CLI Example:
  
  salt '*' slack.list_users

  salt '*' slack.list_users api_key=peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

```
salt.modules.slack_notify.post_message(channel, message, from_name, api_key=None)
  Send a message to a Slack channel.  :param channel: The channel name, either will work.  :param message: The
  message to send to the Slack channel.  :param from_name: Specify who the message is from.  :param api_key: The
  Slack api key, if not specified in the configuration.  :return: Boolean if message was sent successfully.

  CLI Example:
  
  salt '*' slack.post_message channel="Development Room" message="Build is done" from_name="Build"
31.16.240 salt.modules.smartos_imgadm

Module for running imgadm command on SmartOS

salt.modules.smartos_imgadm.avail(search=None, verbose=False)
Return a list of available images
   search [string] Specifies search keyword
   verbose [boolean (False)] Specifies verbose output
   CLI Example:
   ```
salt '*' imgadm.avail [percona]
salt '*' imgadm.avail verbose=True
```  
salt.modules.smartos_imgadm.delete(uuid=None)
Remove an installed image
   uuid [string] Specifies uuid to import
   CLI Example:
   ```
salt '*' imgadm.delete e42f8c84-bbea-11e2-b920-078fab2aabb1f
```  
salt.modules.smartos_imgadm.get(uuid=None)
Return info on an installed image
   CLI Example:
   ```
salt '*' imgadm.get e42f8c84-bbea-11e2-b920-078fab2aabb1f
```  
salt.modules.smartos_imgadm.import(uuid=None, verbose=False)
Import an image from the repository
   uuid [string] Specifies uuid to import
   verbose [boolean (False)] Specifies verbose output
   CLI Example:
   ```
salt '*' imgadm.import e42f8c84-bbea-11e2-b920-078fab2aabb1f [verbose=True]
```  
salt.modules.smartos_imgadm.list(verbose=False)
Return a list of installed images
   verbose [boolean (False)] Specifies verbose output
   CLI Example:
   ```
salt '*' imgadm.list [verbose=True]
```  
salt.modules.smartos_imgadm.show(uuid=None)
Show manifest of a given image
   CLI Example:
   ```
salt '*' imgadm.show e42f8c84-bbea-11e2-b920-078fab2aabb1f
```  
salt.modules.smartos_imgadm.update(uuid='``
Gather info on unknown image(s) (locally installed)
   uuid [string] Specifies uuid of image
CLI Example:

```
salt '*' imgadm.update [uuid]
```

```python
salt.modules.smartos_imgadm.vacuum(verbos=False)

Remove unused images

verbos [boolean (False)] Specifies verbose output

CLI Example:

```
salt '*' imgadm.vacuum [verbos=True]
```

```
salt.modules.smartos_imgadm.version()

Return imgadm version

CLI Example:

```
salt '*' imgadm.version
```

### 31.16.241 salt.modules.smartos_vmadm

Module for running vmadm command on SmartOS

```
salt.modules.smartos_vmadm.create(**kwargs)

Create a new vm

from_file [string] Specifies the json file to create the vm from. Note: when this is present all other options will be ignored.

*: string... Specifies options to set for the vm. Example: image_uuid=UUID, will specify the image_uuid for the vm to be created.

    nics=["nic_tag": "admin", "ip": "198.51.100.123", "netmask": "255.255.255.0"], adds 1 nic over the admin tag

CLI Example:

```
salt '*' vmadm.create from_file=/tmp/new_vm.json
salt '*' vmadm.create image_uuid='...' alias='...' nics=[{"nic_tag": "admin", "ip": "198.51.100.123", "netmask": "255.255.255.0"}], adds 1 nic over the admin tag
```

```
salt.modules.smartos_vmadm.create_snapshot(vm=None, name=None, key='uuid')

Create snapshot of a vm

vm [string] Specifies the vm

name [string] Name of snapshot. The snapshot name must be 64 characters or less and must only contain alphanumeric characters and characters in the set [._:.] to comply with ZFS restrictions.

key [string] Specifies what `vm` is. Value = uuid|alias|hostname

CLI Example:

```
salt '*' vmadm.create_snapshot 186da9ab-7392-4f55-91a5-b8f1fe770543 baseline
salt '*' vmadm.create_snapshot nacl baseline key=alias
```

```
salt.modules.smartos_vmadm.delete(vm=None, key='uuid')

Delete a vm

vm [string] Specifies the vm
key [string] Specifies what 'vm' is. Value = uuid|alias|hostname

CLI Example:

    salt '*' vmadm.delete 186da9ab-7392-4f55-91a5-b8f1fe770543
    salt '*' vmadm.delete nacl key=alias

salt.modules.smartos_vmadm.delete_snapshot(vm=None, name=None, key='uuid')
Delete snapshot of a vm

    vm [string] Specifies the vm
    name [string] Name of snapshot. The snapname must be 64 characters or less and must only contain alphanumeric characters and characters in the set [\-._:%] to comply with ZFS restrictions.
    key [string] Specifies what 'vm' is. Value = uuid|alias|hostname

CLI Example:

    salt '*' vmadm.delete_snapshot 186da9ab-7392-4f55-91a5-b8f1fe770543 baseline
    salt '*' vmadm.delete_snapshot nacl baseline key=alias

salt.modules.smartos_vmadm.get(vm=None, key='uuid')
Output the JSON object describing a VM

    vm [string] Specifies the vm
    key [string] Specifies what 'vm' is. Value = uuid|alias|hostname

CLI Example:

    salt '*' vmadm.get 186da9ab-7392-4f55-91a5-b8f1fe770543
    salt '*' vmadm.get nacl key=alias

salt.modules.smartos_vmadm.info(vm=None, info_type='all', key='uuid')
Lookup info on running kvm

    vm [string] Specifies the vm
    info_type [string] Specifies what info to return. Value = all|block|blockstats|chardev|cpus|kvm|pci|spice|version|vnc
    key [string] Specifies what 'vm' is. Value = uuid|alias|hostname

CLI Example:

    salt '*' vmadm.info 186da9ab-7392-4f55-91a5-b8f1fe770543
    salt '*' vmadm.info 186da9ab-7392-4f55-91a5-b8f1fe770543 vnc
    salt '*' vmadm.info nacl key=alias
    salt '*' vmadm.info nacl vnc key=alias

salt.modules.smartos_vmadm.list(search=None, sort=None, order='uuid, type, ram, state, alias', keyed=False)
Return a list of VMs

    search [string] Specifies the vmadm filter property
    sort [string] Specifies the vmadm sort (-s) property
    order [string] Specifies the vmadm order (-o) property Default: uuid,type,ram,state,alias
    keyed [boolean]
        Specified if the output should be an array (False) or dict (True) Dict key is first field from order parameter Note: if key is not unique last vm wins.
CLI Example:
```
salt '*' vmadm.list
salt '*' vmadm.list order=alias,ram,cpu_cap sort=-ram,-cpu_cap
salt '*' vmadm.list search='type=KVM'
```

```
salt.modules.smartos_vmadm.lookup(search=None, order=None, one=False)
Return a list of VMs using lookup

    search [string] Specifies the vmadm filter property
    order [string] Specifies the vmadm order (-o) property Default: uuid,type,ram,state,alias
    one [boolean] Specifies if to one result only (-1)
```

CLI Example:
```
salt '*' vmadm.lookup search='state=running'
salt '*' vmadm.lookup search='state=running' order=uuid(alias,hostname
salt '*' vmadm.lookup search='alias-nacl' one=True
```

```
salt.modules.smartos_vmadm.reboot(vm=None, force=False, key='uuid')
Reboot a vm

    vm [string] Specifies the vm to be rebooted
    force [boolean] Specifies if the vm should be force rebooted
    key [string] Specifies if `vm` is a uuid, alias or hostname.
```

CLI Example:
```
salt '*' vmadm.reboot 186da9ab-7392-4f55-91a5-b8f1fe770543
salt '*' vmadm.reboot 186da9ab-7392-4f55-91a5-b8f1fe770543 True
salt '*' vmadm.reboot vm=nacl key=alias
salt '*' vmadm.reboot vm=nina.example.org key=hostname
```

```
salt.modules.smartos_vmadm.receive(uuid=None, source=None)
Receive a vm from a directory

    uuid [string] Specifies uuid of vm to receive
    source [string] Specifies the target. Can be a directory path.
```

CLI Example:
```
salt '*' vmadm.receive 186da9ab-7392-4f55-91a5-b8f1fe770543 /opt/backups
```

```
salt.modules.smartos_vmadm.reprovision(vm=None, image=None, key='uuid')
Reprovision a vm

    vm [string] Specifies the vm
    image [string] uuid of new image
    key [string] Specifies what `vm` is. Value = uuid|alias|hostname
```

CLI Example:
```
salt '*' vmadm.reprovision 186da9ab-7392-4f55-91a5-b8f1fe770543 c02a2044-c1bd-11e4-bd8c-dfc1db8b0182 key=alias
```

```
salt.modules.smartos_vmadm.rollback_snapshot(vm=None, name=None, key='uuid')
Rollback snapshot of a vm
```

1224 Chapter 31. Reference
**vm**  [string] Specifies the vm

**name**  [string] Name of snapshot. The snapshot name must be 64 characters or less and must only contain alphanumeric characters and characters in the set [-_.%] to comply with ZFS restrictions.

**key**  [string] Specifies what 'vm' is. Value = uuid|alias|hostname

**CLI Example:**
```
salt '*' vmadm.rollback_snapshot 186da9ab-7392-4f55-91a5-b8f1fe770543 baseline
salt '*' vmadm.rollback_snapshot nacl baseline key=alias
```

**salt.modules.smartos_vmadm.send**(vm=None, target=None, key='uuid')

Send a vm to a directory

**vm**  [string] Specifies the vm to be started

**target**  [string] Specifies the target. Can be a directory path.

**key**  [string] Specifies if 'vm' is a uuid, alias or hostname.

**CLI Example:**
```
salt '*' vmadm.send 186da9ab-7392-4f55-91a5-b8f1fe770543 /opt/backups
salt '*' vmadm.send vm=nacl target=/opt/backups key=alias
```

**salt.modules.smartos_vmadm.start**(vm=None, options=None, key='uuid')

Start a vm

**vm**  [string] Specifies the vm to be started

**options**  [string] Specifies additional options

**key**  [string] Specifies if 'vm' is a uuid, alias or hostname.

**CLI Example:**
```
salt '*' vmadm.start 186da9ab-7392-4f55-91a5-b8f1fe770543
salt '*' vmadm.start nacl key=alias
salt '*' vmadm.start vm=nina.example.org key=hostname
```

**salt.modules.smartos_vmadm.stop**(vm=None, force=False, key='uuid')

Stop a vm

**vm**  [string] Specifies the vm to be stopped

**force**  [boolean] Specifies if the vm should be force stopped

**key**  [string] Specifies if 'vm' is a uuid, alias or hostname.

**CLI Example:**
```
salt '*' vmadm.stop 186da9ab-7392-4f55-91a5-b8f1fe770543
salt '*' vmadm.stop nacl key=alias
salt '*' vmadm.stop vm=nina.example.org key=hostname
```

**salt.modules.smartos_vmadm.sysrq**(vm=None, action='nmi', key='uuid')

Send non-maskable interrupt to vm or capture a screenshot

**vm**  [string] Specifies the vm

**action**  [string] Specifies the action nmi or screenshot

**key**  [string] Specifies what 'vm' is. Value = uuid|alias|hostname

---

**31.16. Full list of builtin execution modules**  1225
**CLI Example:**

```
salt '*' vmadm.sysrq 186da9ab-7392-4f55-91a5-b8f1fe770543 nmi
salt '*' vmadm.sysrq 186da9ab-7392-4f55-91a5-b8f1fe770543 screenshot
salt '*' vmadm.sysrq nacl nmi key=alias
```

salt.modules.smartos_vmadm.update(**kwargs)

Update a new vm

**vm** [string] Specifies the vm to be updated

**key** [string] Specifies if `vm` is a uuid, alias or hostname.

**from_file** [string] Specifies the json file to update the vm with. Note: when this is present all other options except `vm` and `key` will be ignored.

- : string[int]... Specifies options to update for the vm. Example: image_uuid=UUID, will specify the image_uuid for the vm to be created.

  ```python
  add_nics=[``nic_tag'': ``admin'', ``ip'': ``198.51.100.123'', ``netmask'': ``255.255.255.0''}],
  ```

**CLI Example:**

```
salt '*' vmadm.update vm=186da9ab-7392-4f55-91a5-b8f1fe770543 from_file=/tmp/new_vm.json
salt '*' vmadm.update vm=nacl key=alias from_file=/tmp/new_vm.json
salt '*' vmadm.update vm=186da9ab-7392-4f55-91a5-b8f1fe770543 max_physical_memory=1024
```

31.16.242 salt.modules.smbios

Interface to SMBIOS/DMI

(Parsing through dmidecode)

**External References**

- Desktop Management Interface (DMI)
- System Management BIOS
- DMIdecode

salt.modules.smbios.get(string, clean=``True``)

Get an individual DMI string from SMBIOS info

**string**

The string to fetch. DMIdecode supports:

- bios-vendor
- bios-version
- bios-release-date
- system-manufacturer
- system-product-name
• `system-version`
• `system-serial-number`
• `system-uuid`
• `baseboard-manufacturer`
• `baseboard-product-name`
• `baseboard-version`
• `baseboard-serial-number`
• `baseboard-asset-tag`
• `chassis-manufacturer`
• `chassis-type`
• `chassis-version`
• `chassis-serial-number`
• `chassis-asset-tag`
• `processor-family`
• `processor-manufacturer`
• `processor-version`
• `processor-frequency`

`clean`

Don’t return well-known false information
(invalid UUID’s, serial 000000000’s, etcetera)
Defaults to True

CLI Example:
```bash
salt '*' smbios.get system-uuid clean=False
```

salt.modules.smbios.records(
  `rec_type=None, fields=None, clean=True`
)

Return DMI records from SMBIOS

**type**  Return only records of type(s) The SMBIOS specification defines the following DMI types:

<table>
<thead>
<tr>
<th>Type</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>BIOS</td>
</tr>
<tr>
<td>1</td>
<td>System</td>
</tr>
<tr>
<td>2</td>
<td>Baseboard</td>
</tr>
<tr>
<td>3</td>
<td>Chassis</td>
</tr>
<tr>
<td>4</td>
<td>Processor</td>
</tr>
<tr>
<td>5</td>
<td>Memory Controller</td>
</tr>
<tr>
<td>6</td>
<td>Memory Module</td>
</tr>
<tr>
<td>7</td>
<td>Cache</td>
</tr>
<tr>
<td>8</td>
<td>Port Connector</td>
</tr>
<tr>
<td>9</td>
<td>System Slots</td>
</tr>
<tr>
<td>10</td>
<td>On Board Devices</td>
</tr>
<tr>
<td>11</td>
<td>OEM Strings</td>
</tr>
</tbody>
</table>

Continued on next page
Table 31.7 -- continued from previous page

<table>
<thead>
<tr>
<th>Type</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>System Configuration Options</td>
</tr>
<tr>
<td>13</td>
<td>BIOS Language</td>
</tr>
<tr>
<td>14</td>
<td>Group Associations</td>
</tr>
<tr>
<td>15</td>
<td>System Event Log</td>
</tr>
<tr>
<td>16</td>
<td>Physical Memory Array</td>
</tr>
<tr>
<td>17</td>
<td>Memory Device</td>
</tr>
<tr>
<td>18</td>
<td>32-bit Memory Error</td>
</tr>
<tr>
<td>19</td>
<td>Memory Array Mapped Address</td>
</tr>
<tr>
<td>20</td>
<td>Memory Device Mapped Address</td>
</tr>
<tr>
<td>21</td>
<td>Built-in Pointing Device</td>
</tr>
<tr>
<td>22</td>
<td>Portable Battery</td>
</tr>
<tr>
<td>23</td>
<td>System Reset</td>
</tr>
<tr>
<td>24</td>
<td>Hardware Security</td>
</tr>
<tr>
<td>25</td>
<td>System Power Controls</td>
</tr>
<tr>
<td>26</td>
<td>Voltage Probe</td>
</tr>
<tr>
<td>27</td>
<td>Cooling Device</td>
</tr>
<tr>
<td>28</td>
<td>Temperature Probe</td>
</tr>
<tr>
<td>29</td>
<td>Electrical Current Probe</td>
</tr>
<tr>
<td>30</td>
<td>Out-of-band Remote Access</td>
</tr>
<tr>
<td>31</td>
<td>Boot Integrity Services</td>
</tr>
<tr>
<td>32</td>
<td>System Boot</td>
</tr>
<tr>
<td>33</td>
<td>64-bit Memory Error</td>
</tr>
<tr>
<td>34</td>
<td>Management Device</td>
</tr>
<tr>
<td>35</td>
<td>Management Device Component</td>
</tr>
<tr>
<td>36</td>
<td>Management Device Threshold Data</td>
</tr>
<tr>
<td>37</td>
<td>Memory Channel</td>
</tr>
<tr>
<td>38</td>
<td>IPMI Device</td>
</tr>
<tr>
<td>39</td>
<td>Power Supply</td>
</tr>
<tr>
<td>40</td>
<td>Additional Information</td>
</tr>
<tr>
<td>41</td>
<td>Onboard Devices Extended Information</td>
</tr>
<tr>
<td>42</td>
<td>Management Controller Host Interface</td>
</tr>
</tbody>
</table>

clean

Don’t return well-known false information
(invalid UUID’s, serial 000000000’s, etcetera)
Defaults to True

CLI Example:

```
salt '*' smbios.records clean=False
salt '*' smbios.records 14
salt '*' smbios.records 4 core_count,thread_count,current_speed
```

31.16.243 salt.modules.smf

Service support for Solaris 10 and 11, should work with other systems that use SMF also. (e.g. SmartOS)
salt.modules.smf.available(name)

Returns True if the specified service is available, otherwise returns False.
We look up the name with the svcs command to get back the FMRI. This allows users to use simpler service names.

CLI Example:
```
salt '*' service.available net-snmp
```

```python
salt.modules.smf.disable(name, **kwargs)
    Disable the named service to start at boot

CLI Example:
```
salt '*' service.disable <service name>
```

```python
salt.modules.smf.disabled(name)
    Check to see if the named service is disabled to start on boot

CLI Example:
```
salt '*' service.disabled <service name>
```

```python
salt.modules.smf.enable(name, **kwargs)
    Enable the named service to start at boot

CLI Example:
```
salt '*' service.enable <service name>
```

```python
salt.modules.smf.enabled(name, **kwargs)
    Check to see if the named service is enabled to start on boot

CLI Example:
```
salt '*' service.enabled <service name>
```

```python
salt.modules.smf.get_all()
    Return all installed services

CLI Example:
```
salt '*' service.get_all
```

```python
salt.modules.smf.get_disabled()
    Return the disabled services

CLI Example:
```
salt '*' service.get_disabled
```

```python
salt.modules.smf.get_enabled()
    Return the enabled services

CLI Example:
```
salt '*' service.get_enabled
```

```python
salt.modules.smf.get_running()
    Return the running services

CLI Example:
```
salt '*' service.get_running
```
salt.modules.smf.get_stopped()  
Return the stopped services

CLI Example:

```
salt '*' service.get_stopped
```

salt.modules.smf.missing(name)  
The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.

CLI Example:

```
salt '*' service.missing net-snmp
```
salt.modules.smf.reload(name)  
Reload the named service

CLI Example:

```
salt '*' service.reload <service name>
```

salt.modules.smf.restart(name)  
Restart the named service

CLI Example:

```
salt '*' service.restart <service name>
```

salt.modules.smf.start(name)  
Start the specified service

CLI Example:

```
salt '*' service.start <service name>
```

salt.modules.smf.status(name, sig=None)  
Return the status for a service, returns a bool whether the service is running.

CLI Example:

```
salt '*' service.status <service name>
```

salt.modules.smf.stop(name)  
Stop the specified service

CLI Example:

```
salt '*' service.stop <service name>
```

### 31.16.244 salt.modules.smtp

Module for Sending Messages via SMTP

New in version 2014.7.0.

```
depends
  • smtplib python module
```
configuration This module can be used by either passing a jid and password directly to `send_message`,
or by specifying the name of a configuration profile in the minion config, minion pillar, or master
config.

For example:

```
my-smtp-login:
  smtp.server: smtp.domain.com
  smtp.tls: True
  smtp.sender: admin@domain.com
  smtp.username: myuser
  smtp.password: verybadpass
```

The resourcename refers to the resource that is using this account. It is user-definable, and optional.
The following configurations are both valid:

```
my-smtp-login:
  smtp.server: smtp.domain.com
  smtp.tls: True
  smtp.sender: admin@domain.com
  smtp.username: myuser
  smtp.password: verybadpass

another-smtp-login:
  smtp.server: smtp.domain.com
  smtp.tls: True
  smtp.sender: admin@domain.com
  smtp.username: myuser
  smtp.password: verybadpass
```

`salt.modules.smtp.send_msg(recipient, message, subject='Message from Salt', sender=None, 
server=None, use_ssl='True', username=None, password=None, pro-
file=None)`

Send a message to an SMTP recipient. Designed for use in states.

CLI Examples:

```
salt.smtp.send_msg 'admin@example.com' 'This is a salt module test' profile='my-smtp-account'
salt.smtp.send_msg 'admin@example.com' 'This is a salt module test' username='myuser' password='verybadpass'
```

31.16.245 salt.modules.softwareupdate

Support for the softwareupdate command on MacOS.

`salt.modules.softwareupdate.download('updates')`

Download a named update so that it can be installed later with the install or upgrade function. It returns a list
of all updates that are now downloaded.

CLI Example:

```
salt '*' softwareupdate.download <update name>
salt '*' softwareupdate.download "<update with whitespace>"
salt '*' softwareupdate.download <update1> <update2> <update3>
```

`salt.modules.softwareupdate.download_all(rec=False, restart=True)`

Download all available updates so that they can be installed later with the install or upgrade function. It
returns a list of updates that are now downloaded.

CLI Example:
salt 'salt' softwareupdate.download_all

salt.modules.softwareupdate.ignore('updates')
Ignore a specific program update. When an update is ignored the `-` and version number at the end will be omitted, so ``SecUpd2014-001-1.0'' becomes ``SecUpd2014-001''. It will be removed automatically if present. An update is successfully ignored when it no longer shows up after list_upgrades.

CLI Example:

```
salt '*' softwareupdate.ignore <update-name>
salt '*' softwareupdate.ignore "<update with whitespace>"
```

salt.modules.softwareupdate.install('updates')
Install a named upgrade. Returns a dictionary containing the name of the update and the status of its installation.

Return values: - True: The update was installed. - False: The update was not installed. - None: There is no update available with that name.

CLI Example:

```
salt '*' softwareupdate.install <update-name>
salt '*' softwareupdate.install "<update with whitespace>"
```

salt.modules.softwareupdate.list_downloads()
Return a list of all updates that have been downloaded locally.

CLI Example:

```
salt '*' softwareupdate.list_downloads
```

salt.modules.softwareupdate.list_ignored()
List all upgrades that has been ignored. Ignored updates are shown without the `-` and version number at the end, this is how the softwareupdate command works.

CLI Example:

```
salt '*' softwareupdate.list_ignored
```

salt.modules.softwareupdate.list_upgrades(rec=False, restart=False)
List all available updates.

rec Return only the recommended updates.
restart Return only the updates that require a restart.

CLI Example:

```
salt '*' softwareupdate.list_upgrades
```

salt.modules.softwareupdate.reset_ignored()
Make sure the ignored updates are not ignored anymore, returns a list of the updates that are no longer ignored.

CLI Example:

```
salt '*' softwareupdate.reset_ignored
```

salt.modules.softwareupdate.schedule('status')
Decide if automatic checking for upgrades should be on or off. If no arguments are given it will return the current status. Append on or off to change the status.
Return values: - True: Automatic checking is now on, - False: Automatic checking is now off, - None: Invalid argument.

CLI Example:

```
salt '*' softwareupdate.schedule
salt '*' softwareupdate.schedule on|off
```

`salt.modules.softwareupdate.upgrade(rec=False, restart=True)`

Install all available upgrades. Returns a dictionary containing the name of the update and the status of its installation.

Return values: - True: The update was installed. - False: The update was not installed.

* rec If set to True, only install all the recommended updates.
* restart Set this to False if you do not want to install updates that require a restart.

CLI Example:

```
salt '*' softwareupdate.upgrade
```

`salt.modules.softwareupdate.upgrade_available(update)`

Check whether or not an upgrade is available with a given name.

CLI Example:

```
salt '*' softwareupdate.upgrade_available <update-name>
salt '*' softwareupdate.upgrade_available "$<update with whitespace>"
```

31.16.246 `salt.modules.solaris_group`

Manage groups on Solaris

`salt.modules.solaris_group.add(name, gid=None, **kwargs)`

Add the specified group

CLI Example:

```
salt '*' group.add foo 3456
```

`salt.modules.solaris_group.chgid(name, gid)`

Change the gid for a named group

CLI Example:

```
salt '*' group.chgid foo 4376
```

`salt.modules.solaris_group.delete(name)`

Remove the named group

CLI Example:

```
salt '*' group.delete foo
```

`salt.modules.solaris_group.getent(refresh=False)`

Return info on all groups

CLI Example:
salt '*' group.getent

salt.modules.solaris_group.info(name)
Return information about a group

CLI Example:

    salt '*' group.info foo

31.16.247 salt.modules.solaris_shadow

Manage the password database on Solaris systems

salt.modules.solaris_shadow.default_hash()
Returns the default hash used for unset passwords

CLI Example:

    salt '*' shadow.default_hash

salt.modules.solaris_shadow.info(name)
Return information for the specified user

CLI Example:

    salt '*' shadow.info root

salt.modules.solaris_shadow.set_maxdays(name, maxdays)
Set the maximum number of days during which a password is valid. See man passwd.

CLI Example:

    salt '*' shadow.set_maxdays username 90

salt.modules.solaris_shadow.set_mindays(name, mindays)
Set the minimum number of days between password changes. See man passwd.

CLI Example:

    salt '*' shadow.set_mindays username 7

salt.modules.solaris_shadow.set_password(name, password)
Set the password for a named user. The password must be a properly defined hash, the password hash can be generated with this command: openssl passwd -1 <plaintext password>

CLI Example:

    salt '*' shadow.set_password root $1$UYCIxa628.9qXjpQCjM4a..

salt.modules.solaris_shadow.set_warndays(name, warndays)
Set the number of days of warning before a password change is required. See man passwd.

CLI Example:

    salt '*' shadow.set_warndays username 7
31.16.248  salt.modules.solaris_user

Manage users with the useradd command

```
salt.modules.solaris_user.add(name, uid=None, gid=None, groups=None, home=None, shell=None,
unique=True, fullname='', roomnumber='', workphone='', homephone='', createhome=True, **kwargs)
```

Add a user to the minion

CLI Example:
```
salt '*' user.add name <uid> <gid> <groups> <home> <shell>
```

```
salt.modules.solaris_user.chfullname(name, fullname)
```

Change the user's Full Name

CLI Example:
```
salt '*' user.chfullname foo "Foo Bar"
```

```
salt.modules.solaris_user.chgid(name, gid)
```

Change the default group of the user

CLI Example:
```
salt '*' user.chgid foo 4376
```

```
salt.modules.solaris_user.chgroups(name, groups, append=False)
```

Change the groups this user belongs to, add append to append the specified groups

CLI Example:
```
salt '*' user.chgroups foo wheel,root True
```

```
salt.modules.solaris_user.chhome(name, home, persist=False)
```

Change the home directory of the user, pass true for persist to copy files to the new home dir

CLI Example:
```
salt '*' user.chhome foo /home/users/foo True
```

```
salt.modules.solaris_user.chhomephone(name, homephone)
```

Change the user's Home Phone

CLI Example:
```
salt '*' user.chhomephone foo "7735551234"
```

```
salt.modules.solaris_user.chroomnumber(name, roomnumber)
```

Change the user's Room Number

CLI Example:
```
salt '*' user.chroomnumber foo 123
```

```
salt.modules.solaris_user.chshell(name, shell)
```

Change the default shell of the user

CLI Example:
```
salt '*' user.chshell foo /bin/zsh
```
salt.modules.solaris_user.chuid(name, uid)
    Change the uid for a named user
    CLI Example:
    ```
salt '*' user.chuid foo 4376
    ```

salt.modules.solaris_user.chworkphone(name, workphone)
    Change the user's Work Phone
    CLI Example:
    ```
salt '*' user.chworkphone foo "7735550123"
    ```

salt.modules.solaris_user.delete(name, remove=False, force=False)
    Remove a user from the minion
    CLI Example:
    ```
salt '*' user.delete name remove=True force=True
    ```

salt.modules.solaris_user.getent(refresh=False)
    Return the list of all info for all users
    CLI Example:
    ```
salt '*' user.getent
    ```

salt.modules.solaris_user.info(name)
    Return user information
    CLI Example:
    ```
salt '*' user.info root
    ```

salt.modules.solaris_user.list_groups(name)
    Return a list of groups the named user belongs to
    CLI Example:
    ```
salt '*' user.list_groups foo
    ```

salt.modules.solaris_user.rename(name, new_name)
    Change the username for a named user
    CLI Example:
    ```
salt '*' user.rename name new_name
    ```

31.16.249 salt.modules.solarisips

IPS pkg support for Solaris

This module provides support for Solaris 11 new package management - IPS (Image Packaging System). This is the default pkg module for Solaris 11 (and later).

If you want to use also other packaging module (e.g. pkgutil) together with IPS, you need to override the pkg provider in sls for each package:

```python
mypackage:
    pkg.installed:
        - provider: pkgutil
```
Or you can override it globally by setting the `providers` parameter in your Minion config file like this:

```
providers:
  pkg: pkgutil
```

Or you can override it globally by setting the `providers` parameter in your Minion config file like this:

```
providers:
  pkg: pkgutil
```

```

salt.modules.solarisips.available_version(name, **kwargs)

The available version of the package in the repository. In case of multiple match, it returns list of all matched packages. Accepts full or partial FMRI. Please use `pkg.latest_version` as `pkg.available_version` is being deprecated.

CLI Example:

```
salt '*' pkg.latest_version pkg://solaris/entire
```

```

salt.modules.solarisips.get_fmri(name, **kwargs)

Returns FMRI from partial name. Returns empty string ('') if not found. In case of multiple match, the function returns list of all matched packages.

CLI Example:

```
salt '*' pkg.get_fmri bash
```

```

salt.modules.solarisips.install(name=None, refresh=False, pkgs=None, version=None, test=False, **kwargs)

Install the named package using the IPS pkg command. Accepts full or partial FMRI.

Returns a dict containing the new package names and versions:

```
{'<package>': {'old': '<old-version>',
              'new': '<new-version>'}}
```

Multiple Package Installation Options:

pkgs A list of packages to install. Must be passed as a python list.

CLI Example:

```
salt '*' pkg.install vim
salt '*' pkg.install pkg://solaris/editor/vim
salt '*' pkg.install pkg://solaris/editor/vim refresh=True
salt '*' pkg.install pkgs='["foo", "bar"]'
```

```

salt.modules.solarisips.is_installed(name, **kwargs)

Returns True if the package is installed. Otherwise returns False. Name can be full or partial FMRI. In case of multiple match from partial FMRI name, it returns True.

CLI Example:

```
salt '*' pkg.is_installed bash
```

```

salt.modules.solarisips.latest_version(name, **kwargs)

The available version of the package in the repository. In case of multiple match, it returns list of all matched packages. Accepts full or partial FMRI. Please use `pkg.latest_version` as `pkg.available_version` is being deprecated.

CLI Example:

```
```

---

31.16. Full list of builtin execution modules

1237
salt '*' pkg.latest_version pkg://solaris/entire

salt.modules.solarisips.list_pkgs(versions_as_list=False, **kwargs)
List the currently installed packages as a dict:

```python
{
    '<package_name>': '<version>'
}
```

CLI Example:
salt '*' pkg.list_pkgs

salt.modules.solarisips.list_upgrades(refresh=False)
Lists all packages available for update. When run in global zone, it reports only upgradable packages for
the global zone. When run in non-global zone, it can report more upgradable packages than `pkg update
-vn` because `pkg update` hides packages that require newer version of pkg://solaris/entire (which means
that they can be upgraded only from global zone). Simply said: if you see pkg://solaris/entire in the list of
upgrades, you should upgrade the global zone to get all possible updates. You can force full pkg DB refresh
before listing.

CLI Example:
salt '*' pkg.list_upgrades
salt '*' pkg.list_upgrades_refresh=True

salt.modules.solarisips.normalize_name(name, **kwargs)
Internal function. Normalizes pkg name to full FMRI before running pkg.install. In case of multiple match or
no match, it returns the name without modifications and lets the `pkg install` to decide what to do.

CLI Example:
salt '*' pkg.normalize_name vim

salt.modules.solarisips.purge(name=None, pkgs=None, **kwargs)
Remove specified package. Accepts full or partial FMRI.
Returns a list containing the removed packages.

CLI Example:
salt '*' pkg.purge <package name>

salt.modules.solarisips.refresh_db(full=False)
Updates the remote repos database. You can force the full pkg DB refresh from all publishers regardless the
last refresh time.

CLI Example:
salt '*' pkg.refresh_db
salt '*' pkg.refresh_db full=True

salt.modules.solarisips.remove(name=None, pkgs=None, **kwargs)
Remove specified package. Accepts full or partial FMRI. In case of multiple match, the command fails and
won't modify the OS.

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this
      option is passed.
Returns a list containing the removed packages.

CLI Example:

```bash
salt '*' pkg.remove <package name>
salt '*' pkg.remove tcsh
salt '*' pkg.remove pkg://solaris/shell/tcsh
salt '*' pkg.remove pkgs='["foo", "bar"]'
```

```python
salt.modules.solarisips.search(name, versions_as_list=False, **kwargs)
```

Searches the repository for given pkg name. The name can be full or partial FMRI. All matches are printed. Globss are also supported.

CLI Example:

```bash
salt '*' pkg.search bash
```

```python
salt.modules.solarisips.upgrade(refresh=False, **kwargs)
```

Upgrade all packages to the latest possible version. When run in global zone, it updates also all non-global zones. In non-global zones upgrade is limited by dependency constrains linked to the version of `pkg://solaris/entire`.

Returns also a raw output of `"pkg update" command (because if update creates a new boot environment, no immediate changes are visible in `"pkg list"`).

CLI Example:

```bash
salt '*' pkg.upgrade
```

```python
salt.modules.solarisips.upgrade_available(name)
```

Check if there is an upgrade available for a certain package Accepts full or partial FMRI. Returns all matches found.

CLI Example:

```bash
salt '*' pkg.upgrade_available apache-22
```

```python
salt.modules.solarisips.version(*names, **kwargs)
```

Common interface for obtaining the version of installed packages. Accepts full or partial FMRI. If called using pkg_resource, full FMRI is required.

CLI Example:

```bash
salt '*' pkg.version vim
salt '*' pkg.version foo bar baz
salt '*' pkg_resource.version pkg://solaris/entire
```

31.16.250 salt.modules.solarispkg

Package support for Solaris

```python
salt.modules.solarispkg.install(name=None, sources=None, saltenv='base', **kwargs)
```

Install the passed package. Can install packages from the following sources:

* Locally (package already exists on the minion
* HTTP/HTTPS server
* FTP server
* Salt master

Returns a dict containing the new package names and versions:
CLI Example, installing a data stream pkg that already exists on the minion:

```sh
salt '*' pkg.install sources='[{"<pkg name>": "/dir/on/minion/<pkg filename>"}]'
salt '*' pkg.install sources='[{"SMClgcc346": "/var/spool/pkg/gcc-3.4.6-sol10-sparc-local.pkg"}]
```

CLI Example, installing a data stream pkg that exists on the salt master:

```sh
salt '*' pkg.install sources='[{"<pkg name>": "salt://pkgs/<pkg filename>"}]'
salt '*' pkg.install sources='[{"SMClgcc346": "salt://pkgs/gcc-3.4.6-sol10-sparc-local.pkg"}]
```

CLI Example, installing a data stream pkg that exists on a HTTP server:

```sh
salt '*' pkg.install sources='[{"<pkg name>": "http://packages.server.com/<pkg filename>"}]'
salt '*' pkg.install sources='[{"SMClgcc346": "http://packages.server.com/gcc-3.4.6-sol10-sparc-local.pkg"}]
```

If working with solaris zones and you want to install a package only in the global zone you can pass `current_zone_only=True` to salt to have the package only installed in the global zone. (Behind the scenes this is passing `-G` to the pkgadd command.) Solaris default when installing a package in the global zone is to install it in all zones. This overrides that and installs the package only in the global.

CLI Example, installing a data stream package only in the global zone:

```sh
salt 'global_zone' pkg.install sources='[{"SMClgcc346": "/var/spool/pkg/gcc-3.4.6-sol10-sparc-local.pkg"}]' current_zone_only=True
```

By default salt automatically provides an adminfile, to automate package installation, with these options set:

```
email=
instance=quit
partial=nocheck
runlevel=nocheck
idepend=nocheck
rdepend=nocheck
space=nocheck
setuid=nocheck
conflict=nocheck
action=nocheck
basedir=default
```

You can override any of these options in two ways. First you can optionally pass any of the options as a kwarg to the module/state to override the default value or you can optionally pass the `admin_source` option providing your own adminfile to the minions.

Note: You can find all of the possible options to provide to the adminfile by reading the admin man page:

```
man -s 4 admin
```

CLI Example - Overriding the `instance` adminfile option when calling the module directly:

```
salt '*' pkg.install sources='[{"<pkg name>": "salt://pkgs/<pkg filename>"}]' instance="overwrite"
```

CLI Example - Overriding the `instance` adminfile option when used in a state:

```
SMClgcc346:
  pkg.installed:
    - sources:
      - SMClgcc346: salt://srv/salt/pkgs/gcc-3.4.6-sol10-sparc-local.pkg
      - instance: overwrite
```
CLI Example - Providing your own adminfile when calling the module directly:

```bash
salt '*' pkg.install sources='["<pkg name>": "salt://pkgs/<pkg filename>"]' admin_source='salt://pkgs/<adminfile filename>'
```

CLI Example - Providing your own adminfile when using states:

```bash
<pkg name>:
  pkg.installed:
    - sources:
      - <pkg name>: salt://pkgs/<pkg filename>
    - admin_source: salt://pkgs/<adminfile filename>
```

Note: the ID declaration is ignored, as the package name is read from the `sources` parameter.

```python
salt.modules.solarispkg.latest_version(names, **kwargs)
```

Return the latest version of the named package available for upgrade or installation. If more than one package name is specified, a dict of name/version pairs is returned.

If the latest version of a given package is already installed, an empty string will be returned for that package.

CLI Example:

```bash
salt '*' pkg.latest_version <package name>
salt '*' pkg.latest_version <package1> <package2> <package3> ...
```

NOTE: As package repositories are not presently supported for Solaris pkgadd, this function will always return an empty string for a given package.

```python
salt.modules.solarispkg.list_pkgs(versions_as_list=False, **kwargs)
```

List the packages currently installed as a dict:

```bash
{'<package_name>': '<version>'}
```

CLI Example:

```bash
salt '*' pkg.list_pkgs
```

```python
salt.modules.solarispkg.purge(name=None, pkgs=None, **kwargs)
```

Package purges are not supported, this function is identical to remove().

- **name**: The name of the package to be deleted

Multiple Package Options:

- **pkgs**: A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

```bash
salt '*' pkg.purge <package name>
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs=['foo', 'bar']
```

```python
salt.modules.solarispkg.remove(name=None, pkgs=None, saltenv='base', **kwargs)
```

Remove packages with pkgrm

- **name**: The name of the package to be deleted
By default salt automatically provides an adminfile, to automate package removal, with these options set:

```plaintext
email=
instance=quit
partial=nocheck
runlevel=nocheck
depend=nocheck
rdepend=nocheck
space=nocheck
setuid=nocheck
conflict=nocheck
action=nocheck
basedir=default
```

You can override any of these options in two ways. First you can optionally pass any of the options as a kwarg to the module/state to override the default value or you can optionally pass the `admin_source` option providing your own adminfile to the minions.

Note: You can find all of the possible options to provide to the adminfile by reading the admin man page:

```plaintext
man -s 4 admin
```

Multiple Package Options:

- **pkgs** A list of packages to delete. Must be passed as a python list. The `name` parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

```plaintext
salt '*' pkg.remove <package name>
salt '*' pkg.remove SUNWgit
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs='["foo", "bar"]'
```

salt.modules.solarispkg.**upgrade_available**(name)

Check whether or not an upgrade is available for a given package.

CLI Example:

```plaintext
salt '*' pkg.upgrade_available <package name>
```

salt.modules.solarispkg.**version**(names,**kwargs)

Returns a string representing the package version or an empty string if not installed. If more than one package name is specified, a dict of name/version pairs is returned.

CLI Example:

```plaintext
salt '*' pkg.version <package name>
salt '*' pkg.version <package1> <package2> <package3> ...
```

31.16.251 salt.modules.solr

Apache Solr Salt Module

Author: Jed Glazner Version: 0.2.1 Modified: 12/09/2011
This module uses HTTP requests to talk to the apache solr request handlers to gather information and report errors. Because of this the minion doesn't necessarily need to reside on the actual slave. However if you want to use the signal function the minion must reside on the physical solr host.

This module supports multi-core and standard setups. Certain methods are master/slave specific. Make sure you set the solr.type. If you have questions or want a feature request please ask.

**Coming Features in 0.3**

1. Add command for checking for replication failures on slaves
2. Improve match_index_versions since it's pointless on busy solr masters
3. Add additional local fs checks for backups to make sure they succeeded

**Override these in the minion config**

`solr.cores` A list of core names e.g. ['core1','core2']. An empty list indicates non-multicore setup.

`solr.baseurl` The root level URL to access solr via HTTP

`solr.request_timeout` The number of seconds before timing out an HTTP/HTTPS/FTP request. If nothing is specified then the python global timeout setting is used.

`solr.type` Possible values are `master` or `slave`

`solr.backup_path` The path to store your backups. If you are using cores and you can specify to append the core name to the path in the backup method.

`solr.num_backups` For versions of solr >= 3.5. Indicates the number of backups to keep. This option is ignored if your version is less.

`solr.init_script` The full path to your init script with start/stop options

`solr.dih.options` A list of options to pass to the DIH.

**Required Options for DIH**

*clean [False]* Clear the index before importing

*commit [True]* Commit the documents to the index upon completion

*optimize [True]* Optimize the index after commit is complete

*verbose [True]* Get verbose output

```python
salt.modules.solr.abort_import(handler, host=None, core_name=None, verbose=False)
```

MASTER ONLY Aborts an existing import command to the specified handler. This command can only be run if the minion is configured with solr.type=master

*handler [str]* The name of the data import handler.

*host [str (None)]* The solr host to query. __opts__['host'] is default.

*core [str (None)]* The core the handler belongs to.

*verbose [boolean (False)]* Run the command with verbose output.

Return : dict<str,obj>:

{ 'success':boolean, 'data':dict, 'errors':list, 'warnings':list }
**CLI Example:**

```
salt '*' solr.abort_import dataimport None music {'clean':True}
```

```python
salt.modules.solr.backup(host=None, core_name=None, append_core_to_path=False)
```

Tell solr make a backup. This method can be mis-leading since it uses the backup API. If an error happens during the backup you are not notified. The status: `OK' in the response simply means that solr received the request successfully.

- **host** [str (None)] The solr host to query. `__opts__['host']` is default.
- **core_name** [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.
- **append_core_to_path** [boolean (False)] If True add the name of the core to the backup path. Assumes that minion backup path is not None.

Return: dict<str,obj>:

```python
{ 'success':boolean, 'data':dict, 'errors':list, 'warnings':list }
```

**CLI Example:**

```
salt '*' solr.backup music
```

```python
salt.modules.solr.core_status(host=None, core_name=None)
```

MULTI-CORE HOSTS ONLY Get the status for a given core or all cores if no core is specified

- **host** [str (None)] The solr host to query. `__opts__['host']` is default.
- **core_name** [str] The name of the core to reload

Return: dict<str,obj>:

```python
{ 'success':boolean, 'data':dict, 'errors':list, 'warnings':list }
```

**CLI Example:**

```
salt '*' solr.core_status None music
```

```python
salt.modules.solr.delta_import(handler, host=None, core_name=None, options=None, extra=None)
```

Submits an import command to the specified handler using specified options. This command can only be run if the minion is configured with solr.type=master

- **handler** [str] The name of the data import handler.
- **host** [str (None)] The solr host to query. `__opts__['host']` is default.
- **core** [str (None)] The core the handler belongs to.
- **options** [dict (__opts__)] A list of options such as clean, optimize commit, verbose, and pause_replication. leave blank to use __opts__ defaults. options will be merged with __opts__
- **extra** [dict ({}):] Extra name value pairs to pass to the handler. e.g. ['"name=value"']

Return: dict<str,obj>:

```python
{ 'success':boolean, 'data':dict, 'errors':list, 'warnings':list }
```

**CLI Example:**

```
salt '*' solr.delta_import dataimport None music {'clean':True}
```
salt.modules.solr.full_import(handler, host=None, core_name=None, options=None, extra=None)
MASTER ONLY Submits an import command to the specified handler using specified options. This command can only be run if the minion is configured with solr.type=master

**handler** [str] The name of the data import handler.

**host** [str (None)] The solr host to query. __opts__['host'] is default.

**core** [str (None)] The core the handler belongs to.

**options** [dict (__opts__) A list of options such as clean, optimize commit, verbose, and pause_replication. leave blank to use __opts__ defaults. options will be merged with __opts__

**extra** [dict ([]) Extra name value pairs to pass to the handler. e.g. ["name=value"]

Return: dict<str,obj>:
{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}

CLI Example:
salt '*' solr.full_import dataimport None music {'clean':True}

salt.modules.solr.import_status(handler, host=None, core_name=None, verbose=False)
Submits an import command to the specified handler using specified options. This command can only be run if the minion is configured with solr.type: `master`

**handler** [str] The name of the data import handler.

**host** [str (None)] The solr host to query. __opts__['host'] is default.

**core** [str (None)] The core the handler belongs to.

**verbose** [boolean (False)] Specifies verbose output

Return: dict<str,obj>:
{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}

CLI Example:
salt '*' solr.import_status dataimport None music False

salt.modules.solr.is_replication_enabled(host=None, core_name=None)
SLAVE CALL Check for errors, and determine if a slave is replicating or not.

**host** [str (None)] The solr host to query. __opts__['host'] is default.

**core_name** [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.

Return: dict<str,obj>:
{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}

CLI Example:
salt '*' solr.is_replication_enabled music

salt.modules.solr.lucene_version(core_name=None)
Gets the lucene version that solr is using. If you are running a multi-core setup you should specify a core name since all the cores run under the same servlet container, they will all have the same version.

**core_name** [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.
Return: dict<str,obj>:

```python
{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}
```

**CLI Example:**
```
salt '*' solr.lucene_version
```

**salt.modules.solr.match_index_versions**

```python
salt.modules.solr.match_index_versions(host=None, core_name=None)
```

**SLAVE CALL** Verifies that the master and the slave versions are in sync by comparing the index version. If you are constantly pushing updates to the index the master and slave versions will seldom match. A solution to this is pause indexing every so often to allow the slave to replicate and then call this method before allowing indexing to resume.

**host** [str (None)] The solr host to query. `__opts__['host']` is default.

**core_name** [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.

Return : dict<str,obj>:

```python
{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}
```

**CLI Example:**
```
salt '*' solr.match_index_versions music
```

**salt.modules.solr.optimize**

```python
salt.modules.solr.optimize(host=None, core_name=None)
```

Search queries fast, but it is a very expensive operation. The ideal process is to run this with a master/slave configuration. Then you can optimize the master, and push the optimized index to the slaves. If you are running a single solr instance, or if you are going to run this on a slave be aware that search performance will be horrible while this command is being run. Additionally it can take a LONG time to run and your HTTP request may timeout. If that happens adjust your timeout settings.

**host** [str (None)] The solr host to query. `__opts__['host']` is default.

**core_name** [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.

Return : dict<str,obj>:

```python
{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}
```

**CLI Example:**
```
salt '*' solr.optimize music
```

**salt.modules.solr.ping**

```python
salt.modules.solr.ping(host=None, core_name=None)
```

Does a health check on solr, makes sure solr can talk to the indexes.

**host** [str (None)] The solr host to query. `__opts__['host']` is default.

**core_name** [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.

Return : dict<str,obj>:

```python
{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}
```

**CLI Example:**
Cache Management

salt.modules.solr.reload_core

MULTI-CORE HOSTS ONLY Load a new core from the same configuration as an existing registered core. While the "new" core is initializing, the "old" one will continue to accept requests. Once it has finished, all new request will go to the "new" core, and the "old" core will be unloaded.

- **host** [str (None)] The solr host to query. __opts__['host'] is default.
- **core_name** [str] The name of the core to reload

Return: dict<str,obj>:

{'success': boolean, 'data': dict, 'errors': list, 'warnings': list}

CLI Example:
salt '*' solr.reload_core None music

Return data is in the following format:

{'success': bool, 'data': dict, 'errors': list, 'warnings': list}

---

salt.modules.solr.reload_import_config

MASTER ONLY re-loads the handler config XML file. This command can only be run if the minion is a `master' type

- **handler** [str] The name of the data import handler.
- **host** [str (None)] The solr host to query. __opts__['host'] is default.
- **core** [str (None)] The core the handler belongs to.
- **verbose** [boolean (False)] Run the command with verbose output.

Return: dict<str,obj>:

{'success': boolean, 'data': dict, 'errors': list, 'warnings': list}

CLI Example:
salt '*' solr.reload_import_config dataimport None music {'clean':True}

---

salt.modules.solr.replication_details

Get the full replication details.

- **host** [str (None)] The solr host to query. __opts__['host'] is default.
- **core_name** [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.

Return: dict<str,obj>:

{'success': boolean, 'data': dict, 'errors': list, 'warnings': list}

CLI Example:
salt '*' solr.replication_details music

---

salt.modules.solr.set_is_polling

SLAVE CALL Prevent the slaves from polling the master for updates.
polling [boolean] True will enable polling. False will disable it.

host [str (None)] The solr host to query. __opts__['host'] is default.

core_name [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.

Return: dict<str,obj>:

{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}

CLI Example:
salt '*' solr.set_is_polling False

salt.modules.solr.set_replication_enabled(status, host=None, core_name=None)

MASTER ONLY Sets the master to ignore poll requests from the slaves. Useful when you don't want the slaves replicating during indexing or when clearing the index.

status [boolean] Sets the replication status to the specified state.

host [str (None)] The solr host to query. __opts__['host'] is default.

core_name [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to set the status on all cores.

Return: dict<str,obj>:

{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}

CLI Example:
salt '*' solr.set_replication_enabled false, None, music

salt.modules.solr.signal(signal=None)

Signals Apache Solr to start, stop, or restart. Obviously this is only going to work if the minion resides on the solr host. Additionally Solr doesn't ship with an init script so one must be created.

signal [str (None)] The command to pass to the apache solr init valid values are `start`, `stop`, and `restart`

CLI Example:
salt '*' solr.signal restart

salt.modules.solr.version(core_name=None)

Gets the solr version for the core specified. You should specify a core here as all the cores will run under the same servlet container and so will all have the same version.

core_name [str (None)] The name of the solr core if using cores. Leave this blank if you are not using cores or if you want to check all cores.

Return: dict<str,obj>:

{'success':boolean, 'data':dict, 'errors':list, 'warnings':list}

CLI Example:
salt '*' solr.version

31.16.252 salt.modules.splay

Splay function calls across targeted minions
salt.modules.splay.show(splaytime=600)
Show calculated splaytime for this minion Will use default value of 600 (seconds) if splaytime value not provided

CLI Example: salt example-host splay.show salt example-host splay.show 60

salt.modules.splay.splay(*args, **kwargs)
Splay a salt function call execution time across minions over a number of seconds (default: 600)

Note: You probably want to use --async here and look up the job results later. If you’re dead set on getting the output from the CLI command, then make sure to set the timeout (with the -t flag) to something greater than the splaytime (max splaytime + time to execute job). Otherwise, it’s very likely that the cli will time out before the job returns.

CLI Examples:

```
salt --async '*' splay.splay pkg.install cowsay version=3.03-8.el6
```

```
# With specified splaytime (5 minutes) and timeout with 10 second buffer
salt -t 310 '*' splay.splay 300 pkg.version cowsay
```

31.16.253 salt.modules.splunk_search
Module for interop with the Splunk API
New in version 2015.5.0.

depends
• splunk-sdk python module

configuration Configure this module by specifying the name of a configuration profile in the minion config, minion pillar, or master config. The module will use the `splunk` key by default, if defined.

For example:

```
splunk:
  username: alice
  password: abc123
  host: example.splunkcloud.com
  port: 8080
```

salt.modules.splunk_search.create(name, profile='splunk', **kwargs)
Create a splunk search

CLI Example:
```
splunk_search.create `my search name` search='error msg'
```

salt.modules.splunk_search.delete(name, profile='splunk')
Delete a splunk search

CLI Example:
```
splunk_search.delete `my search name`
```

salt.modules.splunk_search.get(name, profile='splunk')
Get a splunk search

CLI Example:
splunk_search.get `my search name`
salt.modules.splunk_search.list(profile='splunk')
List splunk searches (names only)

CLI Example: splunk_search.list

salt.modules.splunk_search.list_all(prefix=None, app=None, owner=None, description_contains=None, name_not_contains=None, profile='splunk')
Get all splunk search details. Produces results that can be used to create an sls file.

if app or owner are specified, results will be limited to matching saved searches.

if description_contains is specified, results will be limited to those where ```description_contains in description```
is true if name_not_contains is specified, results will be limited to those where ```name_not_contains not in name```
is true.

If prefix parameter is given, alarm names in the output will be prepended with the prefix; alarms that have the
prefix will be skipped. This can be used to convert existing alarms to be managed by salt, as follows:

CLI example:

1. Make a ```backup`` of all existing searches $ salt-call splunk_search.list_all --out=txt | sed `\``s/local: //``" > legacy_searches.sls
2. Get all searches with new prefixed names $ salt-call splunk_search.list_all `\`prefix=**MANAGED BY SALT**`` --out=txt | sed `\``s/local: //``" > managed_searches.sls
3. Insert the managed searches into splunk $ salt-call state.sls managed_searches.sls
4. Manually verify that the new searches look right
5. Delete the original searches $ sed s/present/absent/ legacy_searches.sls > remove_legacy_searches.sls $ salt-call state.sls remove_legacy_searches.sls
6. Get all searches again, verify no changes $ salt-call splunk_search.list_all --out=txt | sed `\``s/local: //``" > final_searches.sls $ diff final_searches.sls managed_searches.sls

salt.modules.splunk_search.update(name, profile='splunk', **kwargs)
Update a splunk search

CLI Example:

splunk_search.update `my search name` sharing=app

31.16.254 salt.modules.sqlite3

Support for SQLite3

salt.modules.sqlite3.fetch(db=None, sql=None)
Retrieve data from an sqlite3 db (returns all rows, be careful!)

CLI Example:

```text
salt '*' sqlite3.fetch /root/test.db 'SELECT * FROM test;'
```
salt.modules.sqlite3.indexes(db=None)
Show all indices in the database, for people with poor spelling skills

CLI Example:
salt '*' sqlite3.indexes /root/test.db

salt.modules.sqlite3.indices(db=None)
    Show all indices in the database
    CLI Example:
    salt '*' sqlite3.indices /root/test.db

salt.modules.sqlite3.modify(db=None, sql=None)
    Issue an SQL query to sqlite3 (with no return data), usually used to modify the database in some way (insert, delete, create, etc)
    CLI Example:
    salt '*' sqlite3.modify /root/test.db 'CREATE TABLE test(id INT, testdata TEXT);'

salt.modules.sqlite3.sqlite_version()
    Return version of sqlite
    CLI Example:
    salt '*' sqlite3.sqlite_version

salt.modules.sqlite3.tables(db=None)
    Show all tables in the database
    CLI Example:
    salt '*' sqlite3.tables /root/test.db

salt.modules.sqlite3.version()
    Return version of pysqlite
    CLI Example:
    salt '*' sqlite3.version

31.16.255 salt.modules.ssh

Manage client ssh components

Note: This module requires the use of MD5 hashing. Certain security audits may not permit the use of MD5. For those cases, this module should be disabled or removed.

salt.modules.ssh.auth_keys(user=None, config='.ssh/authorized_keys')
    Return the authorized keys for users
    CLI Example:
    salt '*' ssh.auth_keys
    salt '*' ssh.auth_keys root
    salt '*' ssh.auth_keys user=root
    salt '*' ssh.auth_keys user="[user1, user2]"

salt.modules.ssh.check_key(user, key, enc, comment, options, config='.ssh/authorized_keys', cache_keys=None)
    Check to see if a key needs updating, returns "update", "add" or "exists"
CLI Example:
```
salt '*' ssh.check_key <user> <key> <enc> <comment> <options>
```

salt.modules.ssh.check_key_file(user, source, config='.ssh/authorized_keys', saltenv='base', env=None)
Check a keyfile from a source destination against the local keys and return the keys to change

CLI Example:
```
salt '*' ssh.check_key_file root salt://ssh/keyfile
```

salt.modules.ssh.check_known_host(user=None, hostname=None, key=None, fingerprint=None, config=None, port=None)
Check the record in known_hosts file, either by its value or by fingerprint (it’s enough to set up either key or fingerprint, you don’t need to set up both).
If provided key or fingerprint doesn’t match with stored value, return `update`, if no value is found for a given host, return `add`, otherwise return `exists`.
If neither key, nor fingerprint is defined, then additional validation is not performed.

CLI Example:
```
salt '*' ssh.check_known_host <user> <hostname> key='AAAA...FAaQ=='
```

salt.modules.ssh.get_known_host(user, hostname, config=None, port=None)
Return information about known host from the config file, if any. If there is no such key, return None.

CLI Example:
```
salt '*' ssh.get_known_host <user> <hostname>
```

salt.modules.ssh.hash_known_hosts(user=None, config=None)
Hash all the hostnames in the known hosts file.
New in version 2014.7.0.

CLI Example:
```
salt '*' ssh.hash_known_hosts
```

salt.modules.ssh.host_keys(keydir=None, private=True)
Return the minion’s host keys

CLI Example:
```
salt '*' ssh.host_keys
salt '*' ssh.host_keys keydir=/etc/ssh
salt '*' ssh.host_keys keydir=/etc/ssh private=False
```

salt.modules.ssh.recv_known_host(hostname, enc=None, port=None, hash_hostname=False)
Retrieve information about host public key from remote server

CLI Example:
```
salt '*' ssh.recv_known_host <hostname> enc=<enc> port=<port>
```

salt.modules.ssh.rm_auth_key(user, key, config='.ssh/authorized_keys')
Remove an authorized key from the specified user’s authorized key file

CLI Example:
salt '...' ssh.rm_auth_key <user> <key>

salt.modules.ssh.rm_auth_key_from_file(user, source, config='ssh/authorized_keys', saltenv='base', env=None)
Remove an authorized key from the specified user's authorized key file, using a file as source

CLI Example:
salt '*' ssh.rm_auth_key_from_file <user> salt://ssh_keys/<user>.id_rsa.pub

salt.modules.ssh.rm_known_host(user=None, hostname=None, config=None, port=None)
Remove all keys belonging to hostname from a known_hosts file.

CLI Example:
salt '*' ssh.rm_known_host <user> <hostname>

salt.modules.ssh.set_auth_key(user, key, enc='ssh-rsa', comment=' ', options=None, config='ssh/authorized_keys', cache_keys=None)
Add a key to the authorized_keys file. The ``key'' parameter must only be the string of text that is the encoded key. If the key begins with ``ssh-rsa'' or ends with user@host, remove those from the key before passing it to this function.

CLI Example:
salt '*' ssh.set_auth_key <user> '<key>' enc='dsa'

salt.modules.ssh.set_auth_key_from_file(user, source, config='ssh/authorized_keys', saltenv='base', env=None)
Add a key to the authorized_keys file, using a file as the source.

CLI Example:

salt '*' ssh.set_auth_key_from_file <user> salt://ssh_keys/<user>.id_rsa.pub

salt.modules.ssh.set_known_host(user=None, hostname=None, fingerprint=None, key=None, port=None, enc=None, hash_hostname=True, config=None)
Download SSH public key from remote host ``hostname'', optionally validate its fingerprint against ``fingerprint'' variable and save the record in the known_hosts file.

If such a record does already exists in there, do nothing.

CLI Example:
salt '*' ssh.set_known_host <user> fingerprint='xx:xx:...:xx' enc='ssh-rsa' config='.ssh/known_hosts'

salt.modules.ssh.user_keys(user=None, pubfile=None, prvfile=None)
Return the user's ssh keys on the minion

New in version 2014.7.0.

CLI Example:
salt '*' ssh.user_keys
salt '*' ssh.user_keys user=user1
salt '*' ssh.user_keys user=user1 pubfile=/home/user1/.ssh/id_rsa.pub prvfile=/home/user1/.ssh/id_rsa
salt '*' ssh.user_keys user=user1 prvfile=False
salt '*' ssh.user_keys user=[['user1','user2']] pubfile=id_rsa.pub prvfile=id_rsa

As you can see you can tell Salt not to read from the user's private (or public) key file by setting the file path to False. This can be useful to prevent Salt from publishing private data via Salt Mine or others.
31.16.256  salt.modules.state

Control the state system on the minion.

State Caching

When a highstate is called, the minion automatically caches a copy of the last high data. If you then run a highstate with cache=True it will use that cached highdata and won’t hit the fileserver except for salt:// links in the states themselves.

```
salt.modules.state.apply(mods=None, **kwargs)
```

New in version 2015.5.0.

Apply states! This function will call highstate or state.sls based on the arguments passed in, state.apply is intended to be the main gateway for all state executions.

CLI Example:
```
salt '*' state.apply
salt '*' state.apply test
salt '*' state.apply test,pkgs
```

```
salt.modules.state.check_request(name=None)
```

New in version 2015.5.0.

Return the state request information, if any

CLI Example:
```
salt '*' state.check_request
```

```
salt.modules.state.clear_cache()
```

Clear out cached state files, forcing even cache runs to refresh the cache on the next state execution.

Remember that the state cache is completely disabled by default, this execution only applies if cache=True is used in states

CLI Example:
```
salt '*' state.clear_cache
```

```
salt.modules.state.clear_request(name=None)
```

New in version 2015.5.0.

Clear out the state execution request without executing it

CLI Example:
```
salt '*' state.clear_request
```

```
salt.modules.state.disable(states)
```

Disable state runs.

CLI Example:
```
salt '*' state.disable highstate
```

```
salt '*' state.disable highstate,test.succeed_without_changes
```
Note: To disable a state file from running provide the same name that would be passed in a state.sls call.
salt '*' state.disable bind.config

```
salt.modules.state.enable(states)
Enable state function or sls run

CLI Example:
salt '*' state.enable highstate
salt '*' state.enable test.succeed_without_changes
```

Note: To enable a state file from running provide the same name that would be passed in a state.sls call.
salt '*' state.disable bind.config

```
salt.modules.state.high(data, test=False, queue=False, **kwargs)
Execute the compound calls stored in a single set of high data This function is mostly intended for testing the state system

CLI Example:
salt '*' state.high '{"vim": {"pkg": ["installed"]}}'
```

```
salt.modules.state.highstate(test=None, queue=False, **kwargs)
Retrieve the state data from the salt master for this minion and execute it

test  Notify states to execute in test-only (dry-run) mode.

pillar Custom Pillar data can be passed with the pillar kwarg. Values passed here will override hard-coded Pillar values.

queue [False] Instead of failing immediately when another state run is in progress, queue the new state run to begin running once the other has finished.

This option starts a new thread for each queued state run so use this option sparingly.

localconfig: Instead of using running minion opts, load localconfig and merge that with the running minion opts. This functionality is intended for using "roots" of salt directories (with their own minion config, pillars, file_roots) to run highstate out of.

CLI Example:
salt '*' state.highstate

salt '*' state.highstate whitelist=sls1_to_run,sls2_to_run
salt '*' state.highstate exclude=sls_to_exclude
salt '*' state.highstate exclude="[{'id': 'id_to_exclude'}, {'sls': 'sls_to_exclude'}]"
salt '*' state.highstate pillar="{foo: 'Foo!', bar: 'Bar!'}"
```

```
salt.modules.state.list_disabled()
List the states which are currently disabled

CLI Example:
```

31.16. Full list of builtin execution modules
salt '*' state.list_disabled

salt.modules.state.low(data, queue=False, **kwargs)
Execute a single low data call. This function is mostly intended for testing the state system.

CLI Example:
salt '*' state.low '{"state": "pkg", "fun": "installed", "name": "vi"}"

salt.modules.state.pkg(pkg_path, pkg_sum, hash_type, test=False, **kwargs)
Execute a packaged state run. The packaged state run will exist in a tarball available locally. This packaged state can be generated using salt-ssh.

CLI Example:
salt '*' state.pkg /tmp/state_pkg.tgz

salt.modules.state.request(mods=None, **kwargs)
New in version 2015.5.0.
Request that the local admin execute a state run via salt-call state.run_request. All arguments match state.apply.

CLI Example:
salt '*' state.request
salt '*' state.request test
taxt '*' state.request test, pkgs

salt.modules.state.run_request(name='default', **kwargs)
New in version 2015.5.0.
Execute the pending state request.

CLI Example:
salt '*' state.run_request

salt.modules.state.running(concurrent=False)
Return a list of strings that contain state return data if a state function is already running. This function is used to prevent multiple state calls from being run at the same time.

CLI Example:
salt '*' state.running

salt.modules.state.show_highstate(queue=False, **kwargs)
Retrieve the highstate data from the salt master and display it.
Custom Pillar data can be passed with the pillar kwarg.

CLI Example:
salt '*' state.show_highstate

salt.modules.state.show_low_sls(mods, saltenv='base', test=None, queue=False, env=None, **kwargs)
Display the low data from a specific sls. The default environment is base, use saltenv (env in Salt 0.17.x and older) to specify a different environment.

CLI Example:
```
salt '*' state.show_low_sls foo
```

salt.modules.state.show_lowstate(queue=False, **kwargs)
List out the low data that will be applied to this minion

CLI Example:
```
salt '*' state.show_lowstate
```

salt.modules.state.show_sls(mods, saltenv='base', test=None, queue=False, env=None, **kwargs)
Display the state data from a specific sls or list of sls files on the master. The default environment is base, use saltenv (env in Salt 0.17.x and older) to specify a different environment.

This function does not support top files. For top.sls please use show_top instead.

Custom Pillar data can be passed with the pillar kwarg.

CLI Example:
```
salt '*' state.show_sls core,edit.vim dev
```

salt.modules.state.show_top(queue=False, **kwargs)
Return the top data that the minion will use for a highstate

CLI Example:
```
salt '*' state.show_top
```

salt.modules.state.single(fun, name, test=None, queue=False, **kwargs)
Execute a single state function with the named kwargs, returns False if insufficient data is sent to the command

By default, the values of the kwargs will be parsed as YAML. So, you can specify lists values, or lists of single entry key-value maps, as you would in a YAML salt file. Alternatively, JSON format of keyword values is also supported.

CLI Example:
```
salt '*' state.single pkg.installed name=vim
```

salt.modules.state.sls(mods, saltenv=None, test=None, exclude=None, queue=False, env=None, pillarenv=None, **kwargs)
Execute a set list of state files from an environment.

**test** Notify states to execute in test-only (dry-run) mode.

Sets the test variable in the minion opts for the duration of the state run.

**pillar** Custom Pillar data can be passed with the pillar kwarg. Values passed here will override hard-coded Pillar values.

**queue** [False] Instead of failing immediately when another state run is in progress, queue the new state run to begin running once the other has finished.

This option starts a new thread for each queued state run so use this option sparingly.

**saltenv** [None] Specify a file_roots environment.

Changed in version 0.17.0: Argument name changed from env to saltenv.

Changed in version 2014.7: Defaults to None. If no saltenv is specified, the minion config will be checked for a saltenv and if found, it will be used. If none is found, base will be used.

**pillarenv** [None] Specify a pillar_roots environment. By default all pillar environments merged together will be used.
**concurrent:** WARNING: This flag is potentially dangerous. It is designed for use when multiple state runs can safely be run at the same time. Do not use this flag for performance optimization.

**localconfig:** Instead of using running minion opts, load localconfig and merge that with the running minion opts. This functionality is intended for using "roots" of salt directories (with their own minion config, pillars, file_roots) to run highstate out of.

CLI Example:

```
salt '*' state.sls core,edit.vim dev
salt '*' state.sls core exclude="[{'id': 'id_to_exclude'}, {'sls': 'sls_to_exclude'}]"
salt '*' state.sls myslsfile pillar="{'foo': 'Foo!', bar: 'Bar!'}"
```

**salt.modules.state.sls_id**

```
salt.modules.state.sls_id(id_, mods, saltenv='base', test=None, queue=False, **kwargs)
```

Call a single ID from the named module(s) and handle all requisites

New in version 2014.7.0.

CLI Example:

```
salt '*' state.sls_id apache http
```

**salt.modules.state.template**

```
salt.modules.state.template(tem, queue=False, **kwargs)
```

Execute the information stored in a template file on the minion.

This function does not ask a master for a SLS file to render but instead directly processes the file at the provided path on the minion.

CLI Example:

```
salt '*' state.template '<Path to template on the minion>'
```

**salt.modules.state.template_str**

```
salt.modules.state.template_str(tem, queue=False, **kwargs)
```

Execute the information stored in a string from an sls template

CLI Example:

```
salt '*' state.template_str '<Template String>'
```

**salt.modules.state.top**

```
salt.modules.state.top(topfn, test=None, queue=False, saltenv=None, **kwargs)
```

Execute a specific top file instead of the default

CLI Example:

```
salt '*' state.top reverse_top.sls
salt '*' state.top reverse_top.sls exclude=sls_to_exclude
salt '*' state.top reverse_top.sls exclude="[{'id': 'id_to_exclude'}, {'sls': 'sls_to_exclude'}]"
```

### 31.16.257 salt.modules.status

Module for returning various status data about a minion. These data can be useful for compiling into stats later.

```
salt.modules.status.all_status()
```

Return a composite of all status data and info for this minion. Warning: There is a LOT here!

CLI Example:

```
salt '*' status.all_status
```
salt.modules.status.cpuinfo()
Return the CPU info for this minion

CLI Example:
```
salt '*' status.cpuinfo
```

salt.modules.status.cpustats()
Return the CPU stats for this minion

CLI Example:
```
salt '*' status.cpustats
```

salt.modules.status.custom()
Return a custom composite of status data and info for this minion, based on the minion config file. An example config like might be:
```
status.cpustats.custom: [ 'cpu', 'ctxt', 'btime', 'processes' ]
```

Where status refers to status.py, cpustats is the function where we get our data, and custom is this function. It is followed by a list of keys that we want returned.

This function is meant to replace all_status(), which returns anything and everything, which we probably don't want.

By default, nothing is returned. Warning: Depending on what you include, there can be a LOT here!

CLI Example:
```
salt '*' status.custom
```

salt.modules.status.diskstats()
Return the disk stats for this minion

CLI Example:
```
salt '*' status.diskstats
```

salt.modules.status.diskusage(*args)
Return the disk usage for this minion

Usage:
```
salt '*' status.diskusage [paths and/or filesystem types]
```

CLI Example:
```
salt '*' status.diskusage # usage for all filesystems
salt '*' status.diskusage /tmp # usage for / and /tmp
salt '*' status.diskusage ext? # usage for ext[234] filesystems
salt '*' status.diskusage / ext? # usage for / and all ext filesystems
```

salt.modules.status.loadavg()
Return the load averages for this minion

CLI Example:
```
salt '*' status.loadavg
```

salt.modules.status.master(master=None, connected=True)
New in version 2014.7.0.

31.16. Full list of built-in execution modules
Fire an event if the minion gets disconnected from its master. This function is meant to be run via a scheduled job from the minion. If master_ip is an FQDN/Hostname, it must be resolvable to a valid IPv4 address.

CLI Example:

```bash
salt '*' status.master
```

```python
salt.modules.status.meminfo()
```

Return the memory info for this minion

CLI Example:

```bash
salt '*' status.meminfo
```

```python
salt.modules.status.netdev()
```

Return the network device stats for this minion

CLI Example:

```bash
salt '*' status.netdev
```

```python
salt.modules.status.netstats()
```

Return the network stats for this minion

CLI Example:

```bash
salt '*' status.netstats
```

```python
salt.modules.status.nproc()
```

Return the number of processing units available on this system

CLI Example:

```bash
salt '*' status.nproc
```

```python
salt.modules.status.pid(sig)
```

Return the PID or an empty string if the process is running or not. Pass a signature to use to find the process via ps. Note you can pass a Python-compatible regular expression to return all pids of processes matching the regexp.

CLI Example:

```bash
salt '*' status.pid <sig>
```

```python
salt.modules.status.procs()
```

Return the process data

CLI Example:

```bash
salt '*' status.procs
```

```python
salt.modules.status.uptime()
```

Return the uptime for this minion

CLI Example:

```bash
salt '*' status.uptime
```

```python
salt.modules.status.version()
```

Return the system version for this minion

CLI Example:
salt '*' status.version

salt.modules.status.vmstats()
Return the virtual memory stats for this minion
CLI Example:
salt '*' status.vmstats

salt.modules.status.w()
Return a list of logged in users for this minion, using the w command
CLI Example:
salt '*' status.w

31.16.258 salt.modules.stormpath

Support for Stormpath
New in version 2015.8.0.
salt.modules.stormpath.create_account(directory_id, email, password, givenName, surname, **kwargs)
Create an account
CLI Examples:
salt myminion stormpath.create_account <directory_id> shemp@example.com letmein Shemp Howard

salt.modules.stormpath.delete_account(account_id)
Delete an account.
CLI Examples:
salt myminion stormpath.delete_account <account_id>

salt.modules.stormpath.list_accounts()
Show all accounts.
CLI Example:
salt myminion stormpath.list_accounts

salt.modules.stormpath.list_directories()
Show all directories.
CLI Example:
salt myminion stormpath.list_directories

salt.modules.stormpath.show_account(account_id=None, email=None, directory_id=None, application_id=None, group_id=None, **kwargs)
Show a specific account.
CLI Example:
salt myminion stormpath.show_account <account_id>

salt.modules.stormpath.show_tenant()
Get the tenant for the login being used.

31.16. Full list of builtin execution modules
salt.modules.stormpath.update_account(account_id, key=None, value=None, items=None)

Update one or more items for this account. Specifying an empty value will clear it for that account.

CLI Examples:

- salt myminion stormpath.update_account <account_id> givenName shemp
- salt myminion stormpath.update_account <account_id> middleName 
- salt myminion stormpath.update_account <account_id> items='{``givenName'': ``Shemp''} 
- salt myminion stormpath.update_account <account_id> items='{``middleName'': ``''} 

31.16.259  salt.modules.sudo

Allow for the calling of execution modules via sudo.

This module is invoked by the minion if the sudo_user minion config is present.

Example minion config:

```
sudo_user: saltdev
```

Once this setting is made, any execution module call done by the minion will be run under sudo -u <sudo_user> salt-call. For example, with the above minion config,

```
salt sudo_minion cmd.run 'cat /etc/sudoers'
```

is equivalent to

```
sudo -u saltdev salt-call cmd.run 'cat /etc/sudoers'
```

being run on sudo_minion.

salt.modules.sudo.salt_call(runas, fun, *args, **kwargs)

Wrap a shell execution out to salt call with sudo

Example:

```
/etc/salt/minion
```

```
sudo_user: saltdev
```

```
salt '*!' test.ping  # is run as saltdev user
```

31.16.260  salt.modules.supervisord

Provide the service module for system supervisord or supervisord in a virtualenv

salt.modules.supervisord.add(name, user=None, conf_file=None, bin_env=None)

Activates any updates in config for process/group.

- user user to run supervisorctl as
- conf_file path to supervisord config file
- bin_env path to supervisorctl bin or path to virtualenv with supervisor installed

CLI Example:

```
salt '*!' supervisord.add <name>
```

salt.modules.supervisord.custom(command, user=None, conf_file=None, bin_env=None)

Run any custom supervisord command
user  user to run supervisorctl as
conf_file  path to supervisord config file
bin_env  path to supervisorctl bin or path to virtualenv with supervisor installed

CLI Example:
salt '*' supervisord.custom "mstop '*'gunicorn*'"

```python
salt.modules.supervisord.options(name, conf_file=None)
```
New in version 2014.1.0.
Read the config file and return the config options for a given process
name  Name of the configured process
conf_file  path to supervisord config file

CLI Example:
salt '*' supervisord.options foo

```python
salt.modules.supervisord.remove(name, user=None, conf_file=None, bin_env=None)
```
Removes process/group from active config
user  user to run supervisorctl as
conf_file  path to supervisord config file
bin_env  path to supervisorctl bin or path to virtualenv with supervisor installed

CLI Example:
salt '*' supervisord.remove <name>

```python
salt.modules.supervisord.reread(user=None, conf_file=None, bin_env=None)
```
Reload the daemon’s configuration files
user  user to run supervisorctl as
conf_file  path to supervisord config file
bin_env  path to supervisorctl bin or path to virtualenv with supervisor installed

CLI Example:
salt '*' supervisord.reread

```python
salt.modules.supervisord.restart(name='all', user=None, conf_file=None, bin_env=None)
```
Restart the named service. Process group names should not include a trailing asterisk.
user  user to run supervisorctl as
conf_file  path to supervisord config file
bin_env  path to supervisorctl bin or path to virtualenv with supervisor installed

CLI Example:
salt '*' supervisord.restart <service>
salt '*' supervisord.restart <group>:

```python
salt.modules.supervisord.start(name='all', user=None, conf_file=None, bin_env=None)
```
Start the named service. Process group names should not include a trailing asterisk.
user  user to run supervisorctl as
conf_file  path to supervisord config file
bin_env   path to supervisorctl bin or path to virtualenv with supervisor installed

CLI Example:
salt '*' supervisord.start <service>
salt '*' supervisord.start <group>:

```
salt.modules.supervisord.status(name=None, user=None, conf_file=None, bin_env=None)
```
List programs and its state
```python
user    user to run supervisorctl as
conf_file  path to supervisord config file
bin_env   path to supervisorctl bin or path to virtualenv with supervisor installed
```
CLI Example:
salt '*' supervisord.status

```
salt.modules.supervisord.status_raw(name=None, user=None, conf_file=None, bin_env=None)
```
Display the raw output of status
```python
user    user to run supervisorctl as
conf_file  path to supervisord config file
bin_env   path to supervisorctl bin or path to virtualenv with supervisor installed
```
CLI Example:
salt '*' supervisord.status_raw

```
salt.modules.supervisord.stop(name='all', user=None, conf_file=None, bin_env=None)
```
Stop the named service. Process group names should not include a trailing asterisk.
```python
user    user to run supervisorctl as
conf_file  path to supervisord config file
bin_env   path to supervisorctl bin or path to virtualenv with supervisor installed
```
CLI Example:
salt '*' supervisord.stop <service>
salt '*' supervisord.stop <group>:

```
salt.modules.supervisord.update(user=None, conf_file=None, bin_env=None)
```
Reload config and add/remove as necessary
```python
user    user to run supervisorctl as
conf_file  path to supervisord config file
bin_env   path to supervisorctl bin or path to virtualenv with supervisor installed
```
CLI Example:
salt '*' supervisord.update
31.16.261 salt.modules.svn

Subversion SCM

salt.modules.svn.add(cwd, targets, user=\text{None}, username=\text{None}, password=\text{None}, *opts)

Add files to be tracked by the Subversion working-copy checkout

- \text{cwd} The path to the Subversion repository
- \text{targets} [\text{None}] files and directories to pass to the command as arguments
- \text{user} [\text{None}] Run svn as a user other than what the minion runs as
- \text{username} [\text{None}] Connect to the Subversion server as another user
- \text{password} [\text{None}] Connect to the Subversion server with this password

New in version 0.17.0.

CLI Example:

```bash
salt '*' svn.add /path/to/repo /path/to/new/file
```

salt.modules.svn.checkout(cwd, remote, target=\text{None}, user=\text{None}, username=\text{None}, password=\text{None}, *opts)

Download a working copy of the remote Subversion repository directory or file

- \text{cwd} The path to the Subversion repository
- \text{remote} [\text{None}] URL to checkout
- \text{target} [\text{None}] The name to give the file or directory working copy Default: svn uses the remote basename
- \text{user} [\text{None}] Run svn as a user other than what the minion runs as
- \text{username} [\text{None}] Connect to the Subversion server as another user
- \text{password} [\text{None}] Connect to the Subversion server with this password

New in version 0.17.0.

CLI Example:

```bash
salt '*' svn.checkout /path/to/repo svn://remote/repo
```

salt.modules.svn.commit(cwd, targets=\text{None}, msg=\text{None}, user=\text{None}, username=\text{None}, password=\text{None}, *opts)

Commit the current directory, files, or directories to the remote Subversion repository

- \text{cwd} The path to the Subversion repository
- \text{targets} [\text{None}] files and directories to pass to the command as arguments Default: svn uses `.`
- \text{msg} [\text{None}] Message to attach to the commit log
- \text{user} [\text{None}] Run svn as a user other than what the minion runs as
- \text{username} [\text{None}] Connect to the Subversion server as another user
- \text{password} [\text{None}] Connect to the Subversion server with this password

New in version 0.17.0.

CLI Example:

```bash
salt '*' svn.commit /path/to/repo
```
salt.modules.svn.diff(
cwd, targets=None, user=None, username=None, password=None, *opts)

Return the diff of the current directory, files, or directories from the remote Subversion repository

cwd  The path to the Subversion repository

targets  [None] files and directories to pass to the command as arguments Default: svn uses `.

user  [None] Run svn as a user other than what the minion runs as

username  [None] Connect to the Subversion server as another user

password  [None] Connect to the Subversion server with this password

New in version 0.17.0.

CLI Example:

```
salt '*' svn.diff /path/to/repo
```

salt.modules.svn.export(
cwd, remote, target=None, user=None, username=None, password=None, revision='HEAD', *opts)

Create an unversioned copy of a tree.

cwd  The path to the Subversion repository

remote  [None] URL and path to file or directory checkout

target  [None] The name to give the file or directory working copy Default: svn uses the remote basename

user  [None] Run svn as a user other than what the minion runs as

username  [None] Connect to the Subversion server as another user

password  [None] Connect to the Subversion server with this password

New in version 0.17.0.

CLI Example:

```
salt '*' svn.export /path/to/repo svn://remote/repo
```

salt.modules.svn.info(
cwd, targets=None, user=None, username=None, password=None, fmt='str')

Display the Subversion information from the checkout.

cwd  The path to the Subversion repository

targets  [None] files, directories, and URLs to pass to the command as arguments svn uses `.` by default

user  [None] Run svn as a user other than what the minion runs as

username  [None] Connect to the Subversion server as another user

password  [None] Connect to the Subversion server with this password

New in version 0.17.0.

fmt  [str] How to fmt the output from info. (str, xml, list, dict)

CLI Example:

```
salt '*' svn.info /path/to/svn/repo
```

salt.modules.svn.remove(
cwd, targets, msg=None, user=None, username=None, password=None, *opts)

Remove files and directories from the Subversion repository

cwd  The path to the Subversion repository
targets [None] files, directories, and URLs to pass to the command as arguments
msg [None] Message to attach to the commit log
user [None] Run svn as a user other than what the minion runs as
username [None] Connect to the Subversion server as another user
password [None] Connect to the Subversion server with this password

New in version 0.17.0.

CLI Example:
```bash
salt '*' svn.remove /path/to/repo /path/to/repo/remove
```

salt.modules.svn.status(cwd, targets=None, user=None, username=None, password=None, *opts)
Display the status of the current directory, files, or directories in the Subversion repository

cwd The path to the Subversion repository
targets [None] files, directories, and URLs to pass to the command as arguments Default: svn uses `.'
user [None] Run svn as a user other than what the minion runs as
username [None] Connect to the Subversion server as another user
password [None] Connect to the Subversion server with this password

New in version 0.17.0.

CLI Example:
```bash
salt '*' svn.status /path/to/repo
```

salt.modules.svn.switch(cwd, remote, target=None, user=None, username=None, password=None, *opts)
New in version 2014.1.0.
Switch a working copy of a remote Subversion repository directory
cwd The path to the Subversion repository
remote [None] URL to switch
target [None] The name to give the file or directory working copy Default: svn uses the remote basename
user [None] Run svn as a user other than what the minion runs as
username [None] Connect to the Subversion server as another user
password [None] Connect to the Subversion server with this password

CLI Example:
```bash
salt '*' svn.switch /path/to/repo svn://remote/repo
```

salt.modules.svn.update(cwd, targets=None, user=None, username=None, password=None, *opts)
Update the current directory, files, or directories from the remote Subversion repository
cwd The path to the Subversion repository
targets [None] files and directories to pass to the command as arguments Default: svn uses `.'
user [None] Run svn as a user other than what the minion runs as
password [None] Connect to the Subversion server with this password

New in version 0.17.0.
username [None] Connect to the Subversion server as another user

CLI Example:
salt '*' svn.update /path/to/repo

31.16.262 salt.modules.swift

Module for handling OpenStack Swift calls

Author: Anthony Stanton <anthony.stanton@gmail.com>

Inspired by the S3 and Nova modules

depends

- swiftclient Python module

configuration This module is not usable until the user, password, tenant, and auth URL are specified either in a pillar or in the minion's config file. For example:

<table>
<thead>
<tr>
<th>keystone.user: admin</th>
</tr>
</thead>
<tbody>
<tr>
<td>keystone.password: verybadpass</td>
</tr>
<tr>
<td>keystone.tenant: admin</td>
</tr>
<tr>
<td>keystone.auth_url: '<a href="http://127.0.0.1:5000/v2.0/">http://127.0.0.1:5000/v2.0/</a>'</td>
</tr>
</tbody>
</table>

If configuration for multiple OpenStack accounts is required, they can be set up as different configuration profiles: For example:

openstack1:
- keystone.user: admin
- keystone.password: verybadpass
- keystone.tenant: admin
- keystone.auth_url: 'http://127.0.0.1:5000/v2.0/'

openstack2:
- keystone.user: admin
- keystone.password: verybadpass
- keystone.tenant: admin
- keystone.auth_url: 'http://127.0.0.2:5000/v2.0/'

With this configuration in place, any of the swift functions can make use of a configuration profile by declaring it explicitly. For example:

salt '*' swift.get mycontainer myfile /tmp/file profile=openstack1

salt.modules.swift.delete(cont, path=None, profile=None)
Delete a container, or delete an object from a container.

CLI Example to delete a container:
salt myminion swift.delete mycontainer

CLI Example to delete an object from a container:
salt myminion swift.delete mycontainer remoteobject

salt.modules.swift.get(cont=None, path=None, local_file=None, return_bin=False, profile=None)
List the contents of a container, or return an object from a container. Set return_bin to True in order to retrieve an object wholesale. Otherwise, Salt will attempt to parse an XML response.

CLI Example to list containers:
salt myminion swift.get

CLI Example to list the contents of a container:

```shell
salt myminion swift.get mycontainer
```

CLI Example to return the binary contents of an object:

```shell
salt myminion swift.get mycontainer myfile.png return_bin=True
```

CLI Example to save the binary contents of an object to a local file:

```shell
salt myminion swift.get mycontainer myfile.png local_file=/tmp/myfile.png
```

```python
salt.modules.swift.head()
```

```python
salt.modules.swift.put(cont, path=None, local_file=None, profile=None)
```

Create a new container, or upload an object to a container.

CLI Example to create a container:

```shell
salt myminion swift.put mycontainer
```

CLI Example to upload an object to a container:

```shell
salt myminion swift.put mycontainer remotepath local_file=/path/to/file
```

31.16.263 salt.modules.sysbench

The `sysbench` module is used to analyze the performance of the minions, right from the master! It measures various system parameters such as CPU, Memory, File I/O, Threads and Mutex.

```python
salt.modules.sysbench.cpu()
```

Tests for the CPU performance of minions.

CLI Examples:

```shell
salt '*' sysbench.cpu
```

```python
salt.modules.sysbench.fileio()
```

This tests for the file read and write operations. Various modes of operations are

- sequential write
- sequential rewrite
- sequential read
- random read
- random write
- random read and write

The test works with 32 files with each file being 1Gb in size. The test consumes a lot of time. Be patient!

CLI Examples:

```shell
salt '*' sysbench.fileio
```
salt.modules.sysbench.memory()
    This tests the memory for read and write operations.
    CLI Examples:
    
    salt '*' sysbench.memory

salt.modules.sysbench.mutex()
    Tests the implementation of mutex
    CLI Examples:
    
    salt '*' sysbench.mutex

salt.modules.sysbench.ping()

salt.modules.sysbench.threads()
    This tests the performance of the processor's scheduler
    CLI Example:
    
    salt '*' sysbench.threads

31.16.264 salt.modules.syslog_ng

Module for getting information about syslog-ng

    maintainer  Tibor Benke <btibi@sch.bme.hu>
    maturity    new
    depends     cmd
    platform    all

This module is capable of managing syslog-ng instances which were installed via a package manager or from source. Users can use a directory as a parameter in the case of most functions, which contains the syslog-ng and syslog-ng-ctl binaries.

Syslog-ng can be installed via a package manager or from source. In the latter case, the syslog-ng and syslog-ng-ctl binaries are not available from the PATH, so users should set the location of the sbin directory with syslog_ng.set_binary_path.

Similarly, users can specify the location of the configuration file with syslog_ng.set_config_file, then the module will use it. If it is not set, syslog-ng uses the default configuration file.

class salt.modules.syslog_ng.Argument(value=’’)
    A TypedParameterValue has one or more Arguments. For example this can be the value of key_file.
    Doesn't need examples.

    build()

class salt.modules.syslog_ng.Buildable(iterable, join_body_on=’,’, append_extra_newline=True)
    Base class of most classes, which have a build method.
    It contains a common build function.
    Doesn't need examples.

    build()
    Builds the textual representation of the whole configuration object with it's children.
build_body()  
Builds the body of a syslog-ng configuration object.

build_header()  
Builds the header of a syslog-ng configuration object.

build_tail()  
Builds the tail of a syslog-ng configuration object.

class salt.modules.syslog_ng.GivenStatement(value, add_newline=True)  
This statement returns a string without modification. It can be used to use existing configuration snippets.  
Does not need examples.

build()  
class salt.modules.syslog_ng.NamedStatement(type=", id='", options=None)  
It represents a configuration statement, which has a name, e.g. a source.  
Does not need examples.

class salt.modules.syslog_ng.Option(type=", params=None)  
A Statement class contains Option instances.  
An instance of Option can represent a file(), tcp(), udp(), etc. option.  
Does not need examples.

add_parameter(param)  
build()  
class salt.modules.syslog_ng.Parameter(iterable=None, join_body_on="")  
An Option has one or more Parameter instances.  
Does not need examples.

class salt.modules.syslog_ng.ParameterValue(iterable=None, join_body_on="")  
A TypedParameter can have one or more values.  
Does not need examples.

class salt.modules.syslog_ng.SimpleParameter(value='')  
A Parameter is a SimpleParameter, if it's just a simple type, like a string.  
For example:

destination d_file {
    file("/var/log/messages")
};

/var/log/messages is a SimpleParameter.  
Does not need examples.

build()  
class salt.modules.syslog_ng.SimpleParameterValue(value='')  
A ParameterValue which holds a simple type, like a string or a number.  
For example in ip(127.0.0.1) 127.0.0.1 is a SimpleParameterValue.  
Does not need examples.
build()

class salt.modules.syslog_ng.Statement(type, id='`, options=None, has_name=True)
   It represents a syslog-ng configuration statement, e.g. source, destination, filter.
   Does not need examples.
   add_child(option)
   build_header()
   build_tail()

exception salt.modules.syslog_ng.SyslogNgError

class salt.modules.syslog_ng.TypedParameter(type='`, values=None)
   A Parameter, which has a type:

   \[
   \text{destination} \ d_{tcp} \{ \\
   \quad \text{tcp(} \\
   \quad \quad \text{ip(127.0.0.1)} \\
   \quad \}; \\
   \\]

   ip(127.0.0.1) is a TypedParameter.
   Does not need examples.
   add_value(value)
   build()

class salt.modules.syslog_ng.TypedParameterValue(type='`, arguments=None)
   We have to go deeper...

   A TypedParameter can have a `parameter', which also have a type. For example key_file and cert_file:

   \[
   \text{source} \ \text{demo}_tls_source \{ \\
   \quad \text{tcp(} \\
   \quad \quad \text{ip(0.0.0.0)} \\
   \quad \quad \text{port(1999)} \\
   \quad \quad \text{tls(} \\
   \quad \quad \quad \text{key_file(}`/opt/syslog-ng/etc/syslog-ng/key.d/syslog-ng.key`)} \\
   \quad \quad \quad \text{cert_file(}`/opt/syslog-ng/etc/syslog-ng/cert.d/syslog-ng.cert`)} \\
   \quad \}; \\
   \\]

   Does not need examples.
   add_argument(arg)
   build()

class salt.modules.syslog_ng.UnnamedStatement(type, options=None)
   It represents a configuration statement, which doesn't have a name, e.g. a log path.
   Does not need examples.

salt.modules.syslog_ng.config(name, config, write=True)
   Builds syslog-ng configuration. This function is intended to be used from the state module, users should not use it directly!
   name : the id of the Salt document or it is the format of <statement name>.id config : the parsed YAML code write : if True, it writes the config into the configuration file, otherwise just returns it
CLI Example:
```
salt '*' syslog_ng.config name="s_local" config="[{'tcp': [{'ip': '127.0.0.1'}, {'port': 1233}]]"
```

```
salt.modules.syslog_ng.config_test(syslog_ng_sbin_dir=None, cfgfile=None)
```
Runs syntax check against `cfgfile`. If `syslog_ng_sbin_dir` is specified, it is added to the PATH during the test.

CLI Example:
```
salt '*' syslog_ng.config_test
salt '*' syslog_ng.config_test /home/user/install/syslog-ng/sbin
salt '*' syslog_ng.config_test /home/user/install/syslog-ng/sbin /etc/syslog-ng/syslog-ng.conf
```

```
salt.modules.syslog_ng.get_config_file()
```
Returns the configuration directory, which contains `syslog-ng.conf`.

CLI Example:
```
salt '*' syslog_ng.get_config_file
```

```
salt.modules.syslog_ng.modules(syslog_ng_sbin_dir=None)
```
Returns the available modules. If `syslog_ng_sbin_dir` is specified, it is added to the PATH during the execution of the command `syslog-ng`.

CLI Example:
```
salt '*' syslog_ng.modules
salt '*' syslog_ng.modules /home/user/install/syslog-ng/sbin
```

```
salt.modules.syslog_ng.reload(name)
```
Reloads `syslog-ng`. This function is intended to be used from states.

If `syslog_ng.set_config_file`, is called before, this function will use the set binary path.

CLI Example:
```
salt '*' syslog_ng.reload
```

```
salt.modules.syslog_ng.set_binary_path(name)
```
Sets the path, where the `syslog-ng` binary can be found. This function is intended to be used from states.

If `syslog-ng` is installed via a package manager, users don’t need to use this function.

CLI Example:
```
salt '*' syslog_ng.set_binary_path name="/usr/sbin"
```

```
salt.modules.syslog_ng.set_config_file(name)
```
Sets the configuration’s name. This function is intended to be used from states.

CLI Example:
```
salt '*' syslog_ng.set_config_file name="/etc/syslog-ng"
```

```
salt.modules.syslog_ng.set_parameters(version=None, binary_path=None, config_file=None, *args, **kwargs)
```
Sets variables.

CLI Example:
```
salt '*' syslog_ng.set_parameters version="3.6"
salt '*' syslog_ng.set_parameters binary_path="/home/user/install/syslog-ng/sbin" config_file="""
salt.modules.syslog_ng.start(name=None, user=None, group=None, chroot=None, caps=None, no_caps=False, pidfile=None, enable_core=False, fd_limit=None, verbose=False, debug=False, trace=False, yydebug=False, persist_file=None, control=None, worker_threads=None)

Ensures, that syslog-ng is started via the given parameters. This function is intended to be used from the state module.

Users shouldn't use this function, if the service module is available on their system. If syslog_ng.set_config_file, is called before, this function will use the set binary path.

CLI Example:
salt '*' syslog_ng.start

salt.modules.syslog_ng.stats(syslog_ng_sbin_dir=None)

Returns statistics from the running syslog-ng instance. If syslog_ng_sbin_dir is specified, it is added to the PATH during the execution of the command syslog-ng-ctl.

CLI Example:
salt '*' syslog_ng.stats	salt '*' syslog_ng.stats /home/user/install/syslog-ng/sbin

salt.modules.syslog_ng.stop(name=None)

Kills syslog-ng. This function is intended to be used from the state module.

Users shouldn't use this function, if the service module is available on their system. If syslog_ng.set_config_file is called before, this function will use the set binary path.

CLI Example:
salt '*' syslog_ng.stop

salt.modules.syslog_ng.version(syslog_ng_sbin_dir=None)

Returns the version of the installed syslog-ng. If syslog_ng_sbin_dir is specified, it is added to the PATH during the execution of the command syslog-ng.

CLI Example:
salt '*' syslog_ng.version	salt '*' syslog_ng.version /home/user/install/syslog-ng/sbin

salt.modules.syslog_ng.write_config(config, newlines=2)

Writes the given parameter config into the config file. This function is intended to be used from states.

If syslog_ng.set_config_file, is called before, this function will use the set config file.

CLI Example:
salt '*' syslog_ng.write_config config="# comment"

salt.modules.syslog_ng.write_version(name)

Removes the previous configuration file, then creates a new one and writes the name line. This function is intended to be used from states.

If syslog_ng.set_config_file, is called before, this function will use the set config file.

CLI Example:
salt '*' syslog_ng.write_version name="3.6"
31.16.265 salt.modules.sysmod

The sys module provides information about the available functions on the minion

salt.modules.sysmod.argspec(module='')
Return the argument specification of functions in Salt execution modules.

CLI Example:

salt '*' sys.argspec pkg.install
salt '*' sys.argspec sys
salt '*' sys.argspec

Module names can be specified as globs.
New in version 2015.5.0.

salt '*' sys.argspec 'pkg.*'

salt.modules.sysmod.doc('args')
Return the docstrings for all modules. Optionally, specify a module or a function to narrow the selection.
The strings are aggregated into a single document on the master for easy reading.
Multiple modules/functions can be specified.

CLI Example:

salt '*' sys.doc
salt '*' sys.doc sys
salt '*' sys.doc sys.doc
salt '*' sys.doc network.traceroute user.info

Modules can be specified as globs.
New in version 2015.5.0.

salt '*' sys.doc 'sys.*'
salt '*' sys.doc 'sys.list_*'

salt.modules.sysmod.list_functions('args', **kwargs)
List the functions for all modules. Optionally, specify a module or modules from which to list.

CLI Example:

salt '*' sys.list_functions
salt '*' sys.list_functions sys
salt '*' sys.list_functions sys user

Function names can be specified as globs.
New in version 2015.5.0.

salt '*' sys.list_functions 'sys.list_*'

salt.modules.sysmod.list_modules('args')
List the modules loaded on the minion
New in version 2015.5.0.

CLI Example:
salt '*' sys.list_modules

Module names can be specified as globs.

salt '*' sys.list_modules 's*'

salt.modules.sysmod.list_renderers(*args)
List the renderers loaded on the minion
New in version 2015.5.0.
CLI Example:
salt '*' sys.list_renderers

Render names can be specified as globs.
salt '*' sys.list_renderers 'yaml*'

salt.modules.sysmod.list_returner_functions(*args, **kwargs)
List the functions for all returner modules. Optionally, specify a returner module or modules from which to list.
New in version 2014.7.0.
CLI Example:
salt '*' sys.list_returner_functions	salt '*' sys.list_returner_functions mysql	salt '*' sys.list_returner_functions mysql etcd

Returner names can be specified as globs.
New in version 2015.5.0.
salt '*' sys.list_returner_functions 'sqlite3.get_*'

salt.modules.sysmod.list_runners(*args)
List the runners loaded on the minion
New in version 2014.7.0.
CLI Example:
salt '*' sys.list_runners

Runner names can be specified as globs.
New in version 2015.5.0.
salt '*' sys.list_runners 's*'

salt.modules.sysmod.list_runner_functions(*args, **kwargs)
List the functions for all runner modules. Optionally, specify a runner module or modules from which to list.
New in version 2014.7.0.
CLI Example:
salt '*' sys.list_runner_functions	salt '*' sys.list_runner_functions state	salt '*' sys.list_runner_functions state virt
Runner function names can be specified as globs.
New in version 2015.5.0.

```
salt '*' sys.list_runner_functions 'state.*' 'virt.*'
```

salt.modules.sysmod.list_runners(*args)
List the runners loaded on the minion
New in version 2014.7.0.
CLI Example:
```
salt '*' sys.list_runners
```

Runner names can be specified as globs.
New in version 2015.5.0.

```
salt '*' sys.list_runners 'm*'
```

salt.modules.sysmod.list_state_functions(*args, **kwargs)
List the functions for all state modules. Optionally, specify a state module or modules from which to list.
New in version 2014.7.0.
CLI Example:
```
salt '*' sys.list_state_functions
salt '*' sys.list_state_functions file
salt '*' sys.list_state_functions pkg user
```

State function names can be specified as globs.
New in version 2015.5.0.

```
salt '*' sys.list_state_functions 'file.*'
salt '*' sys.list_state_functions 'file.s*'
```

salt.modules.sysmod.list_state_modules(*args)
List the modules loaded on the minion
New in version 2014.7.0.
CLI Example:
```
salt '*' sys.list_state_modules
```

State module names can be specified as globs.
New in version 2015.5.0.

```
salt '*' sys.list_state_modules 'mysql_.*'
```

salt.modules.sysmod.reload_modules()
Tell the minion to reload the execution modules
CLI Example:
```
salt '*' sys.reload_modules
```

salt.modules.sysmod.renderer_doc(*args)
Return the docstrings for all renderers. Optionally, specify a renderer or a function to narrow the selection.
The strings are aggregated into a single document on the master for easy reading.
Multiplerendererscanbespecified.
Newinversion2015.5.0.

CLIExample:

```bash
salt '*' sys.renderer_doc
salt '*' sys.renderer_doc cheetah
salt '*' sys.renderer_doc jinja json
```

Renderer names can be specified as globs.

```bash
salt '*' sys.renderer_doc 'c*' 'j*' 
```

```bash
salt.modules.sysmod.returner_argspec(module='')
```
Return the argument specification of functions in Salt returner modules.
Newinversion2015.5.0.

CLIExample:

```bash
salt '*' sys.returner_argspec xmpp
salt '*' sys.returner_argspec xmpp smtp
salt '*' sys.returner_argspec
```

Returner names can be specified as globs.

```bash
salt '*' sys.returner_argspec 'sqlite3.*'
```

```bash
salt.modules.sysmod.returner_doc('args')
```
Return the docstrings for all returners. Optionally, specify a returner or a function to narrow the selection.
The strings are aggregated into a single document on the master for easy reading.
Multiplereturners/functions can be specified.
Newinversion2014.7.0.

CLIExample:

```bash
salt '*' sys.returner_doc
salt '*' sys.returner_doc sqlite3
salt '*' sys.returner_doc sqlite3.get_fun
salt '*' sys.returner_doc sqlite3.get_fun etcd.get_fun
```

Returner names can be specified as globs.

Newinversion2015.5.0.

```bash
salt '*' sys.returner_doc 'sqlite3.get_*'
```

```bash
salt.modules.sysmod.runner_argspec(module='')
```
Return the argument specification of functions in Salt runner modules.
Newinversion2015.5.0.

CLIExample:

```bash
salt '*' sys.runner_argspec state
salt '*' sys.runner_argspec http
salt '*' sys.runner_argspec
```
Runner names can be specified as globs.

```
salt 'winrepo.*' sys.runner_argspec
```

```
salt.modules.sysmod.runner_doc(*args)
```

Return the docstrings for all runners. Optionally, specify a runner or a function to narrow the selection.

The strings are aggregated into a single document on the master for easy reading.

Multiple runners/functions can be specified.

New in version 2014.7.0.

CLI Example:

```
salt '*' sys.runner_doc
salt '*' sys.runner_doc cache
salt '*' sys.runner_doc cache.grains
salt '*' sys.runner_doc cache.grains mine.get
```

Runner names can be specified as globs.

New in version 2015.5.0.

```
salt 'cache.clear_*'
```

```
salt.modules.sysmod.state_argspec(module='')
```

Return the argument specification of functions in Salt state modules.

New in version 2015.5.0.

CLI Example:

```
salt '*' sys.state_argspec pkg.installed
salt '*' sys.state_argspec file
salt '*' sys.state_argspec
```

State names can be specified as globs.

```
salt '*' sys.state_argspec 'pkg.*'
```

```
salt.modules.sysmod.state_doc(*args)
```

Return the docstrings for all states. Optionally, specify a state or a function to narrow the selection.

The strings are aggregated into a single document on the master for easy reading.

Multiple states/functions can be specified.

New in version 2014.7.0.

CLI Example:

```
salt '*' sys.state_doc
salt '*' sys.state_doc service
salt '*' sys.state_doc service.running
salt '*' sys.state_doc service.running ipables.append
```

State names can be specified as globs.

New in version 2015.5.0.

```
salt '*' sys.state_doc 'service.*' 'iptables.*'
```
31.16.266 salt.modules.sysrc

sysrc module for FreeBSD

salt.modules.sysrc.get(**kwargs)
   Return system rc configuration variables
   CLI Example:
   ```
salt '*' sysrc.get includeDefaults=True
   ```

salt.modules.sysrc.remove(name, **kwargs)
   Remove system rc configuration variables
   CLI Example:
   ```
salt '*' sysrc.remove name=sshd_enable
   ```

salt.modules.sysrc.set(name, value, **kwargs)
   Set system rc configuration variables
   CLI Example:
   ```
salt '*' sysrc.remove name=sshd_enable
   ```

31.16.267 salt.modules.system

Support for reboot, shutdown, etc

salt.modules.system.halt()
   Halt a running system
   CLI Example:
   ```
salt '*' system.halt
   ```

salt.modules.system.init(runlevel)
   Change the system runlevel on sysV compatible systems
   CLI Example:
   ```
salt '*' system.init 3
   ```

salt.modules.system.poweroff()
   Poweroff a running system
   CLI Example:
   ```
salt '*' system.poweroff
   ```

salt.modules.system.reboot()
   Reboot the system using the `reboot` command
   CLI Example:
   ```
salt '*' system.reboot
   ```

salt.modules.system.shutdown(at_time=None)
   Shutdown a running system
   ```
   at_time  The wait time in minutes before the system will be shutdown.
   ```
CLI Example:
```
salt '*' system.shutdown 5
```

### 31.16.268 salt.modules.system_profiler

System Profiler Module

Interface with Mac OSX's command-line System Profiler utility to get information about package receipts and installed applications.

New in version 2015.5.0.

**salt.modules.system_profiler**

- **applications()**
  Return the results of a call to `system_profiler -xml -detail full SPApplicationsDataType` as a dictionary. Top-level keys of the dictionary are the names of each set of install receipts, since there can be multiple receipts with the same name. Contents of each key are a list of dictionaries.

  CLI Example:
  ```
salt '*' systemprofiler.applications
  ```

- **receipts()**
  Return the results of a call to `system_profiler -xml -detail full SPInstallHistoryDataType` as a dictionary. Top-level keys of the dictionary are the names of each set of install receipts, since there can be multiple receipts with the same name. Contents of each key are a list of dictionaries.

  CLI Example:
  ```
salt '*' systemprofiler.receipts
  ```

### 31.16.269 salt.modules.systemd

Provide the service module for systemd

- **available(name)**
  Check that the given service is available taking into account template units.

  CLI Example:
  ```
salt '*' service.available sshd
  ```

- **disable(name, **kwargs)**
  Disable the named service to not start when the system boots

  CLI Example:
  ```
salt '*' service.disable <service name>
  ```

- **disabled(name)**
  Return if the named service is disabled to start on boot

  CLI Example:
  ```
salt '*' service.disabled <service name>
  ```
salt.modules.systemd.enable(name, **kwargs)
    Enable the named service to start when the system boots
    
    CLI Example:
    
    salt '*' service.enable <service name>

salt.modules.systemd.enabled(name, **kwargs)
    Return if the named service is enabled to start on boot
    
    CLI Example:
    
    salt '*' service.enabled <service name>

salt.modules.systemd.execs()
    Return a list of all files specified as ExecStart for all services.
    
    CLI Example:
    
    salt '*' service.execs

salt.modules.systemd.force_reload(name)
    Force-reload the specified service with systemd
    
    CLI Example:
    
    salt '*' service.force_reload <service name>

salt.modules.systemd.get_all()
    Return a list of all available services
    
    CLI Example:
    
    salt '*' service.get_all

salt.modules.systemd.get_disabled()
    Return a list of all disabled services
    
    CLI Example:
    
    salt '*' service.get_disabled

salt.modules.systemd.get_enabled()
    Return a list of all enabled services
    
    CLI Example:
    
    salt '*' service.get_enabled

salt.modules.systemd.mask(name)
    Mask the specified service with systemd
    
    CLI Example:
    
    salt '*' service.mask <service name>

salt.modules.systemd.masked(name)
    Return if the named service is masked.
    
    New in version 2015.8.0.
    
    CLI Example:
salt 'service.masked <service name>'

salt.modules.systemd.missing(name)
The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.

CLI Example:
salt 'service.missing sshd'

salt.modules.systemd.reload(name)
Reload the specified service with systemd

CLI Example:
salt 'service.reload <service name>'

salt.modules.systemd.restart(name)
Restart the specified service with systemd

CLI Example:
salt 'service.restart <service name>'

salt.modules.systemd.show(name)
Show properties of one or more units/jobs or the manager

CLI Example:
salt 'service.show <service name>'

salt.modules.systemd.start(name)
Start the specified service with systemd

CLI Example:
salt 'service.start <service name>'

salt.modules.systemd.status(name, sig=None)
Return the status for a service via systemd, returns a bool whether the service is running.

CLI Example:
salt 'service.status <service name>'

salt.modules.systemd.stop(name)
Stop the specified service with systemd

CLI Example:
salt 'service.stop <service name>'

salt.modules.systemd.systemctl_reload()
Reloads systemctl, an action needed whenever unit files are updated.

CLI Example:
salt 'service.systemctl_reload'

salt.modules.systemd.unmask(name)
Unmask the specified service with systemd

CLI Example:
31.16.270 salt.modules.temp

Simple module for creating temporary directories and files
This is a thin wrapper around Python’s tempfile module
New in version 2015.8.0.

```
salt.modules.temp.dir(suffix='`, prefix='tmp', parent=None)
```
Create a temporary directory

CLI Example:
```
salt '*' temp.dir
salt '*' temp.dir prefix='mytemp-' parent='/var/run/'
```

```
salt.modules.temp.file(suffix='`, prefix='tmp', parent=None)
```
Create a temporary file

CLI Example:
```
salt '*' temp.file
salt '*' temp.file prefix='mytemp-' parent='/var/run/'
```

31.16.271 salt.modules.test

Module for running arbitrary tests

```
salt.modules.test.arg(*args, **kwargs)
```
Print out the data passed into the function `*args` and `**kwargs`, this is used to both test the publication data and cli argument passing, but also to display the information available within the publication data. Returns `{``args'': args,``kwargs'': kwargs}.

CLI Example:
```
salt '*' test.arg 1 "two" 3.1 txt="hello" wow='{a: 1, b: "hello"}'
```

```
salt.modules.test.arg_repr(*args, **kwargs)
```
Print out the data passed into the function `*args` and `**kwargs`, this is used to both test the publication data and cli argument passing, but also to display the information available within the publication data. Returns `{``args'': repr(args),``kwargs'': repr(kwargs)}`.

CLI Example:
```
salt '*' test.arg_repr 1 "two" 3.1 txt="hello" wow='{a: 1, b: "hello"}'
```

```
salt.modules.test.arg_type(*args, **kwargs)
```
Print out the types of the args and kwargs. This is used to test the types of the args and kwargs passed down to the minion

CLI Example:
```
salt '*' test.arg_type 1 'int'
```
salt.modules.test.assertion(assertion)
    Assert the given argument
    CLI Example:
    ```
salt '*' test.assert False
    ```

salt.modules.test.attr_call()
    Call grains.items via the attribute
    CLI Example:
    ```
salt '*' test.attr_call
    ```

salt.modules.test.collatz(start)
    Execute the collatz conjecture from the passed starting number, returns the sequence and the time it took to compute. Used for performance tests.
    CLI Example:
    ```
salt '*' test.collatz 3
    ```

salt.modules.test.conf_test()
    Return the value for test.foo in the minion configuration file, or return the default value
    CLI Example:
    ```
salt '*' test.conf_test
    ```

salt.modules.test.cross_test(func, args=None)
    Execute a minion function via the __salt__ object in the test module, used to verify that the minion functions can be called via the __salt__ module.
    CLI Example:
    ```
salt '*' test.cross_test file.gid_to_group 0
    ```

salt.modules.test.echo(text)
    Return a string - used for testing the connection
    CLI Example:
    ```
salt '*' test.echo 'foo bar baz quo qux'
    ```

salt.modules.test.exception(message='Test Exception')
    Raise an exception
    Optionally provide an error message or output the full stack.
    CLI Example:
    ```
salt '*' test.exception 'Oh noes!' 
    ```

salt.modules.test.false()
    Always return False
    CLI Example:
    ```
salt '*' test.false
    ```
salt.modules.test.fib(num)
   Return the num-th Fibonacci number, and the time it took to compute in seconds. Used for performance tests.
   This function is designed to have terrible performance.
   CLI Example:
   
   salt '*' test.fib 3

salt.modules.test.get_opts()
   Return the configuration options passed to this minion
   CLI Example:
   
   salt '*' test.get_opts

salt.modules.test.kwarg(**kwargs)
   Print out the data passed into the function **kwargs, this is used to both test the publication data and cli kwarg passing, but also to display the information available within the publication data.
   CLI Example:
   
   salt '*' test.kwarg num=1 txt="two" env='{a: 1, b: "hello"}"

salt.modules.test.missing_func()

salt.modules.test.module_report()
   Return a dict containing all of the execution modules with a report on the overall availability via different references
   CLI Example:
   
   .. code-block:: bash

       salt '*' test.module_report

salt.modules.test.not_loaded()
   List the modules that were not loaded by the salt loader system
   CLI Example:
   
   salt '*' test.not_loaded

salt.modules.test.opts_pkg()
   Return an opts package with the grains and opts for this minion. This is primarily used to create the options used for master side state compiling routines
   CLI Example:
   
   salt '*' test.opts_pkg

salt.modules.test.outputter(data)
   Test the outputter, pass in data to return
   CLI Example:
   
   salt '*' test.outputter foobar

salt.modules.test.ping()
   Used to make sure the minion is up and responding. Not an ICMP ping.
   Returns True.
CLI Example:
```bash
salt '*' test.ping
```

salt.modules.test.provider(module)
Pass in a function name to discover what provider is being used
CLI Example:
```bash
salt '*' test.provider service
```

salt.modules.test.providers()
Return a dict of the provider names and the files that provided them
CLI Example:
```bash
salt '*' test.providers
```

salt.modules.test.rand_sleep(max=60)
Sleep for a random number of seconds, used to test long-running commands and minions returning at differing intervals
CLI Example:
```bash
salt '*' test.rand_sleep 60
```

salt.modules.test.rand_str(size=9999999999, hash_type=None)
Return a random string
```
size  size of the string to generate
hash_type  hash type to use
                      New in version 2015.5.2.
```
CLI Example:
```bash
salt '*' test.rand_str
```

salt.modules.test.retcodencode=42)
Test that the returncode system is functioning correctly
CLI Example:
```bash
salt '*' test.retcodencode=42
```

salt.modules.test.sleep(length)
Instruct the minion to initiate a process that will sleep for a given period of time.
CLI Example:
```bash
salt '*' test.sleep 20
```

salt.modules.test.stack()
Return the current stack trace
CLI Example:
```bash
salt '*' test.stack
```

salt.modules.test.true()
Always return True
CLI Example:
salt '*' test.true

salt.modules.test.try_(module, return_try_exception=False, **kwargs)
Try to run a module command. On an exception return None. If return_try_exception is set True return the exception. This can be helpful in templates where running a module might fail as expected.

CLI Example:

```
<pre>
{% for i in range(0,230) %}
    {{ salt['test.try'](module='ipmi.get_users', bmc_host='172.2.2.'+i)|yaml(None) }}
{% endfor %}
</pre>
```

salt.modules.test.tty(*args, **kwargs)
Depreciated! Moved to cmdmod.

CLI Example:

```
salt '*' test.tty tty0 'This is a test'
salt '*' test.tty pts3 'This is a test'
```

salt.modules.test.version()
Return the version of salt on the minion

CLI Example:

```
salt '*' test.version
```

salt.modules.test.versions()
Returns versions of components used by salt

CLI Example:

```
salt '*' test.versions_report
```

salt.modules.test.versions_information()
Report the versions of dependent and system software

CLI Example:

```
salt '*' test.versions_information
```

salt.modules.test.versions_report()
Returns versions of components used by salt

CLI Example:

```
salt '*' test.versions_report
```

31.16.272  salt.modules.test_virtual
Module for running arbitrary tests with a __virtual__ function

salt.modules.test_virtual.ping()

31.16.273  salt.modules.timezone
Module for managing timezone on POSIX-like systems.
salt.modules.timezone.get_hwclock()  
Get current hardware clock setting (UTC or localtime)  
   CLI Example:  
   ```py
   salt '*' timezone.get_hwclock
   ```

salt.modules.timezone.get_offset()  
Get current numeric timezone offset from UCT (i.e. -0700)  
   CLI Example:  
   ```py
   salt '*' timezone.get_offset
   ```

salt.modules.timezone.get_zone()  
Get current timezone (i.e. America/Denver)  
   CLI Example:  
   ```py
   salt '*' timezone.get_zone
   ```

salt.modules.timezone.get_zonecode()  
Get current timezone (i.e. PST, MDT, etc)  
   CLI Example:  
   ```py
   salt '*' timezone.get_zonecode
   ```

salt.modules.timezone.set_hwclock(clock)  
Sets the hardware clock to be either UTC or localtime  
   CLI Example:  
   ```py
   salt '*' timezone.set_hwclock UTC
   ```

salt.modules.timezone.set_zone(timezone)  
Unlinks, then symlinks /etc/localtime to the set timezone.  
   The timezone is crucial to several system processes, each of which SHOULD be restarted (for instance, whatever you system uses as its cron and syslog daemons). This will not be automagically done and must be done manually!  
   CLI Example:  
   ```py
   salt '*' timezone.set_zone 'America/Denver'
   ```

salt.modules.timezone.zone_compare(timezone)  
Checks the hash sum between the given timezone, and the one set in /etc/localtime. Returns True if they match, and False if not. Mostly useful for running state checks.  
   CLI Example:  
   ```py
   salt '*' timezone.zone_compare 'America/Denver'
   ```

### 31.16.274 salt.modules.tls

A salt module for SSL/TLS. Can create a Certificate Authority (CA) or use Self-Signed certificates.

   depends  
   - PyOpenSSL Python module (0.10 or later, 0.14 or later for
X509 extension support

**configuration** Add the following values in `/etc/salt/minion` for the CA module to function properly:

```plaintext
cacert_base_path: '/etc/pki'
```

### CLI Example #1 Creating a CA, a server request and its signed certificate:

```bash
# salt-call tls.create_ca my_little \
days=5 \nCN='My Little CA' \nC=US \nST=Utah \nL=Salt Lake City \nO=Saltstack \nemailAddress=pleasedonemail@thisisnot.coms

Created Private Key: "/etc/pki/my_little/my_little_ca_cert.key"
Created CA "my_little_ca": "/etc/pki/my_little_ca/my_little_ca_cert.crt"

# salt-call tls.create_csr my_little CN=www.thisisnot.coms
Created Private Key: "/etc/pki/my_little/certs/www.thisisnot.coms.key"
Created CSR for "www.thisisnot.coms": "/etc/pki/my_little/certs/www.thisisnot.coms.csr"

# salt-call tls.create_ca_signed_cert my_little CN=www.thisisnot.coms
Created Certificate for "www.thisisnot.coms": "/etc/pki/my_little/certs/www.thisisnot.coms.crt"
```

### CLI Example #2: Creating a client request and its signed certificate

```bash
# salt-call tls.create_csr my_little CN=DBReplica_No.1 cert_type=client
Created Private Key: "/etc/pki/my_little/certs/DBReplica_No.1.key".
Created CSR for "DBReplica_No.1": "/etc/pki/my_little/certs/DBReplica_No.1.csr".

# salt-call tls.create_ca_signed_cert my_little CN=DBReplica_No.1
Created Certificate for "DBReplica_No.1": "/etc/pki/my_little/certs/DBReplica_No.1.crt"
```

### CLI Example #3: Creating both a server and client req + cert for the same CN

```bash
# salt-call tls.create_csr my_little CN=MasterDBReplica_No.2 \
   cert_type=client
Created Private Key: "/etc/pki/my_little/certs/MasterDBReplica_No.2.key".
Created CSR for "DBReplica_No.1": "/etc/pki/my_little/certs/MasterDBReplica_No.2.csr".

# salt-call tls.create_ca_signed_cert my_little CN=MasterDBReplica_No.2
Created Certificate for "DBReplica_No.1": "/etc/pki/my_little/certs/MasterDBReplica_No.2.crt"

# salt-call tls.create_csr my_little CN=MasterDBReplica_No.2 \
   cert_type=server
Certificate "MasterDBReplica_No.2" already exists
(doh!)

# salt-call tls.create_csr my_little CN=MasterDBReplica_No.2 \
   cert_type=server type_ext=True
Created Private Key: "/etc/pki/my_little/certs/DBReplica_No.1_client.key".
Created CSR for "DBReplica_No.1": "/etc/pki/my_little/certs/DBReplica_No.1_client.csr".

# salt-call tls.create_ca_signed_cert my_little CN=MasterDBReplica_No.2
Certificate "MasterDBReplica_No.2" already exists
# salt-call tls.create_ca_signed_cert my_little CN=MasterDBReplica_No.2 cert_type=server type_ext=True
Created Certificate for "MasterDBReplica_No.2": "/etc/pki/my_little/certs/MasterDBReplica_No.2_server.crt"

CLI Example #4: Create a server req + cert with non-CN filename for the cert

# salt-call tls.create_csr my_little CN=www.anothersometh.ing cert_type=server type_ext=True
Created Private Key: "/etc/pki/my_little/certs/www.anothersometh.ing_server.key." Created CSR for "DBReplica_No.1": "/etc/pki/my_little/certs/www.anothersometh.ing_server.csr."

# salt-call tls_create_ca_signed_cert my_little CN=www.anothersometh.ing cert_type=server cert_filename="something_completely_different"
Created Certificate for "www.anothersometh.ing": /etc/pki/my_little/certs/something_completely_different.crt

salt.modules.tls.ca_exists(ca_name, cacert_path=None, ca_filename=None)
Verify whether a Certificate Authority (CA) already exists
    ca_name  name of the CA
    cacert_path  absolute path to ca certificates root directory
    ca_filename  alternative filename for the CA

    New in version 2015.5.3.
    CLI Example:
    salt '*' tls.ca_exists test_ca /etc/certs

salt.modules.tls.cert_base_path(cacert_path=None)
Return the base path for certs from CLI or from options
    cacert_path  absolute path to ca certificates root directory

    CLI Example:
    salt '*' tls.cert_base_path

salt.modules.tls.cert_info(cert_path, digest='sha256')
Return information for a particular certificate
    cert_path  path to the cert file
    digest  what digest to use for fingerprinting

    CLI Example:
    salt '*' tls.cert_info /dir/for/certs/cert.pem

salt.modules.tls.create_ca(ca_name, bits=2048, days=365, CN='localhost', C='US', ST='Utah', L='Salt Lake City', O='SaltStack', OU=None, emailAddress='xyz@pdq.net', fix-mode=False, cacert_path=None, ca_filename=None, digest='sha256', onlyif=None, unless=None, replace=False)
Create a Certificate Authority (CA)
    ca_name  name of the CA
    bits  number of RSA key bits, default is 2048
    days  number of days the CA will be valid, default is 365
CN common name in the request, default is `localhost`
C country, default is `US`
ST state, default is `Utah`
L locality, default is `Centerville`, the city where SaltStack originated
O organization, default is `SaltStack`
OU organizational unit, default is None
emailAddress email address for the CA owner, default is `xyz@pdq.net`
cacert_path absolute path to ca certificates root directory
c_filename alternative filename for the CA

digest The message digest algorithm. Must be a string describing a digest algorithm supported by OpenSSL
(by EVP_get_digestbyname, specifically). For example, `md5` or `sha1`. Default: `sha256`
replace Replace this certificate even if it exists

Writes out a CA certificate based upon defined config values. If the file already exists, the function just returns
assuming the CA certificate already exists.

If the following values were set:

```
cert_base_path='/etc/pki'
ca_name='koji'
```

the resulting CA, and corresponding key, would be written in the following location:

```
/etc/pki/koji/koji_ca_cert.crt
/etc/pki/koji/koji_ca_cert.key
```

CLI Example:

```
salt '*' tls.create_ca test_ca
```

salt.modules.tls.create_ca_signed_cert(ca_name, CN, days=365, cacert_path=None, ca_filename=None, cert_path=None, cert_filename=None, digest='sha256', cert_type=None, type_ext=False, replace=False)

Create a Certificate (CERT) signed by a named Certificate Authority (CA)

If the certificate file already exists, the function just returns assuming the CERT already exists.

The CN must match an existing CSR generated by create_csr. If it does not, this method does nothing.

c_name name of the CA
CN common name matching the certificate signing request
days number of days certificate is valid, default is 365 (1 year)
cacert_path absolute path to ca certificates root directory
c_filename alternative filename for the CA

cert_path full path to the certificates directory
cert_filename  alternative filename for the certificate, useful when using special characters in the CN. If this option is set it will override the certificate filename output effects of cert_type. type_ext will be completely overridden.

New in version 2015.5.3.

digest  The message digest algorithm. Must be a string describing a digest algorithm supported by OpenSSL (by EVP_get_digestbyname, specifically). For example, `md5` or `sha1`. Default: `sha256`

replace  Replace this certificate even if it exists

New in version 2015.5.1.

cert_type  string. Either `server` or `client` (see create_csr() for details).

If create_csr(type_ext=True) this function must be called with the same cert_type so it can find the CSR file.

Note:  create_csr() defaults to cert_type='server'; therefore, if it was also called with type_ext, cert_type becomes a required argument for create_ca_signed_cert()

type_ext  bool. If set True, use cert_type as an extension to the CN when formatting the filename.

e.g.: some_subject_CN_server.crt or some_subject_CN_client.crt

This facilitates the context where both types are required for the same subject

If cert_filename is not None, setting type_ext has no effect

If the following values were set:

| ca.cert_base_path='/etc/pki' |
| ca_name='koji' |
| CN='test.egavas.org' |

the resulting signed certificate would be written in the following location:

| /etc/pki/koji/certs/test.egavas.org.crt |

CLI Example:

| salt '*' tls.create_ca_signed_cert test localhost |

salt.modules.tls.create_csr(ca_name, bits=2048, CN='localhost', C='US', ST='Utah', L='Salt Lake City', O='SaltStack', OU=None, emailAddress='xyz@pdq.net', subjectAltName=None, cacert_path=None, ca_filename=None, csr_path=None, csr_filename=None, digest='sha256', type_ext=False, cert_type='server', replace=False)

Create a Certificate Signing Request (CSR) for a particular Certificate Authority (CA)

c_a_name  name of the CA

bits  number of RSA key bits, default is 2048

CN  common name in the request, default is `localhost`

C  country, default is `US`

ST  state, default is `Utah`

L  locality, default is `Centerville`, the city where SaltStack originated

O  organization, default is `SaltStack` NOTE: Must the same as CA certificate or an error will be raised
OU organizational unit, default is None

e-mailAddress email address for the request, default is `xyz@pdq.net`

subjectAltName valid subjectAltNames in full form, e.g. to add DNS entry you would call this function with this value:

examples: ['DNS:somednsname.com', 'DNS:1.2.3.4', 'IP:1.2.3.4', 'IP:2001:4801:7821:77:be76:4eff:fe11:e51', 'email:me@i.like.pie.com']

Note: some libraries do not properly query IP: prefixes, instead looking for the given req. source with a DNS: prefix. To be thorough, you may want to include both DNS: and IP: entries if you are using subjectAltNames for destinations for your TLS connections. e.g.: requests to https://1.2.3.4 will fail from python's requests library w/out the second entry in the above list

New in version 2015.8.0.

cert_type Specify the general certificate type. Can be either server or client. Indicates the set of common extensions added to the CSR.

server: {
    'basicConstraints': 'CA:FALSE',
    'extendedKeyUsage': 'serverAuth',
    'keyUsage': 'digitalSignature, keyEncipherment'
}

client: {
    'basicConstraints': 'CA:FALSE',
    'extendedKeyUsage': 'clientAuth',
    'keyUsage': 'nonRepudiation, digitalSignature, keyEncipherment'
}

type_ext boolean. Whether or not to extend the filename with CN_[cert_type] This can be useful if a server and client certificate are needed for the same CN. Defaults to False to avoid introducing an unexpected file naming pattern

The files normally named some_subject_CN.csr and some_subject_CN.key will then be saved

replace Replace this signing request even if it exists

New in version 2015.5.1.

Writes out a Certificate Signing Request (CSR) If the file already exists, the function just returns assuming the CSR already exists.

If the following values were set:

c.a.cert_base_path='/etc/pki'
c.a_name='koji'
CN='test.egavas.org'

the resulting CSR, and corresponding key, would be written in the following location:

/etc/pki/koji/certs/test.egavas.org.csr
/etc/pki/koji/certs/test.egavas.org.key

CLI Example:
salt '*' tls.create_csr test
salt.modules.tls.create_empty_crl(ca_name, cacert_path=None, ca_filename=None, crl_file=None)

Create an empty Certificate Revocation List.
New in version 2015.8.0.

cr_name name of the CA
cacert_path absolute path to ca certificates root directory
c_filename alternative filename for the CA

New in version 2015.5.3.

c_filename full path to the CRL file

CLI Example:
salt '*' tls.create_empty_crl ca_name='koji' ca_filename='ca'

salt.modules.tls.create_pkcs12(ca_name, CN, passphrase='`, cacert_path=None, replace=False)

Create a PKCS#12 browser certificate for a particular Certificate (CN)

cr_name name of the CA
CN common name matching the certificate signing request
passphrase used to unlock the PKCS#12 certificate when loaded into the browser
cacert_path absolute path to ca certificates root directory
replace Replace this certificate even if it exists

New in version 2015.5.1.

If the following values were set:
ca.cert_base_path='/etc/pki'
ca_name='koji'
CN='test.egavas.org'

the resulting signed certificate would be written in the following location:

/etc/pki/koji/certs/test.egavas.org.p12

CLI Example:
salt '*' tls.create_pkcs12 test localhost

salt.modules.tls.create_self_signed_cert(tls_dir='tls', bits=2048, days=365, CN='localhost', C='US', ST='Utah', L='Salt Lake City', O='SaltStack', OU=None, emailAddress='xyz@pdq.net', cacert_path=None, cert_filename=None, digest='sha256', replace=False)

Create a Self-Signed Certificate (CERT)

tls_dir location appended to the ca.cert_base_path, default is `tls'
bts number of RSA key bits, default is 2048
CN common name in the request, default is `localhost'
C country, default is `US'
ST state, default is `Utah'
locality, default is "Centerville", the city where SaltStack originated
organization, default is "SaltStack" NOTE: Must the same as CA certificate or an error will be raised
organizational unit, default is None
email address for the request, default is `xyz@pdq.net`
absolute path to ca certificates root directory
The message digest algorithm. Must be a string describing a digest algorithm supported by OpenSSL
(by EVP_get_digestbyname, specifically). For example, `md5` or `sha1`. Default: `sha256`
Replace this certificate even if it exists
New in version 2015.5.1.
Writes out a Self-Signed Certificate (CERT). If the file already exists, the function just returns.
If the following values were set:
```
cacert_path='/etc/pki'
tls_dir='koji'
CN='test.egavas.org'
```
the resulting CERT, and corresponding key, would be written in the following location:
```
/etc/pki/koji/certs/test.egavas.org.crt
/etc/pki/koji/certs/test.egavas.org.key
```
CLI Example:
```
salt '*' tls.create_self_signed_cert
```
Passing options from the command line:
```
salt 'minion' tls.create_self_signed_cert CN='test.mysite.org'
```
salt.modules.tls.get_ca(ca_name , as_text=False, cacert_path=None)
Get the certificate path or content
```
ca_name name of the CA
as_text if true, return the certificate content instead of the path
cacert_path absolute path to ca certificates root directory
```
CLI Example:
```
salt '*' tls.get_ca test_ca as_text=False cacert_path=/etc/certs
```
salt.modules.tls.get_ca_signed_cert(ca_name , CN='localhost', as_text=False, cacert_path=None, cert_filename=None)
Get the certificate path or content
```
ca_name name of the CA
CN common name of the certificate
as_text if true, return the certificate content instead of the path
cacert_path absolute path to certificates root directory
```
Alternative filename for the certificate, useful when using special characters in the CN
New in version 2015.5.3.
CLI Example:

```
salt '*' tls.get_ca_signed_cert test_ca CN=localhost as_text=False cacert_path=/etc/certs
```

salt.modules.tls.get_ca_signed_key(ca_name, CN='localhost', as_text=False, cacert_path=None, key_filename=None)

Get the certificate path or content

- **ca_name**  name of the CA
- **CN**  common name of the certificate
- **as_text**  if true, return the certificate content instead of the path
- **cacert_path**  absolute path to certificates root directory
- **key_filename**  alternative filename for the key, useful when using special characters

New in version 2015.5.3.

CLI Example:

```
salt '*' tls.get_ca_signed_key test_ca CN=localhost as_text=False cacert_path=/etc/certs
```

salt.modules.tls.get_extensions(cert_type)

Fetch X509 and CSR extension definitions from tls:extensions: (common|server|client) or set them to standard defaults.

New in version 2015.8.0.

- **cert_type**  The type of certificate such as server or client.

CLI Example:

```
salt '*' tls.get_extensions client
```

salt.modules.tls.maybe_fix_ssl_version(ca_name, cacert_path=None, ca_filename=None)

Check that the X509 version is correct (was incorrectly set in previous salt versions). This will fix the version if needed.

- **ca_name**  ca authority name
- **cacert_path**  absolute path to ca certificates root directory
- **ca_filename**  alternative filename for the CA

New in version 2015.5.3.

CLI Example:

```
salt '*' tls.maybe_fix_ssl_version test_ca /etc/certs
```

salt.modules.tls.revoke_cert(ca_name, CN, cacert_path=None, ca_filename=None, cert_path=None, cert_filename=None, crl_file=None)

Revoke a certificate.

New in version 2015.8.0.

- **ca_name**  Name of the CA.
- **CN**  Common name matching the certificate signing request.
- **cacert_path**  Absolute path to ca certificates root directory.
- **ca_filename**  Alternative filename for the CA.
cert_path  Path to the cert file.
cert_filename  Alternative filename for the certificate, useful when using special characters in the CN.
crl_file  Full path to the CRL file.

CLI Example:
salt '*' tls.revoke_cert ca_name='koji' ca_filename='ca'

```
salt.modules.tls.set_ca_path(cacert_path)
If wanted, store the aforementioned cacert_path in context to be used as the basepath for further operations

CLI Example:
salt '*' tls.set_ca_path /etc/certs
```

31.16.275 salt.modules.tomcat

Support for Tomcat

This module uses the manager webapp to manage Apache tomcat webapps. If the manager webapp is not configured some of the functions won't work.

Note: The config format was changed in 2014.7.0, but backwards compatibility for the old-style config will be in the 2014.7.1 release.

The following grains/pillar should be set:

```
tomcat-manager:
  user: <username>
  passwd: <password>
```

or the old format:

```
tomcat-manager.user: <username>
tomcat-manager.passwd: <password>
```

Also configure a user in the conf/tomcat-users.xml file:

```
<?xml version='1.0' encoding='utf-8'?>
<tomcat-users>
  <role rolename="manager-script"/>
  <user username="tomcat" password="tomcat" roles="manager-script"/>
</tomcat-users>
```

Note:

- if you use only this module for deployments you've might want to strict access to the manager only from localhost for more info: http://tomcat.apache.org/tomcat-7.0-doc/manager-howto.html#Configuring_Manager_Application_Access

- Tested on:
  JVM Vendor: Sun Microsystems Inc.
  JVM Version: 1.6.0_43-b01
  OS Architecture: amd64
OS Name: Linux
OS Version: 2.6.32-358.el6.x86_64
Tomcat Version: Apache Tomcat/7.0.37

```
salt.modules.tomcat.deploy_war(war, context, force='no', url='http://localhost:8080/manager',
saltenv='base', timeout=180, env=None,
temp_war_location=None)
```

Deploy a WAR file

- `war` absolute path to WAR file (should be accessible by the user running tomcat) or a path supported by the salt.modules.cp.get_file function
- `context` the context path to deploy
- `force` [False] set True to deploy the webapp even one is deployed in the context
- `url` [http://localhost:8080/manager] the URL of the server manager webapp
- `saltenv` [base] the environment for WAR file in used by salt.modules.cp.get_url function
- `timeout` [180] timeout for HTTP request
- `temp_war_location` [None] use another location to temporarily copy to war file by default the system's temp directory is used

CLI Examples:

```
cp module
salt '*' tomcat.deploy_war salt://application.war /api
salt '*' tomcat.deploy_war salt://application.war /api no
salt '*' tomcat.deploy_war salt://application.war /api yes http://localhost:8080/manager
```

minion local file system

```
salt '*' tomcat.deploy_war /tmp/application.war /api
salt '*' tomcat.deploy_war /tmp/application.war /api no
salt '*' tomcat.deploy_war /tmp/application.war /api yes http://localhost:8080/manager
```

```
salt.modules.tomcat.fullversion()
```

Return all server information from catalina.sh version

CLI Example:
```
salt '*' tomcat.fullversion
```

```
salt.modules.tomcat.leaks(url='http://localhost:8080/manager', timeout=180)
```

Find memory leaks in tomcat

- `url` [http://localhost:8080/manager] the URL of the server manager webapp
- `timeout` [180] timeout for HTTP request

CLI Examples:
```
salt '*' tomcat.leaks
```

```
salt.modules.tomcat.ls(url='http://localhost:8080/manager', timeout=180)
```

list all the deployed webapps

- `url` [http://localhost:8080/manager] the URL of the server manager webapp
- `timeout` [180] timeout for HTTP request

31.16. Full list of builtin execution modules
CLI Examples:

salt '*' tomcat.ls
salt '*' tomcat.ls http://localhost:8080/manager

salt.modules.tomcat.passwd(passwd, user='-', alg='md5', realm=None)
This function replaces the $CATALINA_HOME/bin/digest.sh script convert a clear-text password to the
$CATALINA_BASE/conf/tomcat-users.xml format

CLI Examples:

salt '*' tomcat.passwd secret
salt '*' tomcat.passwd secret tomcat sha1
salt '*' tomcat.passwd secret tomcat sha1 'Protected Realm'

salt.modules.tomcat.reload(app, url='http://localhost:8080/manager', timeout=180)
Reload the webapp
app the webapp context path
url [http://localhost:8080/manager] the URL of the server manager webapp
timeout [180] timeout for HTTP request

CLI Examples:

salt '*' tomcat.reload /jenkins
salt '*' tomcat.reload /jenkins http://localhost:8080/manager

salt.modules.tomcat.serverinfo(url='http://localhost:8080/manager', timeout=180)
return details about the server
url [http://localhost:8080/manager] the URL of the server manager webapp
timeout [180] timeout for HTTP request

CLI Examples:

salt '*' tomcat.serverinfo
salt '*' tomcat.serverinfo http://localhost:8080/manager

salt.modules.tomcat.sessions(app, url='http://localhost:8080/manager', timeout=180)
return the status of the webapp sessions
app the webapp context path
url [http://localhost:8080/manager] the URL of the server manager webapp
timeout [180] timeout for HTTP request

CLI Examples:

salt '*' tomcat.sessions /jenkins
salt '*' tomcat.sessions /jenkins http://localhost:8080/manager

salt.modules.tomcat.signal(signal=None)
Signals catalina to start, stop, securestart, forcestop.

CLI Example:

salt '*' tomcat.signal start

salt.modules.tomcat.start(app, url='http://localhost:8080/manager', timeout=180)
Start the webapp
**app** the webapp context path

**url** [http://localhost:8080/manager] the URL of the server manager webapp

**timeout** timeout for HTTP request

CLI Examples:

```shell
salt '*' tomcat.start /jenkins
salt '*' tomcat.start /jenkins http://localhost:8080/manager
```

**salt.modules.tomcat.status**(*url='http://localhost:8080/manager', timeout=180*)

Used to test if the tomcat manager is up

**url** [http://localhost:8080/manager] the URL of the server manager webapp

**timeout** [180] timeout for HTTP request

CLI Examples:

```shell
salt '*' tomcat.status
salt '*' tomcat.status http://localhost:8080/manager
```

**salt.modules.tomcat.status_webapp**(*app, url='http://localhost:8080/manager', timeout=180*)

return the status of the webapp (stopped | running | missing)

**app** the webapp context path

**url** [http://localhost:8080/manager] the URL of the server manager webapp

**timeout** [180] timeout for HTTP request

CLI Examples:

```shell
salt '*' tomcat.status_webapp /jenkins
salt '*' tomcat.status_webapp /jenkins http://localhost:8080/manager
```

**salt.modules.tomcat.stop**(*app, url='http://localhost:8080/manager', timeout=180*)

Stop the webapp

**app** the webapp context path

**url** [http://localhost:8080/manager] the URL of the server manager webapp

**timeout** [180] timeout for HTTP request

CLI Examples:

```shell
salt '*' tomcat.stop /jenkins
salt '*' tomcat.stop /jenkins http://localhost:8080/manager
```

**salt.modules.tomcat.undeploy**(*app, url='http://localhost:8080/manager', timeout=180*)

Undeploy a webapp

**app** the webapp context path

**url** [http://localhost:8080/manager] the URL of the server manager webapp

**timeout** [180] timeout for HTTP request

CLI Examples:

```shell
salt '*' tomcat.undeploy /jenkins
salt '*' tomcat.undeploy /jenkins http://localhost:8080/manager
```
salt.modules.tomcat.version()
   Return server version from catalina.sh version
   
   CLI Example:
   salt '*' tomcat.version

31.16.276 salt.modules.trafficserver

Apache Traffic Server execution module.

New in version 2015.8.0.

traffic_line is used to execute individual Traffic Server commands and to script multiple commands in a shell.

salt.modules.trafficserver.alarms()
   List all alarm events that have not been acknowledged (cleared).
   salt '*' trafficserver.alarms

salt.modules.trafficserver.bounce_cluster()
   Bounce all Traffic Server nodes in the cluster. Bouncing Traffic Server shuts down and immediately restarts
   Traffic Server, node-by-node.
   salt '*' trafficserver.bounce_cluster

salt.modules.trafficserver.bounce_local(drain=False)
   Bounce Traffic Server on the local node. Bouncing Traffic Server shuts down and immediately restarts the
   Traffic Server node.
   
   This option modifies the behavior of traffic_line -b and traffic_line -L such that traffic_server is
   not shut down until the number of active client connections drops to the number given by the
   proxy.config.restart.active_client_threshold configuration variable.
   
   salt '*' trafficserver.bounce_local
   salt '*' trafficserver.bounce_local drain=True

salt.modules.trafficserver.clear_alarms(alarm)
   Clear (acknowledge) an alarm event. The arguments are “all” for all current alarms, a specific alarm number
   (e.g. “1”), or an alarm string identifier (e.g. “MGMT_ALARM_PROXY_CONFIG_ERROR”).
   
   salt '*' trafficserver.clear_alarms [all | #event | name]

salt.modules.trafficserver.clear_cluster()
   Clears accumulated statistics on all nodes in the cluster.
   
   salt '*' trafficserver.clear_cluster

salt.modules.trafficserver.clear_node()
   Clears accumulated statistics on the local node.
   
   salt '*' trafficserver.clear_node

salt.modules.trafficserver.match_var(regex)
   Display the current values of all performance statistics or configuration variables whose names match the
   given regular expression.
salt '%%' trafficserver.match_var regex

salt.modules.trafficserver.offline(path)
Mark a cache storage device as offline. The storage is identified by a path which must match exactly a path
specified in storage.config. This removes the storage from the cache and redirects requests that would have
used this storage to other storage. This has exactly the same effect as a disk failure for that storage. This does
not persist across restarts of the traffic_server process.

salt '%%' trafficserver.offline /path/to/cache

salt.modules.trafficserver.read_var('args)
Read variable definitions from the traffic_line command
This allows reading arbitrary key=value pairs from within trafficserver

salt '%%' trafficserver.read_var proxy.process.http.tcp_hit_count_stat

salt.modules.trafficserver.refresh()
Initiate a Traffic Server configuration file reread. Use this command to update the running configuration after
any configuration file modification.
The timestamp of the last reconfiguration event (in seconds since epoch) is published in the
proxy.node.config.reconfigure_time metric.

salt '%%' trafficserver.refresh

salt.modules.trafficserver.restart_cluster()
Restart the traffic_manager process and the traffic_server process on all the nodes in a cluster.

salt '%%' trafficserver.restart_cluster

salt.modules.trafficserver.restart_local(drain=False)
Restart the traffic_manager and traffic_server processes on the local node.
This option modifies the behavior of traffic_line -b and traffic_line -L such that traffic_server is
not shut down until the number of active client connections drops to the number given by the
proxy.config.restart.active_client_threshold configuration variable.

salt '%%' trafficserver.restart_local
salt '%%' trafficserver.restart_local drain=True

salt.modules.trafficserver.set_var(variable, value)

salt '%%' trafficserver.set_var proxy.config.http.server_ports

salt.modules.trafficserver.shutdown()
Shut down Traffic Server on the local node.

salt '%%' trafficserver.shutdown

salt.modules.trafficserver.startup()
Start Traffic Server on the local node.

salt '%%' trafficserver.start

salt.modules.trafficserver.status()
Show the current proxy server status, indicating if we’re running or not.
salt ' '*' trafficserver.status

salt.modules.trafficserver.zero_cluster()
Reset performance statistics to zero across the cluster.
salt ' '*' trafficserver.zero_cluster

salt.modules.trafficserver.zero_node()
Reset performance statistics to zero on the local node.
salt ' '*' trafficserver.zero_cluster

31.16.277 salt.modules.tuned

Interface to Red Hat tuned-adm module

maintainer  Syed Ali <alicsyed@gmail.com>
maturity  new
depends  tuned-adm
platform  Linux

salt.modules.tuned.active()
Return current active profile
CLI Example:
salt ' '*' tuned.active

salt.modules.tuned.list()
List the profiles available
CLI Example:
salt ' '*' tuned.list

salt.modules.tuned.off()
Turn off all profiles
CLI Example:
salt ' '*' tuned.off

salt.modules.tuned.profile(profile_name)
Activate specified profile
CLI Example:
salt ' '*' tuned.profile virtual-guest

31.16.278 salt.modules.twilio_notify

Module for notifications via Twilio
New in version 2014.7.0.

depends
  • twilio python module
configuration Configure this module by specifying the name of a configuration profile in the minion
config, minion pillar, or master config.

For example:

```
my-twilio-account:
twilio.account_sid: AC32a3c83990934481add5ce1659f04d2
twilio.auth_token: mytoken
```

```
salt.modules.twilio_notify.send_sms(profile, body, to, from_)
```

Send an sms

CLI Example:

```
twilio.send_sms twilio-account "Test sms" +18019999999 +18011111111
```

### 31.16.279 salt.modules.udev

Manage and query udev info

New in version 2015.8.0.

```
salt.modules.udev.env(dev)
```

Return all environment variables udev has for dev

CLI Example:

```
salt '*' udev.env /dev/sda
salt '*' udev.env /sys/class/net/eth0
```

```
salt.modules.udev.info(dev)
```

Extract all info delivered by udevadm

CLI Example:

```
salt '*' udev.info /dev/sda
salt '*' udev.info /sys/class/net/eth0
```

```
salt.modules.udev.links(dev)
```

Return all udev-created device symlinks

CLI Example:

```
salt '*' udev.links /dev/sda
salt '*' udev.links /sys/class/net/eth0
```

```
salt.modules.udev.name(dev)
```

Return the actual dev name(s?) according to udev for dev

CLI Example:

```
salt '*' udev.dev /dev/sda
salt '*' udev.dev /sys/class/net/eth0
```

```
salt.modules.udev.path(dev)
```

Return the physical device path(s?) according to udev for dev

CLI Example:

```
salt '*' udev.path /dev/sda
salt '*' udev.path /sys/class/net/eth0
```
31.16.280 salt.modules.upstart

Module for the management of upstart systems. The Upstart system only supports service starting, stopping and restarting.

Currently (as of Ubuntu 12.04) there is no tool available to disable Upstart services (like update-rc.d). This[1] is the recommended way to disable an Upstart service. So we assume that all Upstart services that have not been disabled in this manner are enabled.

But this is broken because we do not check to see that the dependent services are enabled. Otherwise we would have to do something like parse the output of `"initctl show-config"` to determine if all service dependencies are enabled to start on boot. For example, see the "start on" condition for the lightdm service below[2]. And this would be too hard. So we wait until the upstart developers have solved this problem. :) This is to say that an Upstart service that is enabled may not really be enabled.

Also, when an Upstart service is enabled, should the dependent services be enabled too? Probably not. But there should be a notice about this, at least.


[2] example upstart configuration file:

```
lightdm
emits login-session-start
emits desktop-session-start
emits desktop-shutdown
start on (((filesystem and runlevel ![06]) and started dbus) and (drm-device-added card0 PRIMARY_DEVICE_FOR_DISPLAY=1 or stopped udev-fallback-graphics)) or runlevel PREVLEVEL=S)
stop on runlevel [016]
```

**Warning:** This module should not be used on Red Hat systems. For these, the rh_service module should be used, as it supports the hybrid upstart/sysvinit system used in RHEL/CentOS 6.

salt.modules.upstart.available(name)

   Returns True if the specified service is available, otherwise returns False.

   CLI Example:

   ```
salt '*' service.available sshd
   ```

salt.modules.upstart.disable(name, **kwargs)

   Disable the named service from starting on boot

   CLI Example:

   ```
salt '*' service.disable <service name>
   ```

salt.modules.upstart.disabled(name)

   Check to see if the named service is disabled to start on boot

   CLI Example:

   ```
salt '*' service.disabled <service name>
   ```

salt.modules.upstart.enable(name, **kwargs)

   Enable the named service to start at boot

   CLI Example:

   ```
salt '*' service.enable <service name>
   ```
### Salt Modules: upstart

#### enabled

**salt.modules.upstart.enabled(name, **kwargs)**

Check to see if the named service is enabled to start on boot

**CLI Example:**

```
salt '*' service.enabled <service name>
```

#### force_reload

**salt.modules.upstart.force_reload(name)**

Force-reload the named service

**CLI Example:**

```
salt '*' service.force_reload <service name>
```

#### full_restart

**salt.modules.upstart.full_restart(name)**

Do a full restart (stop/start) of the named service

**CLI Example:**

```
salt '*' service.full_restart <service name>
```

#### get_all

**salt.modules.upstart.get_all()**

Return all installed services

**CLI Example:**

```
salt '*' service.get_all
```

#### get_disabled

**salt.modules.upstart.get_disabled()**

Return the disabled services

**CLI Example:**

```
salt '*' service.get_disabled
```

#### get_enabled

**salt.modules.upstart.get_enabled()**

Return the enabled services

**CLI Example:**

```
salt '*' service.get_enabled
```

#### missing

**salt.modules.upstart.missing(name)**

The inverse of service.available. Returns True if the specified service is not available, otherwise returns False.

**CLI Example:**

```
salt '*' service.missing sshd
```

#### reload

**salt.modules.upstart.reload(name)**

Reload the named service

**CLI Example:**

```
salt '*' service.reload <service name>
```

#### restart

**salt.modules.upstart.restart(name)**

Restart the named service

**CLI Example:**
salt '*' service.restart <service name>

salt.modules.upstart.start(name)
Start the specified service
CLI Example:
    salt '*' service.start <service name>

salt.modules.upstart.status(name, sig=None)
Return the status for a service, returns a bool whether the service is running.
CLI Example:
    salt '*' service.status <service name>

salt.modules.upstart.stop(name)
Stop the specified service
CLI Example:
    salt '*' service.stop <service name>

31.16.281 salt.modules.uptime

Wrapper around uptime API

salt.modules.uptime.check_exists(name)
Check if a given URL is in being monitored by uptime
CLI Example:
    salt '*' uptime.check_exists http://example.org

salt.modules.uptime.checks_list()
List URL checked by uptime
CLI Example:
    salt '*' uptime.checks_list

salt.modules.uptime.create(name, **params)
Create a check on a given URL.
Additional parameters can be used and are passed to API (for example interval, maxTime, etc). See the documentation https://github.com/fzaninotto/uptime for a full list of the parameters.
CLI Example:
    salt '*' uptime.create http://example.org

salt.modules.uptime.delete(name)
Delete a check on a given URL
CLI Example:
    salt '*' uptime.delete http://example.org
31.16.282  salt.modules.useradd

Manage users with the useradd command

```python
salt.modules.useradd.add(name, uid=None, gid=None, groups=None, home=None, shell=None,
unique=True, system=False, fullname='`, roomnumber='`, workphone='`,
homephone='`, createhome=True, loginclass=None)
```

Add a user to the minion

CLI Example:

```bash
salt '*' user.add name <uid> <gid> <groups> <home> <shell>
```

```python
salt.modules.useradd.chfullname(name, fullname)
```

Change the user's Full Name

CLI Example:

```bash
salt '*' user.chfullname foo "Foo Bar"
```

```python
salt.modules.useradd.chgid(name, gid)
```

Change the default group of the user

CLI Example:

```bash
salt '*' user.chgid foo 4376
```

```python
salt.modules.useradd.chgroups(name, groups, append=False)
```

Change the groups to which this user belongs

- **name**: User to modify
- **groups**: Groups to set for the user
- **append**: [False] If True, append the specified group(s). Otherwise, this function will replace the user's groups with the specified group(s).

CLI Examples:

```bash
salt '*' user.chgroups foo wheel,root
salt '*' user.chgroups foo wheel,root append=True
```

```python
salt.modules.useradd.chhome(name, home, persist=False)
```

Change the home directory of the user, pass True for persist to move files to the new home directory if the old home directory exist.

CLI Example:

```bash
salt '*' user.chhome foo /home/users/foo True
```

```python
salt.modules.useradd.chhomephone(name, homephone)
```

Change the user's Home Phone

CLI Example:

```bash
salt '*' user.chhomephone foo 7735551234
```

```python
salt.modules.useradd.chloginclass(name, loginclass)
```

Change the default login class of the user

- **Note**: This function only applies to OpenBSD systems.

31.16. Full list of builtin execution modules
CLI Example:

```
salt '*' user.chloginclass foo staff
```

```python
salt.modules.useradd.chroomnumber(name, roomnumber)

Change the user's Room Number

CLI Example:

```
salt '*' user.chroomnumber foo 123
```
```
salt.modules.useradd.chshell(name, shell)

Change the default shell of the user

CLI Example:

```
salt '*' user.chshell foo /bin/zsh
```
```
salt.modules.useradd.chuid(name, uid)

Change the uid for a named user

CLI Example:

```
salt '*' user.chuid foo 4376
```
```
salt.modules.useradd.chworkphone(name, workphone)

Change the user's Work Phone

CLI Example:

```
salt '*' user.chworkphone foo 7735550123
```
```
salt.modules.useradd.delete(name, remove=False, force=False)

Remove a user from the minion

CLI Example:

```
salt '*' user.delete name remove=True force=True
```
```
salt.modules.useradd.get_loginclass(name)

Get the login class of the user

Note: This function only applies to OpenBSD systems.

CLI Example:

```
salt '*' user.get_loginclass foo
```
```
salt.modules.useradd.getent(refresh=False)

Return the list of all info for all users

CLI Example:

```
salt '*' user.getent
```
```
salt.modules.useradd.info(name)

Return user information

CLI Example:

```
salt '*' user.info root
```
salt.modules.useradd.list_groups(name)
Return a list of groups the named user belongs to
CLI Example:
```
salt '*' user.list_groups foo
```

salt.modules.useradd.list_users()
Return a list of all users
CLI Example:
```
salt '*' user.list_users
```

salt.modules.useradd.rename(name, new_name)
Change the username for a named user
CLI Example:
```
salt '*' user.rename name new_name
```

31.16.283 salt.modules.uwsgi

maintainer Peter Baumgartner <pete@lincolnloop.com>
maturity new
platform all
salt.modules.uwsgi.stats(socket)
Return the data from uwsgi --connect-and-read as a dictionary.
socket The socket the uWSGI stats server is listening on
CLI Example:
```
salt '*' uwsgi.stats /var/run/mystatsserver.sock
salt '*' uwsgi.stats 127.0.0.1:5050
```

31.16.284 salt.modules.varnish

Support for Varnish
New in version 2014.7.0.

Note: These functions are designed to work with all implementations of Varnish from 3.x onwards

salt.modules.varnish.ban(ban_expression)
Add ban to the varnish cache
CLI Example:
```
salt '*' varnish.ban ban_expression
```
salt.modules.varnish.ban_list()
List varnish cache current bans

CLI Example:
salt '*' varnish.ban_list

salt.modules.varnish.param_set(param, value)
Set a param in varnish cache

CLI Example:
salt '*' varnish.param_set param value

salt.modules.varnish.param_show(param=None)
Show params of varnish cache

CLI Example:
salt '*' varnish.param_show param

salt.modules.varnish.purge()
Purge the varnish cache

CLI Example:
salt '*' varnish.purge

salt.modules.varnish.version()
Return server version from varnishd -V

CLI Example:
salt '*' varnish.version

31.16.285 salt.modules.vbox_guest

VirtualBox Guest Additions installer

salt.modules.vbox_guest.additions_install(*args, **kwargs)
Install VirtualBox Guest Additions. Uses the CD, connected by VirtualBox.

To connect VirtualBox Guest Additions via VirtualBox graphical interface press `Host+D` (`Host` is usually `Right Ctrl`).

See https://www.virtualbox.org/manual/ch04.html#idp52733088 for more details.

CLI Example:
salt '*' vbox_guest.additions_install
salt '*' vbox_guest.additions_install reboot=True
salt '*' vbox_guest.additions_install upgrade_os=True

Parameters

- **reboot** (bool) -- reboot computer to complete installation
- **upgrade_os** (bool) -- upgrade OS (to ensure the latests version of kernel and developer tools are installed)

Returns version of VirtualBox Guest Additions or string with error
**salt.modules.vbox_guest.additions_mount()**

Mount VirtualBox Guest Additions CD to the temp directory.

To connect VirtualBox Guest Additions via VirtualBox graphical interface press `Host+D` (`Host` is usually `Right Ctrl`).

CLI Example:

```
salt '*' vbox_guest.additions_mount
```

Returns True or OSError exception

**salt.modules.vbox_guest.additions_remove(**kwargs**)**

Remove VirtualBox Guest Additions.

Firstly it tries to uninstall itself by executing `/opt/VBoxGuestAdditions-VERSION/uninstall.run uninstall`. It uses the CD, connected by VirtualBox if it fails.

CLI Example:

```
salt '*' vbox_guest.additions_remove
salt '*' vbox_guest.additions_remove force=True
```

Parameters **force** *(bool)* -- force VirtualBox Guest Additions removing

Returns True if VirtualBox Guest Additions were removed successfully else False

**salt.modules.vbox_guest.additions_umount(mount_point)**

Unmount VirtualBox Guest Additions CD from the temp directory.

CLI Example:

```
salt '*' vbox_guest.additions_umount
```

Parameters **mount_point** -- directory VirtualBox Guest Additions is mounted to

Returns True or an string with error

**salt.modules.vbox_guest.additions_version()**

Check VirtualBox Guest Additions version.

CLI Example:

```
salt '*' vbox_guest.additions_version
```

Returns version of VirtualBox Guest Additions or False if they are not installed

**salt.modules.vbox_guest.grant_access_to_shared_folders_to(name, users=None)**

Grant access to auto-mounted shared folders to the users.

User is specified by it's name. To grant access for several users use argument `users`. Access will be denied to the users not listed in `users` argument.


CLI Example:

```
salt '*' vbox_guest.grant_access_to_shared_folders_to fred
salt '*' vbox_guest.grant_access_to_shared_folders_to users ['fred', 'roman']
```
Parameters

- **name** *(str)* -- name of the user to grant access to auto-mounted shared folders to
- **users** *(list of str)* -- list of names of users to grant access to auto-mounted shared folders to (if specified, `name` will not be taken into account)

Returns list of users who have access to auto-mounted shared folders

```python
salt.modules.vbox_guest.list_shared_folders_users()
```

List users who have access to auto-mounted shared folders.


CLI Example:

```
salt '*' vbox_guest.list_shared_folders_users
```

Returns list of users who have access to auto-mounted shared folders

### 31.16.286 `salt.modules.victorops`

Support for VictorOps

New in version 2015.8.0.

Requires an `api_key` in `/etc/salt/minion`

```python
salt.modules.victorops.create_event(message_type=None, routing_key='everybody', **kwargs)
```

Create an event in VictorOps. Designed for use in states.

The following parameters are required:

Parameters `message_type` -- One of the following values: INFO, WARNING, ACKNOWLEDGEMENT, CRITICAL, RECOVERY.

The following parameters are optional:

Parameters

- **routing_key** -- The key for where messages should be routed. By default, sent to `everyone` route.
- **entity_id** -- The name of alerting entity. If not provided, a random name will be assigned.
- **timestamp** -- Timestamp of the alert in seconds since epoch. Defaults to the time the alert is received at VictorOps.

:param timestamp_fmt The date format for the timestamp parameter.

Parameters

- **state_start_time** -- The time this entity entered its current state (seconds since epoch). Defaults to the time alert is received.
- **state_start_time_fmt** -- The date format for the timestamp parameter.
- **state_message** -- Any additional status information from the alert item.
- **entity_is_host** -- Used within VictorOps to select the appropriate display format for the incident.
- **entity_display_name** -- Used within VictorOps to display a human-readable name for the entity.
- **ack_message** -- A user entered comment for the acknowledgment.
- **ack_author** -- The user that acknowledged the incident.

Returns A dictionary with result, entity_id, and message if result was failure.

CLI Example:

```shell
salt myminion victorops.create_event message_type='CRITICAL' routing_key='everyone'
salt myminion victorops.create_event message_type='ACKNOWLEDGEMENT' routing_key='everyone'
salt myminion victorops.create_event message_type='RECOVERY' routing_key='everyone'
```

The following parameters are required: message_type

### 31.16.287 salt.modules.virt

Work with virtual machines managed by libvirt

**depends** libvirt Python module

- `salt.modules.virt.create(vm_)`
  Start a defined domain
  
  CLI Example:
  ```shell
  salt '*' virt.create <vm name>
  ```

- `salt.modules.virt.create_xml_path(path)`
  Start a domain based on the XML-file path passed to the function
  
  CLI Example:
  ```shell
  salt '*' virt.create_xml_path <path to XML file on the node>
  ```

- `salt.modules.virt.create_xml_str(xml)`
  Start a domain based on the XML passed to the function
  
  CLI Example:
  ```shell
  salt '*' virt.create_xml_str <XML in string format>
  ```

- `salt.modules.virt.ctrl_alt_del(vm_)`
  Sends CTRL+ALT+DEL to a VM
  
  CLI Example:
  ```shell
  salt '*' virt.ctrl_alt_del <vm name>
  ```

- `salt.modules.virt.define_vol_xml_path(path)`
  Define a volume based on the XML-file path passed to the function
  
  CLI Example:
  ```shell
  salt '*' virt.define_vol_xml_path <path to XML file on the node>
  ```
salt.modules.virt.define_vol_xml_str(xml)
    Define a volume based on the XML passed to the function
    CLI Example:
    ```
salt '*' virt.define_vol_xml_str <XML in string format>
    ```

salt.modules.virt.define_xml_path(path)
    Define a domain based on the XML-file path passed to the function
    CLI Example:
    ```
salt '*' virt.define_xml_path <path to XML file on the node>
    ```

salt.modules.virt.define_xml_str(xml)
    Define a domain based on the XML passed to the function
    CLI Example:
    ```
salt '*' virt.define_xml_str <XML in string format>
    ```

salt.modules.virt.destroy(vm_)
    Hard power down the virtual machine, this is equivalent to pulling the power
    CLI Example:
    ```
salt '*' virt.destroy <vm name>
    ```

salt.modules.virt.freecpu()
    Return an int representing the number of unallocated cpus on this hypervisor
    CLI Example:
    ```
salt '*' virt.freecpu
    ```

salt.modules.virt.freemem()
    Return an int representing the amount of memory (in MB) that has not been given to virtual machines on this node
    CLI Example:
    ```
salt '*' virt.freemem
    ```

salt.modules.virt.full_info()
    Return the node_info, vm_info and freemem
    CLI Example:
    ```
salt '*' virt.full_info
    ```

salt.modules.virt.get_disks(vm_)
    Return the disks of a named vm
    CLI Example:
    ```
salt '*' virt.get_disks <vm name>
    ```

salt.modules.virt.get_graphics(vm_)
    Returns the information on vnc for a given vm
    CLI Example:
salt.modules.virt.get_graphics <vm name>

salt.modules.virt.get_macs(vm_)
    Return a list of MAC addresses from the named vm
    CLI Example:
    salt '*' virt.get_macs <vm name>

salt.modules.virt.get_nics(vm_)
    Return info about the network interfaces of a named vm
    CLI Example:
    salt '*' virt.get_nics <vm name>

salt.modules.virt.get_profiles(hypervisor=None)
    Return the virt profiles for hypervisor.
    Currently there are profiles for:
    • nic
    • disk
    CLI Example:
    salt '*' virt.get_profiles
    salt '*' virt.get_profiles hypervisor=esxi

salt.modules.virt.get_xml(vm_)
    Returns the XML for a given vm
    CLI Example:
    salt '*' virt.get_xml <vm name>

salt.modules.virt.init(name, cpu, mem, image=None, nic='default', hypervisor='kvm', start=True, disk='default', saltenv='base', **kwargs)
    Initialize a new vm
    CLI Example:
    salt 'hypervisor' virt.init vm_name 4 512 salt://path/to/image.raw
    salt 'hypervisor' virt.init vm_name 4 512 nic=profile disk=profile

salt.modules.virt.is_hyper()
    Returns a bool whether or not this node is a hypervisor of any kind
    CLI Example:
    salt '*' virt.is_hyper

salt.modules.virt.is_kvm_hyper()
    Returns a bool whether or not this node is a KVM hypervisor
    CLI Example:
    salt '*' virt.is_kvm_hyper

salt.modules.virt.is_xen_hyper()
    Returns a bool whether or not this node is a XEN hypervisor
CLI Example:
```
salt '*' virt.is_xen_hyper
```

`salt.modules.virt.list_active_vms()`
Return a list of names for active virtual machine on the minion
CLI Example:
```
salt '*' virt.list_active_vms
```

`salt.modules.virt.list_inactive_vms()`
Return a list of names for inactive virtual machine on the minion
CLI Example:
```
salt '*' virt.list_inactive_vms
```

`salt.modules.virt.list_vms()`
Return a list of virtual machine names on the minion
CLI Example:
```
salt '*' virt.list_vms
```

`salt.modules.virt.migrate(vm_, target, ssh=False)`
Shared storage migration
CLI Example:
```
salt '*' virt.migrate <vm name> <target hypervisor>
```

`salt.modules.virt.migrate_non_shared(vm_, target, ssh=False)`
Attempt to execute non-shared storage "all" migration
CLI Example:
```
salt '*' virt.migrate_non_shared <vm name> <target hypervisor>
```

`salt.modules.virt.migrate_non_shared_inc(vm_, target, ssh=False)`
Attempt to execute non-shared storage "all" migration
CLI Example:
```
salt '*' virt.migrate_non_shared_inc <vm name> <target hypervisor>
```

`salt.modules.virt.node_info()`
Return a dict with information about this node
CLI Example:
```
salt '*' virt.node_info
```

`salt.modules.virt.pause(vm_)`
Pause the named vm
CLI Example:
```
salt '*' virt.pause <vm name>
```

`salt.modules.virt.purge(vm_, dirs=False)`
Recursively destroy and delete a virtual machine, pass True for dir's to also delete the directories containing the virtual machine disk images - USE WITH EXTREME CAUTION!
CLI Example:

```bash
salt '*' virt.purge <vm name>
```

 предназначен для удаления виртуальной машины.

CLI Example:

```bash
salt '*' virt.reboot <vm name>
```

Reboota domain via ACPI request

CLI Example:

```bash
salt '*' virt.reset <vm name>
```

Reset a VM by emulating the reset button on a physical machine

CLI Example:

```bash
salt '*' virt.resume <vm name>
```

Resume the named vm

CLI Example:

```bash
salt '*' virt.seed_non_shared_migrate <disks>
```

Non shared migration requires that the disks be present on the migration destination, pass the disks information via this function, to the migration destination before executing the migration.

CLI Example:

```bash
salt '*' virt.set_autostart <vm name> <on | off>
```

Set the autostart flag on a VM so that the VM will start with the host system on reboot.

CLI Example:

```bash
salt '*' virt.set_mem <vm name> <memory> <on | off>
```

Changes the amount of memory allocated to VM. The VM must be shutdown for this to work.

CLI Example:

```bash
salt '*' virt.set_cpu <vm name> <vcpus>
```

Changes the amount of vcpus allocated to VM. The VM must be shutdown for this to work.

CLI Example:
salt '*' virt.shutdown <vm name>

salt.modules.virt.start(vm_)

    Alias for the obscurely named `create` function

    CLI Example:

    salt '*' virt.start <vm name>

salt.modules.virt.stop(vm_)

    Alias for the obscurely named `destroy` function

    CLI Example:

    salt '*' virt.stop <vm name>

salt.modules.virt.undefine(vm_)

    Remove a defined vm, this does not purge the virtual machine image, and this only works if the vm is powered down

    CLI Example:

    salt '*' virt.undefine <vm name>

salt.modules.virt.virt_type()

    Returns the virtual machine type as a string

    CLI Example:

    salt '*' virt.virt_type

salt.modules.virt.vm_cputime(vm_=None)

    Return cputime used by the vms on this hyper in a list of dicts:

    [  
      'your-vm': {  
        'cputime' <int>,  
        'cputime_percent' <int>  
      },  
      ...  
    ]

    If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.

    CLI Example:

    salt '*' virt.vm_cputime

salt.modules.virt.vm_diskstats(vm_=None)

    Return disk usage counters used by the vms on this hyper in a list of dicts:

    [  
      'your-vm': {  
        'rd_req' : 0,  
        'rd_bytes' : 0,  
        'wr_req' : 0,  
        'wr_bytes' : 0,  
        'errs' : 0  
      },  
    ]
If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.

CLI Example:

```
salt '*' virt.vm_blockstats
```

```
salt.modules.virt.vm_info(vm_=None)

Return detailed information about the vms on this hyper in a list of dicts:

```
[
    'your-vm': {
        'cpu': <int>,
        'maxMem': <int>,
        'mem': <int>,
        'state': '<state>',
        'cputime' <int>
    },
    ...
]
```

If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.

CLI Example:

```
salt '*' virt.vm_info
```

```
salt.modules.virt.vm_netstats(vm_=None)

Return combined network counters used by the vms on this hyper in a list of dicts:

```
[
    'your-vm': {
        'rx_bytes' : 0,
        'rx_packets' : 0,
        'rx_errs' : 0,
        'rx_drop' : 0,
        'tx_bytes' : 0,
        'tx_packets' : 0,
        'tx_errs' : 0,
        'tx_drop' : 0
    },
    ...
]
```

If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.

CLI Example:

```
salt '*' virt.vm_netstats
```

```
salt.modules.virt.vm_state(vm_=None)

Return list of all the vms and their state.

If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.

31.16. Full list of builtin execution modules
### 31.16.288 `salt.modules.virtualenv`

Create virtualenv environments

```python
salt.modules.virtualenv_mod.create(path, venv_bin=None, system_site_packages=False, distribute=False, clear=False, python=None, extra_search_dir=None, never_download=None, prompt=None, pip=False, symlinks=None, upgrade=None, user=None, use_vt=False, saltenv='base')
```

Create a virtualenv

- **path** The path to create the virtualenv
- **venv_bin** [None (default `virtualenv`)] The name (and optionally path) of the virtualenv command. This can also be set globally in the minion config file as `virtualenv.venv_bin`.
- **system_site_packages** [False] Passthrough argument given to virtualenv or pyenv
- **distribute** [False] Passthrough argument given to virtualenv
- **pip** [False] Install pip after creating a virtual environment, implies distribute=True
- **clear** [False] Passthrough argument given to virtualenv or pyenv
- **python** [None (default)] Passthrough argument given to virtualenv
- **extra_search_dir** [None (default)] Passthrough argument given to virtualenv
- **never_download** [None (default)] Passthrough argument given to virtualenv if True
- **prompt** [None (default)] Passthrough argument given to virtualenv if not None
- **symlinks** [None] Passthrough argument given to pyenv if True
- **upgrade** [None] Passthrough argument given to pyenv if True
- **user** [None] Set ownership for the virtualenv
- **runas** [None] Set ownership for the virtualenv
- **use_vt** Use VT terminal emulation (see output while installing)

Note: The `runas` argument is deprecated as of 2014.1.0. `user` should be used instead.

```python
salt.modules.virtualenv_mod.get_resource_content(venv, package_or_requirement, resource_name)
```

Returns the content of a resource of a package or a distribution inside a virtualenv

```python
salt.modules.virtualenv_mod.get_resource_path(venv, package_or_requirement, resource_name)
```

Returns the path to a resource of a package or a distribution inside a virtualenv
CLI Example:

```bash
salt '*' virtualenv.get_resource_path /path/to/my/venv my_package my/resource.xml
```

```python
salt.modules.virtualenv_mod.get_site_packages(venv)

Returns the path to the site-packages directory inside a virtualenv
```

CLI Example:

```bash
salt '*' virtualenv.get_site_packages /path/to/my/venv
```

### 31.16.289 salt.modules.win_autoruns

Module for listing programs that automatically run on startup (very alpha...not tested on anything but my Win 7x64)

```python
salt.modules.win_autoruns.list()

Get a list of automatically running programs
```

CLI Example:

```bash
salt '*' autoruns.list
```

### 31.16.290 salt.modules.win_dacl

Manage DACLs on Windows

```python
depends
    • winreg Python module
```

```python
class salt.modules.win_dacl.User

class object that returns a users SID
```

```python
class salt.modules.win_dacl.add_ace(path, objectType, user, permission, acetype, propagation)

add an ace to an object
```

- path: path to the object (i.e. `c:\temp\file`, `HKEY_LOCAL_MACHINE\SOFTWARE\KEY`, etc)
- user: user to add
- permission: permissions for the user acetypes: either allow/deny for each user/permission (ALLOW, DENY)
- propagation: how the ACE applies to children for Registry Keys and Directories (KEY, KEY&SUBKEYS, SUBKEYS)

CLI Example:

```bash
allow domain\fakeuser full control on HKLM\SOFTWARE\somekey, propagate to this key and subkeys
salt 'myminion' win_dacl.add_ace 'HKEY_LOCAL_MACHINE\SOFTWARE\somekey' 'Registry' 'domain\fakeuser' 'FULLCONTROL' 'ALLOW' 'KEY&SUBKEYS'
```

```python
class salt.modules.win_dacl.check_ace(path, objectType, user=None, permission=None, acetype=None, propagation=None, exactPermissionMatch=False)

checks a path to verify the ACE (access control entry) specified exists returns 'Exists' true if the ACE exists, false if it does not
```

- path: path to the file/reg key user: user that the ACL is for permission: permission to test for (READ, FULLCONTROL, etc) acetype: the type of ACE (ALLOW or DENY) propagation: the propagation type of the ACE (FILES, FOLDERS, KEY, KEY&SUBKEYS, SUBKEYS, etc) exactPermissionMatch: the ACL must match exactly, IE if READ is specified, the user must have READ exactly and not FULLCONTROL (which also has the READ permission obviously)
salt.modules.win_dacl.check_inheritance(path, objectType)
check a specified path to verify if inheritance is enabled returns 'Inheritance' of True/False
hkey: HKEY_LOCAL_MACHINE, HKEY_CURRENT_USER, etc path: path of the registry key to check

class salt.modules.win_dacl.daclConstants
dacl constants used throughout the module

getAceTypeBit(t)
returns the acetype bit of a text value

getAceTypeText(t)
returns the textual representation of a acetype bit

ggetObjectTypeBit(t)
returns the bit value of the string object type

getPermissionBit(t, m)
returns a permission bit of the string permission value for the specified object type

getPermissionText(t, m)
returns the permission textual representation of a specified permission bit/object type

getPropagationBit(t, p)
returns the propagation bit of a text value

getPropagationText(t, p)
returns the textual representation of a propagation bit

getSecurityHkey(s)
returns the necessary string value for an HKEY for the win32security module

processPath(path, objectType)
processes a path/object type combo and returns: registry types with the correct HKEY text representation files/directories with environment variables expanded

salt.modules.win_dacl.disable_inheritance(path, objectType, copy=True)
disable inheritance on an object
copy = True will copy the Inerhited ACEs to the DACL before disabling inheritance

salt.modules.win_dacl.enable_inheritance(path, objectType, clear=False)
enable/disable inheritance on an object
clear = True will remove non-Inherited ACEs from the ACL

salt.modules.win_dacl.get(path, objectType)
get the acl of an object

salt.modules.win_dacl.rm_ace(path, objectType, user, permission, acetype, propagation)
remove an ace to an object
path: path to the object (i.e. c:\temp\file, HKEY_LOCAL_MACHINE\SOFTWARE\KEY, etc) user: user to remove permission: permissions for the user acetypes: either allow/deny for each user/permission (ALLOW, DENY) propagation: how the ACE applies to children for Registry Keys and Directories(KEY, KEY&SUBKEYS, SUBKEYS)

"The entire ACE must match to be removed"

CLI Example:
remove allow domain\fakeuser full control on HKLM\SOFTWARE\somekey propagated to this key and
salt 'myminion' win_dacl.rm_ace 'Registry' 'HKEY_LOCAL_MACHINE\SOFTWARE\somekey' 'domain\fakeuser'
31.16.291 salt.modules.win_disk

Module for gathering disk information on Windows

    depends

    • win32api Python module

salt.modules.win_disk.usage()
    Return usage information for volumes mounted on this minion

    CLI Example:

    salt '*' disk.usage

31.16.292 salt.modules.win_dns_client

Module for configuring DNS Client on Windows systems

    salt.modules.win_dns_client.add_dns(ip, interface='Local Area Connection', index=1)
    Add the DNS server to the network interface (index starts from 1)

    Note: if the interface DNS is configured by DHCP, all the DNS servers will be removed from the interface and
    the requested DNS will be the only one

    CLI Example:

    salt '*' win_dns_client.add_dns <ip> <interface> <index>

    salt.modules.win_dns_client.dns_dhcp(interface='Local Area Connection')
    Configure the interface to get its DNS servers from the DHCP server

    CLI Example:

    salt '*' win_dns_client.dns_dhcp <interface>

    salt.modules.win_dns_client.get_dns_config(interface='Local Area Connection')
    Get the type of DNS configuration (dhcp / static)

    CLI Example:

    salt '*' win_dns_client.get_dns_config 'Local Area Connection'

    salt.modules.win_dns_client.get_dns_servers(interface='Local Area Connection')
    Return a list of the configured DNS servers of the specified interface

    CLI Example:

    salt '*' win_dns_client.get_dns_servers 'Local Area Connection'

    salt.modules.win_dns_client.rm_dns(ip, interface='Local Area Connection')
    Remove the DNS server from the network interface

    CLI Example:

    salt '*' win_dns_client.rm_dns <ip> <interface>
31.16.293 salt.modules.win_file

Manage information about files on the minion, set/read user, group data

depends

- win32api
- win32file
- win32security

salt.modules.win_file.chgrp(path, group)
Change the group of a file

Under Windows, this will do nothing.

While a file in Windows does have a 'primary group', this rarely used attribute generally has no bearing
on permissions unless intentionally configured and is only used to support Unix compatibility features (e.g.
Services For Unix, NFS services).

Salt, therefore, remaps this function to do nothing while still being compatible with Unix behavior. When
managing Windows systems, this function is superfluous and will generate an info level log entry if used
directly.

If you do actually want to set the 'primary group' of a file, use file.chgrp.

CLI Example:

```
salt '*' file.chgrp c:\temp\test.txt administrators
```

salt.modules.win_file.chown(path, user=None, group=None, pgroup=None, follow_symlinks=True)
Chown a file, pass the file the desired user and group

Under Windows, the group parameter will be ignored.

This is because while files in Windows do have a 'primary group' property, this is rarely used. It generally
has no bearing on permissions unless intentionally configured and is most commonly used to provide Unix
compatibility (e.g. Services For Unix, NFS services).

If you do want to change the 'primary group' property and understand the implications, pass the Windows
only parameter, pgroup, instead.

To set the primary group to 'None', it must be specified in quotes. Otherwise Salt will interpret it as the Python
value of None and no primary group changes will occur. See the example below.

CLI Example:

```
salt '*' file.chown c:\temp\test.txt myusername
salt '*' file.chown c:\temp\test.txt myusername pgroup=Administrators
salt '*' file.chown c:\temp\test.txt myusername "pgroup='None'"
```

salt.modules.win_file.chpgrp(path, group)
Change the group of a file

Under Windows, this will set the rarely used primary group of a file. This generally has no bearing on permis-
sions unless intentionally configured and is most commonly used to provide Unix compatibility (e.g. Services
For Unix, NFS services).

Ensure you know what you are doing before using this function.

To set the primary group to 'None', it must be specified in quotes. Otherwise Salt will interpret it as the Python
value of None and no primary group changes will occur. See the example below.

CLI Example:
salt.modules.win_file.get_attributes(path)
Return a dictionary object with the Windows file attributes for a file.

CLI Example:
```
salt '*' file.get_attributes c:\temp\test.txt
```

salt.modules.win_file.get_gid(path, follow_symlinks=True)
Return the id of the group that owns a given file

Under Windows, this will return the uid of the file.

While a file in Windows does have a `primary group', this rarely used attribute generally has no bearing on permissions unless intentionally configured and is only used to support Unix compatibility features (e.g. Services For Unix, NFS services).

Salt, therefore, remaps this function to provide functionality that somewhat resembles Unix behavior for API compatibility reasons. When managing Windows systems, this function is superfluous and will generate an info level log entry if used directly.

If you do actually want to access the `primary group' of a file, use file.get_pgid.

CLI Example:
```
salt '*' file.get_gid c:\temp\test.txt
```

salt.modules.win_file.get_group(path, follow_symlinks=True)
Return the group that owns a given file

Under Windows, this will return the user (owner) of the file.

While a file in Windows does have a `primary group', this rarely used attribute generally has no bearing on permissions unless intentionally configured and is only used to support Unix compatibility features (e.g. Services For Unix, NFS services).

Salt, therefore, remaps this function to provide functionality that somewhat resembles Unix behavior for API compatibility reasons. When managing Windows systems, this function is superfluous and will generate an info level log entry if used directly.

If you do actually want to access the `primary group' of a file, use file.get_pgroup.

CLI Example:
```
salt '*' file.get_group c:\temp\test.txt
```

salt.modules.win_file.get_mode(path)
Return the mode of a file

Right now we're just returning None because Windows' doesn't have a mode like Linux

CLI Example:
```
salt '*' file.get_mode /etc/passwd
```

salt.modules.win_file.get_pgid(path, follow_symlinks=True)
Return the id of the primary group that owns a given file (Windows only)

This function will return the rarely used primary group of a file. This generally has no bearing on permissions unless intentionally configured and is most commonly used to provide Unix compatibility (e.g. Services For Unix, NFS services).
Ensure you know what you are doing before using this function.

CLI Example:

```bash
salt '*' file.get_pgid c:\temp\test.txt
```

salt.modules.win_file.get_pgroup(path, follow_symlinks=True)
Return the name of the primary group that owns a given file (Windows only)

This function will return the rarely used primary group of a file. This generally has no bearing on permissions unless intentionally configured and is most commonly used to provide Unix compatibility (e.g. Services For Unix, NFS services).

Ensure you know what you are doing before using this function.

The return value may be `None', e.g. if the user is not on a domain. This is a valid group - do not confuse this with the Salt/Python value of None which means no value was returned. To be certain, use the get_pgid function which will return the SID, including for the system `None' group.

CLI Example:

```bash
salt '*' file.get_pgid c:\temp\test.txt
```

salt.modules.win_file.get_uid(path, follow_symlinks=True)
Return the id of the user that owns a given file

Symlinks are followed by default to mimic Unix behavior. Specify follow_symlinks=False to turn off this behavior.

CLI Example:

```bash
salt '*' file.get_uid c:\temp\test.txt
salt '*' file.get_uid c:\temp\test.txt follow_symlinks=False
```

salt.modules.win_file.get_user(path, follow_symlinks=True)
Return the user that owns a given file

Symlinks are followed by default to mimic Unix behavior. Specify follow_symlinks=False to turn off this behavior.

CLI Example:

```bash
salt '*' file.get_user c:\temp\test.txt
salt '*' file.get_user c:\temp\test.txt follow_symlinks=False
```

salt.modules.win_file.gid_to_group(gid)
Convert the group id to the group name on this system

Under Windows, because groups are just another ACL entity, this function behaves the same as uid_to_user.

For maintaining Windows systems, this function is superfluous and only exists for API compatibility with Unix. Use the uid_to_user function instead; an info level log entry will be generated if this function is used directly.

CLI Example:

```bash
salt '*' file.gid_to_group S-1-5-21-626487655-2533044672-482107328-1010
```

salt.modules.win_file.group_to_gid(group)
Convert the group to the gid on this system

Under Windows, because groups are just another ACL entity, this function behaves the same as user_to_uid, except if None is given, ” is returned.
For maintaining Windows systems, this function is superfluous and only exists for API compatibility with Unix. Use the user_to_uid function instead; an info level log entry will be generated if this function is used directly.

CLI Example:
```
salt '...' file.group_to_gid administrators
```

`salt.modules.win_file.is_link(path)`

Return the path that a symlink points to

This is only supported on Windows Vista or later.

Inline with Unix behavior, this function will raise an error if the path is not a symlink, however, the error raised will be a SaltInvocationError, not an OSError.

CLI Example:
```
salt '...' file.is_link /path/to/link
```

`salt.modules.win_file.lchown(path, user, group=None, pgroup=None)`

Chown a file, pass the file the desired user and group without following any symlinks.

Under Windows, the group parameter will be ignored.

This is because while files in Windows do have a 'primary group' property, this is rarely used. It generally has no bearing on permissions unless intentionally configured and is most commonly used to provide Unix compatibility (e.g. Services For Unix, NFS services).

If you do want to change the 'primary group' property and understand the implications, pass the Windows only parameter, pgroup, instead.

To set the primary group to 'None', it must be specified in quotes. Otherwise Salt will interpret it as the Python value of None and no primary group changes will occur. See the example below.

CLI Example:
```
salt '...' file.lchown c:\temp\test.txt myusername
salt '...' file.lchown c:\temp\test.txt myusername pgroup=Administrators
salt '...' file.lchown c:\temp\test.txt myusername "pgroup='None'"
```

`salt.modules.win_file.readlink(path)`

Return the path that a symlink points to

This is only supported on Windows Vista or later.

Inline with Unix behavior, this function will raise an error if the path is not a symlink, however, the error raised will be a SaltInvocationError, not an OSError.

CLI Example:
```
salt '...' file.readlink /path/to/link
```

`salt.modules.win_file.set_attributes(path, archive=None, hidden=None, normal=None, notIndexed=None, readonly=None, system=None, temporary=None)`

Set file attributes for a file. Note that the normal attribute means that all others are false. So setting it will clear all others.

CLI Example:
```
salt '...' file.set_attributes c:\temp\a.txt normal=True
salt '...' file.set_attributes c:\temp\a.txt readonly=True hidden=True
```
salt.modules.win_file.set_mode(path, mode)
Set the mode of a file
This just calls get_mode, which returns None because we don’t use mode on Windows

CLI Example:
```
salt '*' file.set_mode /etc/passwd 0644
```

salt.modules.win_file.stats(path, hash_type='md5', follow_symlinks=True)
Return a dict containing the stats for a given file
Under Windows, gid will equal uid and group will equal user.
While a file in Windows does have a `primary group`, this rarely used attribute generally has no bearing
on permissions unless intentionally configured and is only used to support Unix compatibility features (e.g.
Services For Unix, NFS services).
Salt, therefore, remaps these properties to keep some kind of compatibility with Unix behavior. If the `primary
group` is required, it can be accessed in the pgroup and pgid properties.

CLI Example:
```
salt '*' file.stats /etc/passwd
```

salt.modules.win_file.symlink(src, link)
Create a symbolic link to a file
This is only supported with Windows Vista or later and must be executed by a user with the SeCreateSymbolicLink privilege.
The behavior of this function matches the Unix equivalent, with one exception - invalid symlinks cannot be
created. The source path must exist. If it doesn’t, an error will be raised.

CLI Example:
```
salt '*' file.symlink /path/to/file /path/to/link
```

salt.modules.win_file.uid_to_user(uid)
Convert a uid to a user name

CLI Example:
```
salt '*' file.uid_to_user S-1-5-21-626487655-2533044672-482107328-1010
```

salt.modules.win_file.user_to_uid(user)
Convert user name to a uid

CLI Example:
```
salt '*' file.user_to_uid myusername
```

31.16.294 salt.modules.win_firewall
Module for configuring Windows Firewall
salt.modules.win_firewall.add_rule(name, localport, protocol='tcp', action='allow', dir='in')
New in version 2015.5.0.
Add a new firewall rule

CLI Example:
salt '*' firewall.add_rule 'test' '8080' 'tcp'

salt.modules.win_firewall.delete_rule(name, localport, protocol='tcp', dir='in')

- New in version 2015.8.0.
- Delete an existing firewall rule

**CLI Example:**

```
salt '*' firewall.delete_rule 'test' '8080' 'tcp' 'in'
```

salt.modules.win_firewall.disable(profile='allprofiles')

- Disable firewall profile
- **param profile:** (default: allprofiles)

**CLI Example:**

```
salt '*' firewall.disable
```

salt.modules.win_firewall.enable(profile='allprofiles')

- Enable firewall profile
- **param profile:** (default: allprofiles)

- New in version 2015.5.0.

**CLI Example:**

```
salt '*' firewall.enable
```

salt.modules.win_firewall.get_config()

- Get the status of all the firewall profiles

**CLI Example:**

```
salt '*' firewall.get_config
```

salt.modules.win_firewall.get_rule(name='all')

- New in version 2015.5.0.
- Get firewall rule(s) info

**CLI Example:**

```
salt '*' firewall.get_rule 'MyAppPort'
```

### 31.16.295 salt.modules.win_groupadd

Manage groups on Windows

salt.modules.win_groupadd.add(name, gid=None, system=False)

- Add the specified group

**CLI Example:**

```
salt '*' group.add foo
```

salt.modules.win_groupadd.adduser(name, username)

- add a user to a group

**CLI Example:**

```
salt '*' group.adduser foo username
```

---

31.16. Full list of builtin execution modules 1331
salt.modules.win_groupadd.delete(name)
    Remove the named group
    CLI Example:
    ```
salt '*' group.delete foo
    ```

salt.modules.win_groupadd.deluser(name, username)
    remove a user from a group
    CLI Example:
    ```
salt '*' group.deluser foo username
    ```

salt.modules.win_groupadd.getent(refresh=False)
    Return info on all groups
    CLI Example:
    ```
salt '*' group.getent
    ```

salt.modules.win_groupadd.info(name)
    Return information about a group
    CLI Example:
    ```
salt '*' group.info foo
    ```

salt.modules.win_groupadd.members(name, members_list)
    remove a user from a group
    CLI Example:
    ```
salt '*' group.members foo 'user1,user2,user3'
    ```

31.16.296 salt.modules.win_ip

The networking module for Windows based systems

salt.modules.win_ip.disable(iface)
    Disable an interface
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.disable 'Local Area Connection #2'
    ```

salt.modules.win_ip.enable(iface)
    Enable an interface
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.enable 'Local Area Connection #2'
    ```

salt.modules.win_ip.get_all_interfaces()
    Return configs for all interfaces
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.get_all_interfaces
    ```
salt.modules.win_ip.get_default_gateway()
    Set DNS source to DHCP on Windows
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.get_default_gateway
    ```

salt.modules.win_ip.get_interface(iface)
    Return the configuration of a network interface
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.get_interface 'Local Area Connection'
    ```

salt.modules.win_ip.get_subnet_length(mask)
    Convenience function to convert the netmask to the CIDR subnet length
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.get_subnet_length 255.255.255.0
    ```

salt.modules.win_ip.is_disabled(iface)
    Returns True if interface is disabled, otherwise False
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.is_disabled 'Local Area Connection #2'
    ```

salt.modules.win_ip.is_enabled(iface)
    Returns True if interface is enabled, otherwise False
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.is_enabled 'Local Area Connection #2'
    ```

salt.modules.win_ip.raw_interface_configs()
    Return raw configs for all interfaces
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.raw_interface_configs
    ```

salt.modules.win_ip.set_dhcp_all(iface)
    Set both IP Address and DNS to DHCP
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.set_dhcp_all 'Local Area Connection'
    ```

salt.modules.win_ip.set_dhcp_dns(iface)
    Set DNS source to DHCP on Windows
    CLI Example:
    ```
salt -G 'os_family:Windows' ip.set_dhcp_dns 'Local Area Connection'
    ```

salt.modules.win_ip.set_dhcp_ip(iface)
    Set Windows NIC to get IP from DHCP
    CLI Example:
salt -G 'os_family:Windows' ip.set_dhcp_ip 'Local Area Connection'

salt.modules.win_ip.set_static_dns(iface, 'addrs')
Set static DNS configuration on a Windows NIC

CLI Example:
salt -G 'os_family:Windows' ip.set_static_dns 'Local Area Connection' '192.168.1.1'
salt -G 'os_family:Windows' ip.set_static_dns 'Local Area Connection' '192.168.1.252' '192.168.1.253'

salt.modules.win_ip.set_static_ip(iface, addr, gateway=None, append=False)
Set static IP configuration on a Windows NIC

iface The name of the interface to manage

addr IP address with subnet length (ex. 10.1.2.3/24). The ip.get_subnet_length function can be used to calculate the subnet length from a netmask.

gateway [None] If specified, the default gateway will be set to this value.

append [False] If True, this IP address will be added to the interface. Default is False, which overrides any existing configuration for the interface and sets addr as the only address on the interface.

CLI Example:
salt -G 'os_family:Windows' ip.set_static_ip 'Local Area Connection' 10.1.2.3/24 gateway=10.1.2.1
salt -G 'os_family:Windows' ip.set_static_ip 'Local Area Connection' 10.1.2.4/24 append=True

31.16.297 salt.modules.win_network

Module for gathering and managing network information

salt.modules.win_network.dig(host)
Performs a DNS lookup with dig

Note: dig must be installed on the Windows minion

CLI Example:
salt '*' network.dig archlinux.org

salt.modules.win_network.hw_addr(iface)
Return the hardware address (a.k.a. MAC address) for a given interface

CLI Example:
salt '*' network.hw_addr 'Wireless Connection #1'

salt.modules.win_network.hwaddr(iface)
Return the hardware address (a.k.a. MAC address) for a given interface

CLI Example:
salt '*' network.hw_addr 'Wireless Connection #1'

salt.modules.win_network.in_subnet(cidr)
Returns True if host is within specified subnet, otherwise False

CLI Example:
salt '*' network.in_subnet 10.0.0.0/16

salt.modules.win_network.interfaces()
    Return a dictionary of information about all the interfaces on the minion
    CLI Example:
        salt '*' network.interfaces

salt.modules.win_network.interfaces_names()
    Return a list of all the interfaces names
    CLI Example:
        salt '*' network.interfaces_names

salt.modules.win_network.ip_addrs(interface=None, include_loopback=False)
    Returns a list of IPv4 addresses assigned to the host. 127.0.0.1 is ignored, unless `include_loopback=True' is indicated. If `interface' is provided, then only IP addresses from that interface will be returned.
    CLI Example:
        salt '*' network.ip_addrs

salt.modules.win_network.ip_addrs6(interface=None, include_loopback=False)
    Returns a list of IPv6 addresses assigned to the host. ::1 is ignored, unless `include_loopback=True' is indicated. If `interface' is provided, then only IP addresses from that interface will be returned.
    CLI Example:
        salt '*' network.ip_addrs6

salt.modules.win_network.ipaddr(interface=None, include_loopback=False)
    Returns a list of IPv4 addresses assigned to the host. 127.0.0.1 is ignored, unless `include_loopback=True' is indicated. If `interface' is provided, then only IP addresses from that interface will be returned.
    CLI Example:
        salt '*' network.ip_addr

salt.modules.win_network.ipaddr6(interface=None, include_loopback=False)
    Returns a list of IPv6 addresses assigned to the host. ::1 is ignored, unless `include_loopback=True' is indicated. If `interface' is provided, then only IP addresses from that interface will be returned.
    CLI Example:
        salt '*' network.ip_addrs6

salt.modules.win_network.netstat()
    Return information on open ports and states
    CLI Example:
        salt '*' network.netstat

salt.modules.win_network.nslookup(host)
    Query DNS for information about a domain or ip address
    CLI Example:
        salt '*' network.nslookup archlinux.org
salt.modules.win_network.ping(host)
Performs a ping to a host

CLI Example:
salt '*' network.ping archlinux.org

salt.modules.win_network.subnets()
Returns a list of subnets to which the host belongs

CLI Example:
salt '*' network.subnets

salt.modules.win_network.traceroute(host)
Performs a traceroute to a 3rd party host

CLI Example:
salt '*' network.traceroute archlinux.org

31.16.298 salt.modules.win_ntp

Management of NTP servers on Windows
New in version 2014.1.0.
salt.modules.win_ntp.get_servers()
Get list of configured NTP servers

CLI Example:
salt '*' ntp.get_servers

salt.modules.win_ntp.set_servers(*servers)
Set Windows to use a list of NTP servers

CLI Example:
salt '*' ntp.set_servers 'pool.ntp.org' 'us.pool.ntp.org'

31.16.299 salt.modules.win_path

Manage the Windows System PATH
Note that not all Windows applications will rehash the PATH environment variable, Only the ones that listen to the WM_SETTINGCHANGE message http://support.microsoft.com/kb/104011
salt.modules.win_path.add(path, index=0)
Add the directory to the SYSTEM path in the index location

Returns: boolean True if successful, False if unsuccessful

CLI Example:
# Will add to the beginning of the path
salt '*' win_path.add 'c:\python27' 0

# Will add to the end of the path
salt '*' win_path.add 'c:\python27' index='-1'
### salt.modules.win_path

- **exists** *(path)*
  
  Check if the directory is configured in the SYSTEM path Case-insensitive and ignores trailing backslash

  **Returns**: boolean True if path exists, False if not

  **CLI Example**:

  ```
  salt '*' win_path.exists 'c:\python27'
  salt '*' win_path.exists 'c:\python27\'
  salt '*' win_path.exists 'C:\pyThon27'
  ```

- **get_path** *
  
  Returns a list of items in the SYSTEM path

  **CLI Example**:

  ```
  salt '*' win_path.get_path
  ```

- **rehash** *
  
  Send a WM_SETTINGCHANGE Broadcast to Windows to refresh the Environment variables

  **CLI Example**:

  ```
  ... code-block:: bash
  salt '*' win_path.rehash
  ```

- **remove** *(path)*
  
  Remove the directory from the SYSTEM path

  **Returns**: boolean True if successful, False if unsuccessful

  **CLI Example**:

  ```
  # Will remove C:\Python27 from the path
  salt '*' win_path.remove 'c:\\python27'
  ```

### salt.modules.win_pkg

A module to manage software on Windows

- **depends** *
  
  - win32com
  - win32con
  - win32api
  - pywintypes

- **compare_versions** *(ver1=", oper='==', ver2=")*
  
  Compare software package versions

- **genrepo** *(saltenv='base')*
  
  Generate winrepo_cachefile based on sls files in the winrepo

  **CLI Example**:

  ```
  salt-run winrepo.genrepo
  ```

- **get_name_map** *
  
  31.16.300 salt.modules.win_pkg

A module to manage software on Windows

- **depends** *
  
  - win32com
  - win32con
  - win32api
  - pywintypes

- **compare_versions** *(ver1=", oper='==', ver2=")*
  
  Compare software package versions

- **genrepo** *(saltenv='base')*
  
  Generate winrepo_cachefile based on sls files in the winrepo

  **CLI Example**:

  ```
  salt-run winrepo.genrepo
  ```

- **get_name_map** *
salt.modules.win_pkg.get_repo_data(saltenv='base')
Returns the cached winrepo data

CLI Example:
salt '*' pkg.get_repo_data

salt.modules.win_pkg.install(name=None, refresh=False, pkgs=None, saltenv='base', **kwargs)
Install the passed package(s) on the system using winrepo

Parameters
- **name** *(str, list, or None)* -- The name of a single package, or a comma-separated list of packages to install. (no spaces after the commas)
- **version** *(str)* -- The specific version to install. If omitted, the latest version will be installed. If passed with multiple install, the version will apply to all packages. Recommended for single installation only.
- **refresh** *(bool)* -- Boolean value representing whether or not to refresh the winrepo db
- **pkgs** *(list or None)* -- A list of packages to install from a software repository. All packages listed under pkgs will be installed via a single command.
- **saltenv** *(str)* -- The salt environment to use. Default is base.
- **kwargs** *(dict)* -- Any additional argument that may be passed from the state module. If they don't apply, they are ignored.

Returns  Return a dict containing the new package names and versions:

Return type
dict

If the package is installed by pkg.install:

\{<package>': {'old': '<old-version>',
              'new': '<new-version>'}}

If the package is already installed:

\{<package>': {'current': '<current-version>'}}

The following example will refresh the winrepo and install a single package, 7zip.

CLI Example:
salt '*' pkg.install 7zip refresh=True

CLI Example:
salt '*' pkg.install 7zip
salt '*' pkg.install 7zip,filezilla
salt '*' pkg.install pkgs='["7zip","filezilla"]'

salt.modules.win_pkg.latest_version(*names, **kwargs)
Return the latest version of the named package available for upgrade or installation. If more than one package name is specified, a dict of name/version pairs is returned.

If the latest version of a given package is already installed, an empty string will be returned for that package.

CLI Example:
salt.modules.win_pkg.list_available('names')
    Return a list of available versions of the specified package.
    CLI Example:
    salt '*' pkg.list_available <package name>
salt.modules.win_pkg.list_pkgs(versions_as_list=False, **kwargs)
    List the packages currently installed in a dict:
    {'<package_name>': '<version>'}
    CLI Example:
    salt '*' pkg.list_pkgs
    salt '*' pkg.list_pkgs versions_as_list=True
salt.modules.win_pkg.list_upgrades(refresh=True)
    List all available package upgrades on this system
    CLI Example:
    salt '*' pkg.list_upgrades
salt.modules.win_pkg.purge(name=None, pkgs=None, version=None, **kwargs)
    Package purges are not supported, this function is identical to remove().
    name  The name of the package to be deleted.
    version  The version of the package to be deleted. If this option is used in combination with the pkgs option below, then this version will be applied to all targeted packages.
    Multiple Package Options:
    pkgs  A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.
    New in version 0.16.0.
    Returns a dict containing the changes.
    CLI Example:
    salt '*' pkg.purge <package name>
salt.modules.win_pkg.remove(name=None, pkgs=None, version=None, **kwargs)
    Remove the passed package(s) from the system using winrepo
Parameters

- **name** *(str, list, or None)* -- The name of the package to be uninstalled.
- **version** *(str)* -- The version of the package to be uninstalled. If this option is used to uninstall multiple packages, then this version will be applied to all targeted packages. Recommended using only when uninstalling a single package. If this parameter is omitted, the latest version will be uninstalled.

Multiple Package Options:

**Parameters** **pkgs** *(list or None)* -- A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

**Returns** Returns a dict containing the changes.

**Return type** dict

If the package is removed by `pkg.remove`:

```
{`<package>`: {`old`: `<old-version>`, `new`: `<new-version>`}}
```

If the package is already uninstalled:

```
{`<package>`: {`current`: `notinstalled`}}
```

CLI Example:

```
salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs=['foo', 'bar']
```

salt.modules.win_pkg.upgrade(*refresh=True*)
Run a full system upgrade

Return a dict containing the new package names and versions:

```
{`<package>`: {`old`: `<old-version>`,
              `new`: `<new-version>`}}
```

CLI Example:

```
salt '*' pkg.upgrade
```

salt.modules.win_pkg.upgrade_available(*name*)
Check whether or not an upgrade is available for a given package

CLI Example:

```
salt '*' pkg.upgrade_available <package name>
```

salt.modules.win_pkg.version(*names*, **kwargs)*
Returns a version if the package is installed, else returns an empty string

CLI Example:

```
salt '*' pkg.version <package name>
```
31.16.301 salt.modules.win_powercfg

This module allows you to control the power settings of a windows minion via powercfg.

New in version 2015.8.0.

```python
salt '*' powercfg.set_monitor_timeout 0 power=dc
salt '*' powercfg.set_disk_timeout 120 power=ac
```

salt.modules.win_powercfg.get_disk_timeout()
Get the current disk timeout of the current scheme

CLI Example:

```python
salt '*' powercfg.get_disk_timeout
```

salt.modules.win_powercfg.get_hibernate_timeout()
Get the current hibernate timeout of the current scheme

CLI Example:

```python
salt '*' powercfg.get_hibernate_timeout
```

salt.modules.win_powercfg.get_monitor_timeout()
Get the current monitor timeout of the current scheme

CLI Example:

```python
salt '*' powercfg.get_monitor_timeout
```

salt.modules.win_powercfg.get_standby_timeout()
Get the current standby timeout of the current scheme

CLI Example:

```python
salt '*' powercfg.get_standby_timeout
```

salt.modules.win_powercfg.set_disk_timeout(timeout, power='ac')
Set the disk timeout in minutes for the current power scheme

CLI Example:

```python
salt '*' powercfg.set_disk_timeout 30 power=dc
```

**timeout**  The amount of time in minutes before the disk will timeout

**power**  Should we set the value for AC or DC (battery)? Valid options ac,dc.

salt.modules.win_powercfg.set_hibernate_timeout(timeout, power='ac')
Set the hibernate timeout in minutes for the current power scheme

CLI Example:

```python
salt '*' powercfg.set_hibernate_timeout 30 power=pc
```

**timeout**  The amount of time in minutes before the computer hibernates

**power**  Should we set the value for AC or DC (battery)? Valid options ac,dc.
salt.modules.win_powercfg.set_monitor_timeout(timeout, power='ac')
Set the monitor timeout in minutes for the current power scheme

CLI Example:

```
salt '*' powercfg.set_monitor_timeout 30 power=ac
```

timeout  The amount of time in minutes before the monitor will timeout
power  Should we set the value for AC or DC (battery)? Valid options ac,dc.

salt.modules.win_powercfg.set_standby_timeout(timeout, power='ac')
Set the standby timeout in minutes for the current power scheme

CLI Example:

```
salt '*' powercfg.set_standby_timeout 30 power=dc
```

timeout  The amount of time in minutes before the computer sleeps
power  Should we set the value for AC or DC (battery)? Valid options ac,dc.

31.16.302  salt.modules.win_repo

Module to manage Windows software repo on a Standalone Minion

```
file_client: local must be set in the minion config file.
```

For documentation on Salt's Windows Repo feature, see here <windows-package-manager

salt.modules.win_repo.genrepo()
Generate winrepo_cachefile based on sls files in the winrepo_dir

CLI Example:

```
salt-call winrepo.genrepo
```

salt.modules.win_repo.show_sls(name, saltenv='base')
New in version 2015.8.0.

Display the rendered software definition from a specific sls file in the local winrepo cache. This will parse all
Jinja. Run pkg.refresh_db to pull the latest software definitions from the master.

Parameters

- **name** *(str)*  -- The name of the package you want to view. Start from the local winrepo
root. If you have .sls files organized in subdirectories you’ll have to denote them with ..
For example, if I have a test directory in the winrepo root with a gvim.sls file inside,
I would target that file like so: test.gvim. Directories can be targeted as well as long
as they contain an init.sls inside. For example, if I have a node directory with an
init.sls inside, I would target that like so: node.

- **saltenv** *(str)*  -- The default environment is base

Returns  Returns a dictionary containing the rendered data structure

Return type  *dict*

CLI Example:
```
salt '*' winrepo.show_sls gvim
salt '*' winrepo.show_sls test.npp
```

```python
salt.modules.win_repo.update_git_repos(clean=False)
```

Checkout git repos containing *Windows Software Package Definitions*

**Important:** This function requires *Git for Windows* to be installed in order to work. When installing, make sure to select an installation option which permits the git executable to be run from the Command Prompt.

**clean** [False] Clean repo cachedirs which are not configured under `winrepo_remotes`.

**Note:** This option only applies if either *pygit2* or *GitPython* is installed into Salt's bundled Python.

**Warning:** This argument should not be set to *True* if a mix of git and non-git repo definitions are being used, as it will result in the non-git repo definitions being removed.

New in version 2015.8.0.

CLI Example:
```
salt-call winrepo.update_git_repos
```

### 31.16.303 `salt.modules.win_servermanager`

Manage Windows features via the `ServerManager powershell module`

```python
salt.modules.win_servermanager.install(feature, recurse=False)
```

Install a feature

**Note:** Some features requires reboot after un/installation, if so until the server is restarted Other features can not be installed!

**Note:** Some features takes a long time to complete un/installation, set `t` with a long timeout

CLI Example:
```
salt '*' win_servermanager.install Telnet-Client
salt '*' win_servermanager.install SNMP-Service True
```

```python
salt.modules.win_servermanager.list_available()
```

List available features to install

CLI Example:
```
salt '*' win_servermanager.list_available
```

```python
salt.modules.win_servermanager.list_installed()
```

List installed features. Supported on Windows Server 2008 and Windows 8 and newer.

CLI Example:
```
salt '*' win_servermanager.list_installed
```

```python
salt.modules.win_servermanager.remove(feature)
```

Remove an installed feature
Note: Some features require a reboot after installation/uninstallation. If one of these features are modified, then other features cannot be installed until the server is restarted. Additionally, some features take a while to complete installation/uninstallation, so it is a good idea to use the `-t` option to set a longer timeout.

CLI Example:

```
salt -t 600 '*\ win_servermanager.remove Telnet-Client
```

### 31.16.304 salt.modules.win_service

Windows Service module.

**salt.modules.win_service.available(name)**

Returns `True` if the specified service is available, otherwise returns `False`.

CLI Example:

```
salt '*\ service.available <service name>
```

**salt.modules.win_service.create(name, binpath, DisplayName=None, type='own', start='demand', error='normal', group=None, tag='no', depend=None, obj=None, password=None, **kwargs)**

Create the named service.

New in version 2015.8.0.

Required parameters: name: Specifies the service name returned by the getkeyname operation binpath: Specifies the path to the service binary file, backslashes must be escaped

  • eg: C:\path\to\binary.exe

Optional parameters: DisplayName: the name to be displayed in the service manager type: Specifies the service type, default is own

  • own (default): Service runs in its own process
  • share: Service runs as a shared process
  • interact: Service can interact with the desktop
  • kernel: Service is a driver
  • filesys: Service is a system driver
  • rec: Service is a file system-recognized driver that identifies filesystems on the computer

**start**: Specifies the start type for the service

  • boot: Device driver that is loaded by the boot loader
  • system: Device driver that is started during kernel initialization
  • auto: Service that automatically starts
  • demand (default): Service must be started manually
  • disabled: Service cannot be started
  • delayed-auto: Service starts automatically after other auto-services start

**error**: Specifies the severity of the error

  • normal (default): Error is logged and a message box is displayed
Salt Documentation, Release 2015.8.0

- severe: Error is logged and computer attempts a restart with last known good configuration
- critical: Error is logged, computer attempts to restart with last known good configuration, system halts on failure
- ignore: Error is logged and startup continues, no notification is given to the user

group: Specifies the name of the group of which this service is a member
tag: Specifies whether or not to obtain a TagID from the CreateService call. For boot-start and system-start drivers
  * yes/no

depend: Specifies the names of services or groups that must start before this service. The names are separated by forward slashes.
obj: Specifies the name of an account in which a service will run. Default is LocalSystem
password: Specifies a password. Required if other than LocalSystem account is used.

CLI Example:

```bash
salt '*' service.create <service name> <path to exe> display_name='display name'
```

salt.modules.win_service.create_win_salt_restart_task()  
Create a task in Windows task scheduler to enable restarting the salt-minion

CLI Example:

```bash
salt '*' service.create_win_salt_restart_task()
```

salt.modules.win_service.delete(name)
  Delete the named service

CLI Example:

```bash
salt '*' service.delete <service name>
```

salt.modules.win_service.disable(name, **kwargs)
  Disable the named service to start at boot

CLI Example:

```bash
salt '*' service.disable <service name>
```

salt.modules.win_service.disabled(name, **kwargs)
  Check to see if the named service is disabled to start on boot

CLI Example:

```bash
salt '*' service.disabled <service name>
```

salt.modules.win_service.enable(name, **kwargs)
  Enable the named service to start at boot

CLI Example:

```bash
salt '*' service.enable <service name>
```

salt.modules.win_service.enabled(name, **kwargs)
  Check to see if the named service is enabled to start on boot

CLI Example:

```bash
salt '*' service.enabled <service name>
```
salt.modules.win_service.execute_salt_restart_task()
Run the Windows Salt restart task
    CLI Example:
    salt '*' service.execute_salt_restart_task()

salt.modules.win_service.get_all()
Return all installed services
    CLI Example:
    salt '*' service.get_all

salt.modules.win_service.get_disabled()
Return the disabled services
    CLI Example:
    salt '*' service.get_disabled

salt.modules.win_service.get_enabled()
Return the enabled services
    CLI Example:
    salt '*' service.get_enabled

salt.modules.win_service.get_service_name(*args)
The Display Name is what is displayed in Windows when services.msc is executed. Each Display Name has
an associated Service Name which is the actual name of the service. This function allows you to discover the
Service Name by returning a dictionary of Display Names and Service Names, or filter by adding arguments
of Display Names.

    If no args are passed, return a dict of all services where the keys are the service Display Names and the values
    are the Service Names.

    If arguments are passed, create a dict of Display Names and Service Names
    CLI Example:
    salt '*' service.get_service_name
    salt '*' service.get_service_name 'Google Update Service (gupdate)' 'DHCP Client'

salt.modules.win_service.getsid(name)
Return the sid for this windows service
    CLI Example:
    salt '*' service.getsid <service name>

salt.modules.win_service.has_powershell()
Confirm if Powershell is available
    CLI Example:
    salt '*' service.has_powershell

salt.modules.win_service.missing(name)
The inverse of service.available. Returns True if the specified service is not available, otherwise returns
False.
    CLI Example:
salt '*' service.missing <service name>

salt.modules.win_service.restart(name)
    Restart the named service
    CLI Example:
    
salt '*' service.restart <service name>

salt.modules.win_service.start(name)
    Start the specified service
    CLI Example:
    salt '*' service.start <service name>

salt.modules.win_service.status(name, sig=None)
    Return the status for a service, returns the PID or an empty string if the service is running or not, pass a
    signature to use to find the service via ps
    CLI Example:
    salt '*' service.status <service name> [service signature]

salt.modules.win_service.stop(name)
    Stop the specified service
    CLI Example:
    salt '*' service.stop <service name>

31.16.305 salt.modules.win_shadow

Manage the shadow file
salt.modules.win_shadow.info(name)
    Return information for the specified user This is just returns dummy data so that salt states can work.
    CLI Example:
    
salt '*' shadow.info root

salt.modules.win_shadow.set_password(name, password)
    Set the password for a named user.
    CLI Example:
    salt '*' shadow.set_password root mysecretpassword

31.16.306 salt.modules.win_status

Module for returning various status data about a minion. These data can be useful for compiling into stats later, or
for problem solving if your minion is having problems.
New in version 0.12.0.

    depends
        • pythoncom
• wmi

salt.modules.win_status.cpulead()  
New in version 2015.8.0.
Return the processor load as a percentage
CLI Example:
```python
salt '*' status.cpulead
```

salt.modules.win_status.diskusage(human_readable=False, path=None)  
New in version 2015.8.0.
Return the disk usage for this minion
human_readable [False] If True, usage will be in KB/MB/GB etc.
CLI Example:
```python
salt '*' status.disk_usage path=c:/salt
```

salt.modules.win_status.master(master=None, connected=True)  
New in version 2015.5.0.
Fire an event if the minion gets disconnected from its master. This function is meant to be run via a scheduled job from the minion. If master_ip is an FQDN/Hostname, is must be resolvable to a valid IPv4 address.
CLI Example:
```python
salt '*' status.master
```

salt.modules.win_status.procs(count=False)  
Return the process data
count [False] If True, this function will simply return the number of processes.
New in version 2015.8.0.
CLI Example:
```python
salt '*' status.procs
salt '*' status.procs count
```

salt.modules.win_status.saltmem(human_readable=False)  
New in version 2015.8.0.
Returns the amount of memory that salt is using
human_readable [False] return the value in a nicely formatted number
CLI Example:
```python
salt '*' status.salt_mem
salt '*' status.salt_mem human_readable=True
```

salt.modules.win_status.uptime(human_readable=False)  
New in version 2015.8.0.
Return the system uptime for this machine in seconds
human_readable [False] If True, then the number of seconds will be translated into years, months, days, etc.
CLI Example:
31.16.307 salt.modules.win_system

Module for managing windows systems.

depends
  • win32net

Support for reboot, shutdown, etc

salt.modules.win_system.get_computer_desc()
Get the Windows computer description

Returns Returns the computer description if found. Otherwise returns False

CLI Example:

```
salt 'minion-id' system.get_computer_desc
```

salt.modules.win_system.get_computer_name()
Get the Windows computer name

Returns Returns the computer name if found. Otherwise returns False

CLI Example:

```
salt 'minion-id' system.get_computer_name
```

salt.modules.win_system.get_pending_computer_name()
Get a pending computer name. If the computer name has been changed, and the change is pending a system reboot, this function will return the pending computer name. Otherwise, None will be returned. If there was an error retrieving the pending computer name, False will be returned, and an error message will be logged to the minion log.

Returns Returns the pending name if pending restart. Returns none if not pending restart.

CLI Example:

```
salt 'minion-id' system.get_pending_computer_name
```

salt.modules.win_system.get_system_date()
Get the Windows system date

Returns Returns the system date.

Return type str

CLI Example:

```
salt '*' system.get_system_date
```

salt.modules.win_system.get_system_info()
Get system information.

Returns Returns a Dictionary containing information about the system to include name, description, version, etc...

Return type dict
salt.modules.win_system.get_system_time()

Get the system time.

Returns Returns the system time in HH:MM AM/PM format.

Return type str

salt.modules.win_system.halt(timeout=5, in_seconds=False)

Halt a running system.

Parameters timeout (int) -- Number of seconds before halting the system. Default is 5 seconds.

Returns True is successful.

Return type bool

timeout The wait time before the system will be shutdown.

in_seconds Whether to treat timeout as seconds or minutes.

New in version 2015.8.0.

CLI Example:

salt '*' system.halt 5

salt.modules.win_system.init(runlevel)

Change the system runlevel on sysV compatible systems

CLI Example:

salt '*' system.init 3

salt.modules.win_system.join_domain()

Join a computer to an Active Directory domain

Parameters

• domain (str) -- The domain to which the computer should be joined, e.g. my-company.com

• username (str) -- Username of an account which is authorized to join computers to the specified domain. Need to be either fully qualified like user@domain.tld or simply user

• password (str) -- Password of the specified user

• account_ou (str) -- The DN of the OU below which the account for this computer should be created when joining the domain, e.g. ou=computers,ou=department_432,dc=my-company,dc=com

• account_exists (bool) -- Needs to be set to True to allow re-using an existing account

CLI Example:

salt 'minion-id' system.join_domain domain='domain.tld' \ username='joinuser' password='joinpassword' \ account_ou='ou=clients,ou=org,dc=my-company,dc=tld' \ account_exists=False

salt.modules.win_system.lock()

Lock the workstation.
Returns True if successful
Return type bool

salt.modules.win_system.poweroff(timeout=5, in_seconds=False)
Power off a running system.

Parameters timeout (int) -- Number of seconds before powering off the system. Default is 5 seconds.

Returns True if successful
Return type bool

timeout The wait time before the system will be shutdown.
in_seconds Whether to treat timeout as seconds or minutes.

New in version 2015.8.0.

CLI Example:
salt '*' system.poweroff 5

salt.modules.win_system.reboot(timeout=5, in_seconds=False)
Reboot a running system.

Parameters timeout (int) -- Number of seconds before rebooting the system. Default is 5 seconds.

Returns True if successful
Return type bool

timeout The wait time before the system will be shutdown.
in_seconds Whether to treat timeout as seconds or minutes.

New in version 2015.8.0.

CLI Example:
salt '*' system.reboot 5

salt.modules.win_system.set_computer_desc(desc=None)
Set the Windows computer description

Parameters desc (str) -- The computer description

Returns False if it fails. Description if successful.

CLI Example:
salt 'minion-id' system.set_computer_desc 'This computer belongs to Dave!' 

salt.modules.win_system.set_computer_name(name)
Set the Windows computer name

Parameters name (str) -- The new name to give the computer. Requires a reboot to take effect.

Returns Returns a dictionary containing the old and new names if successful. False if not.

CLI Example:
salt 'minion-id' system.set_computer_name 'DavesComputer'
salt.modules.win_system.set_system_date(newdate)
Set the Windows system date. Use <mm-dd-yyyy> format for the date.

Parameters

- **newdate** *(str)* -- The date to set. Can be any of the following formats - YYYY-MM-DD
  - MM-DD-YYYY - MM-DD-YY - MM/DD/YYYY - MM/DD/YY - YYYY/MM/DD

CLI Example:

```
salt '*' system.set_system_date '03-28-13'
```

salt.modules.win_system.set_system_date_time(years=None, months=None, days=None, hours=None, minutes=None, seconds=None)
Set the system date and time. Each argument is an element of the date, but not required. If an element is not passed, the current system value for that element will be used. For example, if you don’t pass the year, the current system year will be used. (Used by set_system_date and set_system_time)

Parameters

- **years** *(int)* -- Years digit, ie: 2015
- **months** *(int)* -- Months digit: 1 - 12
- **days** *(int)* -- Days digit: 1 - 31
- **hours** *(int)* -- Hours digit: 0 - 23
- **minutes** *(int)* -- Minutes digit: 0 - 59
- **seconds** *(int)* -- Seconds digit: 0 - 59

Returns

True if successful. Otherwise False.

Return type  **bool**

CLI Example:

```
salt '*' system.set_system_date_time 2015 5 12 11 37 53
```

salt.modules.win_system.set_system_time(newtime)
Set the system time.

Parameters

- **newtime** *(str)* -- The time to set. Can be any of the following formats. - HH:MM:SS

Returns

Returns True if successful. Otherwise False.

Return type  **bool**

salt.modules.win_system.shutdown(message=None, timeout=5, force_close=True, reboot=False, in_seconds=False)
Shutdown a running system.

Parameters

- **message** *(str)* -- A message to display to the user before shutting down.
- **timeout** *(int)* -- The length of time that the shutdown dialog box should be displayed, in seconds. While this dialog box is displayed, the shutdown can be stopped by the shutdown_abort function.

If dwTimeout is not zero, InitiateSystemShutdown displays a dialog box on the specified computer. The dialog box displays the name of the user who called the function, displays the message specified by the lpMessage parameter, and prompts the user to log off. The dialog box beeps when it is created and remains on top of other windows in the system.
The dialog box can be moved but not closed. A timer counts down the remaining time before a forced shutdown.

If dwTimeout is zero, the computer shuts down without displaying the dialog box, and the shutdown cannot be stopped by shutdown_abort.

Default is 5

- **in_seconds (bool)** -- Whether to treat timeout as seconds or minutes.
  
  New in version 2015.8.0.

- **force_close (bool)** -- True to force close all open applications. False displays a dialog box instructing the user to close the applications.

- **reboot (bool)** -- True restarts the computer immediately after shutdown. False caches to disk and safely powers down the system.

**Returns**  True if successful

**Return type**  bool

**CLI Example:**

```python
salt '*' system.shutdown 5
```

salt.modules.win_system.shutdown_abort()

Abort a shutdown. Only available while the dialog box is being displayed to the user. Once the shutdown has initiated, it cannot be aborted.

**Returns**  True if successful

**Return type**  bool

salt.modules.win_system.shutdown_hard()

Shutdown a running system with no timeout or warning.

**Parameters**  **timeout (int)** -- Number of seconds before shutting down the system. Default is 5 seconds.

**Returns**  True if successful

**Return type**  bool

**CLI Example:**

```python
salt '*' system.shutdown_hard
```

salt.modules.win_system.start_time_service()

Start the Windows time service

**Returns**  True if successful. Otherwise False

**Return type**  bool

**CLI Example:**

```python
salt '*' system.start_time_service
```

salt.modules.win_system.stop_time_service()

Stop the Windows time service

**Returns**  True if successful. Otherwise False

**Return type**  bool
Salt Documentation, Release 2015.8.0

CLI Example:
```
salt '*' system.stop_time_service
```

`salt.modules.win_system.unjoin_domain(username=None, password=None, disable=False)`
Unjoin a computer from an Active Directory Domain

Parameters
- **username** -- Username of an account which is authorized to join computers to the specified domain. Need to be either fully qualified like user@domain.tld or simply user
- **password (str)** -- Password of the specified user
- **disable (bool)** -- Disable the user account in Active Directory. True to disable.

Returns
True if successful. False if not. Log contains error code.

Return type  bool

CLI Example:
```
salt 'minion-id' system.unjoin_domain username='unjoinuser' \ password='unjoinpassword' disable=True
```

31.16.308 `salt.modules.win_timezone`

Module for managing timezone on Windows systems.

`salt.modules.win_timezone.get_hwclock()`
Get current hardware clock setting (UTC or localtime)

CLI Example:
```
salt '*' timezone.get_hwclock
```

`salt.modules.win_timezone.get_offset()`
Get current numeric timezone offset from UCT (i.e. -0700)

CLI Example:
```
salt '*' timezone.get_offset
```

`salt.modules.win_timezone.get_zone()`
Get current timezone (i.e. America/Denver)

CLI Example:
```
salt '*' timezone.get_zone
```

`salt.modules.win_timezone.get_zonecode()`
Get current timezone (i.e. PST, MDT, etc)

CLI Example:
```
salt '*' timezone.get_zonecode
```

`salt.modules.win_timezone.set_hwclock(clock)`
Sets the hardware clock to be either UTC or localtime

CLI Example:
salt '*' timezone.set_hwclock UTC

salt.modules.win_timezone.set_zone(timezone)
Unlinks, then symlinks /etc/localtime to the set timezone.
The timezone is crucial to several system processes, each of which SHOULD be restarted (for instance, whatever you system uses as its cron and syslog daemons). This will not be magically done for you!
CLI Example:
salt '*' timezone.set_zone 'America/Denver'

class salt.modules.win_timezone.zone_compare(timezone)
Checks the md5sum between the given timezone, and the one set in /etc/localtime. Returns True if they match, and False if not. Mostly useful for running state checks.
Example:
salt '*' timezone.zone_compare 'America/Denver'

31.16.309 salt.modules.win_update

Module for running windows updates.

depends
  • win32com
  • win32con
  • win32api
  • pywintypes

New in version 2014.7.0.
class salt.modules.win_update.PyWinUpdater(categories=None, skipUI=True, skipDownloaded=False, skipInstalled=True, skipReboot=False, skipPresent=False, softwareUpdates=True, driverUpdates=False, skipHidden=True)

AutoSearch()
  this function generates a search string. simplifying the search function while still providing as many features as possible.

Download()
GetAvailableCategories()
GetCategories()
GetDownloadResults()
GetInstallationResults()
  this gets results of installation process.
GetInstallationResultsPretty()
  converts the installation results into a pretty print.
GetSearchResults()
GetSearchResultsPretty()
Install()
Search(searchString)
SetCategories(categories)
SetInclude(include, state)
SetIncludes(includes)

salt.modules.win_update.download_updates(includes=None, retries=5, categories=None)
Downloads all available updates, skipping those that require user interaction.
Various aspects of the updates can be included or excluded. This feature is still in development.

- **retries**: Number of retries to make before giving up. This is total, not per step.
- **categories**: Specify the categories to update. Must be passed as a list.

```python
salt '*' win_update.download_updates categories=['Updates']
```

Categories include the following:
- Updates
- Windows 7
- Critical Updates
- Security Updates
- Update Rollups

**CLI Examples:**

```bash
# Normal Usage
salt '*' win_update.download_updates
# Download critical updates only
salt '*' win_update.download_updates categories=['Critical Updates']
```

salt.modules.win_update.install_updates(includes=None, retries=5, categories=None)
Downloads and installs all available updates, skipping those that require user interaction.

Add cached to only install those updates which have already been downloaded.
you can set the maximum number of retries to n in the search process by adding: retries=n
various aspects of the updates can be included or excluded. This function is still under development.

- **retries**: Number of retries to make before giving up. This is total, not per step.
- **categories**: Specify the categories to install. Must be passed as a list.

```python
salt '*' win_update.install_updates categories=['Updates']
```

Categories include the following:
- Updates
- Windows 7
- Critical Updates
- Security Updates
- Update Rollups
CLI Examples:

# Normal Usage
salt '*' win_update.install_updates

# Install all critical updates
salt '*' win_update.install_updates categories="[Critical Updates']"

salt.modules.win_update.list_updates(
    verbose=False, includes=None, retries=5, categories=None)

Returns a summary of available updates, grouped into their non-mutually exclusive categories.

verbose  Print results in greater detail
retries  Number of retries to make before giving up. This is total, not per step.
categories  Specify the categories to list. Must be passed as a list.

salt '*' win_update.list_updates categories="[Updates']"

Categories include the following:
- Updates
- Windows 7
- Critical Updates
- Security Updates
- Update Rollups

CLI Examples:

# Normal Usage
salt '*' win_update.list_updates

# List all critical updates list in verbose detail
salt '*' win_update.list_updates categories="[Critical Updates'] verbose=True

31.16.310  salt.modules.win_useradd

Module for managing Windows Users

depends
- pywintypes
- win32api
- win32net
- win32netcon
- win32profile
- win32security
- win32ts

Note:  This currently only works with local user accounts, not domain accounts
salt.modules.win_useradd.

\texttt{add}\ (name, \texttt{password=None}, \texttt{fullname=False}, \texttt{description=None}, \texttt{groups=None}, \texttt{home=None}, \texttt{homedrive=None}, \texttt{profile=None}, \texttt{logonscript=None})

Add a user to the minion.

**Parameters**

- \texttt{name (str)} -- User name
- \texttt{password (str)} -- User's password in plain text.
- \texttt{fullname (str)} -- The user's full name.
- \texttt{description (str)} -- A brief description of the user account.
- \texttt{groups (list)} -- A list of groups to add the user to.
- \texttt{home (str)} -- The path to the user's home directory.
- \texttt{homedrive (str)} -- The drive letter to assign to the home directory. Must be the Drive Letter followed by a colon. ie: U:
- \texttt{profile (str)} -- An explicit path to a profile. Can be a UNC or a folder on the system. If left blank, windows uses it's default profile directory.
- \texttt{logonscript (str)} -- Path to a login script to run when the user logs on.

**Returns**  
True if successful. False is unsuccessful.

**Return type**  
\texttt{bool}

**CLI Example:**

```
salt '*' user.add name password
```

salt.modules.win_useradd.

\texttt{addgroup}\ (name, group)

Add user to a group

**Parameters**

- \texttt{name (str)} -- user name to add to the group
- \texttt{group (str)} -- name of the group to which to add the user

**Returns**  
True if successful. False is unsuccessful.

**Return type**  
\texttt{bool}

**CLI Example:**

```
salt '*' user.addgroup jsnuffy 'Power Users'
```

salt.modules.win_useradd.

\texttt{chfullname}\ (name, fullname)

Change the full name of the user

**Parameters**

- \texttt{name (str)} -- user name for which to change the full name
- \texttt{fullname (str)} -- the new value for the full name

**Returns**  
True if successful. False is unsuccessful.

**Return type**  
\texttt{bool}

**CLI Example:**
salt '‡' user.chfullname user 'First Last'

```python
salt.modules.win_useradd.chgroups(name, groups, append=True)
```

Change the groups this user belongs to, add `append=False` to make the user a member of only the specified groups.

**Parameters**

- `name (str)` -- user name for which to change groups
- `groups (list, str)` -- a single group or a list of groups to assign to the user
- `append (bool)` -- True adds the passed groups to the user’s current groups False sets the user’s groups to the passed groups only

**Returns**

True if successful. False is unsuccessful.

**Return type**

bool

**CLI Example:**

```
salt '‡' user.chgroups jsnuffy Administrators,Users True
```

salt.modules.win_useradd.chhome(name, home, persist=False)

Change the home directory of the user, pass `True` for `persist` to move files to the new home directory if the old home directory exist.

**Parameters**

- `name (str)` -- name of the user whose home directory you wish to change
- `home (str)` -- new location of the home directory
- `persist (bool)` -- True to move the contents of the existing home directory to the new location

**Returns**

True if successful. False is unsuccessful.

**Return type**

bool

**CLI Example:**

```
salt '‡' user.chhome foo \\fileserver\home\foo True
```

salt.modules.win_useradd.chprofile(name, profile)

Change the profile directory of the user

**Parameters**

- `name (str)` -- name of the user whose profile you wish to change
- `profile (str)` -- new location of the profile

**Returns**

True if successful. False is unsuccessful. :rtype: bool

**CLI Example:**

```
salt '‡' user.chprofile foo \\fileserver\profiles\foo
```

salt.modules.win_useradd.current(sam=False)

Get the username that salt-minion is running under. If salt-minion is running as a service it should return the Local System account. If salt is running from a command prompt it should return the username that started the command prompt.
New in version 2015.5.6.

Parameters **sam** *(bool)* -- False returns just the username without any domain notation. True returns the domain with the username in the SAM format. I.e:

```
domain\username
```

Returns Returns False if the username cannot be returned. Otherwise returns the username.

Return type **bool str**

CLI Example:

```
salt '*' user.current
```

### **salt.modules.win_useradd.delete** *(name, purge=False, force=False)*

Remove a user from the minion

Parameters

- **name** *(str)* -- The name of the user to delete
- **purge** *(bool)* -- Boolean value indicating that the user profile should also be removed when the user account is deleted. If set to True the profile will be removed.
- **force** *(bool)* -- Boolean value indicating that the user account should be deleted even if the user is logged in. True will log the user out and delete user.

Returns True if successful

Return type **bool**

CLI Example:

```
salt '*' user.delete name
```

### **salt.modules.win_useradd.getUserSid** *(username)*

Get the Security ID for the user

Parameters **username** *(str)* -- user name for which to look up the SID

Returns Returns the user SID

Return type **str**

CLI Example:

```
salt '*' user.getUserSid jsnuffy
```

### **salt.modules.win_useradd.getent** *(refresh=False)*

Return the list of all info for all users

Parameters **refresh** *(bool)* -- Refresh the cached user information. Default is False. Useful when used from within a state function.

Returns A dictionary containing information about all users on the system

Return type **dict**

CLI Example:

```
salt '*' user.getent
```

### **salt.modules.win_useradd.info** *(name)*

Return user information

Parameters **name** *(str)* -- Username for which to display information
Returns

A dictionary containing user information

- fullname
- username
- SID
- passwd (will always return None)
- comment (same as description, left here for backwards compatibility)
- description
- active
- logonscript
- profile
- home
- homedrive
- groups
- gid

Return type  dict

CLI Example:

```bash
salt '*' user.info jsnuffy
```

salt.modules.win_useradd.list_groups(name)

Return a list of groups the named user belongs to

Parameters  name (str) -- user name for which to list groups

Returns  list of groups to which the user belongs

Return type  list

CLI Example:

```bash
salt '*' user.list_groups foo
```

salt.modules.win_useradd.list_users()

Return a list of users on Windows

Returns  list of users on the system

Return type  list

CLI Example:

```bash
salt '*' user.list_users
```

salt.modules.win_useradd.removegroup(name, group)

Remove user from a group

Parameters

- name (str) -- user name to remove from the group
- group (str) -- name of the group from which to remove the user
Returns True if successful. False is unsuccessful.

Return type bool

CLI Example:

    salt '*' user.removegroup jsnuffy 'Power Users'

salt.modules.win_useradd.rename(name, new_name)
Change the username for a named user

Parameters

• name (str) -- user name to change
• new_name (str) -- the new name for the current user

Returns True if successful. False is unsuccessful.

Return type bool

CLI Example:

    salt '*' user.rename jsnuffy jshmoe

salt.modules.win_useradd.setPassword(name, password)
Set the user's password

Parameters

• name (str) -- user name for which to set the password
• password (str) -- the new password

Returns True if successful. False is unsuccessful.

Return type bool

CLI Example:

    salt '*' user.setPassword jsnuffy sup3rs3cr3t

salt.modules.win_useradd.update(name, password=None, fullname=None, description=None, home=None, homedrive=None, logonscript=None, profile=None)
Updates settings for the windows user. Name is the only required parameter. Settings will only be changed if the parameter is passed a value.

New in version 2015.8.0.

Parameters

• name (str) -- The user name to update.
• password (str) -- New user password in plain text.
• fullname (str) -- The user's full name.
• description (str) -- A brief description of the user account.
• home (str) -- The path to the user's home directory.
• homedrive (str) -- The drive letter to assign to the home directory. Must be the Drive Letter followed by a colon. ie: U:
• logonscript (str) -- The path to the logon script.
• profile (str) -- The path to the user's profile directory.
**Returns**

True if successful. False is unsuccessful.

**Return type**

`bool`

**CLI Example:**

```
salt '*' user.update bob password=secret profile=C:\Users\Bob
     home=\server\homeshare\bob homedrive=U:
```

31.16.311 **salt.modules.win_wua**

Module for managing Windows Updates using the Windows Update Agent.

New in version 2015.8.0.

**depends**

- `win32com`
- `pythoncom`

**salt.modules.win_wua.download_update(**`guid=None`**)**

Downloads a single update

**Parameters**

- `guid` -- str A GUID for the update to be downloaded

**Returns**

A dictionary containing the status, a message, and a list of updates that were downloaded.

**CLI Examples:**

```
salt '*' win_wua.download_update 12345678-abcd-1234-abcd-1234567890ab
```

**salt.modules.win_wua.download_updates(**`guid=None`**)**

Downloads updates that match the list of passed GUIDs. It's easier to use this function by using list_updates and setting install=True.

**Parameters**

- `guid` -- A list of GUIDs to be downloaded

**Returns**

A dictionary containing the status, a message, and a list of updates that were downloaded.

**CLI Examples:**

```
# Normal Usage
salt '*' win_wua.download_updates guid=['12345678-abcd-1234-abcd-1234567890ab',
     '87654321-dcba-4321-dcba-ba0987654321']
```

**salt.modules.win_wua.get_needs_reboot()**

Determines if the system needs to be rebooted.

**Returns**

`bool` True if the system requires a reboot, False if not

**CLI Examples:**

```
salt '*' win_wua.get_needs_reboot
```

**salt.modules.win_wua.get_wu_settings()**

Get current Windows Update settings.

**Returns**

- **Featured Updates**: Boolean value that indicates whether to display notifications for featured updates.
- **Group Policy Required (Read-only)**: Boolean value that indicates whether Group Policy requires the Automatic Updates service.
**Microsoft Update**: Boolean value that indicates whether to turn on Microsoft Update for other Microsoft Products

**Needs Reboot**: Boolean value that indicates whether the machine is in a reboot pending state.

**Non Admins Elevated**: Boolean value that indicates whether non-administrators can perform some update-related actions without administrator approval.

**Notification Level**:

Number 1 to 4 indicating the update level:
1. Never check for updates
2. Check for updates but let me choose whether to download and install them
3. Download updates but let me choose whether to install them
4. Install updates automatically

**Read Only (Read-only)**: Boolean value that indicates whether the Automatic Update settings are read-only.

**Recommended Updates**: Boolean value that indicates whether to include optional or recommended updates when a search for updates and installation of updates is performed.

**Scheduled Day**: Days of the week on which Automatic Updates installs or uninstalls updates.

**Scheduled Time**: Time at which Automatic Updates installs or uninstalls updates.

CLI Examples:

```shell
salt '*' win_wua.get_wu_settings
```

```python
salt.modules.win_wua.install_update(guid=None)
```
Installs a single update

**Parameters**
- `guid` -- str A GUID for the update to be installed

**Returns**
- `dict` A dictionary containing the details about the installed update

CLI Examples:

```shell
salt '*' win_wua.install_update 12345678-abcd-1234-abcd-1234567890ab
```

```python
salt.modules.win_wua.install_updates(guid=None)
```
Installs updates that match the passed criteria. It may be easier to use the list_updates function and set install=True.

**Parameters**
- `guid` -- list A list of GUIDs to be installed

**Returns**
- `dict` A list of GUIDs to be installed

CLI Examples:

```shell
# Normal Usage
salt '*' win_wua.install_updates
guid=['12345678-abcd-1234-abcd-1234567890ab', '87654321-dcbe-4321-dcbe-ba0987654321']
```

```python
salt.modules.win_wua.list_update(name=None, download=False, install=False)
```
Returns details for all updates that match the search criteria

**Parameters**
• **name (str)** -- The name of the update you're searching for. This can be the GUID (preferred), a KB number, or the full name of the update. Run `list_updates` to get the GUID for the update you're looking for.

• **download (bool)** -- Download the update returned by this function. Run this function first to see if the update exists, then set `download=True` to download the update.

• **install (bool)** -- Install the update returned by this function. Run this function first to see if the update exists, then set `install=True` to install the update. This will override `download=True`.

**Returns**

Returns a dict containing a list of updates that match the name if `download` and `install` are both set to False. Should usually be a single update, but can return multiple if a partial name is given. If `download` or `install` is set to True it will return the results of `win_wua.download_updates`.

List of Updates:

```python
{'<GUID>': {'Title': <title>,
    'KB': <KB>,
    'GUID': <the globally unique identifier for the update>
    'Description': <description>,
    'Downloaded': <has the update been downloaded>,
    'Installed': <has the update been installed>,
    'Mandatory': <is the update mandatory>,
    'UserInput': <is user input required>,
    'EULAAccepted': <has the EULA been accepted>,
    'Severity': <update severity>,
    'NeedsReboot': <is the update installed and awaiting reboot>,
    'RebootBehavior': <will the update require a reboot>,
    'Categories': [{'<category 1>'},
        {'<category 2>'},
        ...
    ]
}
```

**Return type**  
dict

**CLI Examples:**

```bash
# Recommended Usage using GUID without braces
# Use this to find the status of a specific update
salt '*' wua.list_update 12345678-abcd-1234-abcd-1234567890ab

# Use the following if you don't know the GUID:

# Using a KB number (could possibly return multiple results)
# Not all updates have an associated KB
salt '*' wua.list_update KB3030298

# Using part or all of the name of the update
# Could possibly return multiple results
# Not all updates have an associated KB
salt '*' wua.list_update 'Microsoft Camera Codec Pack'
```

```
salt.modules.win_wua.list_updates(software=True, drivers=False, summary=False, installed=False, categories=None, severities=None, download=False, install=False)
```

Returns a detailed list of available updates or a summary.
Parameters

- **software** *(bool)* -- Include software updates in the results (default is True)
- **drivers** *(bool)* -- Include driver updates in the results (default is False)
- **summary** *(bool)* -- True: Return a summary of updates available for each category. False (default): Return a detailed list of available updates.
- **installed** *(bool)* -- Include installed updates in the results (default if False)
- **download** *(bool)* -- (Overrides reporting functionality) Download the list of updates returned by this function. Run this function first to see what will be installed, then set download=True to download the updates.
- **install** *(bool)* -- (Overrides reporting functionality) Install the list of updates returned by this function. Run this function first to see what will be installed, then set install=True to install the updates. This will override download=True
- **categories** *(list)* -- Specify the categories to list. Must be passed as a list. All categories returned by default.

Categories include the following:
- Critical Updates
- Definition Updates
- Drivers (make sure you set drivers=True)
- Feature Packs
- Security Updates
- Update Rollups
- Updates
- Update Rollups
- Windows 7
- Windows 8.1
- Windows 8.1 drivers
- Windows 8.1 and later drivers
- Windows Defender

- **severities** *(list)* -- Specify the severities to include. Must be passed as a list. All severities returned by default.

Severities include the following:
- Critical
- Important

Returns

Returns a dict containing either a summary or a list of updates:

```
List of Updates:
{'<GUID>': {'Title': <title>,
             'KB': <KB>,
             'GUID': <the globally unique identifier for the update>}
```
{'Description': <description>,
'Downloaded': <has the update been downloaded>,
'Installed': <has the update been installed>,
'Mandatory': <is the update mandatory>,
'UserInput': <is user input required>,
'EULAAccepted': <has the EULA been accepted>,
'Severity': <update severity>,
'NeedsReboot': <is the update installed and awaiting reboot>,
'RebootBehavior': <will the update require a reboot>,
'Categories': [ '<category 1>',
    '<category 2>',
    ...
]}
}

Summary of Updates:
{"Total': <total number of updates returned>,
 'Available': <updates that are not downloaded or installed>,
 'Downloaded': <updates that are downloaded but not installed>,
 'Installed': <updates installed (usually 0 unless installed=True)>,
 'Categories': { <category 1>: <total for that category>,
    <category 2>: <total for category 2>,
    ... }
}

Return type  dict

CLI Examples:

# Normal Usage (list all software updates)
salt '*' wua.list_updates

# List all updates with categories of Critical Updates and Drivers
salt '*' wua.list_updates categories=['Critical Updates', 'Drivers']

# List all Critical Security Updates
salt '*' wua.list_updates categories=['Security Updates'] severities=['Critical']

# List all updates with a severity of Critical
salt '*' wua.list_updates severities=['Critical']

# A summary of all available updates
salt '*' wua.list_updates summary=True

# A summary of all Feature Packs and Windows 8.1 Updates
salt '*' wua.list_updates categories=['Feature Packs', 'Windows 8.1'] summary=True

salt.modules.win_wua.set_wu_settings(level=None, recommended=None, featured=None, elevated=None, msupdate=None, day=None, time=None)

Change Windows Update settings. If no parameters are passed, the current value will be returned.

Parameters

• **level** *(int)* --

  Number from 1 to 4 indicating the update level:

  1. Never check for updates
  2. Check for updates but let me choose whether to download and install them
3. Download updates but let me choose whether to install them
4. Install updates automatically
   - recommended (bool) -- Boolean value that indicates whether to include optional or recommended updates when a search for updates and installation of updates is performed.
   - featured (bool) -- Boolean value that indicates whether to display notifications for featured updates.
   - elevated (bool) -- Boolean value that indicates whether non-administrators can perform some update-related actions without administrator approval.
   - msupdate (bool) -- Boolean value that indicates whether to turn on Microsoft Update for other Microsoft products.
   - day (str) -- Days of the week on which Automatic Updates installs or uninstalls updates. Accepted values: - Everyday - Monday - Tuesday - Wednesday - Thursday - Friday - Saturday
   - time (str) -- Time at which Automatic Updates installs or uninstalls updates. Must be in the ###:## 24hr format, eg. 3:00 PM would be 15:00

Returns
Returns a dictionary containing the results.

CLI Examples:
```
salt '*' win_wua.set_wu_settings level=4 recommended=True featured=False
```

31.16.312 salt.modules.x509
Manage X509 certificates
New in version 2015.8.0.
salt.modules.x509.create_certificate(path=None, text=False, ca_server=None, **kwargs)
Create an X509 certificate.

path: Path to write the certificate to.
text: If True, return the PEM text without writing to a file. Default False.
kwargs: Any of the properties below can be included as additional keyword arguments.

ca_server: Request a remotely signed certificate from ca_server. For this to work, a signing_policy must be specified, and that same policy must be configured on the ca_server. See signing_policy for details. Also the salt master must permit peers to call the sign_remote_certificate function.

Example:
```
/etc/salt/master.d/peer.conf
```
peer:
  .*:
    - x509.sign_remote_certificate

subject properties: Any of the values below can be included to set subject properties Any other subject properties supported by OpenSSL should also work.

C: 2 letter Country code
CN: Certificate common name, typically the FQDN.
Email: Email address

GN: Given Name
L: Locality
O: Organization
OU: Organization Unit
SN: SurName
ST: State or Province

signing_private_key: A path or string of the private key in PEM format that will be used to sign this certificate. If neither signing_cert, public_key, or csr are included, it will be assumed that this is a self-signed certificate, and the public key matching signing_private_key will be used to create the certificate.

signing_cert: A certificate matching the private key that will be used to sign this certificate. This is used to populate the issuer values in the resulting certificate. Do not include this value for self-signed certificates.

public_key: The public key to be included in this certificate. This can be sourced from a public key, certificate, csr or private key. If a private key is used, the matching public key from the private key will be generated before any processing is done. This means you can request a certificate from a remote CA using a private key file as your public_key and only the public key will be sent across the network to the CA. If neither public_key or csr are specified, it will be assumed that this is a self-signed certificate, and the public key derived from signing_private_key will be used. Specify either public_key or csr, not both. Because you can input a CSR as a public key or as a CSR, it is important to understand the difference. If you import a CSR as a public key, only the public key will be added to the certificate, subject or extension information in the CSR will be lost.

csr: A file or PEM string containing a certificate signing request. This will be used to supply the subject, extensions and public key of a certificate. Any subject or extensions specified explicitly will overwrite any in the CSR.

basicConstraints: X509v3 Basic Constraints extension.

extensions: The following arguments set X509v3 Extension values. If the value starts with "critical", the extension will be marked as critical.

Some special extensions are subjectKeyIdentifier and authorityKeyIdentifier.

subjectKeyIdentifier can be an explicit value or it can be the special string hash. hash will set the subjectKeyIdentifier equal to the SHA1 hash of the modulus of the public key in this certificate. Note that this is not the exact same hashing method used by OpenSSL when using the hash value.

authorityKeyIdentifier Use values acceptable to the openssl CLI tools. This will automatically populate authorityKeyIdentifier with the subjectKeyIdentifier of signing_cert. If this is a self-signed cert these values will be the same.

basicConstraints: X509v3 Basic Constraints

keyUsage: X509v3 Key Usage

extendedKeyUsage: X509v3 Extended Key Usage

subjectKeyIdentifier: X509v3 Subject Key Identifier

issuerAltName: X509v3 Issuer Alternative Name

subjectAltName: X509v3 Subject Alternative Name

crlDistributionPoints: X509v3 CRL distribution points
**issuingDistributionPoint:** X509v3 Issuing Distribution Point

**certificatePolicies:** X509v3 Certificate Policies

**policyConstraints:** X509v3 Policy Constraints

**inhibitAnyPolicy:** X509v3 Inhibit Any Policy

**nameConstraints:** X509v3 Name Constraints

**noCheck:** X509v3 OCSP No Check

**nsComment:** Netscape Comment

**nsCertType:** Netscape Certificate Type

**days_valid:** The number of days this certificate should be valid. This sets the notAfter property of the certificate. Defaults to 365.

**version:** The version of the X509 certificate. Defaults to 3. This is automatically converted to the version value, so version=3 sets the certificate version field to 0x2.

**serial_number:** The serial number to assign to this certificate. If omitted a random serial number of size **serial_bits** is generated.

**serial_bits:** The number of bits to use when randomly generating a serial number. Defaults to 64.

**algorithm:** The hashing algorithm to be used for signing this certificate. Defaults to sha256.

**copypath:** An additional path to copy the resulting certificate to. Can be used to maintain a copy of all certificates issued for revocation purposes.

**signing_policy:** A signing policy that should be used to create this certificate. Signing policies should be defined in the minion configuration, or in a minion pillar. It should be a yaml formatted list of arguments which will override any arguments passed to this function. If the minions key is included in the signing policy, only minions matching that pattern will be permitted to remotely request certificates from that policy.

Example:

```yaml
x509_signing_policies:
  www:
    - minions: 'www*
    - signing_private_key: /etc/pki/ca.key
    - signing_cert: /etc/pki/ca.crt
    - C: US
    - ST: Utah
    - L: Salt Lake City
    - basicConstraints: "critical CA:false"
    - keyUsage: "critical cRLSign, keyCertSign"
    - subjectKeyIdentifier: hash
    - authorityKeyIdentifier: keyid,issuer:always
    - days_valid: 90
    - copypath: /etc/pki/issued_certs/
```

The above signing policy can be invoked with signing_policy=www

**CLI Example:**

```
salt '*' x509.create_certificate path=/etc/pki/myca.crt \
    signing_private_key='/etc/pki/myca.key' csr='/etc/pki/myca.csr'}
```
salt.modules.x509.create_crl(path=None, text=False, signing_private_key=None, signing_cert=None, revoked=None, include_expired=False, days_valid=100)

Create a CRL

Depends

- PyOpenSSL Python module

path: Path to write the crl to.

text: If True, return the PEM text without writing to a file. Default False.

signing_private_key: A path or string of the private key in PEM format that will be used to sign this crl. This is required.

signing_cert: A certificate matching the private key that will be used to sign this crl. This is required.

revoked: A list of dicts containing all the certificates to revoke. Each dict represents one certificate. A dict must contain either the key serial_number with the value of the serial number to revoke, or certificate with either the PEM encoded text of the certificate, or a path of the certificate to revoke.

The dict can optionally contain the revocation_date key. If this key is omitted the revocation date will be set to now. If should be a string in the format ``%Y-%m-%d %H:%M:%S``.

The dict can also optionally contain the not_after key. This is redundant if the certificate key is included. If the Certificate key is not included, this can be used for the logic behind the include_expired parameter. If should be a string in the format ``%Y-%m-%d %H:%M:%S``.

The dict can also optionally contain the reason key. This is the reason code for the revocation. Available choices are unspecified, keyCompromise, CACompromise, affiliationChanged, superseded, cessationOfOperation and certificateHold.

include_expired: Include expired certificates in the CRL. Default is False.

days_valid: The number of days that the CRL should be valid. This sets the Next Update field in the CRL.

CLI Example:

```
salt '*' x509.create_crl path=/etc/pki/mykey.key signing_private_key=/etc/pki/ca.key 
    signing_cert=/etc/pki/ca.crt 
    revoked="[{'compromised-web-key': {'certificate': '/etc/pki/certs/www1.crt', 
        'revocation_date': '2015-03-01 00:00:00'}}]
```

salt.modules.x509.create_csr(path=None, text=False, **kwargs)

Create a certificate signing request.

path: Path to write the certificate to.

text: If True, return the PEM text without writing to a file. Default False.

kwargs: The subject, extension and version arguments from x509.create_certificate can be used.

CLI Example:

```
salt '*' x509.create_csr path=/etc/pki/myca.csr public_key='/etc/pki/myca.key' CN='My Cert
```

salt.modules.x509.create_private_key(path=None, text=False, bits=2048)

Creates a private key in PEM format.

path: The path to write the file to, either path or text are required.

text: If True, return the PEM text without writing to a file. Default False.
bits: Lenth of the private key in bits. Default 2048

CLI Example:
```
salt '*' x509.create_private_key path=/etc/pki/mykey.key
```

salt.modules.x509.get_pem_entries(glob_path)
Returns a dict containing PEM entries in files matching a glob

glob_path: A path to certificates to be read and returned.

CLI Example:
```
salt '*' x509.read_pem_entries "/etc/pki/*/crt"
```

salt.modules.x509.get_pem_entry(text, pem_type=None)
Returns a properly formatted PEM string from the input text fixing any whitespace or line-break issues

text: Text containing the X509 PEM entry to be returned or path to a file containing the text.
Pem_type: If specified, this function will only return a pem of a certain type, for example `CERTIFICATE` or `CERTIFICATE REQUEST`.

CLI Example:
```
salt '*' x509.get_pem_entry "-----BEGIN CERTIFICATE REQUEST-----MIICyzCC Ar8CAQI..."-----END CERTIFICATE REQUEST"
```

salt.modules.x509.get_private_key_size(private_key)
Returns the bit length of a private key in PEM format.

private_key: A path or PEM encoded string containing a private key.

CLI Example:
```
salt '*' x509.get_private_key_size /etc/pki/mycert.key
```

salt.modules.x509.get_public_key(key)
Returns a string containing the public key in PEM format.

key: A path or PEM encoded string containing a CSR, Certificate or Private Key from which a public key can be retrieved.

CLI Example:
```
salt '*' x509.get_public_key /etc/pki/mycert.cer
```

salt.modules.x509.get_signing_policy(signing_policy_name)
Returns the details of a names signing policy, including the text of the public key that will be used to sign it. Does not return the private key.

CLI Example:
```
salt '*' x509.get_signing_policy www
```

salt.modules.x509.read_certificate(certificate)
Returns a dict containing details of a certificate. Input can be a PEM string or file path.

certificate: The certificate to be read. Can be a path to a certificate file, or a string containing the PEM formatted text of the certificate.

CLI Example:
```
salt '*' x509.read_certificate /etc/pki/mycert.crt
```
salt.modules.x509.read_certificates(glob_path)
Returns a dict containing details of all certificates matching a glob

glob_path: A path to certificates to be read and returned.

CLI Example:
```
salt '***' x509.read_certificates "'/etc/pki/*.*.crt"
```

salt.modules.x509.read_crl(crl)
Returns a dict containing details of a certificate revocation list. Input can be a PEM string or file path.

Depends

- OpenSSL command line tool
csl: A path or PEM encoded string containing the CSL to read.

CLI Example:
```
salt '***' x509.read_crl /etc/pki/mycrl.crl
```

salt.modules.x509.read_csr(csr)
Returns a dict containing details of a certificate request.

Depends

- OpenSSL command line tool
csr: A path or PEM encoded string containing the CSR to read.

CLI Example:
```
salt '***' x509.read_csr /etc/pki/mycert.csr
```

salt.modules.x509.sign_remote_certificate(argdic, **kwargs)
Request a certificate to be remotely signed according to a signing policy.

argdic: A dict containing all the arguments to be passed into the create_certificate function. This will become kwargs when passed to create_certificate.

kwargs: kwargs delivered from publish.publish

CLI Example:
```
salt '***' x509.sign_remote_certificate argdic={"public_key": '/etc/pki/www.key', \ 'signing_policy': 'www'}" __pub_id='www1'
```

salt.modules.x509.verify_crl(crl, cert)
Validate a CRL against a certificate. Parses openssl command line output, this is a workaround for M2Crypto's inability to get them from CSR objects.
crl: The CRL to verify
cert: The certificate to verify the CRL against

CLI Example:
```
salt '***' x509.verify_crl crl=/etc/pki/myca.crl cert=/etc/pki/myca.crt
```

salt.modules.x509.verify_private_key(private_key, public_key)
Verify that `private_key` matches `public_key`
**private_key**: The private key to verify, can be a string or path to a private key in PEM format.

**public_key**: The public key to verify, can be a string or path to a PEM formatted certificate, csr, or another private key.

CLI Example:
```
salt '*' x509.verify_private_key private_key=/etc/pki/myca.key public_key=/etc/pki/myca.crt
```

```
salt.modules.x509.verify_signature (certificate, signing_pub_key= None)
```
Verify that certificate has been signed by signing_pub_key

certificate: The certificate to verify. Can be a path or string containing a PEM formatted certificate.

**signing_pub_key**: The public key to verify, can be a string or path to a PEM formatted certificate, csr, or private key.

CLI Example:
```
salt '*' x509.verify_private_key private_key=/etc/pki/myca.key public_key=/etc/pki/myca.crt
```

```
salt.modules.x509.write_pem (text, path, pem_type=None)
```
Writes out a PEM string fixing any formatting or whitespace issues before writing.

text: PEM string input to be written out.

path: Path of the file to write the pem out to.

**pem_type**: The PEM type to be saved, for example CERTIFICATE or PUBLIC KEY. Adding this will allow the function to take input that may contain multiple pem types.

CLI Example:
```
salt '*' x509.write_pem "-----BEGIN CERTIFICATE-----MIIGMzCCBBugA..." path=/etc/pki/mycert.crt
```

### 31.16.313 salt.modules.xapi

This module (mostly) uses the XenAPI to manage Xen virtual machines.

Big fat warning: the XenAPI used in this file is the one bundled with Xen Source, NOT XenServer nor Xen Cloud Platform. As a matter of fact it will fail under those platforms. From what I’ve read, little work is needed to adapt this code to XS/XCP, mostly playing with XenAPI version, but as XCP is not taking precedence on Xen Source on many platforms, please keep compatibility in mind.

Useful documentation:

- [http://downloads.xen.org/Wiki/XenAPI/xenapi-1.0.6.pdf](http://downloads.xen.org/Wiki/XenAPI/xenapi-1.0.6.pdf)
- [http://docs.vmd.citrix.com/XenServer/6.0.0/1.0/en_gb/api/](http://docs.vmd.citrix.com/XenServer/6.0.0/1.0/en_gb/api/)
- [https://github.com/xapi-project/xen-api/tree/master/scripts/examples/python](https://github.com/xapi-project/xen-api/tree/master/scripts/examples/python)
- [http://xenbits.xen.org/gitweb/?p=xen.git;a=tree;f=tools/python/xen/xm;hb=HEAD](http://xenbits.xen.org/gitweb/?p=xen.git;a=tree;f=tools/python/xen/xm;hb=HEAD)

```
salt.modules.xapi.create (config_)
```
Start a defined domain

CLI Example:
```
salt '*' virt.create <path to Xen cfg file>
```

```
salt.modules.xapi.destroy (vm_)
```
Hard power down the virtual machine, this is equivalent to pulling the power

CLI Example:
<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>CLI Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>salt '*' virt.destroy &lt;vm name&gt;</code></td>
<td>Returns an int representing the number of unallocated cpus on this hypervisor</td>
<td><code>salt '*' virt.destroy</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.freecpu()</code></td>
<td>Return an int representing the number of unallocated cpus on this hypervisor</td>
<td><code>salt '*' virt.freecpu</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.freemem()</code></td>
<td>Return an int representing the amount of memory that has not been given to virtual machines on this node</td>
<td><code>salt '*' virt.freemem</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.full_info()</code></td>
<td>Return the node_info, vm_info and freemem</td>
<td><code>salt '*' virt.full_info</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.get_disks(vm_)</code></td>
<td>Return the disks of a named vm</td>
<td><code>salt '*' virt.get_disks &lt;vm name&gt;</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.get_macs(vm_)</code></td>
<td>Return a list of MAC addresses from the named vm</td>
<td><code>salt '*' virt.get_macs &lt;vm name&gt;</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.get_nics(vm_)</code></td>
<td>Return info about the network interfaces of a named vm</td>
<td><code>salt '*' virt.get_nics &lt;vm name&gt;</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.is_hyper()</code></td>
<td>Returns a bool whether or not this node is a hypervisor of any kind</td>
<td><code>salt '*' virt.is_hyper</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.list_vms()</code></td>
<td>Return a list of virtual machine names on the minion</td>
<td><code>salt '*' virt.list_vms</code></td>
</tr>
<tr>
<td><code>salt.modules.xapi.migrate(vm_, target, live=1, port=0, node=-1, ssl=None, change_home_server=0)</code></td>
<td>Migrates the virtual machine to another hypervisor</td>
<td><code>salt '*' virt.migrate</code></td>
</tr>
</tbody>
</table>
```
salt '*' virt.migrate <vm name> <target hypervisor> [live] [port] [node] [ssl] [change_home_server]
```

Optional values:

- `live` Use live migration
- `port` Use a specified port
- `node` Use specified NUMA node on target
- `ssl` Use ssl connection for migration
- `change_home_server` change home server for managed domains

```
salt.modules.xapi.node_info()
```

Return a dict with information about this node

CLI Example:
```
salt '*' virt.node_info
```

```
salt.modules.xapi.pause(vm_)
```

Pause the named vm

CLI Example:
```
salt '*' virt.pause <vm name>
```

```
salt.modules.xapi.reboot(vm_)
```

Reboot a domain via ACPI request

CLI Example:
```
salt '*' virt.reboot <vm name>
```

```
salt.modules.xapi.reset(vm_)
```

Reset a VM by emulating the reset button on a physical machine

CLI Example:
```
salt '*' virt.reset <vm name>
```

```
salt.modules.xapi.resume(vm_)
```

Resume the named vm

CLI Example:
```
salt '*' virt.resume <vm name>
```

```
salt.modules.xapi.setmem(vm_, memory)
```

Changes the amount of memory allocated to VM.

Memory is to be specified in MB

CLI Example:
```
salt '*' virt.setmem myvm 768
```

```
salt.modules.xapi.setvcpus(vm_, vcpus)
```

Changes the amount of vcpus allocated to VM.

`vcpus` is an int representing the number to be assigned

CLI Example:
salt '*' virt.setvcpus myvm 2

salt.modules.xapi.shutdown(vm_)
    Send a soft shutdown signal to the named vm
    CLI Example:
    salt '*' virt.shutdown <vm name>

salt.modules.xapi.start(config_)
    Alias for the obscurely named 'create' function
    CLI Example:
    salt '*' virt.start <path to Xen cfg file>

salt.modules.xapi.vcpu_pin(vm_, vcpu, cpus)
    Set which CPUs a VCPU can use.
    CLI Example:
    salt 'foo' virt.vcpu_pin domU-id 2 1
    salt 'foo' virt.vcpu_pin domU-id 2 2-6

salt.modules.xapi.vm_cputime(vm_=None)
    Return cpu time used by the vms on this hyper in a list of dicts:
    
    ['your-vm': {'cputime': <int>,
                 'cputime_percent': <int>},
     ...]

    If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.
    CLI Example:
    salt '*' virt.vm_cputime

salt.modules.xapi.vm_diskstats(vm_=None)
    Return disk usage counters used by the vms on this hyper in a list of dicts:
    
    ['your-vm': {'io_read_kbs': 0, 'io_write_kbs': 0},
     ...]

    If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.
    CLI Example:
    salt '*' virt.vm_diskstats
salt.modules.xapi.vm_info(vm_=None)
Return detailed information about the vms.
If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.
CLI Example:
salt '*' virt.vm_info

salt.modules.xapi.vm_netstats(vm_=None)
Return combined network counters used by the vms on this hyper in a list of dicts:

```
[  
  'your-vm': {  
    'io_read_kbs':     0,  
    'io_total_read_kbs': 0,  
    'io_total_write_kbs': 0,  
    'io_write_kbs':     0  
  },  
  ...
]
```
If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.
CLI Example:
salt '*' virt.vm_netstats

salt.modules.xapi.vm_state(vm_=None)
Return list of all the vms and their state.
If you pass a VM name in as an argument then it will return info for just the named VM, otherwise it will return all VMs.
CLI Example:
salt '*' virt.vm_state <vm name>

31.16.314  salt.modules.xfs
Module for managing XFS file systems.
salt.modules.xfs.defragment(device)
Defragment mounted XFS filesystem. In order to mount a filesystem, device should be properly mounted and writable.
CLI Example:
salt '*' xfs.defragment /dev/sda1

salt.modules.xfs.devices()
Get known XFS formatted devices on the system.
CLI Example:
salt '*' xfs.devices
salt.modules.xfs.dump( device, destination, level=0, label=None, noerase=None)

Dump filesystem device to the media (file, tape etc).

Required parameters:
- **device**: XFS device, content of which to be dumped.
- **destination**: Specifies a dump destination.

Valid options are:
- **label**: Label of the dump. Otherwise automatically generated label is used.
- **level**: Specifies a dump level of 0 to 9.
- **noerase**: Pre-erase media.

Other options are not used in order to let xfsdump use its default values, as they are most optimal. See the xfsdump(8) manpage for a more complete description of these options.

CLI Example:
```
salt '*' xfs.dump /dev/sda1 /destination/on/the/client
salt '*' xfs.dump /dev/sda1 /destination/on/the/client label='Company accountancy'
salt '*' xfs.dump /dev/sda1 /destination/on/the/client noerase=True
```

salt.modules.xfs.estimate(path)

Estimate the space that an XFS filesystem will take. For each directory estimate the space that directory would take if it were copied to an XFS filesystem. Estimation does not cross mount points.

CLI Example:
```
salt '*' xfs.estimate /path/to/file
salt '*' xfs.estimate /path/to/dir/*
```

salt.modules.xfs.info(device)

Get filesystem geometry information.

CLI Example:
```
salt '*' xfs.info /dev/sda1
```

salt.modules.xfs.inventory()

Display XFS dump inventory without restoration.

CLI Example:
```
salt '*' xfs.inventory
```

salt.modules.xfs.mkfs(device, label=None, ssize=None, noforce=None, bso=None, gmo=None, ino=None, lso=None, rso=None, nmo=None, dso=None)

Create a filesystem on the specified device. By default wipes out with force.

General options:
- **label**: Specify volume label.
- **ssize**: Specify the fundamental sector size of the filesystem.
- **noforce**: Do not force create filesystem, if disk is already formatted.

Filesystem geometry options:
- **bso**: Block size options.
- **gmo**: Global metadata options.
• **dso**: Data section options. These options specify the location, size, and other parameters of the data section of the filesystem.

• **ino**: Inode options to specify the inode size of the filesystem, and other inode allocation parameters.

• **lso**: Log section options.

• **nno**: Naming options.

• **rso**: Realtime section options.

See the `mkfs.xfs(8)` manpage for a more complete description of corresponding options description.

**CLI Example:**

```bash
salt '*' xfs.mkfs /dev/sda1
dso='su=32k,sw=6' noforce=True

salt '*' xfs.mkfs /dev/sda1
dso='su=32k,sw=6' lso='logdev=/dev/sda2,size=10000b'
```

**salt.modules.xfs.modify(device, label=None, lazy_counting=None, uuid=None)**

Modify parameters of an XFS filesystem.

**CLI Example:**

```bash
salt '*' xfs.modify /dev/sda1 label='My backup' lazy_counting=False
salt '*' xfs.modify /dev/sda1 uuid=False
salt '*' xfs.modify /dev/sda1 uuid=True
```

**salt.modules.xfs.prune_dump(sessionid)**

Prunes the dump session identified by the given session id.

**CLI Example:**

```bash
salt '*' xfs.prune_dump b74a3586-e52e-4a4a-8775-c3334fa8ea2c
```

### 31.16.315 `salt.modules.xmpp`

Module for Sending Messages via XMPP (a.k.a. Jabber)

New in version 2014.1.0.

**depends**

- sleekxmpp>=1.3.1
- pyasn1
- pyasn1-modules
- dnspython

**configuration** This module can be used by either passing a jid and password directly to `send_message`, or by specifying the name of a configuration profile in the minion config, minion pillar, or master config.

For example:

```yaml
my-xmpp-login:
  xmpp.jid: myuser@jabber.example.org/resource\name
  xmpp.password: verybadpass
```

The resource\name refers to the resource that is using this account. It is user-definable, and optional.

The following configurations are both valid:
Salt Documentation, Release 2015.8.0

my-xmpp-login:
xmpp.jid: myuser@jabber.example.org/salt
xmmp.password: verybadpass

my-xmpp-login:
xmpp.jid: myuser@jabber.example.org
xmmp.password: verybadpass

class salt.modules.xmpp.SendMsgBot(jid, password, recipient, msg)

    classmethod create_multi(jid, password, recipients=None, rooms=None, nick='SaltStack Bot')
    Alternate constructor that accept multiple recipients and rooms

    start(event)

class salt.modules.xmpp.SleekXMPPMUC(name='')

    filter(record)

salt.modules.xmpp.send_msg(recipient, message, jid=None, password=None, profile=None)
    Send a message to an XMPP recipient. Designed for use in states.

    CLI Examples:

            xmpp.send_msg 'admins@xmpp.example.com' 'This is a salt module test' profile='my-xmpp-account'
            xmpp.send_msg 'admins@xmpp.example.com' 'This is a salt module test' jid='myuser@xmpp.example.com'

salt.modules.xmpp.send_msg_multi(message, recipients=None, rooms=None, jid=None, password=None, nick='SaltStack Bot', profile=None)
    Send a message to an XMPP recipient, support send message to multiple recipients or chat room.

    CLI Examples:

            xmpp.send_msg recipients=['admins@xmpp.example.com'] rooms=['secret@conference.xmpp.example.com']
            xmpp.send_msg recipients=['admins@xmpp.example.com'] rooms=['secret@conference.xmpp.example.com']

31.16.3.16 salt.modules.yumpkg

Support for YUM

Note: This module makes heavy use of the repoquery utility, from the yum-utils package. This package will be installed as a dependency if salt is installed via EPEL. However, if salt has been installed using pip, or a host is being managed using salt-ssh, then as of version 2014.7.0 yum-utils will be installed automatically to satisfy this dependency.

salt.modules.yumpkg.check_db(*names, **kwargs)
    New in version 0.17.0.
    Returns a dict containing the following information for each specified package:

    1. A key found, which will be a boolean value denoting if a match was found in the package database.

    2. If found is False, then a second key called suggestions will be present, which will contain a list of possible matches.

    The fromrepo, enablerepo and disablerepo arguments are supported, as used in pkg states, and the disableexcludes option is also supported.
New in version 2014.7.0: Support for the `disableexcludes` option

**CLI Examples:**

```bash
salt '*' pkg.check_db <package1> <package2> <package3>
salt '*' pkg.check_db <package1> <package2> <package3> fromrepo=epel-testing
salt '*' pkg.check_db <package1> <package2> <package3> disableexcludes=main
```

```python
salt.modules.yumpkg.clean_metadata(**kwargs)
```

New in version 2014.1.0.

Cleans local yum metadata. Functionally identical to `refresh_db()`.

**CLI Example:**

```bash
salt '*' pkg.clean_metadata
```

```python
salt.modules.yumpkg.del_repo(repo, basedir=None, **kwargs)
```

Delete a repo from <basedir> (default basedir: all dirs in `reposdir` yum option).

If the .repo file that the repo exists in does not contain any other repo configuration, the file itself will be deleted.

**CLI Examples:**

```bash
salt '*' pkg.del_repo myrepo
salt '*' pkg.del_repo myrepo basedir=/path/to/dir
salt '*' pkg.del_repo myrepo basedir=/path/to/dir,/path/to/another/dir
```

```python
salt.modules.yumpkg.diff('paths')
```

Return a formatted diff between current files and original in a package. NOTE: this function includes all files (configuration and not), but does not work on binary content.

**Parameters** path -- Full path to the installed file

**Returns** Difference string or raises and exception if examined file is binary.

**CLI example:**

```bash
salt '*' pkg.diff /etc/apache2/httpd.conf /etc/sudoers
```

```python
salt.modules.yumpkg.download('packages')
```

New in version 2015.5.0.

Download packages to the local disk. Requires `yumdownloader` from `yum-utils` package.

**Note:** `yum-utils` will already be installed on the minion if the package was installed from the Fedora / EPEL repositories.

**CLI example:**

```bash
salt '*' pkg.download httpd
salt '*' pkg.download httpd postfix
```

```python
salt.modules.yumpkg.expand_repo_def(repokwargs)
```

Take a repository definition and expand it to the full pkg repository dict that can be used for comparison. This is a helper function to make certain repo managers sane for comparison in the pkgrepo states.

There is no use to calling this function via the CLI.

```python
salt.modules.yumpkg.file_dict('packages')
```

New in version 2014.1.0.
List the files that belong to a package, grouped by package. Not specifying any packages will return a list of every file on the system's rpm database (not generally recommended).

CLI Examples:

- `salt '*' pkg.file_list httpd`
- `salt '*' pkg.file_list httpd postfix`
- `salt '*' pkg.file_list`

```
salt.modules.yumpkg.file_list(*packages)
```

New in version 2014.1.0.

List the files that belong to a package. Not specifying any packages will return a list of every file on the system's rpm database (not generally recommended).

CLI Examples:

- `salt '*' pkg.file_list httpd`
- `salt '*' pkg.file_list httpd postfix`
- `salt '*' pkg.file_list`

```
salt.modules.yumpkg.get_locked_packages(pattern=None, full=True)
```

Get packages that are currently locked `yum -q versionlock list`.

CLI Example:

```
salt '*' pkg.get_locked_packages
```

```
salt.modules.yumpkg.get_repo(repo, basedir=None, **kwargs)
```

Display a repo from <basedir> (default basedir: all dirs in `reposdir yum option`).

CLI Examples:

- `salt '*' pkg.get_repo myrepo`
- `salt '*' pkg.get_repo myrepo basedir=/path/to/dir`
- `salt '*' pkg.get_repo myrepo basedir=/path/to/dir,/path/to/another/dir`

```
salt.modules.yumpkg.group_diff(name)
```

New in version 2014.1.0.

Lists packages belonging to a certain group, and which are installed

CLI Example:

```
salt '*' pkg.group_diff 'Perl Support'
```

```
salt.modules.yumpkg.group_info(name)
```

New in version 2014.1.0.

Lists packages belonging to a certain group

CLI Example:

```
salt '*' pkg.group_info 'Perl Support'
```

```
salt.modules.yumpkg.group_install(name, skip=(), include=(), **kwargs)
```

New in version 2014.1.0.

Install the passed package group(s). This is basically a wrapper around `pkg.install`, which performs package group resolution for the user. This function is currently considered experimental, and should be expected to undergo changes.
**name**  Package group to install. To install more than one group, either use a comma-separated list or pass the value as a python list.

**CLI Examples:**

```bash
salt '*' pkg.group_install 'Group 1'
salt '*' pkg.group_install 'Group 1,Group 2'
salt '*' pkg.group_install ['"Group 1", "Group 2"]
```

**skip**  Packages that would normally be installed by the package group (``default'' packages), which should not be installed. Can be passed either as a comma-separated list or a python list.

**CLI Examples:**

```bash
salt '*' pkg.group_install 'My Group' skip='foo,bar'
salt '*' pkg.group_install 'My Group' skip=['"foo", "bar"]'
```

**include**  Packages which are included in a group, which would not normally be installed by a `yum groupinstall` (``optional'' packages). Note that this will not enforce group membership; if you include packages which are not members of the specified groups, they will still be installed. Can be passed either as a comma-separated list or a python list.

**CLI Examples:**

```bash
salt '*' pkg.group_install 'My Group' include='foo,bar'
salt '*' pkg.group_install 'My Group' include=['"foo", "bar"]'
```

---

**Note:**  Because this is essentially a wrapper around `pkg.install`, any argument which can be passed to `pkg.install` may also be included here, and it will be passed along wholesale.

---

**salt.modules.yumpkg.group_list()**

New in version 2014.1.0.

Lists all groups known by yum on this system

**CLI Example:**

```bash
salt '*' pkg.group_list
```

**salt.modules.yumpkg.hold(name=None, pkgs=None, sources=None, **kwargs)**

New in version 2014.7.0.

Hold packages with `yum -q versionlock`.

**name**  The name of the package to be held.

Multiple Package Options:

**pkgs**  A list of packages to hold. Must be passed as a python list. The `name` parameter will be ignored if this option is passed.

Returns a dict containing the changes.

**CLI Example:**

```bash
salt '*' pkg.hold <package name>
salt '*' pkg.hold pkgs=['"foo", "bar"]'
```

**salt.modules.yumpkg.info_installed(names)**

Return the information of the named package(s), installed on the system.

**CLI example:**
```
salt '*' pkg.info_installed <package1>
salt '*' pkg.info_installed <package1> <package2> <package3> ...
```

```python
salt.modules.yumpkg.install(name=None, refresh=False, fromrepo=None, skip_verify=False, pkgs=None, sources=None, reinstall=False, normalize=True, **kwargs)
```

Install the passed package(s), add refresh=True to clean the yum database before package is installed.

**name** The name of the package to be installed. Note that this parameter is ignored if either ``pkgs'' or ``sources'' is passed. Additionally, please note that this option can only be used to install packages from a software repository. To install a package file manually, use the ``sources'' option.

32-bit packages can be installed on 64-bit systems by appending the architecture designation (`.i686`, `.i586`, etc.) to the end of the package name.

CLI Example:
```
salt '*' pkg.install <package name>
```

**refresh** Whether or not to update the yum database before executing.

**reinstall** Specifying reinstall=True will use `yum reinstall` rather than `yum install` for requested packages that are already installed.

If a version is specified with the requested package, then `yum reinstall` will only be used if the installed version matches the requested version.

Works with `sources` when the package header of the source can be matched to the name and version of an installed package.

New in version 2014.7.0.

**skip_verify** Skip the GPG verification check (e.g., `--nogpgcheck`)

**version** Install a specific version of the package, e.g. 1.2.3-4.el5. Ignored if ``pkgs'' or ``sources'' is passed.

Repository Options:

**fromrepo** Specify a package repository (or repositories) from which to install. (e.g., `yum --disablerepo='*' --enablerepo='somerepo'`)

**enablerepo** (ignored if **fromrepo** is specified) Specify a disabled package repository (or repositories) to enable. (e.g., `yum --enablerepo='somerepo'`)

**disablerepo** (ignored if **fromrepo** is specified) Specify an enabled package repository (or repositories) to disable. (e.g., `yum --disablerepo='somerepo'`)

**disableexcludes** Disable exclude from main, for a repo or for everything. (e.g., `yum --disableexcludes='main'`)

New in version 2014.7.0.

Multiple Package Installation Options:

**pkgs** A list of packages to install from a software repository. Must be passed as a python list. A specific version number can be specified by using a single-element dict representing the package and its version.

CLI Examples:
```
salt '*' pkg.install pkgs=["foo", "bar"]
salt '*' pkg.install pkgs=["foo", {"bar": "1.2.3-4.el5"}]
```

**sources** A list of RPM packages to install. Must be passed as a list of dicts, with the keys being package names, and the values being the source URI or local path to the package.
**CLI Example:**
```
salt '* pkg.install sources=\[\{"foo": "salt://foo.rpm"}, \{"bar": "salt://bar.rpm"}\]\]
```

**normalize** [True] Normalize the package name by removing the architecture. This is useful for poorly created packages which might include the architecture as an actual part of the name such as kernel modules which match a specific kernel version.

```
salt -G role:nsd pkg.install gpfs.gplbin-2.6.32-279.31.1.el6.x86_64 normalize=False
```

New in version 2014.7.0.

Returns a dict containing the new package names and versions:
```
{ '<package>': { 'old': '<old-version>', 'new': '<new-version>' }}
```

**salt.modules.yumpkg.latest_version(**names**, **kwargs)**
Return the latest version of the named package available for upgrade or installation. If more than one package name is specified, a dict of name/version pairs is returned.

If the latest version of a given package is already installed, an empty string will be returned for that package.

A specific repo can be requested using the fromrepo keyword argument, and the disableexcludes option is also supported.

New in version 2014.7.0: Support for the disableexcludes option

**CLI Example:**
```
salt '* pkg.latest_version <package name>
salt '* pkg.latest_version <package name> fromrepo=epel-testing
salt '* pkg.latest_version <package name> disableexcludes=main
salt '* pkg.latest_version <package1> <package2> <package3> ...
```

**salt.modules.yumpkg.list_pkgs**(versions_as_list=False, **kwargs)**
List the packages currently installed in a dict:
```
{ '<package_name>': '<version>' }
```

**CLI Example:**
```
salt '* pkg.list_pkgs
```

**salt.modules.yumpkg.list_repo_pkgs**(args, **kwargs)**
New in version 2014.7.0.

Changed in version 2014.7.0: All available versions of each package are now returned. This required a slight modification to the structure of the return dict. The return data shown below reflects the updated return dict structure.

Returns all available packages. Optionally, package names (and name globs) can be passed and the results will be filtered to packages matching those names. This is recommended as it speeds up the function considerably.

This function can be helpful in discovering the version or repo to specify in a pkg.installed state.

The return data is a dictionary of repo names, with each repo containing a dictionary in which the keys are package names, and the values are a list of version numbers. Here is an example of the return data:
```
{
    'base': {
        'bash': ['4.1.2-15.el6_4'],
    }
}
from repo [None] Only include results from the specified repo(s). Multiple repos can be specified, comma-separated.

CLI Example:
```
salt '*' pkg.list_repo_pkgs
salt '*' pkg.list_repo_pkgs foo bar baz
salt '*' pkg.list_repo_pkgs 'samba4*' fromrepo=base,updates
```

salt.modules.yumpkg.list_repos(basedir=None)
Lists all repos in <basedir> (default: all dirs in reposdir yum option).

CLI Example:
```
salt '*' pkg.list_repos
salt '*' pkg.list_repos basedir=/path/to/dir
salt '*' pkg.list_repos basedir=/path/to/dir,/path/to/another/dir
```

salt.modules.yumpkg.list_upgrades(refresh=True, **kwargs)
Check whether or not an upgrade is available for all packages

The fromrepo, enablerepo, and disablerepo arguments are supported, as used in pkg states, and the
disableexcludes option is also supported.

New in version 2014.7.0: Support for the disableexcludes option

CLI Example:
```
salt '*' pkg.list_upgrades
```

salt.modules.yumpkg.mod_repo(repo, basedir=None, **kwargs)
Modify one or more values for a repo. If the repo does not exist, it will be created, so long as the following
values are specified:

repo name by which the yum refers to the repo
name a human-readable name for the repo
baseurl the URL for yum to reference
mirrorlist the URL for yum to reference

Key/Value pairs may also be removed from a repo's configuration by setting a key to a blank value. Bear in
mind that a name cannot be deleted, and a baseurl can only be deleted if a mirrorlist is specified (or vice versa).
CLI Examples:

```bash
salt '*' pkg.mod_repo reponame enabled=1 gpgcheck=1
salt '*' pkg.mod_repo reponame basedir=/path/to/dir enabled=1
salt '*' pkg.mod_repo reponame baseurl=mirrorlist=http://host.com/
```

```python
salt.modules.yumpkg.modified('packages', **'flags')
```

List the modified files that belong to a package. Not specifying any packages will return a list of _all_ modified files on the system’s RPM database.

New in version 2015.5.0.

Filtering by flags (True or False):

- **size** Include only files where size changed.
- **mode** Include only files which file’s mode has been changed.
- **checksum** Include only files which MD5 checksum has been changed.
- **device** Include only files which major and minor numbers has been changed.
- **symlink** Include only files which are symbolic link contents.
- **owner** Include only files where owner has been changed.
- **group** Include only files where group has been changed.
- **time** Include only files where modification time of the file has been changed.
- **capabilities** Include only files where capabilities differ or not. Note: supported only on newer RPM versions.

CLI Examples:

```bash
salt '*' pkg.modified
salt '*' pkg.modified httpd
salt '*' pkg.modified httpd postfix
salt '*' pkg.modified httpd owner=True group=False
```

```python
salt.modules.yumpkg.normalize_name(name)
```

Strips the architecture from the specified package name, if necessary. Circumstances where this would be done include:

- If the arch is 32 bit and the package name ends in a 32-bit arch.
- If the arch matches the OS arch, or is noarch.

CLI Example:

```bash
salt '*' pkg.normalize_name zsh.x86_64
```

```python
salt.modules.yumpkg.owner('paths')
```

New in version 2014.7.0.

Return the name of the package that owns the file. Multiple file paths can be passed. Like `pkg.version` <salt.modules.yumpkg.version>, if a single path is passed, a string will be returned, and if multiple paths are passed, a dictionary of file/package name pairs will be returned.

If the file is not owned by a package, or is not present on the minion, then an empty string will be returned for that path.

CLI Examples:

```bash
salt '*' pkg.owner /usr/bin/apachectl
salt '*' pkg.owner /etc/httpd/conf/httpd.conf
```
salt.modules.yumpkg.purge(name=None, pkgs=None, **kwargs)

Package purges are not supported by yum, this function is identical to pkg.remove.

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

salt '*' pkg.purge <package name>
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs='["foo", "bar"]'

salt.modules.yumpkg.refresh_db(branch_arg=None, repo_arg=None, exclude_arg=None, branch=None, repo=None, exclude=None)

Check the yum repos for updated packages

Returns:

- True: Updates are available
- False: An error occurred
- None: No updates are available

CLI Example:

salt '*' pkg.refresh_db

salt.modules.yumpkg.remove(name=None, pkgs=None, **kwargs)

Remove packages with yum -q -y remove.

name The name of the package to be deleted.

Multiple Package Options:

pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:

salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs='["foo", "bar"]'

salt.modules.yumpkg.unhold(name=None, pkgs=None, sources=None, **kwargs)

New in version 2014.7.0.

Hold packages with yum -q versionlock.

name The name of the package to be deleted.

Multiple Package Options:
**pkgs** A list of packages to unhold. Must be passed as a python list. The `name` parameter will be ignored if this option is passed.

Returns a dict containing the changes.

CLI Example:

```
salt '*' pkg.unhold <package name>
salt '*' pkg.unhold pkgs=['"foo", "bar"]
```

**salt.modules.yumpkg.upgrade**(refresh=True, fromrepo=None, skip_verify=False, **kwargs)

Run a full system upgrade, a yum upgrade

Changed in version 2014.7.0.

Return a dict containing the new package names and versions:

```
{'<package>': {'old': '<old-version>', 'new': '<new-version>'}}
```

CLI Example:

```
salt '*' pkg.upgrade
```

Repository Options:

- `fromrepo` Specify a package repository (or repositories) from which to install. (e.g., `yum --disablerepo='*' --enablerepo='somerepo'`)
- `enablerepo` (ignored if `fromrepo` is specified) Specify a disabled package repository (or repositories) to enable. (e.g., `yum --enablerepo='somerepo'`)
- `disablerepo` (ignored if `fromrepo` is specified) Specify an enabled package repository (or repositories) to disable. (e.g., `yum --disablerepo='somerepo'`)
- `disableexcludes` Disable exclude from main, for a repo or for everything. (e.g., `yum --disableexcludes='main'`)

New in version 2014.7.0.

**salt.modules.yumpkg.upgrade_available**(name)

Check whether or not an upgrade is available for a given package

CLI Example:

```
salt '*' pkg.upgrade_available <package name>
```

**salt.modules.yumpkg.verify**(names, **kwargs)

New in version 2014.1.0.

Runs an rpm -Va on a system, and returns the results in a dict

Files with an attribute of config, doc, ghost, license or readme in the package header can be ignored using the `ignore_types` keyword argument

CLI Example:

```
salt '*' pkg.verify
salt '*' pkg.verify httpd
salt '*' pkg.verify 'httpd postfix'
salt '*' pkg.verify 'httpd postfix' ignore_types=['config','doc']
```
```
salt.modules.yumpkg.version(*names, **kwargs)
    Returns a string representing the package version or an empty string if not installed. If more than one package
    name is specified, a dict of name/version pairs is returned.
    
    CLI Example:
    salt '*' pkg.version <package name>
    salt '*' pkg.version <package1> <package2> <package3> ...

salt.modules.yumpkg.version_cmp(pkg1, pkg2)
    New in version 2015.5.4.
    Do a cmp-style comparison on two packages. Return -1 if pkg1 < pkg2, 0 if pkg1 == pkg2, and 1 if pkg1 >
    pkg2. Return None if there was a problem making the comparison.
    
    CLI Example:
    salt '*' pkg.version_cmp '0.2-001' '0.2.0.1-002'
```

### 31.16.317 salt.modules.zcbuildout

Management of zc.buildout

New in version 2014.1.0.

This module is inspired by minitage's buildout maker

---

**Note:** The zc.buildout integration is still in beta; the API is subject to change

**General notes**

You have those following methods:

- upgrade_bootstrap
- bootstrap
- run_buildout
- buildout

```
salt.modules.zcbuildout.bootstrap(*a, **kw)
    Run the buildout bootstrap dance (python bootstrap.py).
    
    directory  directory to execute in
    config    alternative buildout configuration file to use
    runas     User used to run buildout as
    env       environment variables to set when running
    buildout_ver  force a specific buildout version (1 | 2)
    test_release    buildout accept test release
    offline    are we executing buildout in offline mode
    distribute Forcing use of distribute
    new_st    Forcing use of setuptools >= 0.7
```
Salt Documentation, Release 2015.8.0

python path to a python executable to use in place of default (salt one)
onlyif Only execute cmd if statement on the host return 0
unless Do not execute cmd if statement on the host return 0
use_vt Use the new salt VT to stream output [experimental]

CLI Example:

```
salt '*' buildout.bootstrap /srv/mybuildout
```

salt.modules.zcbuildout.buildout(*a,**kw)
Run buildout in a directory.
directory directory to execute in
config buildout config to use
parts specific buildout parts to run
runas user used to run buildout as
env environment variables to set when running
buildout_ver force a specific buildout version (1 | 2)
test_release buildout accept test release
new_st Forcing use of setuptools >= 0.7
distribute use distribute over setuptools if possible
offline does buildout run offline
python python to use
debug run buildout with -D debug flag
onlyif Only execute cmd if statement on the host return 0
unless Do not execute cmd if statement on the host return 0
newest run buildout in newest mode
verbose run buildout in verbose mode (-vvvvv)
use_vt Use the new salt VT to stream output [experimental]

CLI Example:

```
salt '*' buildout.buildout /srv/mybuildout
```

salt.modules.zcbuildout.run_buildout(*a,**kw)
Run a buildout in a directory.
directory directory to execute in
config alternative buildout configuration file to use
offline are we executing buildout in offline mode
runas user used to run buildout as
env environment variables to set when running
onlyif Only execute cmd if statement on the host return 0
unless Do not execute cmd if statement on the host return 0
newest  run buildout in newest mode
force  run buildout unconditionally
verbose  run buildout in verbose mode (-vvvvv)
use_vt  Use the new salt VT to stream output [experimental]

CLI Example:
```bash
salt '*' buildout.run_buildout /srv/mybuildout
```

```
salt.modules.zcbuildout.upgrade_bootstrap(*a,**kw)
    Upgrade current bootstrap.py with the last released one.
```
Indeed, when we first run a buildout, a common source of problem is to have a locally stale bootstrap, we just try to grab a new copy
directory  directory to execute in
offline  are we executing buildout in offline mode
buildout_ver  forcing to use a specific buildout version (1 | 2)
onlyif  Only execute cmd if statement on the host return 0
unless  Do not execute cmd if statement on the host return 0

CLI Example:
```bash
salt '*' buildout.upgrade_bootstrap /srv/mybuildout
```

### 31.16.318 salt.modules.zfs
Salt interface to ZFS commands

codeauthor  Nitin Madhok <nmadhok@clemson.edu>

```
salt.modules.zfs.create(name, **kwargs)
    New in version 2015.5.0.
    Create a ZFS File System.
```

CLI Example:
```bash
salt '*' zfs.create myzpool/mydataset [create_parent=True|False]
```

**Note:** ZFS properties can be specified at the time of creation of the filesystem by passing an additional argument called "properties" and specifying the properties with their respective values in the form of a python dictionary:

```
properties="{'property1': 'value1', 'property2': 'value2'}"
```
Example:
```bash
salt '*' zfs.create myzpool/mydataset properties="{'mountpoint': '/export/zfs', 'sharenfs': 'on'}"
```

```
salt.modules.zfs.destroy(name, **kwargs)
    New in version 2015.5.0.
    Destroy a ZFS File System.
```
CLI Example:

```bash
salt '*' zfs.destroy myzpool/mydataset [force=True|False]
```

**salt.modules.zfs.exists**(name)

New in version 2015.5.0.

Check if a ZFS filesystem or volume or snapshot exists.

CLI Example:

```bash
salt '*' zfs.exists myzpool/mydataset
```

**salt.modules.zfs.list**(name='*', **kwargs)

New in version 2015.5.0.

Return a list of all datasets or a specified dataset on the system and the values of their used, available, referenced, and mountpoint properties.

**Note:** Information about the dataset and all of its descendent datasets can be displayed by passing `recursive=True` on the CLI.

CLI Example:

```bash
salt '*' zfs.list [recursive=True|False]
salt '*' zfs.list /myzpool/mydataset [recursive=True|False]
```

**Note:** Dataset property value output can be customized by passing an additional argument called `"properties"` in the form of a python list:

```python
properties="[property1, property2, property3]"
```

**Example:**

```bash
salt '*' zfs.list /myzpool/mydataset properties="[name, sharenfs, mountpoint]"
```

**salt.modules.zfs.rename**(name, new_name)

New in version 2015.5.0.

Rename or Relocate a ZFS File System.

CLI Example:

```bash
salt '*' zfs.rename myzpool/mydataset myzpool/renameddataset
```

### 31.16.319 salt.modules.zk_concurrency

**Concurrency controls in zookeeper**

This module allows you to acquire and release a slot. This is primarily useful for ensuring that no more than N hosts take a specific action at once. This can also be used to coordinate between masters.

**salt.modules.zk_concurrency.lock**(path, zk_hosts, identifier=None, max_concurrency=1, timeout=None, ephemeral_lease=False, force=False)

Get lock (with optional timeout)

- **path** The path in zookeeper where the lock is
zk_hosts  zookeeper connect string
identifier  Name to identify this minion
max_concurrency  Maximum number of lock holders
timeout  timeout to wait for the lock. A None timeout will block forever
ephemeral_lease  Whether the locks in zookeeper should be ephemeral
force  Forcibly acquire the lock regardless of available slots

Example:
... code-block: bash
salt minion zk_concurrency.lock /lock/path host1:1234,host2:1234

salt.modules.zk_concurrency.lock_holders(path, zk_hosts, max_concurrency=1, ephemeral_lease=False)

Return an un-ordered list of lock holders
path  The path in zookeeper where the lock is
zk_hosts  zookeeper connect string
identifier  Name to identify this minion
max_concurrency  Maximum number of lock holders
timeout  timeout to wait for the lock. A None timeout will block forever
ephemeral_lease  Whether the locks in zookeeper should be ephemeral

Example:
... code-block: bash
salt minion zk_concurrency.lock_holders /lock/path host1:1234,host2:1234

salt.modules.zk_concurrency.party_members(path, zk_hosts)
Get the List of identifiers in a particular party
path  The path in zookeeper where the lock is
zk_hosts  zookeeper connect string

Example:
... code-block: bash
salt minion zk_concurrency.party_members /lock/path host1:1234,host2:1234

salt.modules.zk_concurrency.unlock(path, zk_hosts=None, identifier=None, max_concurrency=1, ephemeral_lease=False)
Remove lease from semaphore
path  The path in zookeeper where the lock is
zk_hosts  zookeeper connect string
identifier  Name to identify this minion
max_concurrency  Maximum number of lock holders
timeout  timeout to wait for the lock. A None timeout will block forever
ephemeral_lease  Whether the locks in zookeeper should be ephemeral
Example:

```bash
salt minion zk_concurrency.unlock /lock/path host1:1234,host2:1234
```

### 31.16.320 salt.modules.znc

**znc** - An advanced IRC bouncer

New in version 2014.7.0.

Provides an interface to basic ZNC functionality

```python
salt.modules.znc.buildmod(modules)

Build module using znc-buildmod
```

CLI Example:

```bash
salt '*' znc.buildmod module.cpp [...]
```

```python
salt.modules.znc.dumpconf()

Write the active configuration state to config file
```

CLI Example:

```bash
salt '*' znc.dumpconf
```

```python
salt.modules.znc.rehashconf()

Rehash the active configuration state from config file
```

CLI Example:

```bash
salt '*' znc.rehashconf
```

```python
salt.modules.znc.version()

Return server version from znc --version
```

CLI Example:

```bash
salt '*' znc.version
```

### 31.16.321 salt.modules.zpool

Module for running ZFS zpool command

#### codeauthor
Nitin Madhok <nmadhok@clemson.edu>

```python
salt.modules.zpool.add(pool_name, *vdevs)

Add the specified vdev's to the given pool
```

CLI Example:

```bash
salt '*' zpool.add myzpool /path/to/vdev1 /path/to/vdev2 [...]
```

```python
salt.modules.zpool.create(pool_name, *vdevs, **kwargs)

New in version 2015.5.0.

Create a simple zpool, a mirrored zpool, a zpool having nested VDEVs, a hybrid zpool with cache, spare and log drives or a zpool with RAIDZ-1, RAIDZ-2 or RAIDZ-3
```

CLI Example:
salt '*' zpool.create myzpool /path/to/vdev1 [...] [force=True|False]
salt '*' zpool.create myzpool mirror /path/to/vdev1 /path/to/vdev2 [...] [force=True|False]
salt '*' zpool.create myzpool raidz1 /path/to/vdev1 /path/to/vdev2 raidz2 /path/to/vdev3 [...] mirror /path/to/vdev2 /path/to/vdev3 [...] [force=True|False]
salt '*' zpool.create myhybridzpool mirror /tmp/file1 [...] log mirror /path/to/vdev1 [...] cache /path/to/vdev2 [...] spare /path/to/vdev3 [...] [force=True|False]

Note: Zpool properties can be specified at the time of creation of the pool by passing an additional argument called ''properties'' and specifying the properties with their respective values in the form of a python dictionary:

```
properties={"property1": 'value1', 'property2': 'value2'}
```

Example:

```
salt '*' zpool.create myzpool /path/to/vdev1 [...] properties={"property1": 'value1', 'property2': 'value2'}
```

salt.modules.zpool.create_file_vdev(size, *vdevs)

Creates file based virtual devices for a zpool

*vdevs is a list of full paths for mkfile to create

CLI Example:

```
salt '*' zpool.create_file_vdev 7g /path/to/vdev1 [/path/to/vdev2] [...] 
```

Note: Depending on file size, the above command may take a while to return.

salt.modules.zpool.destroy(pool_name)

Destroys a storage pool

CLI Example:

```
salt '*' zpool.destroy myzpool
```

salt.modules.zpool.exists(pool_name)

Check if a ZFS storage pool is active

CLI Example:

```
salt '*' zpool.exists myzpool
```

salt.modules.zpool.export(*pools, **kwargs)

New in version 2015.5.0.

Export storage pools

CLI Example:

```
salt '*' zpool.export myzpool ...
```

salt.modules.zpool.import(pool_name='`, new_name='`, **kwargs)

New in version 2015.5.0.

Import storage pools or list pools available for import

CLI Example:
### salt.modules.zpool

<table>
<thead>
<tr>
<th>Documentation Function</th>
<th>Description</th>
<th>Example Syntax</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>iostat</code></td>
<td>Display I/O statistics for the given pools</td>
<td><code>salt '*' zpool.iostat myzpool</code></td>
</tr>
<tr>
<td><code>list()</code></td>
<td>Return a list of all pools in the system with health status and space usage</td>
<td><code>salt '*' zpool.list</code></td>
</tr>
<tr>
<td><code>offline(pool_name, *vdevs, **kwargs)</code></td>
<td>Ensure that the specified devices are offline</td>
<td>`salt '*' zpool.offline myzpool /path/to/vdev1 [... ] [temporary=True</td>
</tr>
<tr>
<td><code>online(pool_name, *vdevs, **kwargs)</code></td>
<td>Ensure that the specified devices are online</td>
<td><code>salt '*' zpool.online myzpool /path/to/vdev1 [... ]</code></td>
</tr>
<tr>
<td><code>replace(pool_name, old, new)</code></td>
<td>Replaces old device with new device.</td>
<td><code>salt '*' zpool.replace myzpool /path/to/vdev1 /path/to/vdev2</code></td>
</tr>
<tr>
<td><code>scrub(pool_name=None)</code></td>
<td>Begin a scrub</td>
<td><code>salt '*' zpool.scrub myzpool</code></td>
</tr>
<tr>
<td><code>status(name='')</code></td>
<td>Return the status of the named zpool</td>
<td><code>salt '*' zpool.status myzpool</code></td>
</tr>
</tbody>
</table>

---

**Warning:** By default, the OFFLINE state is persistent. The device remains offline when the system is rebooted. To temporarily take a device offline, use `temporary=True`. |
salt.modules.zpool.zpool_list()

Deprecated since version 2014.7.0: Use list_() instead.

Return a list of all pools in the system with health status and space usage

CLI Example:

```
salt '*' zpool.zpool_list
```

### 31.16.322 salt.modules.zypper

Package support for openSUSE via the zypper package manager

```python
def depends
    • zypp Python module. Install with zypper install python-zypp
```

salt.modules.zypper.add_lock(name=None, pkgs=None, **kwargs)

Add a package lock. Specify packages to lock by exact name.

CLI Example:

```
salt '*' pkg.add_lock <package name>
salt '*' pkg.add_lock <package1>,<package2>,<package3>
salt '*' pkg.add_lock pkgs='["foo", "bar"]'
```

salt.modules.zypper.clean_locks()

Remove unused locks that do not currently (with regard to repositories used) lock any package.

CLI Example:

```
salt '*' pkg.clean_locks
```

salt.modules.zypper.del_repo(repo)

Delete a repo.

CLI Examples:

```
salt '*' pkg.del_repo alias
```

salt.modules.zypper.diff('paths)

Return a formatted diff between current files and original in a package. NOTE: this function includes all files (configuration and not), but does not work on binary content.

**Parameters** path -- Full path to the installed file

**Returns** Difference string or raises and exception if examined file is binary.

CLI example:

```
salt '*' pkg.diff /etc/apache2/httpd.conf /etc/sudoers
```

salt.modules.zypper.download('packages)

Download packages to the local disk.

CLI example:

```
salt '*' pkg.download httpd
salt '*' pkg.download httpd postfix
```
salt.modules.zypper.file_dict(packages)
    List the files that belong to a package, grouped by package. Not specifying any packages will return a list of every file on the system's rpm database (not generally recommended).

    CLI Examples:
    salt '*' pkg.file_list httpd
    salt '*' pkg.file_list httpd postfix
    salt '*' pkg.file_list

salt.modules.zypper.file_list(packages)
    List the files that belong to a package. Not specifying any packages will return a list of every file on the system's rpm database (not generally recommended).

    CLI Examples:
    salt '*' pkg.file_list httpd
    salt '*' pkg.file_list httpd postfix
    salt '*' pkg.file_list

salt.modules.zypper.get_repo(repo, **kwargs)
    Display a repo.

    CLI Example:
    salt '*' pkg.get_repo alias
	salt.modules.zypper.info(names, **kwargs)
    Deprecated since version Nitrogen: Use info_available() instead.
    Return the information of the named package available for the system.

    CLI example:
    salt '*' pkg.info <package1>
    salt '*' pkg.info <package1> <package2> <package3> ...

salt.modules.zypper.info_available(names, **kwargs)
    Return the information of the named package available for the system.

    CLI example:
    salt '*' pkg.info_available <package1>
    salt '*' pkg.info_available <package1> <package2> <package3> ...

salt.modules.zypper.info_installed(names)
    Return the information of the named package(s), installed on the system.

    CLI example:
    salt '*' pkg.info_installed <package1>
    salt '*' pkg.info_installed <package1> <package2> <package3> ...

salt.modules.zypper.install(name=None, refresh=False, fromrepo=None, pkgs=None, sources=None, downloadonly=None, **kwargs)
    Install the passed package(s), add refresh=True to run `zypper refresh' before package is installed.

    name The name of the package to be installed. Note that this parameter is ignored if either ``pkgs'' or ``sources'' is passed. Additionally, please note that this option can only be used to install packages from a software repository. To install a package file manually, use the ``sources'' option.

    CLI Example:
salt '...' pkg.install <package name>

**refresh** Whether or not to refresh the package database before installing.

**fromrepo** Specify a package repository to install from.

**downloadonly** Only download the packages, do not install.

**version** Can be either a version number, or the combination of a comparison operator (<, >, <=, >=, =) and a version number (ex. `>1.2.3-4`). This parameter is ignored if `"pkgs"` or `"sources"` is passed.

Multiple Package Installation Options:

**pkgs** A list of packages to install from a software repository. Must be passed as a python list. A specific version number can be specified by using a single-element dict representing the package and its version. As with the version parameter above, comparison operators can be used to target a specific version of a package.

CLI Examples:

```
salt '...' pkg.install pkgs='["foo", "bar"]'
salt '...' pkg.install pkgs='["foo", {"bar": "1.2.3-4"}]'
salt '...' pkg.install pkgs='["foo", {"bar": "<1.2.3-4"}]'
```

**sources** A list of RPM packages to install. Must be passed as a list of dicts, with the keys being package names, and the values being the source URI or local path to the package.

CLI Example:

```
salt '...' pkg.install sources='[{"foo": "salt://foo.rpm"},{"bar": "salt://bar.rpm"}]'
```

Returns a dict containing the new package names and versions:

```python
{ '<package>': { 'old': '<old-version>', 'new': '<new-version>' }}
```

salt.modules.zypper.latest_version(*names, **kwargs)

Return the latest version of the named package available for upgrade or installation. If more than one package name is specified, a dict of name/version pairs is returned.

If the latest version of a given package is already installed, an empty dict will be returned for that package.

CLI example:

```
salt '...' pkg.latest_version <package name>
salt '...' pkg.latest_version <package1> <package2> <package3> ...
```

salt.modules.zypper.list_installed_patterns()

List installed patterns on the system.

CLI Examples:

```
salt '...' pkg.list_installed_patterns
```

salt.modules.zypper.list_locks()

List current package locks.

Return a dict containing the locked package with attributes:

```python
{ '<package>': { 'case_sensitive': 'case_sensitive', 'match_type': 'match_type', 'type': 'type' }}
```
CLI Example:

```python
salt '* pkg.list_locks
```

```
salt.modules.zypper.list_patterns()

List all known patterns from available repos.

CLI Examples:

```python
salt '* pkg.list_patterns
```

```
salt.modules.zypper.list_pkgs(versions_as_list=False, **kwargs)

List the packages currently installed as a dict:

```python
{ '<package_name>': '<version>'}
```

CLI Example:

```python
salt '* pkg.list_pkgs
```

```
salt.modules.zypper.list_products()

List all installed SUSE products.

CLI Examples:

```python
salt '* pkg.list_products
```

```
salt.modules.zypper.list_repos()

List all repos.

CLI Example:

```python
salt '* pkg.list_repos
```

```
salt.modules.zypper.list_upgrades(refresh=True)

List all available package upgrades on this system

CLI Example:

```python
salt '* pkg.list_upgrades
```

```
salt.modules.zypper.mod_repo(repo, **kwargs)

Modify one or more values for a repo. If the repo does not exist, it will be created, so long as the following values are specified:

- **repo or alias** alias by which the zypper refers to the repo
- **url, mirrorlist or baseurl** the URL for zypper to reference
- **enabled** enable or disable (True or False) repository, but do not remove if disabled.
- **refresh** enable or disable (True or False) auto-refresh of the repository.
- **cache** Enable or disable (True or False) RPM files caching.
- **gpgcheck** Enable or disable (True or False) GOG check for this repository.
- **gpgautoimport** Automatically trust and import new repository.

Key/Value pairs may also be removed from a repo's configuration by setting a key to a blank value. Bear in mind that a name cannot be deleted, and a url can only be deleted if a mirrorlist is specified (or vice versa).

CLI Examples:
salt.modules.zypper.modified(*packages, **flags)
List the modified files that belong to a package. Not specifying any packages will return a list of _all_ modified files on the system’s RPM database.

New in version 2015.5.0.
Filtering by flags (True or False):
- size: Include only files where size changed.
- mode: Include only files which file’s mode has been changed.
- checksum: Include only files which MD5 checksum has been changed.
- device: Include only files which major and minor numbers has been changed.
- symlink: Include only files which are symbolic link contents.
- owner: Include only files where owner has been changed.
- group: Include only files where group has been changed.
- time: Include only files where modification time of the file has been changed.
- capabilities: Include only files where capabilities differ or not. Note: supported only on newer RPM versions.

CLI Examples:
```
salt '*' pkg.modified
salt '*' pkg.modified httpd
salt '*' pkg.modified httpd postfix
salt '*' pkg.modified httpd owner=True group=False
```

salt.modules.zypper.owner(*paths)
Return the name of the package that owns the file. Multiple file paths can be passed. If a single path is passed, a string will be returned, and if multiple paths are passed, a dictionary of file/package name pairs will be returned.

If the file is not owned by a package, or is not present on the minion, then an empty string will be returned for that path.

CLI Examples:
```
salt '*' pkg.owner /usr/bin/apachectl
salt '*' pkg.owner /usr/bin/apachectl /etc/httpd/conf/httpd.conf
```

salt.modules.zypper.purge(name=None, pkgs=None, **kwargs)
Recursively remove a package and all dependencies which were installed with it, this will call a zypper -n remove -u

- name: The name of the package to be deleted.
- pkgs: A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this option is passed.

New in version 0.16.0.

Returns a dict containing the changes.

CLI Example:
salt '*' pkg.purge <package name>
salt '*' pkg.purge <package1>,<package2>,<package3>
salt '*' pkg.purge pkgs='["foo", "bar"]'

salt.modules.zypper.refresh_db()
    Just run a zypper refresh, return a dict:

    {'<database name>': Bool}

    CLI Example:
    salt '*' pkg.refresh_db

salt.modules.zypper.remove(name=None, pkgs=None, **kwargs)
    Remove packages with zypper -n remove
    name The name of the package to be deleted.
    Multiple Package Options:
    pkgs A list of packages to delete. Must be passed as a python list. The name parameter will be ignored if this
    option is passed.
    New in version 0.16.0.
    Returns a dict containing the changes.
    CLI Example:
    salt '*' pkg.remove <package name>
salt '*' pkg.remove <package1>,<package2>,<package3>
salt '*' pkg.remove pkgs='["foo", "bar"]'

salt.modules.zypper.remove_lock(name=None, pkgs=None, **kwargs)
    Remove specified package lock.
    CLI Example:
    salt '*' pkg.remove_lock <package name>
salt '*' pkg.remove_lock <package1>,<package2>,<package3>
salt '*' pkg.remove_lock pkgs='["foo", "bar"]'

salt.modules.zypper.search(criteria)
    List known packages, available to the system.
    CLI Examples:
    salt '*' pkg.search <criteria>

salt.modules.zypper.upgrade(refresh=True)
    Run a full system upgrade, a zypper upgrade
    Return a dict containing the new package names and versions:

    {'<package>': {'old': '<old-version>',
                  'new': '<new-version>'}}

    CLI Example:
    salt '*' pkg.upgrade
salt.modules.zypper.upgrade_available(name)
Check whether or not an upgrade is available for a given package

CLI Example:

```
salt '* pkg.upgrade_available <package name>
```

salt.modules.zypper.verify("names", **kwargs)
Runs an rpm -Va on a system, and returns the results in a dict

Files with an attribute of config, doc, ghost, license or readme in the package header can be ignored using the ignore_types keyword argument

CLI Example:

```
salt '* pkg.verify
salt '* pkg.verify httpd
salt '* pkg.verify 'httpd postfix'
salt '* pkg.verify 'httpd postfix' ignore_types=['config','doc']
```

salt.modules.zypper.version("names", **kwargs)
Returns a string representing the package version or an empty dict if not installed. If more than one package name is specified, a dict of name/version pairs is returned.

CLI Example:

```
salt '* pkg.version <package name>
salt '* pkg.version <package1> <package2> <package3> ...
```

### 31.17 Full list of netapi modules

#### 31.17.1 rest_cherrypy

A REST API for Salt

New in version 2014.7.0.

**depends**

- CherryPy Python module. Version 3.2.3 is currently recommended when SSL is enabled, since this version worked the best with SSL in internal testing. Versions 3.2.3 - 4.x can be used if SSL is not enabled. Be aware that there is a known SSL error introduced in version 3.2.5. The issue was reportedly resolved with CherryPy milestone 3.3, but the patch was committed for version 3.6.1.

**optdepends**

- ws4py Python module for websockets support.

**client_libraries**

- Java: [https://github.com/SUSE/saltstack-netapi-client-java](https://github.com/SUSE/saltstack-netapi-client-java)
- Python: [https://github.com/saltstack/pepper](https://github.com/saltstack/pepper)

**configuration** All authentication is done through Salt’s external auth system which requires additional configuration not described here.

Example production-ready configuration; add to the Salt master config file and restart the salt-master and salt-api daemons:
rest_cherrypy:
  port: 8000
  ssl_crt: /etc/pki/tls/certs/localhost.crt
  ssl_key: /etc/pki/tls/certs/localhost.key

Using only a secure HTTPS connection is strongly recommended since Salt authentication credentials will be sent over the wire.

A self-signed certificate can be generated using the `create_self_signed_cert()` execution function. Running this function requires pyOpenSSL and the `salt-call` script is available in the `salt-minion` package.

```
salt-call --local tls.create_self_signed_cert
```

All available configuration options are detailed below. These settings configure the CherryPy HTTP server and do not apply when using an external server such as Apache or Nginx.

**port Required**

The port for the webserver to listen on.

**host** [0.0.0.0] The socket interface for the HTTP server to listen on.

**debug** [False] Starts the web server in development mode. It will reload itself when the underlying code is changed and will output more debugging info.

**ssl_crt** The path to a SSL certificate. (See below)

**ssl_key** The path to the private key for your SSL certificate. (See below)

**disable_ssl** A flag to disable SSL. Warning: your Salt authentication credentials will be sent in the clear!

**webhook_disable_auth** [False] The Webhook URL requires authentication by default but external services cannot always be configured to send authentication. See the Webhook documentation for suggestions on securing this interface.

**webhook_url** [/hook] Configure the URL endpoint for the Webhook entry point.

**thread_pool** [100] The number of worker threads to start up in the pool.

**socket_queue_size** [30] Specify the maximum number of HTTP connections to queue.

**expireResponses** [True] Whether to check for and kill HTTP responses that have exceeded the default timeout.

**max_request_body_size** [1048576] Maximum size for the HTTP request body.

**collect_stats** [False] Collect and report statistics about the CherryPy server

Reports are available via the Stats URL.

**static** A filesystem path to static HTML/JavaScript/CSS/image assets.

**static_path** [/static] The URL prefix to use when serving static assets out of the directory specified in the static setting.

**app** A filesystem path to an HTML file that will be served as a static file. This is useful for bootstrapping a single-page JavaScript app.

**app_path** [/app] The URL prefix to use for serving the HTML file specified in the app setting. This should be a simple name containing no slashes.

Any path information after the specified path is ignored; this is useful for apps that utilize the HTML5 history API.
root_prefix  [/] A URL path to the main entry point for the application. This is useful for serving multiple applications from the same URL.

Authentication

Authentication is performed by passing a session token with each request. Tokens are generated via the Login URL.

The token may be sent in one of two ways:

- Include a custom header named X-Auth-Token.
  
  For example, using curl:

  ```bash
  curl -sSk https://localhost:8000/login \
  -H 'Accept: application/x-yaml' \
  -d username=saltdev \
  -d password=saltdev \
  -d eauth=auto
  
  Copy the token value from the output and include it in subsequent requests:

  ```bash
  curl -sSk https://localhost:8000 \
  -H 'Accept: application/x-yaml' \
  -H 'X-Auth-Token: 697adbdc8fe971d09ae4c2a3add7248859c87079' \
  -d client=local \n  -d tgt='*' \
  -d fun=test.ping
  ```

- Sent via a cookie. This option is a convenience for HTTP clients that automatically handle cookie support (such as browsers).
  
  For example, using curl:

  ```bash
  # Write the cookie file:
  curl -sSk https://localhost:8000/login \
  -c ~/cookies.txt \
  -H 'Accept: application/x-yaml' \
  -d username=saltdev \
  -d password=saltdev \
  -d eauth=auto

  # Read the cookie file:
  curl -sSk https://localhost:8000 \
  -b ~/cookies.txt \
  -H 'Accept: application/x-yaml' \
  -d client=local \n  -d tgt='*' \
  -d fun=test.ping
  ```

See also:

You can bypass the session handling via the Run URL.

Usage

Commands are sent to a running Salt master via this module by sending HTTP requests to the URLs detailed below.
Content negotiation
This REST interface is flexible in what data formats it will accept as well as what formats it will return (e.g., JSON, YAML, x-www-form-urlencoded).

- Specify the format of data in the request body by including the `Content-Type` header.
- Specify the desired data format for the response body with the `Accept` header.

Data sent in `POST` and `PUT` requests must be in the format of a list of lowstate dictionaries. This allows multiple commands to be executed in a single HTTP request. The order of commands in the request corresponds to the return for each command in the response.

Lowstate, broadly, is a dictionary of values that are mapped to a function call. This pattern is used pervasively throughout Salt. The functions called from netapi modules are described in `Client Interfaces`.

The following example (in JSON format) causes Salt to execute two commands, a command sent to minions as well as a runner function on the master:

```json
[{
    "client": "local",
    "tgt": "*",
    "fun": "test.fib",
    "arg": ["10"]
},
{
    "client": "runner",
    "fun": "jobs.lookup_jid",
    "jid": "20130603122505459265"
}
]
```

Sending JSON or YAML in the request body is simple and most flexible, however sending data in urlencoded format is also supported with the caveats below. It is the default format for HTML forms, many JavaScript libraries, and the `curl` command.

For example, the equivalent to running `salt '*' test.ping` is sending `fun=test.ping&arg&client=local&tgt=*` in the HTTP request body.

Caveats:
- Only a single command may be sent per HTTP request.
- Repeating the `arg` parameter multiple times will cause those parameters to be combined into a single list.

Note, some popular frameworks and languages (notably jQuery, PHP, and Ruby on Rails) will automatically append empty brackets onto repeated parameters. E.g., `arg=one, arg=two` will be sent as `arg[]=one, arg[]=two`. This is not supported; send JSON or YAML instead.

Deployment

The `rest_cherrypy` netapi module is a standard Python WSGI app. It can be deployed one of two ways.

**salt-api using the CherryPy server**

The default configuration is to run this module using `salt-api` to start the Python-based CherryPy server. This server is lightweight, multi-threaded, encrypted with SSL, and should be considered production-ready.
Using a WSGI-compliant web server

This module may be deployed on any WSGI-compliant server such as Apache with mod_wsgi or Nginx with FastCGI, to name just two (there are many).

Note, external WSGI servers handle URLs, paths, and SSL certs directly. The rest_cherrypy configuration options are ignored and the salt-api daemon does not need to be running at all. Remember Salt authentication credentials are sent in the clear unless SSL is being enforced!

An example Apache virtual host configuration:

```xml
<VirtualHost *:80>
    ServerName example.com
    ServerAlias *.example.com
    
    ServerAdmin webmaster@example.com
    LogLevel warn
    ErrorLog /var/www/example.com/logs/error.log
    CustomLog /var/www/example.com/logs/access.log combined
    
    DocumentRoot /var/www/example.com/htdocs
    
    WSGIScriptAlias / /path/to/salt/netapi/rest_cherrypy/wsgi.py
</VirtualHost>
```

REST URI Reference

- `/`
- `/login`
- `/logout`
- `/minions`
- `/jobs`
- `/run`
- `/events`
- `/hook`
- `/keys`
- `/ws`
- `/stats`

/  

class salt.netapi.rest_cherrypy.app.LowDataAdapter

The primary entry point to Salt's REST API

**GET()**

An explanation of the API with links of where to go next

**GET /**

**Request Headers**

- **Accept** -- the desired response format.

**Status Codes**

- **200** -- success
• **401** -- authentication required
• **406** -- requested Content-Type not available

Example request:

curl -i localhost:8000

```plaintext
GET / HTTP/1.1
Host: localhost:8000
Accept: application/json
```

Example response:

```
HTTP/1.1 200 OK
Content-Type: application/json
```

**POST**

Mock out specified imports

This allows autodoc to do its thing without having oodles of req’d installed libs. This doesn’t work with `import *` imports.

http://read-the-docs.readthedocs.org/en/latest/faq.html#i-get-import-errors-on-libraries-that-depend-on-c-modules

/class

`salt.netapi.rest_cherrypy.app.Login(args, **kwargs)`

Log in to receive a session token

*Authentication information.*

**GET()**

Present the login interface

**GET /login**

An explanation of how to log in.

*Status Codes*

• **200** -- success
• **401** -- authentication required
• **406** -- requested Content-Type not available

Example request:

curl -i localhost:8000/login

```plaintext
GET /login HTTP/1.1
Host: localhost:8000
Accept: text/html
```

Example response:

```
HTTP/1.1 200 OK
Content-Type: text/html
```

**POST(**kwargs)**

*Authenticate* against Salt’s eauth system

**POST /login**

Request Headers
- **X-Auth-Token** -- a session token from *Login*.
- **Accept** -- the desired response format.
- **Content-Type** -- the format of the request body.

Form Parameters
- **eauth** -- the eauth backend configured for the user
- **username** -- username
- **password** -- password

Status Codes
- **200** -- success
- **401** -- authentication required
- **406** -- requested Content-Type not available

Example request:
```
curl -si localhost:8000/login
  -H "Accept: application/json"
  -d username='saltuser'
  -d password='saltpass'
  -d eauth='pam'
```

Example response:
```
HTTP/1.1 200 OK
Content-Type: application/json
Content-Length: 206
X-Auth-Token: 6d1b722e
Set-Cookie: session_id=6d1b722e; expires=Sat, 17 Nov 2012 03:23:52 GMT; Path=/

{"return": {
  "token": "6d1b722e",
  "start": 1363805943.776223,
  "expire": 1363849143.776224,
  "user": "saltuser",
  "eauth": "pam",
  "perms": [
    "grains.*",
    "status.*",
    "sys.*",
    "test.*"
  ]
}}
```

### /logout

class salt.netapi.rest_cherrypy.app.Logout

Class to remove or invalidate sessions

**POST**

Destroy the currently active session and expire the session cookie
/minions

class salt.netapi.rest_cherrypy.app.Minions

Convenience URLs for working with minions

GET(mid=None)
A convenience URL for getting lists of minions or getting minion details

GET /minions/ (mid)
Request Headers
- X-Auth-Token -- a session token from Login.
- Accept -- the desired response format.
Status Codes
- 200 -- success
- 401 -- authentication required
- 406 -- requested Content-Type not available

Example request:
curl -i localhost:8000/minions/ms-3

GET /minions/ms-3 HTTP/1.1
Host: localhost:8000
Accept: application/x-yaml

Example response:
HTTP/1.1 200 OK
Content-Length: 129005
Content-Type: application/x-yaml

return:
- ms-3:
  grains.items:
  ...

POST(**kwargs)
Start an execution command and immediately return the job id

POST /minions
Request Headers
- X-Auth-Token -- a session token from Login.
- Accept -- the desired response format.
- Content-Type -- the format of the request body.
Response Headers
- Content-Type -- the format of the response body; depends on the Accept request header.
Status Codes
- 200 -- success
- 401 -- authentication required
- 406 -- requested Content-Type not available

lowstate data describing Salt commands must be sent in the request body. The client option will be set to local_async().

Example request:
curl -sSi localhost:8000/minions \
   -H "Accept: application/x-yaml" \

POST /minions HTTP/1.1
Host: localhost:8000
Accept: application/x-yaml
Content-Length: 26
Content-Type: application/x-www-form-urlencoded

tgt=*&fun=status.diskusage

Example response:

HTTP/1.1 202 Accepted
Content-Length: 86
Content-Type: application/x-yaml

return:
- jid: '20130603122505459265'
  minions: [ms-4, ms-3, ms-2, ms-1, ms-0]
  _links:
    jobs:
      - href: /jobs/20130603122505459265

/jobs

class salt.netapi.rest_cherrypy.app.Jobs

**GET** *(jid=None, timeout='')*
A convenience URL for getting lists of previously run jobs or getting the return from a single job

**GET** /jobs/* *(jid)*
List jobs or show a single job from the job cache.

Request Headers
- X-Auth-Token -- a session token from Login.
- Accept -- the desired response format.

Status Codes
- 200 -- success
- 401 -- authentication required
- 406 -- requested Content-Type not available

Example request:
curl -i localhost:8000/jobs

Example response:

HTTP/1.1 200 OK
Content-Length: 165
Content-Type: application/x-yaml

return:
- '20121130104633606931':
  Arguments:
  - '3'
  Function: test.fib
  Target: jerry
  Target-type: glob

Example request:

curl -i localhost:8000/jobs/20121130104633606931

```
GET /jobs/20121130104633606931 HTTP/1.1
Host: localhost:8000
Accept: application/x-yaml
```

Example response:

```
HTTP/1.1 200 OK
Content-Length: 73
Content-Type: application/x-yaml

info:
  - Arguments:
    - '3'
    Function: test.fib
    Minions:
    - jerry
    Target: '*'
    Target-type: glob
    User: saltdev
  jid: '20121130104633606931'

return:
  - jerry:
    - 0
    - 1
    - 1
    - 2
    - 6.9141387939453125e-06
```

/run

class salt.netapi.rest_cherrypy.app.Run

Class to run commands without normal session handling

```python
POST(**kwargs)

Run commands bypassing the normal session handling

POST /run

This entry point is primarily for ``one-off`` commands. Each request must pass full Salt authentication credentials. Otherwise this URL is identical to the root URL (/).

lowstate data describing Salt commands must be sent in the request body.

Status Codes
- **200** -- success
- **401** -- authentication required
```
- **406** -- requested Content-Type not available

Example request:

```bash
curl -sS localhost:8000/run \
   -H 'Accept: application/x-yaml' \ 
   -d client='local' \ 
   -d tgt='*' \ 
   -d fun='test.ping' \ 
   -d username='saltdev' \ 
   -d password='saltdev' \ 
   -d eauth='pam'
```

```plaintext
POST /run HTTP/1.1
Host: localhost:8000
Accept: application/x-yaml
Content-Length: 75
Content-Type: application/x-www-form-urlencoded

client=local&tgt=*&fun=test.ping&username=saltdev&password=saltdev&eauth=pam
```

Example response:

```plaintext
HTTP/1.1 200 OK
Content-Length: 73
Content-Type: application/x-yaml

return:
- ms-0: true
  ms-1: true
  ms-2: true
  ms-3: true
  ms-4: true
```

The `/run` endpoint can also be used to issue commands using the salt-ssh subsystem.

When using salt-ssh, eauth credentials should not be supplied. Instead, authentication should be handled by the SSH layer itself. The use of the salt-ssh client does not require a salt master to be running. Instead, only a roster file must be present in the salt configuration directory.

All SSH client requests are synchronous.

**Example SSH client request:**

```bash
curl -sS localhost:8000/run \
   -H 'Accept: application/x-yaml' \ 
   -d client='ssh' \ 
   -d tgt='*' \ 
   -d fun='test.ping'
```

```plaintext
POST /run HTTP/1.1
Host: localhost:8000
Accept: application/x-yaml
Content-Length: 75
Content-Type: application/x-www-form-urlencoded

client=ssh&tgt=*&fun=test.ping
```

Example SSH response:
The event bus on the Salt master exposes a large variety of things, notably when executions are started on the master and also when minions ultimately return their results. This URL provides a real-time window into a running Salt infrastructure.

See also:

**events**

**GET** *(token=none, salt_token=none)*

An HTTP stream of the Salt master event bus

This stream is formatted per the Server Sent Events (SSE) spec. Each event is formatted as JSON.

**GET** /events

**Status Codes**

- **200** -- success
- **401** -- authentication required
- **406** -- requested Content-Type not available

**Query Parameters**

- **token** -- optional parameter containing the token ordinarily supplied via the X-Auth-Token header in order to allow cross-domain requests in browsers that do not include CORS support in the EventSource API. E.g., `curl -NsS localhost:8000/events?token=308650d`
- **salt_token** -- optional parameter containing a raw Salt `eauth token` (not to be confused with the token returned from the /login URL). E.g., `curl -NsS localhost:8000/events?salt_token=30742765`

**Example request:**

```
curl -NsS localhost:8000/events
```

**Example response:**

Note, the `tag` field is not part of the spec. SSE compliant clients should ignore unknown fields. This addition allows non-compliant clients to only watch for certain tags without having to deserialize the JSON object each time.

**HTTP/1.1 200 OK**

**Connection:** keep-alive

**Cache-Control:** no-cache
The event stream can be easily consumed via JavaScript:

```javascript
var source = new EventSource('/events');
source.onopen = function() { console.debug('opening') };
source.onerror = function(e) { console.debug('error!', e) };
source.onmessage = function(e) {
  console.debug('Tag: ', e.data.tag)
  console.debug('Data: ', e.data.data)
};
```

Or using CORS:

```javascript
var source = new EventSource('/events?token=ecd589e4e01912cf3c4035afad73426dbb8dba75', {withCredentials: true});
```

It is also possible to consume the stream via the shell.

Records are separated by blank lines; the `data:` and `tag:` prefixes will need to be removed manually before attempting to unserialize the JSON.

curl's `-N` flag turns off input buffering which is required to process the stream incrementally.

Here is a basic example of printing each event as it comes in:

```bash
curl -NsS localhost:8000/events |
  while IFS= read -r line ; do
echo $line
done
```

Here is an example of using awk to filter events based on tag:

```bash
curl -NsS localhost:8000/events |
  awk 'BEGIN { RS=""; FS="\n" } $1 ~ /^tag: salt/job/\[0-9]+\$/ { print $0 }',
tag: salt/job/20140112010149808995/new
data: {"tag": "salt/job/20140112010149808995/new", "data": {"tgt_type": "glob", "jid": "20140112010149808995"}}
tag: salt/job/20140112010149808995/ret/jerry
data: {"tag": "salt/job/20140112010149808995/ret/jerry", "data": {"jid": "20140112010149808995"}}
```

/hook

class salt.netapi.rest_cherrypy.app.Webhook
A generic web hook entry point that fires an event on Salt's event bus

External services can POST data to this URL to trigger an event in Salt. For example, Amazon SNS, Jenkins-CI or Travis-CI, or GitHub web hooks.
Note: Be mindful of security
Salt's Reactor can run any code. A Reactor SLS that responds to a hook event is responsible for validating that the event came from a trusted source and contains valid data.

This is a generic interface and securing it is up to you!
This URL requires authentication however not all external services can be configured to authenticate. For this reason authentication can be selectively disabled for this URL. Follow best practices -- always use SSL, pass a secret key, configure the firewall to only allow traffic from a known source, etc.

The event data is taken from the request body. The Content-Type header is respected for the payload.
The event tag is prefixed with salt/netapi/hook and the URL path is appended to the end. For example, a POST request sent to /hook/mycompany/myapp/mydata will produce a Salt event with the tag salt/netapi/hook/mycompany/myapp/mydata.
The following is an example .travis.yml file to send notifications to Salt of successful test runs:

```yaml
language: python
script: python -m unittest tests
after_success:
  - |
    curl -sSk https://saltapi-url.example.com:8000/hook/travis/build/success -d branch="${TRAVIS_BRANCH}" -d commit="${TRAVIS_COMMIT}"`n
```

See also:
- events
- reactor

**POST** (*args, **kwargs)
Fire an event in Salt with a custom event tag and data

**POST /hook**
Status Codes
- **200** -- success
- **401** -- authentication required
- **406** -- requested Content-Type not available
- **413** -- request body is too large

Example request:

```bash
curl -sS localhost:8000/hook -d foo='Foo!' -d bar='Bar!'
```

Example response:

```
HTTP/1.1 200 OK
Content-Length: 14
Content-Type: application/json

{"success": true}
```

As a practical example, an internal continuous-integration build server could send an HTTP POST request to the URL https://localhost:8000/hook/mycompany/build/success which contains
the result of a build and the SHA of the version that was built as JSON. That would then produce the
following event in Salt that could be used to kick off a deployment via Salt’s Reactor:

```
Event fired at Fri Feb 14 17:40:11 2014
*************************
Tag: salt/netapi/hook/mycompany/build/success
Data:
{'_stamp': '2014-02-14_17:40:11.440996',
 'headers': {
   'X-My-Secret-Key': 'F0fAgoQjIT@W',
   'Content-Length': '37',
   'Content-Type': 'application/json',
   'Host': 'localhost:8000',
   'Remote-Addr': '127.0.0.1'},
'post': {'revision': 'aa22a3c4b2e7', 'result': True}}
```

Salt’s Reactor could listen for the event:

```
reactor:
  - 'salt/netapi/hook/mycompany/build/*':
    - /srv/reactor/react_ci_builds.sls
```

And finally deploy the new build:

```
{% set secret_key = data.get('headers', {}).get('X-My-Secret-Key') %}
{% set build = data.get('post', {}) %}
{% if secret_key == 'F0fAgoQjIT@W' and build.result == True %}
deploy_my_app:
  cmd.state.sls:
    - tgt: 'application*' 
    - arg:
      - myapp.deploy 
      - kwarg:
        pillar:
          revision: {{ revision }}
{% endif %}
```

/keys

class salt.netapi.rest_cherrypy.app.Keys
Convenience URLs for working with minion keys

New in version 2014.7.0.

These URLs wrap the functionality provided by the key wheel module functions.

**GET (mid=None)**
Show the list of minion keys or detail on a specific key

New in version 2014.7.0.

**GET /keys/ (mid)**
List all keys or show a specific key

**Status Codes**
- **200** -- success
- **401** -- authentication required
- **406** -- requested Content-Type not available
Example request:

curl -i localhost:8000/keys

GET /keys HTTP/1.1
Host: localhost:8000
Accept: application/x-yaml

Example response:

HTTP/1.1 200 OK
Content-Length: 165
Content-Type: application/x-yaml

return:
  local:
    - master.pem
    - master.pub
  minions:
    - jerry
  minions_pre: []
  minions_rejected: []

Example request:

curl -i localhost:8000/keys/jerry

GET /keys/jerry HTTP/1.1
Host: localhost:8000
Accept: application/x-yaml

Example response:

HTTP/1.1 200 OK
Content-Length: 73
Content-Type: application/x-yaml

return:
  minions:

POST (mid, keysize=None, force=None, **kwargs)
Easily generate keys for a minion and auto-accept the new key

New in version 2014.7.0.

Example partial kickstart script to bootstrap a new minion:

%post
mkdir -p /etc/salt/pki/minion
curl -sSk https://localhost:8000/keys \
  -d mid=jerry \
  -d username=kickstart \
  -d password=kickstart \
  -d eauth=pam \
  | tar -C /etc/salt/pki/minion -xf -

mkdir -p /etc/salt/minion.d
printf 'master: 10.0.0.5\nid: jerry' > /etc/salt/minion.d/id.conf
%end
**POST /keys**

Generate a public and private key and return both as a tarball

Authentication credentials must be passed in the request.

**Status Codes**

- **200** -- success
- **401** -- authentication required
- **406** -- requested Content-Type not available

**Example request:**

```
curl -sSk https://localhost:8000/keys \
    -d mid=jerry \
    -d username=kickstart \
    -d password=kickstart \
    -d eauth=pam \
    -o jerry-salt-keys.tar
```

**POST /keys** HTTP/1.1
Host: localhost:8000

**Example response:**

```
HTTP/1.1 200 OK
Content-Length: 10240
Content-Disposition: attachment; filename="saltkeys-jerry.tar"
Content-Type: application/x-tar

jerry.pub00006440000000000000000000000703000000000010730 0ustar 00000000000000
```

/\s

`class salt.netapi.rest_cherrypy.app.WebsocketEndpoint`

Open a WebSocket connection to Salt's event bus

The event bus on the Salt master exposes a large variety of things, notably when executions are started on the master and also when minions ultimately return their results. This URL provides a real-time window into a running Salt infrastructure. Uses websocket as the transport mechanism.

**See also:**

- `events`

**GET**(token=None, **kwargs)

Return a websocket connection of Salt's event stream

```python
GET /ws/(token)
```

**Query format_events** The event stream will undergo server-side formatting if the `format_events` parameter is included in the request. This can be useful to avoid formatting on the client-side:

```
curl -NsS \...
```

**Reqheader X-Auth-Token** an authentication token from `Login`.

**Status 101** switching to the websockets protocol

**Status 401** authentication required
Status 406  requested Content-Type not available

Example request:

```
   -H 'Sec-WebSocket-Key: ''$(echo -n $RANDOM | base64)''localhost:8000/ws
GET /ws HTTP/1.1
Connection: Upgrade
Upgrade: websocket
Host: localhost:8000
Origin: https://localhost:8000
Sec-WebSocket-Version: 13
Sec-WebSocket-Key: s65VsgHigh7v/Jcf4nXHnA==
X-Auth-Token: ffedf49d
```

Example response:

```
HTTP/1.1 101 Switching Protocols
Upgrade: websocket
Connection: Upgrade
Sec-WebSocket-Accept: mWZjBV9FCglzn1rIKJAxrTFlnJE=
Sec-WebSocket-Version: 13
```

An authentication token may optionally be passed as part of the URL for browsers that cannot be configured to send the authentication header or cookie:

```
curl -NsS <...snip...> localhost:8000/ws/ffedf49d
```

The event stream can be easily consumed via JavaScript:

```
// Note, you must be authenticated!
var source = new Websocket('ws://localhost:8000/ws/d0ce6c1a');
source.onerror = function(e) { console.debug('error!', e); };
source.onmessage = function(e) { console.debug(e.data); };

source.send('websocket client ready')

source.close();
```

Or via Python, using the Python module websocket-client for example.

```
# Note, you must be authenticated!

from websocket import create_connection

ws = create_connection('ws://localhost:8000/ws/d0ce6c1a')
ws.send('websocket client ready')

# Look at https://pypi.python.org/pypi/websocket-client/ for more examples.
while listening_to_events:
    print ws.recv()

ws.close()
```

Above examples show how to establish a websocket connection to Salt and activating real time updates from Salt's event stream by signaling websocket client ready.
/stats

class salt.netapi.rest_cherrypy.app.Stats
    Expose statistics on the running CherryPy server

    GET()
        Return a dump of statistics collected from the CherryPy server

    GET /stats
        Request Headers
            • X-Auth-Token -- a session token from Login.
            • Accept -- the desired response format.
        Response Headers
            • Content-Type -- the format of the response body; depends on the Accept request header.
        Status Codes
            • 200 -- success
            • 401 -- authentication required
            • 406 -- requested Content-Type not available

31.17.2 rest_tornado

A non-blocking REST API for Salt

depends
    • tornado Python module

configuration
    All authentication is done through Salt’s external auth system which requires additional configuration not described here.

In order to run rest_tornado with the salt-master add the following to the Salt master config file.

rest_tornado:
    # can be any port
    port: 8000
    # address to bind to (defaults to 0.0.0.0)
    address: 0.0.0.0
    # socket backlog
    backlog: 128
    ssl_crt: /etc/pki/api/certs/server.crt
    # no need to specify ssl_key if cert and key # are in one single file
    ssl_key: /etc/pki/api/certs/server.key
    debug: False
    disable_ssl: False
    webhook_disable_auth: False

Authentication

Authentication is performed by passing a session token with each request. Tokens are generated via the SaltAuthHandler URL.

The token may be sent in one of two ways:
    • Include a custom header named X-Auth-Token.
• Sent via a cookie. This option is a convenience for HTTP clients that automatically handle cookie support (such as browsers).

See also:

You can bypass the session handling via the RunSaltAPIHandler URL.

Usage

Commands are sent to a running Salt master via this module by sending HTTP requests to the URLs detailed below.

Content negotiation

This REST interface is flexible in what data formats it will accept as well as what formats it will return (e.g., JSON, YAML, x-www-form-urlencoded).

• Specify the format of data in the request body by including the Content-Type header.
• Specify the desired data format for the response body with the Accept header.

Data sent in POST and PUT requests must be in the format of a list of lowstate dictionaries. This allows multiple commands to be executed in a single HTTP request.

lowstate  A dictionary containing various keys that instruct Salt which command to run, where that command lives, any parameters for that command, any authentication credentials, what returner to use, etc.

Salt uses the lowstate data format internally in many places to pass command data between functions. Salt also uses lowstate for the LocalClient() Python API interface.

The following example (in JSON format) causes Salt to execute two commands:

```
[{
   "client": "local",
   "tgt": "*",
   "fun": "test.fib",
   "arg": ["10"]
},
{
   "client": "runner",
   "fun": "jobs.lookup_jid",
   "jid": "20130603122505459265"
}]
```

Multiple commands in a Salt API request will be executed in serial and makes no guarantees that all commands will run. Meaning that if test.fib (from the example above) had an exception, the API would still execute `jobs.lookup_jid`.

Responses to these lowstates are an in-order list of dicts containing the return data, a yaml response could look like:

```
- ms-1: true
  ms-2: true
- ms-1: foo
  ms-2: bar
```

In the event of an exception while executing a command the return for that lowstate will be a string, for example if no minions matched the first lowstate we would get a return like:

```
- No minions matched the target. No command was sent, no jid was assigned.
  - ms-1: true
    ms-2: true
```
x-www-form-urlencoded

Sending JSON or YAML in the request body is simple and most flexible, however sending data in urlencoded format is also supported with the caveats below. It is the default format for HTML forms, many JavaScript libraries, and the `curl` command.

For example, the equivalent to running `salt '*' test.ping` is sending `fun=test.ping&arg&client=local&tgt=*` in the HTTP request body.

Caveats:

- Only a single command may be sent per HTTP request.
- Repeating the `arg` parameter multiple times will cause those parameters to be combined into a single list.

Note, some popular frameworks and languages (notably jQuery, PHP, and Ruby on Rails) will automatically append empty brackets onto repeated parameters. E.g., `arg=one, arg=two` will be sent as `arg[]=one, arg[]=two`. This is not supported; send JSON or YAML instead.

A Websockets add-on to saltnado

depends
  - tornado Python module

In order to enable saltnado_websockets you must add websockets: True to your saltnado config block.

```yaml
rest_tornado:
  # can be any port
  port: 8000
  ssl_crt: /etc/pki/api/certs/server.crt
  # no need to specify ssl_key if cert and key
  # are in one single file
  ssl_key: /etc/pki/api/certs/server.key
  debug: False
  disable_ssl: False
  websockets: True
```

All Events

Exposes all `"real-time"` events from Salt's event bus on a websocket connection. It should be noted that `"Real-time"` here means these events are made available to the server as soon as any salt related action (changes to minions, new jobs etc) happens. Clients are however assumed to be able to tolerate any network transport related latencies. Functionality provided by this endpoint is similar to the `/events` end point.

The event bus on the Salt master exposes a large variety of things, notably when executions are started on the master and also when minions ultimately return their results. This URL provides a real-time window into a running Salt infrastructure. Uses websocket as the transport mechanism.

Exposes GET method to return websocket connections. All requests should include an auth token. A way to obtain obtain authentication tokens is shown below.

```bash
% curl -si localhost:8000/login \
  -H "Accept: application/json" \
  -d username='salt' \
  -d password='salt' \
  -d eauth='pam'
```
Which results in the response

```json
{
    "return": {
        "perms": [".*", "@runner", "@wheel"],
        "start": 1400556492.277421,
        "token": "d0ce6c1a37e99dccc0374392f272fe19c0090cca7",
        "expire": 1400599692.277422,
        "user": "salt",
        "eauth": "pam"
    }
}
```

In this example the `token` returned is `d0ce6c1a37e99dccc0374392f272fe19c0090cca7` and can be included in subsequent websocket requests (as part of the URL).

The event stream can be easily consumed via JavaScript:

```javascript
// Note, you must be authenticated!
// Get the Websocket connection to Salt
var source = new WebSocket('wss://localhost:8000/all_events/d0ce6c1a37e99dccc0374392f272fe19c0090cca7');

// Get Salt's "real time" event stream.
source.onopen = function() { source.send('websocket client ready'); };

// Other handlers
source.onerror = function(e) { console.debug('error!', e); };

// e.data represents Salt's "real time" event data as serialized JSON.
source.onmessage = function(e) { console.debug(e.data); };

// Terminates websocket connection and Salt's "real time" event stream on the server.
source.close();
```

Or via Python, using the Python module `websocket-client` for example. Or the `tornado` client.

```python
# Note, you must be authenticated!

from websocket import create_connection

# Get the Websocket connection to Salt
ws = create_connection('wss://localhost:8000/all_events/d0ce6c1a37e99dccc0374392f272fe19c0090cca7')

# Get Salt's "real time" event stream.
ws.send('websocket client ready')

# Simple listener to print results of Salt's "real time" event stream.
# Look at https://pypi.python.org/pypi/websocket-client/ for more examples.
while listening_to_events:
    print ws.recv()  # Salt's "real time" event data as serialized JSON.

# Terminates websocket connection and Salt's "real time" event stream on the server.
ws.close()

# Please refer to https://github.com/liris/websocket-client/issues/81 when using a self signed cert
```

Above examples show how to establish a websocket connection to Salt and activating real time updates from Salt's event stream by signaling `websocket client ready`.
Formatted Events

Exposes formatted "real-time" events from Salt's event bus on a websocket connection. It should be noted that "Real-time" here means these events are made available to the server as soon as any salt related action (changes to minions, new jobs etc) happens. Clients are however assumed to be able to tolerate any network transport related latencies. Functionality provided by this endpoint is similar to the /events end point.

The event bus on the Salt master exposes a large variety of things, notably when executions are started on the master and also when minions ultimately return their results. This URL provides a real-time window into a running Salt infrastructure. Uses websocket as the transport mechanism.

Formatted events parses the raw "real time" event stream and maintains a current view of the following:

- minions
- jobs

A change to the minions (such as addition, removal of keys or connection drops) or jobs is processed and clients are updated. Since we use salt's presence events to track minions, please enable presence_events and set a small value for the loop_interval in the salt master config file.

Exposes GET method to return websocket connections. All requests should include an auth token. A way to obtain authentication tokens is shown below.

```bash
% curl -s localhost:8000/login \
   -H "Accept: application/json" \
   -d username='salt' \
   -d password='salt' \
   -d eauth='pam'
```

Which results in the response

```json
{
   "return": [{
      "perms": [".*", "@runner", "@wheel"],
      "start": 1400556492.277421,
      "token": "d0ce6c1a37e99dcc0374392f272fe19c0090cca7",
      "expire": 1400599692.277422,
      "user": "salt",
      "eauth": "pam"
   }]
}
```

In this example the token returned is d0ce6c1a37e99dcc0374392f272fe19c0090cca7 and can be included in subsequent websocket requests (as part of the URL).

The event stream can be easily consumed via JavaScript:

```javascript
// Note, you must be authenticated!

// Get the Websocket connection to Salt
var source = new WebSocket('wss://localhost:8000/formatted_events/d0ce6c1a37e99dcc0374392f272fe19c0090cca7');

// Get Salt's "real time" event stream.
source.onopen = function() { source.send('websocket client ready'); }; 

// Other handlers
source.onerror = function(e) { console.debug('error!', e); }; 

// e.data represents Salt's "real time" event data as serialized JSON.
```
source.onmessage = function(e) { console.debug(e.data); }; 

// Terminates websocket connection and Salt's "real time" event stream on the server.
source.close();

Or via Python, using the Python module websocket-client for example. Or the tornado client.

```python
from websocket import create_connection

# Get the Websocket connection to Salt
ws = create_connection('wss://localhost:8000/formatted_events/d0ce6c1a37e99dcc0374392f272fe19c0090cc2f8')

# Get Salt's "real time" event stream.
ws.send('websocket client ready')

# Simple listener to print results of Salt's "real time" event stream.
# Look at https://pypi.python.org/pypi/websocket-client/ for more examples.
while listening_to_events:
    print ws.recv() # Salt's "real time" event data as serialized JSON.

# Terminates websocket connection and Salt's "real time" event stream on the server.
ws.close()

# Please refer to https://github.com/liris/websocket-client/issues/81 when using a self signed cert
```

Above examples show how to establish a websocket connection to Salt and activating real time updates from Salt's event stream by signaling websocket client ready.

Example responses

Minion information is a dictionary keyed by each connected minion's id (mid), grains information for each minion is also included.

Minion information is sent in response to the following minion events:

- connection drops
  - requires running manage.present periodically every loop_interval seconds
- minion addition
- minion removal

```json
# Not all grains are shown
data: {
  "minions": {
    "minion1": {
      "id": "minion1",
      "grains": {
        "kernel": "Darwin",
        "domain": "local",
        "zmqversion": "4.0.3",
        "kernelrelease": "13.2.0"
      }
    }
  }
}
```
Job information is also tracked and delivered.

Job information is also a dictionary in which each job's information is keyed by salt's jid.

```json
data: {
    "jobs": {
        "20140609153646699137": {
            "tgt_type": "glob",
            "jid": "20140609153646699137",
            "tgt": "*",
            "start_time": "2014-06-09T15:36:46.700315",
            "state": "complete",
            "fun": "test.ping",
            "minions": {
                "minion1": {
                    "return": true,
                    "retcode": 0,
                    "success": true
                }
            }
        }
    }
}
```

Setup

REST URI Reference

- /
- /login
- /minions
- /jobs
- /run
- /events
- /hook

```python
salt.netapi.rest_tornado.saltnado.SaltAPIHandler
   alias of <Mock object at 0x2aee56e9b4d0>

salt.netapi.rest_tornado.saltnado.SaltAuthHandler
   alias of <Mock object at 0x2aee56e9b650>
```
Salt Documentation, Release 2015.8.0

/minions

```
salt.netapi.rest_tornado.saltnado.MinionSaltAPIHandler
   alias of <Mock object at 0x2aee56e9bdd0>
```

/jobs

```
salt.netapi.rest_tornado.saltnado.JobsSaltAPIHandler
   alias of <Mock object at 0x2aee56efd3d0>
```

/run

```
salt.netapi.rest_tornado.saltnado.RunSaltAPIHandler
   alias of <Mock object at 0x2aee56e9bd90>
```

/events

```
salt.netapi.rest_tornado.saltnado.EventsSaltAPIHandler
   alias of <Mock object at 0x2aee56efd2d0>
```

/hook

```
salt.netapi.rest_tornado.saltnado.WebhookSaltAPIHandler
   alias of <Mock object at 0x2aee56efd610>
```

31.17.3 rest_wsgi

A minimalist REST API for Salt

This rest_wsgi module provides a no-frills REST interface for sending commands to the Salt master. There are no dependencies.

Extra care must be taken when deploying this module into production. Please read this documentation in entirety.

All authentication is done through Salt’s external auth system.

Usage

- All requests must be sent to the root URL (/).
- All requests must be sent as a POST request with JSON content in the request body.
- All responses are in JSON.

See also:

rest_cherrypy

The rest_cherrypy module is more full-featured, production-ready, and has builtin security features.
Deployment

The rest_wsgi netapi module is a standard Python WSGI app. It can be deployed one of two ways.

Using a WSGI-compliant web server

This module may be run via any WSGI-compliant production server such as Apache with mod_wsgi or Nginx with FastCGI.

It is strongly recommended that this app be used with a server that supports HTTPS encryption since raw Salt authentication credentials must be sent with every request. Any apps that access Salt through this interface will need to manually manage authentication credentials (either username and password or a Salt token). Tread carefully.

salt-api using a development-only server

If run directly via the salt-api daemon it uses the wsgiref.simple_server() that ships in the Python standard library. This is a single-threaded server that is intended for testing and development. This server does not use encryption; please note that raw Salt authentication credentials must be sent with every HTTP request.

Running this module via salt-api is not recommended!

In order to start this module via the salt-api daemon the following must be put into the Salt master config:

```
rest_wsgi:
  port: 8001
```

Usage examples

**POST /**

Example request for a basic `test.ping`:

```
% curl -sS -i \
    -H 'Content-Type: application/json' \
    -d '[["eauth":"pam","username":"saltdev","password":"saltdev","client":"local","tgt":"*"}}'
```

Example response:

```
HTTP/1.0 200 OK
Content-Length: 89
Content-Type: application/json

{"return": [{"ms--4": true, "ms--3": true, "ms--2": true, "ms--1": true, "ms--0": true}]}```

Example request for an asynchronous `test.ping`:

```
% curl -sS -i \
    -H 'Content-Type: application/json' \
    -d '[["eauth":"pam","username":"saltdev","password":"saltdev","client":"local_async","tgt":"*"}}'
```

Example response:

```
HTTP/1.0 200 OK
Content-Length: 103
Content-Type: application/json

{"return": [{"jid": "20130412192112593739", "minions": ["ms--4", "ms--3", "ms--2", "ms--1", "ms--0"]}]}```

31.17. Full list of netapi modules 1431
Example request for looking up a job ID:

% curl -sS -i \
   -H 'Content-Type: application/json' \
   -d '{"eauth":"pam","username":"saltdev","password":"saltdev","client":"runner","fun":"jobs.lookup_jid","jid":"20130412192112593739"}' localhost:8001

Example response:

HTTP/1.0 200 OK
Content-Length: 89
Content-Type: application/json

{"return": [{"ms--4": true, "ms--3": true, "ms--2": true, "ms--1": true, "ms--0": true}]}

form lowstate A list of lowstate data appropriate for the client interface you are calling.

status 200 success
status 401 authentication required

31.18 Full list of builtin output modules

Follow one of the below links for further information and examples

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>compact</td>
<td>Display compact output data structure</td>
</tr>
<tr>
<td>highstate</td>
<td>Outputer for displaying results of state runs</td>
</tr>
<tr>
<td>json_out</td>
<td>Display return data in JSON format</td>
</tr>
<tr>
<td>key</td>
<td>Display salt-key output</td>
</tr>
<tr>
<td>nested</td>
<td>Recursively display nested data</td>
</tr>
<tr>
<td>newline_values_only</td>
<td>Display values only, separated by newlines</td>
</tr>
<tr>
<td>no_out</td>
<td>Display no output</td>
</tr>
<tr>
<td>no_return</td>
<td>Display output for minions that did not return</td>
</tr>
<tr>
<td>overstatestage</td>
<td>Display clean output of an overstate stage</td>
</tr>
<tr>
<td>pprint_out</td>
<td>Python pretty-print (pprint)</td>
</tr>
<tr>
<td>progress</td>
<td>Display return data as a progress bar</td>
</tr>
<tr>
<td>raw</td>
<td>Display raw output data structure</td>
</tr>
<tr>
<td>txt</td>
<td>Simple text outputter</td>
</tr>
<tr>
<td>virt_query</td>
<td>virt.query outputter</td>
</tr>
<tr>
<td>yaml_out</td>
<td>Display return data in YAML format</td>
</tr>
</tbody>
</table>

31.18.1 salt.output.compact

Display compact output data structure

Example output: `saltdev`: ['test_|-always-passes_|-foo_|-succeed_without_changes': {'comment': 'Success!', 'name': 'foo', 'start_time': '05:16:26.118141', 'result': True, 'duration': 1, '__run_num__': 0, 'changes': {}}, 'test_|-my-custom-combo_|-foo_|-configurable_test_state': {'comment': 'bar.baz', 'name': 'foo', 'start_time': '05:16:26.117177', 'result': False, 'duration': 1, '__run_num__': 4, 'changes': {'testing': {'new': 'Something pretended to change', 'old': 'Unchanged'}}}, 'test_|-always-fails_|-foo_|-fail_without_changes': {'comment': 'Failure!', 'name': 'foo', 'start_time': '05:16:26.113124', 'result': False, 'duration': 1, '__run_num__': 1, 'changes': {}}, 'test_|-always-changes-and-succeeds_|-foo_|-succeed_with_changes': {'comment': 'Success!', 'name': 'foo', 'start_time': '05:16:26.114570', 'result': True, 'duration': 0, '__run_num__': 2, 'changes': {'testing': {'new': 'Something pretended to change', 'old': 'Unchanged'}}}, 'test_|-always-changes-and-fails_|-foo_|-fail_with_changes': {'comment': 'Failure!', 'name': 'foo', 'start_time': '05:16:26.113124', 'result': False, 'duration': 1, '__run_num__': 1, 'changes': {}}, 'test_|-always-fails_|-foo_|-fail_without_changes': {'comment': 'Failure!', 'name': 'foo', 'start_time': '05:16:26.113124', 'result': False, 'duration': 1, '__run_num__': 1, 'changes': {}}, 'test_|-always-changes-and-succeeds_|-foo_|-succeed_with_changes': {'comment': 'Success!', 'name': 'foo', 'start_time': '05:16:26.114570', 'result': True, 'duration': 0, '__run_num__': 2, 'changes': {'testing': {'new': 'Something pretended to change', 'old': 'Unchanged'}}}, 'test_|-always-changes-and-fails_|-foo_|-fail_with_changes': {'comment': 'Failure!'}}

1432 Chapter 31. Reference
31.18.2 salt.output.highstate

Outputter for displaying results of state runs

The return data from the Highstate command is a standard data structure which is parsed by the highstate outputter to deliver a clean and readable set of information about the HighState run on minions.

Two configurations can be set to modify the highstate outputter. These values can be set in the master config to change the output of the salt command or set in the minion config to change the output of the salt-call command.

state_verbose: By default state_verbose is set to True, setting this to False will instruct the highstate outputter to omit displaying anything in green, this means that nothing with a result of True and no changes will not be printed

state_output: The highstate outputter has five output modes, full, terse, mixed, changes and filter.

- The default is set to full, which will display many lines of detailed information for each executed chunk.
- If terse is used, then the output is greatly simplified and shown in only one line.
- If mixed is used, then terse output will be used unless a state failed, in which case full output will be used.
- If changes is used, then terse output will be used if there was no error and no changes, otherwise full output will be used.
- If filter is used, then either or both of two different filters can be used: exclude or terse. These can be set as such from the command line, or in the Salt config as state_output_exclude or state_output_terse, respectively. The values to exclude must be a comma-separated list of True, False and/or None. Because of parsing nuances, if only one of these is used, it must still contain a comma. For instance: exclude=True,

state_tabular: If state_output uses the terse output, set this to True for an aligned output format. If you wish to use a custom format, this can be set to a string.

Example output:

myminion:
----------
ID: test.ping
Function: module.run
Result: True
Comment: Module function test.ping executed
Changes:
--------
ret:
    True
Summary for myminion
----------
Succeeded: 1
Failed: 0
The HighState Outputer is only meant to be used with the state.highstate function, or a function that returns highstate return data.

**31.18.3 salt.output.json_out**

Display return data in JSON format

configuration The output format can be configured in two ways: Using the --out-indent CLI flag and specifying a positive integer or a negative integer to group JSON from each minion to a single line.

Or setting the output_indent setting in the Master or Minion configuration file with one of the following values:

- Null: put each minion return on a single line.
- pretty: use four-space indents and sort the keys.
- An integer: specify the indentation level.

Salt's outputters operate on a per-minion basis. Each minion return will be output as a single JSON object once it comes in to the master.

Some JSON parsers can guess when an object ends and a new one begins but many cannot. A good way to differentiate between each minion return is to use the single-line output format and to parse each line individually. Example output (truncated):

```json
{"dave": {"en0": {"hwaddr": "02:b0:26:32:4c:69", ...}}}
{"jerry": {"en0": {"hwaddr": "02:26:ab:0d:b9:0d", ...}}}
{"kevin": {"en0": {"hwaddr": "02:6d:7f:ce:9f:ee", ...}}}
{"mike": {"en0": {"hwaddr": "02:48:a2:4b:70:a0", ...}}}
{"phill": {"en0": {"hwaddr": "02:1d:cc:a2:33:55", ...}}}
{"stuart": {"en0": {"hwaddr": "02:9a:eo:ea:9e:3c", ...}}}
```

Print the output data in JSON

**31.18.4 salt.output.key**

Display salt-key output

The salt-key command makes use of this outputter to format its output.

Read in the dict structure generated by the salt key API methods and print the structure.

**31.18.5 salt.output.nested**

Recursively display nested data

This is the default outputter for most execution functions.
Example output:

```
myminion:
    foo:
    bar:
    dictionary:
        abc: 123
        def: 456
    list:
        - Hello
        - World
```

class salt.output.nested.NestDisplay
Manage the nested display contents

```
    display(ret, indent, prefix, out)
    Recursively iterate down through data structures to determine output
```

```
    ustring(indent, color, msg, prefix='`', suffix='`', endc=None)
```

salt.output.nested.output(ret)
Display ret data

31.18.6 salt.output.newline_values_only

Display values only, separated by newlines

New in version 2015.5.0.

This outputer is designed for Salt CLI return data. It will do the following to the return dict:

1. Get just the values (ignoring the minion IDs).
2. Each value, if it is iterable, is split a separate line.
3. Each minion's values are separated by newlines.

This results in a single string of return data containing all the values from the various minions.

**Warning:** As noted above, this outputer will discard the minion ID. If the minion ID is important, then an outputer that returns the full return dictionary in a parsable format (such as json, pprint, or yaml) may be more suitable.

Example 1

**Input**

```
{
    'myminion': ['127.0.0.1', '10.0.0.1'],
    'second-minion': ['127.0.0.1', '10.0.0.2']
}
```
Output

```
127.0.0.1
10.0.0.1
127.0.0.1
10.0.0.2
```

Example 2

Input

```
{
    'myminion': 8,
    'second-minion': 10
}
```

Output

```
8
10
```

```
salt.output.newline_values_only.output(data)
    Display modified ret data
```

31.18.7 salt.output.no_out

Display no output

No output is produced when this outputer is selected

```
salt.output.no_out.output(ret)
    Don't display data. Used when you only are interested in the return.
```

31.18.8 salt.output.no_return

Display output for minions that did not return

This outputer is used to display notices about which minions failed to return when a salt function is run with -v or --verbose. It should not be called directly from the CLI.

Example output:

```
virtucentos:
    Minion did not return
```

```
class salt.output.no_return.NestDisplay
    Create generator for nested output
        display(ret, indent, prefix, out)
            Recursively iterate down through data structures to determine output
salt.output.no_return.output(ret)
    Display ret data
```
31.18.9 salt.output.overstatestage

Display clean output of an overstate stage

This outputer is used to display OverState stages, and should not be called directly.

```python
salt.output.overstatestage.output(data)
```

Format the data for printing stage information from the overstate system

31.18.10 salt.output.pprint_out

Python pretty-print (pprint)

The python pretty-print system was once the default outputter. It simply passes the return data through to `pprint.pformat` and prints the results.

Example output:

```python
{'saltmine': {'foo': {'bar': 'baz',
                      'dictionary': {'abc': 123, 'def': 456},
                      'list': ['Hello', 'World']}}}
```

```python
salt.output.pprint_out.output(data)
```

Print out via pretty print

31.18.11 salt.output.progress

Display return data as a progress bar

```python
salt.output.progress.output(ret, bar)
```

Update the progress bar

```python
salt.output.progress.progress_iter(progress)
```

Initialize and return a progress bar iter

31.18.12 salt.output.raw

Display raw output data structure

This outputer simply displays the output as a python data structure, by printing a string representation of it. It is similar to the pprint outputter, only the data is not nicely formatted/indented.

This was the original outputter used by Salt before the outputter system was developed.

Example output:

```python
{'myminion': {'foo': {'list': ['Hello', 'World'], 'bar': 'baz', 'dictionary': {'abc': 123, 'def': 456}}}}
```

```python
salt.output.raw.output(data)
```

Rather basic....
31.18.13 salt.output.txt

Simple text outputter

The txt outputter has been developed to make the output from shell commands on minions appear as they do when the command is executed on the minion.

```
salt.output.txt.output(data)
Output the data in lines, very nice for running commands
```

31.18.14 salt.output.virt_query

virt.query outputter

Used to display the output from the virt.query runner.

```
salt.output.virt_query.output(data)
Display output for the salt-run virt.query function
```

31.18.15 salt.output.yaml_out

Display return data in YAML format

This outputter defaults to printing in YAML block mode for better readability.

Example output:
```
saltmine:
  foo:
    bar: baz
dictionary:
  abc: 123
def: 456
list:
  - Hello
  - World
```

```
salt.output.yaml_out.output(data)
Print out YAML using the block mode
```

31.19 Peer Communication

Salt 0.9.0 introduced the capability for Salt minions to publish commands. The intent of this feature is not for Salt minions to act as independent brokers one with another, but to allow Salt minions to pass commands to each other.

In Salt 0.10.0 the ability to execute runners from the master was added. This allows for the master to return collective data from runners back to the minions via the peer interface.

The peer interface is configured through two options in the master configuration file. For minions to send commands from the master the peer configuration is used. To allow for minions to execute runners from the master the peer_run configuration is used.
Since this presents a viable security risk by allowing minions access to the master publisher the capability is turned off by default. The minions can be allowed access to the master publisher on a per minion basis based on regular expressions. Minions with specific ids can be allowed access to certain Salt modules and functions.

31.19.1 Peer Configuration

The configuration is done under the `peer` setting in the Salt master configuration file, here are a number of configuration possibilities.

The simplest approach is to enable all communication for all minions, this is only recommended for very secure environments.

```
peer:
  .*:
    - .*
```

This configuration will allow minions with IDs ending in example.com access to the test, ps, and pkg module functions.

```
peer:
  .*example.com:
    - test.*
    - ps.*
    - pkg.*
```

The configuration logic is simple, a regular expression is passed for matching minion ids, and then a list of expressions matching minion functions is associated with the named minion. For instance, this configuration will also allow minions ending with foo.org access to the publisher.

```
peer:
  .*example.com:
    - test.*
    - ps.*
    - pkg.*
  .*foo.org:
    - test.*
    - ps.*
    - pkg.*
```

31.19.2 Peer Runner Communication

Configuration to allow minions to execute runners from the master is done via the `peer_run` option on the master. The `peer_run` configuration follows the same logic as the `peer` option. The only difference is that access is granted to runner modules.

To open up access to all minions to all runners:

```
peer_run:
  .*:
    - .*
```

This configuration will allow minions with IDs ending in example.com access to the manage and jobs runner functions.

```
peer_run:
  .*example.com:
    - manage.*
    - jobs.*
```
31.19.3 Using Peer Communication

The publish module was created to manage peer communication. The publish module comes with a number of functions to execute peer communication in different ways. Currently there are three functions in the publish module. These examples will show how to test the peer system via the salt-call command.

To execute test.ping on all minions:

```
# salt-call publish.publish \* test.ping
```

To execute the manage.up runner:

```
# salt-call publish.runner manage.up
```

To match minions using other matchers, use `expr_form`:

```
# salt-call publish.publish 'webserv* and not G@os:Ubuntu' test.ping expr_form='compound'
```

31.20 Pillars

Salt includes a number of built-in external pillars, listed at Full list of builtin pillar modules.

You may also wish to look at the standard pillar documentation, at Pillar Configuration.

The source for the built-in Salt pillars can be found here: https://github.com/saltstack/salt/blob/develop/salt/pillar

31.21 Full list of builtin pillar modules

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cmd_json</td>
<td>Execute a command and read the output as JSON.</td>
</tr>
<tr>
<td>cmd_yaml</td>
<td>Execute a command and read the output as YAML.</td>
</tr>
<tr>
<td>cmd_yamllex</td>
<td>Execute a command and read the output as YAMLEX.</td>
</tr>
<tr>
<td>cobbler</td>
<td>A module to pull data from Cobbler via its API into the Pillar dictionary</td>
</tr>
<tr>
<td>django ORM</td>
<td>Generate Pillar data from Django models through the Django ORM</td>
</tr>
<tr>
<td>ec2_pillar</td>
<td>Retrieve EC2 instance data for minions.</td>
</tr>
<tr>
<td>etcd_pillar</td>
<td>Use etcd data as a Pillar source</td>
</tr>
<tr>
<td>file_tree</td>
<td>Recursively iterate over directories and add all files as Pillar data.</td>
</tr>
<tr>
<td>foreman</td>
<td>A module to pull data from Foreman via its API into the Pillar dictionary</td>
</tr>
<tr>
<td>git_pillar</td>
<td>Use a git repository as a Pillar source</td>
</tr>
<tr>
<td>hg_pillar</td>
<td>Use Mercurial repository as a Pillar source</td>
</tr>
<tr>
<td>hiera</td>
<td>Use hiera data as a Pillar source</td>
</tr>
<tr>
<td>libvirt</td>
<td>Load up the libvirt keys into Pillar for a given minion if said keys have been generated using the libvirt key</td>
</tr>
<tr>
<td>mongo</td>
<td>Read Pillar data from a mongodb collection</td>
</tr>
<tr>
<td>mysql</td>
<td>Retrieve Pillar data by doing a MySQL query</td>
</tr>
<tr>
<td>pepa</td>
<td>Pepa</td>
</tr>
<tr>
<td>pillar_ldap</td>
<td>Use LDAP data as a Pillar source</td>
</tr>
<tr>
<td>puppet</td>
<td>Execute an unmodified puppet_node_classifier and read the output as YAML.</td>
</tr>
<tr>
<td>reclass_adapter</td>
<td>Use the “reclass” database as a Pillar source</td>
</tr>
<tr>
<td>redismod</td>
<td>Read pillar data from a Redis backend</td>
</tr>
<tr>
<td>s3</td>
<td>Copy pillar data from a bucket in Amazon S3</td>
</tr>
<tr>
<td>svn_pillar</td>
<td>Clone a remote SVN repository and use the filesystem as a Pillar source</td>
</tr>
</tbody>
</table>

Continued on next page
31.21.1 salt.pillar.cmd_json

Execute a command and read the output as JSON. The JSON data is then directly overlaid onto the minion’s Pillar data.

```
salt.pillar.cmd_json.ext_pillar(minion_id, pillar, command)
```

Execute a command and read the output as JSON

31.21.2 salt.pillar.cmd_yaml

Execute a command and read the output as YAML. The YAML data is then directly overlaid onto the minion’s Pillar data.

```
salt.pillar.cmd_yaml.ext_pillar(minion_id, pillar, command)
```

Execute a command and read the output as YAML

31.21.3 salt.pillar.cmd_yamllex

Execute a command and read the output as YAMLEX. The YAMLEX data is then directly overlaid onto the minion’s Pillar data.

```
salt.pillar.cmd_yamllex.ext_pillar(minion_id, pillar, command)
```

Execute a command and read the output as YAMLEX

31.21.4 salt.pillar.cobbler

A module to pull data from Cobbler via its API into the Pillar dictionary

Configuring the Cobbler ext_pillar

The same cobbler:* parameters are used for both the Cobbler tops and Cobbler pillar modules.

```
ext_pillar:
  - cobbler:
      key: cobbler # Nest results within this key. By default, values are not nested.
      only: [parameters] # Add only these keys to pillar.

cobbler.url: https://example.com/cobbler_api #default is http://localhost/cobbler_api

cobbler.user: username # default is no username

cobbler.password: password # default is no password
```

Module Documentation

```
salt.pillar.cobbler.ext_pillar(minion_id, pillar, key=None, only=())
```

Read pillar data from Cobbler via its API.
31.21.5 salt.pillar.django_orm

Generate Pillar data from Django models through the Django ORM

maintainer Micah Hausler <micah.hausler@gmail.com>
maturity new

Configuring the django_orm ext_pillar

To use this module, your Django project must be on the salt master server with database access. This assumes you are using virtualenv with all the project's requirements installed.

```yaml
ext_pillar:
  - django_or
    pillar_name: my_application
    project_path: /path/to/project/
    settings_module: my_application.settings
    env_file: /path/to/env/file.sh
    # Optional: If your project is not using the system python, 
    # add your virtualenv path below.
    env: /path/to/virtualenv/

django_app:

  # Required: the app that is included in INSTALLED_APPS
  my_application.clients:

    # Required: the model name
    Client:

      # Required: model field to use as the key in the rendered
      # Pillar. Must be unique; must also be included in the
      # ``fields`` list below.
      name: shortname

      # Optional:
      # See Django's QuerySet documentation for how to use .filter()
      filter: {'kw': 'args'}

      # Required: a list of field names
      # List items will be used as arguments to the .values() method.
      # See Django's QuerySet documentation for how to use .values()
      fields:
        - field_1
        - field_2
```

This would return pillar data that would look like

```yaml
my_application:
  my_application.clients:
    Client:
      client_1:
        field_1: data_from_field_1
        field_2: data_from_field_2
      client_2:
        field_1: data_from_field_1
        field_2: data_from_field_2
```
As another example, data from multiple database tables can be fetched using Django's regular lookup syntax. Note, using ManyToManyFields will not currently work since the return from values() changes if a ManyToMany is present.

```
ext_pillar:
  - django_orm:
      pillar_name: djangotutorial
      project_path: /path/to/mysite
      settings_module: mysite.settings

  django_app:
    mysite.polls:
      Choices:
        name: poll__question
      fields:
        - poll__question
        - poll__id
        - choice_text
        - votes
```

**Module Documentation**

`salt.pillar.django_orm.ext_pillar` *(minion_id, pillar, pillar_name, project_path, settings_module, django_app, env=None, env_file=None, *args, **kwargs)*

Connect to a Django database through the ORM and retrieve model fields

**Parameters**

- **pillar_name** *(str)* -- The name of the pillar to be returned
- **project_path** *(str)* -- The full path to your Django project (the directory manage.py is in)
- **settings_module** *(str)* -- The settings module for your project. This can be found in your manage.py file
- **django_app** *(str)* -- A dictionary containing your apps, models, and fields
- **env** *(str)* -- The full path to the virtualenv for your Django project
- **env_file** *(str)* -- An optional bash file that sets up your environment. The file is run in a subprocess and the changed variables are then added

**31.21.6 salt.pillar.ec2_pillar**

Retrieve EC2 instance data for minions.

The minion id must be the instance-id retrieved from AWS. As an option, use_grain can be set to True. This allows the use of an instance-id grain instead of the minion-id. Since this is a potential security risk, the configuration can be further expanded to include a list of minions that are trusted to only allow the alternate id of the instances to specific hosts. There is no glob matching at this time.

```
ext_pillar:
  - ec2_pillar:
      use_grain: True
      minion_ids:
        - trusted-minion-1
        - trusted-minion-2
        - trusted-minion-3
```
This is a very simple pillar that simply retrieves the instance data from AWS. Currently the only portion implemented are EC2 tags, which returns a list of key/value pairs for all of the EC2 tags assigned to the instance.

```
salt.pillar.ec2_pillar.ext_pillar(minion_id, pillar, use_grain=False, minion_ids=None)
```

Execute a command and read the output as YAML

### 31.21.7 salt.pillar.etcd_pillar

Use etcd data as a Pillar source

New in version 2014.7.0.

```
depends
    - python-etcd
```

In order to use an etcd server, a profile must be created in the master configuration file:

```
my_etcd_config:
    etcd.host: 127.0.0.1
    etcd.port: 4001
```

After the profile is created, configure the external pillar system to use it. Optionally, a root may be specified.

```
ext_pillar:
    - etcd: my_etcd_config
```

```
ext_pillar:
    - etcd: my_etcd_config root=/salt
```

Using these configuration profiles, multiple etcd sources may also be used:

```
ext_pillar:
    - etcd: my_etcd_config
    - etcd: my_other_etcd_config
```

The `minion_id` may be used in the `root` path to expose minion-specific information stored in etcd.

```
ext_pillar:
    - etcd: my_etcd_config root=/salt/%(minion_id)s
```

Minion-specific values may override shared values when the minion-specific root appears after the shared root:

```
ext_pillar:
    - etcd: my_etcd_config root=/salt-shared
    - etcd: my_other_etcd_config root=/salt-private/%(minion_id)s
```

Using the configuration above, the following commands could be used to share a key with all minions but override its value for a specific minion:

```
etcdctl set /salt-shared/mykey my_value
netcdctl set /salt-private/special_minion_id/mykey my_other_value
```

```
salt.pillar.etcd_pillar.ext_pillar(minion_id, pillar, conf)
```

Check etcd for all data

### 31.21.8 salt.pillar.file_tree

Recursively iterate over directories and add all files as Pillar data.
Example configuration:

```yaml
ext_pillar:
  - file_tree:
      root_dir: /path/to/root/directory
      follow_dir_links: False
      raw_data: False
```

The `root_dir` parameter is required and points to the directory where files for each host are stored. The `follow_dir_links` parameter is optional and defaults to False. If `follow_dir_links` is set to True, file_tree will follow symbolic links to other directories. Be careful when using `follow_dir_links`, the current implementation is dumb and will run into infinite recursion if a recursive symlink chain exists in the `root_dir`!

If `raw_data` is set to True, it will revert the behavior of the python open() function, which adds a line break character at the end of the file, in this case, the pillar data.

To fill pillar data for each host, file_tree recursively iterates over `root_dir/hosts/id` (where `id` is a minion ID), and constructs the same directory tree with contents of all the files inside the pillar tree.

For example, the following `root_dir` tree:

```
./hosts/
./hosts/test-host/
./hosts/test-host/files/
./hosts/test-host/files/testdir/
./hosts/test-host/files/testdir/file1.txt
./hosts/test-host/files/testdir/file2.txt
./hosts/test-host/files/another-testdir/
./hosts/test-host/files/another-testdir/symlink-to-file1.txt
```

will result in the following pillar tree for minion with ID `test-host`:

```
test-host:
  ----------
  files:
  """"""
  another-testdir:
    ----------
    symlink-to-file1.txt:
      Contents of file #1.
  testdir:
    ----------
    file1.txt:
      Contents of file #1.
    file2.txt:
    """
    """
```

To fill pillar data for minion in a node group, file_tree recursively iterates over `root_dir/nodegroups/nodegroup` (where `nodegroup` is a minion node group), and constructs the same directory tree with contents of all the files inside the pillar tree. **IMPORTANT:** The host data take precedence over the node group data.

For example, the following `root_dir` tree:

```
./nodegroups/
./nodegroups/test-group/
./nodegroups/test-group/files/
./nodegroups/test-group/files/testdir/
./nodegroups/test-group/files/testdir/file1.txt
```

31.21. Full list of builtin pillar modules
will result in the following pillar tree for minion in the node group `test-group`:

```
**test-host**
  
  **files**
  
  **another-testdir**
    
    **symlink-to-file1.txt**
      Contents of file #1.

  **testdir**
    
    **file1.txt**
      Contents of file #1.
    
    **file2.txt**
      Contents of file #2.
```

_**salt.pillar.file_tree.ext_pillar**_ (minion_id, pillar, root_dir=None, follow_dir_links=False, de-
bug=False, raw_data=False)

Find pillar data for specified ID.

### 31.21.9 salt.pillar.foreman

A module to pull data from Foreman via its API into the Pillar dictionary

#### Configuring the Foreman ext_pillar

Set the following Salt config to setup Foreman as external pillar source:

```
ext_pillar:
  - foreman:
    key: foreman # Nest results within this key
    only: ['hostgroup_name', 'parameters'] # Add only these keys to pillar

foreman.url: https://example.com/foreman_api
foreman.user: username # default is admin
foreman.password: password # default is changeme
```

The following options are optional:

```
foreman.api: apiversion # default is 2 (1 is not supported yet)
foreman.verifyssl: False # default is True
foreman.certfile: /etc/ssl/certs/mycert.pem # default is None
foreman.keyfile: /etc/ssl/private/mykey.pem # default is None
foreman.cafile: /etc/ssl/certs/mycert.ca.pem # default is None
foreman.lookup_parameters: True # default is True
```

An alternative would be to use the Foreman modules integrating Salt features in the Smart Proxy and the webinterface.

Further information can be found on [GitHub](https://github.com/saltstack/salt/tree/master/salt/modules/foreman).
Module Documentation

salt.pillar.foreman.ext_pillar(minion_id, pillar, key=None, only=())
Read pillar data from Foreman via its API.

31.21.10 salt.pillar.git_pillar

Use a git repository as a Pillar source

Note: This external pillar has been rewritten for the 2015.8.0 release. The old method of configuring this external pillar will be maintained for a couple releases, allowing time for configurations to be updated to reflect the new usage.

This external pillar allows for a Pillar top file and Pillar SLS files to be sourced from a git repository. However, since git_pillar does not have an equivalent to the pillar_roots parameter, configuration is slightly different. The Pillar top file must still contain the relevant environment, like so:

```
base:
  '*':
    - foo
```

The branch/tag which maps to that environment must then be specified along with the repo's URL. Configuration details can be found below.

Configuring git_pillar for Salt releases before 2015.8.0

For Salt releases earlier than 2015.8.0, GitPython is the only supported provider for git_pillar. Individual repositories can be configured under the ext_pillar configuration parameter like so:

```
ext_pillar:
  - git: master https://gitserver/git-pillar.git root=subdirectory
```

The repository is specified in the format `<branch> <repo_url>`, with an optional root parameter (added in the 2014.7.0 release) which allows the pillar SLS files to be served up from a subdirectory (similar to gitfs_root in gitfs).

To use more than one branch from the same repo, multiple lines must be specified under ext_pillar:

```
ext_pillar:
  - git: master https://gitserver/git-pillar.git
  - git: dev https://gitserver/git-pillar.git
```

To remap a specific branch to a specific Pillar environment, use the format `<branch>:<env>`:

```
ext_pillar:
  - git: develop:dev https://gitserver/git-pillar.git
  - git: master:prod https://gitserver/git-pillar.git
```

In this case, the develop branch would need its own top.sls with a dev section in it, like this:

```
develop:
  '*':
    - bar
```

The master branch would need its own top.sls with a prod section in it:
If `__env__` is specified as the branch name, then git_pillar will use the branch specified by `gitfs_base`:

```
ext_pillar:
  - git: __env__ https://gitserver/git-pillar.git root=pillar
```

The corresponding Pillar top file would look like this:

```
{{env}}:
  '*':
    - bar
```

### Configuring git_pillar for Salt releases 2015.8.0 and later

**Note:** In version 2015.8.0, the method of configuring git external pillars has changed, and now more closely resembles that of the [Git Fileserver Backend](https://github.com/saltstack/salt/tree/master/doc/channels). If Salt detects the old configuration schema, it will use the pre-2015.8.0 code to compile the external pillar. A warning will also be logged.

Beginning with Salt version 2015.8.0, [pygit2](https://pypi.python.org/pypi/pygit2) is now supported in addition to [GitPython](https://pypi.python.org/pypi/GitPython) (**Dulwich** will not be supported for the foreseeable future). The requirements for [GitPython](https://pypi.python.org/pypi/GitPython) and [pygit2](https://pypi.python.org/pypi/pygit2) are the same as for `gitfs`, as described [here](https://github.com/saltstack/salt/tree/master/doc/channels).

Here is an example git_pillar configuration.

```
ext_pillar:
  - git:
      # Use 'prod' instead of the branch name 'production' as the environment
      - production https://gitserver/git-pillar.git:
        - env: prod
      # Use 'dev' instead of the branch name 'develop' as the environment
      - develop https://gitserver/git-pillar.git:
        - env: dev
      # No per-remote config parameters (and no trailing colon), 'qa' will
      # be used as the environment
      - qa https://gitserver/git-pillar.git
      # SSH key authentication
      - master git@other-git-server:pillardata-ssh.git:
        # Pillar SLS files will be read from the 'pillar' subdirectory in
        # this repository
        - root: pillar
        - privkey: /path/to/key
        - pubkey: /path/to/key.pub
        - passphrase: CorrectHorseBatteryStaple
      # HTTPS authentication
      - master https://other-git-server/pillardata-https.git:
        - user: git
        - password: CorrectHorseBatteryStaple
```

The main difference between this and the old way of configuring `git_pillar` is that multiple remotes can be configured under one `git` section under `ext_pillar`. More than one `git` section can be used, but it is not necessary. Remotes will be evaluated sequentially.

Per-remote configuration parameters are supported (similar to `gitfs`), and global versions of the `git_pillar` configuration parameters can also be set.
With the addition of `pygit2` support, git_pillar can now interact with authenticated remotes. Authentication works just like in gitfs (as outlined in the `Git Fileserver Backend Walkthrough`), only with the global authentication parameter names prefixed with `git_pillar` instead of `gitfs` (e.g. `git_pillar_pubkey`, `git_pillar_privkey`, `git_pillar_passphrase`, etc.).

A full list of the `git_pillar` configuration options can be found [here](#).

```python
salt.pillar.git_pillar.ext_pillar(minion_id, repo, pillar_dirs)
```

Checkout the ext_pillar sources and compile the resulting pillar SLS

### 31.21.11 salt.pillar.hg_pillar

Use remote Mercurial repository as a Pillar source.

New in version 2015.8.0.

The module depends on the `hglib` python module being available. This is the same requirement as for `hgfs_` so should not pose any extra hurdles.

This external Pillar source can be configured in the master config file as such:

```yaml
ext_pillar:
  - hg: ssh://hg@example.co/user/repo
```

```python
class salt.pillar.hg_pillar.Repo(repo_uri)
    Deal with remote hg (mercurial) repository for Pillar
    close()
        Cleanup mercurial command server
    pull()
    update(branch='default')
        Ensure we are using the latest revision in the hg repository

salt.pillar.hg_pillar.ext_pillar(minion_id, pillar, repo, branch='default', root=None)
    Extract pillar from an hg repository

salt.pillar.hg_pillar.update(repo_uri)
    Execute an hg pull on all the repos
```

### 31.21.12 salt.pillar.hiera

Use hiera data as a Pillar source

```python
salt.pillar.hiera.ext_pillar(minion_id, pillar, conf)
    Execute hiera and return the data
```

### 31.21.13 salt.pillar.libvirt

Load up the libvirt keys into Pillar for a given minion if said keys have been generated using the libvirt key runner

```python
salt.pillar.libvirt.ext_pillar(minion_id, pillar, command)
    Read in the generated libvirt keys

salt.pillar.libvirt.gen_hyper_keys(minion_id, country='US', state='Utah', locality='Salt Lake City', organization='Salted')
    Generate the keys to be used by libvirt hypervisors, this routine gens the keys and applies them to the pillar for the hypervisor minions
```

31.21. Full list of builtin pillar modules
31.21.14 salt.pillar.mongo

Read Pillar data from a mongodb collection

depends pymongo (for salt-master)

This module will load a node-specific pillar dictionary from a mongo collection. It uses the node's id for lookups and can load either the whole document, or just a specific field from that document as the pillar dictionary.

Salt Master Mongo Configuration

The module shares the same base mongo connection variables as salt.returners.mongo_return. These variables go in your master config file.

- **mongo.db** - The mongo database to connect to. Defaultsto 'salt'.
- **mongo.host** - The mongo host to connect to. Supports replica sets by specifying all hosts in the set, comma-delimited. Defaultsto 'salt'.
- **mongo.port** - The port that the mongo database is running on. Defaultsto 27017.
- **mongo.user** - The username for connecting to mongo. Only required if you are using mongo authentication. Defaultsto ''. 
- **mongo.password** - The password for connecting to mongo. Only required if you are using mongo authentication. Defaultsto ''. 

Configuring the Mongo ext_pillar

The Mongo ext_pillar takes advantage of the fact that the Salt Master configuration file is yaml. It uses a sub-dictionary of values to adjust specific features of the pillar. This is the explicit single-line dictionary notation for yaml. One may be able to get the easier-to-read multi-line dict to work correctly with some experimentation.

```yaml
ext_pillar:
  - mongo: {collection: vm, id_field: name, re_pattern: \.example\..com, fields: [customer_id, software, apache_vhosts]}
```

In the example above, we've decided to use the *vm* collection in the database to store the data. Minion ids are stored in the name field on documents in that collection. And, since minion ids are FQDNs in most cases, we'll need to trim the domain name in order to find the minion by hostname in the collection. When we find a minion, return only the customer_id, software, and apache_vhosts fields, as that will contain the data we want for a given node. They will be available directly inside the pillar dict in your SLS templates.

Module Documentation

salt.pillar.mongo.ext_pillar *(minion_id, pillar, collection='pillar', id_field='_id', re_pattern=None, re_replace='\:', fields=None)*

Connect to a mongo database and read per-node pillarcollection.

Parameters:

- **collection**: The mongodb collection to read data from. Defaultsto 'pillar'.
- **id_field**: The field in the collection that represents an individual minion id. Defaultsto '_id'.
- **re_pattern**: If your naming convention in the collection is shorter than the minion id, you can use this to trim the name. **re_pattern** will be used to match the name, and **re_replace** will be used to replace it. Backrefs are supported as they are in the Python standard library. If **None**, no mangling
of the name will be performed - the collection will be searched with the entire minion id. Defaults to None.

- `re_replace`: Use as the replacement value in node ids matched with `re_pattern`. Defaults to `. Feel free to use backreferences here.

- `fields`: The specific fields in the document to use for the pillar data. If None, will use the entire document. If using the entire document, the `_id` field will be converted to string. Be careful with other fields in the document as they must be string serializable. Defaults to None.

### 31.21.15 salt.pillar.mysql

Retrieve Pillar data by doing a MySQL query

MariaDB provides Python support through the MySQL Python package. Therefore, you may use this module with both MySQL or MariaDB.

This module is a concrete implementation of the sql_base ext_pillar for MySQL.

```python
maturity new
depends python-mysqldb
platform all
```

**Legacy compatibility**

This module has an extra addition for backward compatibility.

If there's a keyword arg of mysql_query, that'll go first before other args. This legacy compatibility translates to depth 1.

We do this so that it's backward compatible with older configs. This is deprecated and slated to be removed in Boron.

**Configuring the mysql ext_pillar**

Use the `mysql` key under ext_pillar for configuration of queries.

MySQL configuration of the MySQL returner is being used (mysql.db, mysql.user, mysql.pass, mysql.port, mysql.host) for database connection info.

Required python modules: MySQLdb

**Complete example**

```python
mysql:
    user: 'salt'
    pass: 'super_secret_password'
    db: 'salt_db'

ext_pillar:
    - mysql:
        fromdb:
            query: 'SELECT col1,col2,col3,col4,col5,col6,col7
                    FROM some_random_table
                    WHERE minion_pattern LIKE %s
            depth: 5
```

31.21. Full list of builtin pillar modules
as_list: True
with_lists: [1,3]

class salt.pillar.mysql.MySQLExtPillar
    This class receives and processes the database rows from MySQL.

    extract_queries(args, kwargs)
    This function normalizes the config block into a set of queries we can use. The return is a list of consistently laid out dicts.

salt.pillar.mysql.ext_pillar(minion_id, pillar, *args, **kwargs)
    Execute queries against MySQL, merge and return as a dict

31.21.16 salt.pillar.pepa

Pepa

Configuration templating for SaltStack using Hierarchical substitution and Jinja.

Configuring Pepa

extension_modules: /srv/salt/ext

ext_pillar:
    - pepa:
        resource: host
        sequence:
            - hostname:
                name: input
                base_only: True
            - default:
                - environment:
                    - location..region:
                        name: region
                    - location..country:
                        name: country
                    - location..datacenter:
                        name: datacenter
            - roles:
            - osfinger:
                name: os
            - hostname:
                name: override
                base_only: True
subkey: True
subkey_only: True
pepa_roots:
    base: /srv/pepa/base
    dev: /srv/pepa/base
    qa: /srv/pepa/qa
    prod: /srv/pepa/prod

# Use a different delimiter for nested dictionaries, defaults to '..' since some keys may use '.' in names
#pepa_delimiter: ..
# Supply Grains for Pepa, this should **ONLY** be used for testing or validation
#pepa_grains:
# environment: dev

# Supply Pillar for Pepa, this should **ONLY** be used for testing or validation
#pepa_pillars:
# saltversion: 0.17.4

# Enable debug for Pepa, and keep Salt on warning
#log_level: debug

#log_granular_levels:
# salt: warning
# salt.loaded.ext.pillar.pepa: debug

Pepa can also be used in Master-less SaltStack setup.

## Command line

```
hostname
```

### positional arguments:

- **hostname**

### optional arguments:

- **-h, --help** show this help message and exit
- **-c CONFIG, --config CONFIG** Configuration file
- **-d, --debug** Print debug info
- **-g GRAINS, --grains GRAINS** Input Grains as YAML
- **-p PILLAR, --pillar PILLAR** Input Pillar as YAML
- **-n, --no-color** No color output
- **-v, --validate** Validate output

## Templates

Templates is configuration for a host or software, that can use information from Grains or Pillars. These can then be used for hierarchically substitution.

**Example File:** host/input/test_example_com.yaml

```
location..region: emea
location..country: nl
location..datacenter: foobar
environment: dev
roles:
  - salt.master
network..gateway: 10.0.0.254
network..interfaces..eth0..hwaddr: 00:20:26:a1:12:12
network..interfaces..eth0..dhcp: False
network..interfaces..eth0..ipv4: 10.0.0.3
network..interfaces..eth0..netmask: 255.255.255.0
```

31.21. Full list of builtin pillar modules
network..interfaces..eth0..fqdn: {{ hostname }}
cobbler..profile: fedora-19-x86_64

As you see in this example you can use Jinja directly inside the template.

Example File: host/region/amer.yaml

```yaml
network..dns..servers:
  - 10.0.0.1
  - 10.0.0.2
time..ntp..servers:
  - ntp1.amer.example.com
  - ntp2.amer.example.com
  - ntp3.amer.example.com
time..timezone: America/Chihuahua
yum..mirror: yum.amer.example.com
```

Each template is named after the value of the key using lowercase and all extended characters are replaced with underscore.

Example:

osfinger: Fedora-19

Would become:

fedora_19.yaml

**Nested dictionaries**

In order to create nested dictionaries as output you can use double dot ".." as a delimiter. You can change this using "pepa_delimiter" we choose double dot since single dot is already used by key names in some modules, and using ":" requires quoting in the YAML.

Example:

```yaml
network..dns..servers:
  - 10.0.0.1
  - 10.0.0.2
network..dns..options:
  - timeout:2
  - attempts:1
  - ndots:1
network..dns..search:
  - example.com
```

Would become:

```yaml
network:
  dns:
    servers:
      - 10.0.0.1
      - 10.0.0.2
    options:
      - timeout:2
      - attempts:1
      - ndots:1
    search:
      - example.com
```
Operators

Operators can be used to merge/unset a list/hash or set the key as immutable, so it can’t be changed.

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>merge()</td>
<td>Merge list or hash</td>
</tr>
<tr>
<td>unset()</td>
<td>Unset key</td>
</tr>
<tr>
<td>immutable()</td>
<td>Set the key as immutable, so it can’t be changed</td>
</tr>
<tr>
<td>imerge()</td>
<td>Set immutable and merge</td>
</tr>
<tr>
<td>iunset()</td>
<td>Set immutable and unset</td>
</tr>
</tbody>
</table>

Example:

```yaml
network..dns..search..merge():
    - foobar.com
    - dummy.nl
owner..immutable(): Operations
host..printers..unset():
```

Validation

Since it’s very hard to test Jinja as is, the best approach is to run all the permutations of input and validate the output, i.e. Unit Testing.

To facilitate this in Pepa we use YAML, Jinja and Cerberus <https://github.com/nicolaiarocci/cerberus>.

Schema

So this is a validation schema for network configuration, as you see it can be customized with Jinja just as Pepa templates.

This was designed to be run as a build job in Jenkins or similar tool. You can provide Grains/Pillar input using either the config file or command line arguments.

File Example: host/validation/network.yaml

```yaml
network..dns..search:
    type: list
    allowed:
        - example.com

network..dns..options:
    type: list
    allowed: ['timeout:2', 'attempts:1', 'ndots:1']

network..dns..servers:
    type: list
    schema:
        regex: ^([0-9]{1,3}\.){3}[0-9]{1,3}$

network..gateway:
    type: string
    regex: ^([0-9]{1,3}\.){3}[0-9]{1,3}$

{% if network.interfaces is defined %}
{% for interface in network.interfaces %}
```

31.21. Full list of builtin pillar modules
network..interfaces..{{ interface }}..dhcp:
  type: boolean

network..interfaces..{{ interface }}..fqdn:
  type: string
  regex: ^([a-z0-9](\[a-z0-9-]{0,61}[a-z0-9])?\.)+[a-zA-Z]{2,6}$

network..interfaces..{{ interface }}..hwaddr:
  type: string
  regex: ^([0-9a-f]{1,2}:){5}[0-9a-f]{1,2}$

network..interfaces..{{ interface }}..ipv4:
  type: string
  regex: ^([0-9]{1,3}\.){3}[0-9]{1,3}$

network..interfaces..{{ interface }}..netmask:
  type: string
  regex: ^([0-9]{1,3}\.){3}[0-9]{1,3}$

{% endfor %}
{% endif %}

Links

For more examples and information see <https://github.com/mickep76/pepa>.

salt.pillar.pepa.ext_pillar(minion_id, pillar, resource, sequence, subkey=False, subkey_only=False)

Evaluate Pepa templates

salt.pillar.pepa.key_value_to_tree(data)

Convert key/value to tree

salt.pillar.pepa.validate(output, resource)

Validate Pepa templates

31.21.17 salt.pillar.pillar_ldap

Use LDAP data as a Pillar source

This pillar module executes a series of LDAP searches. Data returned by these searches are aggregated, whereby data returned by later searches override data by previous searches with the same key.

The final result is merged with existing pillar data.

The configuration of this external pillar module is done via an external file which provides the actual configuration for the LDAP searches.

Configuring the LDAP ext_pillar

The basic configuration is part of the master configuration.

ext_pillar:
  - pillar_ldap: /etc/salt/master.d/pillar_ldap.yaml
Note: When placing the file in the master.d directory, make sure its name doesn't end in .conf, otherwise the salt-master process will attempt to parse its content.

**Warning:** Make sure this file has very restrictive permissions, as it will contain possibly sensitive LDAP credentials!

The only required key in the master configuration is pillar_ldap pointing to a file containing the actual configuration.

**Configuring the LDAP searches**

The file is processed using *Salt's Renderers* `<renderers>` which makes it possible to reference grains within the configuration.

**Warning:** When using Jinja in this file, make sure to do it in a way which prevents leaking sensitive information. A rogue minion could send arbitrary grains to trick the master into returning secret data. Use only the `id` grain which is verified through the minion's key/cert.

**Map Mode**  The `it-admins` configuration below returns the Pillar `it-admins` by:

- filtering for:
  - members of the group `it-admins`
  - objects with `objectclass=user`
- returning the data of users (mode: `map`), where each user is a dictionary containing the configured string or list attributes.

**Configuration:**

```yaml
salt-users:
  server: ldap.company.tld
  port: 389
  tls: true
  dn: 'dc=company,dc=tld'
  binddn: 'cn=salt-pillars,ou=users,dc=company,dc=tld'
  bindpw: bi7ieBai5Ano
  referrals: false
  anonymous: false
  mode: map
  dn: 'ou=users,dc=company,dc=tld'
  filter: '(&(memberof=cn=it-admins,ou=groups,dc=company,dc=tld)(objectclass=user))'
  attrs:
    - cn
    - displayName
    - givenName
    - sn
  lists:
    - memberOf

**Result:**

31.21. Full list of builtin pillar modules
salt-users:
- cn: cn=johndoe,ou=users,dc=company,dc=tld
  displayName: John Doe
  givenName: John
  sn: Doe
  memberOf:
    - cn=it-admins,ou=groups,dc=company,dc=tld
    - cn=team01,ou=groups,dc=company
- cn: cn=janedoe,ou=users,dc=company,dc=tld
  displayName: Jane Doe
  givenName: Jane
  sn: Doe
  memberOf:
    - cn=it-admins,ou=groups,dc=company,dc=tld
    - cn=team02,ou=groups,dc=company

List Mode  TODO: see also _result_to_dict() documentation

salt.pillar.pillar_ldap.ext_pillar(minion_id, pillar, config_file)
Execute LDAP searches and return the aggregated data

31.21.18 salt.pillar.puppet

Execute an unmodified puppet_node_classifier and read the output as YAML. The YAML data is then directly overlaid onto the minion’s Pillar data.

salt.pillar.puppet.ext_pillar(minion_id, pillar, command)
Execute an unmodified puppet_node_classifier and read the output as YAML

31.21.19 salt.pillar.reclass_adapter

Use the `reclass` database as a Pillar source

This ext_pillar plugin provides access to the reclass database, such that Pillar data for a specific minion are fetched using reclass.

You can find more information about reclass at http://reclass.pantsfullofunix.net.

To use the plugin, add it to the ext_pillar list in the Salt master config and tell reclass by way of a few options how and where to find the inventory:

```
ext_pillar:
  - reclass:
      storage_type: yaml_fs
      inventory_base_uri: /srv/salt
```

This would cause reclass to read the inventory from YAML files in /srv/salt/nodes and /srv/salt/classes.

If you are also using reclass as master_tops plugin, and you want to avoid having to specify the same information for both, use YAML anchors (take note of the differing data types for ext_pillar and master_tops):

```
reclass: &reclass
  storage_type: yaml_fs
  inventory_base_uri: /srv/salt
reclass_source_path: ~/code/reclass
```
If you want to run reclass from source, rather than installing it, you can either let the master know via the PYTHONPATH environment variable, or by setting the configuration option, like in the example above.

```python
salt.pillar.reclass_adapter.\texttt{ext\_pillar}(\texttt{minion\_id}, \texttt{pillar}, **\texttt{kwargs})
```

Obtain the Pillar data from reclass for the given `minion_id`.

### 31.21.20 salt.pillar.redismod

**Read pillar data from a Redis backend**

New in version 2014.7.0.

```python
depends
    * redis Python module (on master)
```

#### Salt Master Redis Configuration

The module shares the same base Redis connection variables as `salt.returners.redis_return`. These variables go in your master config file.

- `redis.db` - The Redis database to use. Defaults to 0.
- `redis.host` - The Redis host to connect to. Defaults to 'salt'.
- `redis.port` - The port that the Redis database is listening on. Defaults to 6379.
- `redis.password` - The password for authenticating with Redis. Only required if you are using master auth. Defaults to None.

#### Configuring the Redis ext_pillar

```python
ext_pillar:
    - redis: {\texttt{function: key\_value}}
```

```
salt.pillar.redismod.\texttt{ext\_pillar}(\texttt{minion\_id}, \texttt{pillar}, \texttt{function}, **\texttt{kwargs})
```

Grabs external pillar data based on configured function

```
salt.pillar.redismod.\texttt{key\_json}(\texttt{minion\_id}, \texttt{pillar}, \texttt{pillar\_key=\texttt{None}})
```

Pulls a string from redis and deserializes it from json. Deserialized dictionary data loaded directly into top level if `pillar_key` is not set.

- `pillar_key` Pillar key to return data into

```
salt.pillar.redismod.\texttt{key\_value}(\texttt{minion\_id}, \texttt{pillar}, \texttt{pillar\_key=\texttt{redis\_pillar}})
```

Looks for key in redis matching `minion_id`, returns a structure based on the data type of the redis key. String for string type, dict for hash type and lists for lists, sets and sorted sets.

- `pillar_key` Pillar key to return data into
31.21.21 salt.pillar.s3

Copy pillar data from a bucket in Amazon S3

The S3 pillar can be configured in the master config file with the following options:

```
ext_pillar:
  - s3:
      bucket: my.fancy.pillar.bucket
      keyid: KASKFJWAKJASJDKAJSKSD
      key: ksladfDLKDALSFKSD93q032sdDasdfasdfsadksdf
      multiple_env: False
      environment: base
      prefix: somewhere/overthere
      verify_ssl: True
      service_url: s3.amazonaws.com
      s3_cache_expire: 30
      s3_sync_on_update: True
```

The `bucket` parameter specifies the target S3 bucket. It is required.

The `keyid` parameter specifies the key id to use when access the S3 bucket. If it is not provided, an attempt to fetch it from EC2 instance meta-data will be made.

The `key` parameter specifies the key to use when access the S3 bucket. If it is not provided, an attempt to fetch it from EC2 instance meta-data will be made.

The `multiple_env` defaults to False. It specifies whether the pillar should interpret top level folders as pillar environments (see mode section below).

The `environment` defaults to `base`. It specifies which environment the bucket represents when in single environments mode (see mode section below). It is ignored if multiple_env is True.

The `prefix` defaults to `. It specifies a key prefix to use when searching for data in the bucket for the pillar. It works when multiple_env is True or False. Essentially it tells ext_pillar to look for your pillar data in a 'subdirectory' of your S3 bucket.

The `verify_ssl` parameter defaults to True. It specifies whether to check for valid S3 SSL certificates. NOTE If you use bucket names with periods, this must be set to False else an invalid certificate error will be thrown (issue #12200).

The `service_url` parameter defaults to `s3.amazonaws.com`. It specifies the base url to use for accessing S3.

The `s3_cache_expire` parameter defaults to 30s. It specifies expiration time of S3 metadata cache file.

The `s3_sync_on_update` parameter defaults to True. It specifies if cache is synced on update rather than jit.

This pillar can operate in two modes, single environment per bucket or multiple environments per bucket.

Single environment mode must have this bucket structure:

```
  s3://<bucket name>/prefix/files
```

Multiple environment mode must have this bucket structure:

```
  s3://<bucket name>/prefix/environment/files
```

If you wish to define your pillar data entirely within S3 it’s recommended that you use the `prefix=` parameter and specify one entry in ext_pillar for each environment rather than specifying multiple_env. This is due to issue #22471 (https://github.com/saltstack/salt/issues/22471)

class salt.pillar.s3.S3Credentials(key, keyid, bucket, service_url, verify_ssl, location)
salt.pillar.s3.<strong>ext_pillar</strong>(minion_id, pillar, bucket, key=None, keyid=None, verify_ssl=True, location=None, multiple_env=False, environment='base', prefix='', service_url=None, s3_cache_expire=30, s3_sync_on_update=True)

Execute a command and read the output as YAML

### 31.21.22 salt.pillar.svn_pillar

Clone a remote SVN repository and use the filesystem as a Pillar source

This external Pillar source can be configured in the master config file like so:

```python
ext_pillar:
    - svn: trunk svn://svnserver/repo root=subdirectory
```

The `root=` parameter is optional and used to set the subdirectory from where to look for Pillar files (such as `top.sls`).

Changed in version 2014.7.0: The optional `root` parameter will be added.

Note that this is not the same thing as configuring pillar data using the `pillar_roots` parameter. The branch referenced in the `ext_pillar` entry above (`master`), would evaluate to the `base` environment, so this branch needs to contain a `top.sls` with a `base` section in it, like this:

```yaml
base:
    '!*':
        - foo
```

To use other environments from the same SVN repo as `svn_pillar` sources, just add additional lines, like so:

```python
ext_pillar:
    - svn: trunk svn://svnserver/repo
    - svn: dev svn://svnserver/repo
```

In this case, the `dev` branch would need its own `top.sls` with a `dev` section in it, like this:

```yaml
dev:
    '!*':
        - bar
```

class salt.pillar.svn_pillar.<strong>SvnPillar</strong>(branch, repo_location, root, opts)

Deal with the remote SVN repository for Pillar

```python
pillar_dir()
```

Returns the directory of the pillars (repo cache + branch + root)

```python
update()
```

salt.pillar.svn_pillar.<strong>ext_pillar</strong>(minion_id, pillar, repo_string)

Execute a command and read the output as YAML

### 31.21.23 salt.pillar.varstack_pillar

Use Varstack data as a Pillar source

**Configuring Varstack**

Using varstack in Salt is fairly simple. Just put the following into the config file of your master:
ext_pillar:
- varstack: /etc/varstack.yaml

Varstack will then use /etc/varstack.yaml to determine which configuration data to return as pillar information. From there you can take a look at the README of varstack on how this file is evaluated.
salt.pillar.varstack_pillar.ext_pillar(minion_id, pillar, conf)
    Parse varstack data and return the result

31.21.24 salt.pillar.virtkey

Accept a key from a hypervisor if the virt runner has already submitted an authorization request

salt.pillar.virtkey.ext_pillar(hyper_id, pillar, name, key)
    Accept the key for the VM on the hyper, if authorized.

31.22 Renderers

The Salt state system operates by gathering information from common data types such as lists, dictionaries, and strings that would be familiar to any developer.

SLS files are translated from whatever data templating format they are written in back into Python data types to be consumed by Salt.

By default SLS files are rendered as Jinja templates and then parsed as YAML documents. But since the only thing the state system cares about is raw data, the SLS files can be any structured format that can be dreamed up.

Currently there is support for Jinja + YAML, Mako + YAML, Wempy + YAML, Jinja + json, Mako + json and Wempy + json.

Renderers can be written to support any template type. This means that the Salt states could be managed by XML files, HTML files, Puppet files, or any format that can be translated into the Pythonic data structure used by the state system.

31.22.1 Multiple Renderers

A default renderer is selected in the master configuration file by providing a value to the renderer key.

When evaluating an SLS, more than one renderer can be used.

When rendering SLS files, Salt checks for the presence of a Salt-specific shebang line.

The shebang line directly calls the name of the renderer as it is specified within Salt. One of the most common reasons to use multiple renderers is to use the Python or py renderer.

Below, the first line is a shebang that references the py renderer.

```python
#!py
def run():
    '''
    Install the python-mako package
    '''
    return {'include': ['python'],
            'python-mako': {'pkg': ['installed']}}
```
31.22.2 Composing Renderers

A renderer can be composed from other renderers by connecting them in a series of pipes (|).

In fact, the default Jinja + YAML renderer is implemented by connecting a YAML renderer to a Jinja renderer. Such renderer configuration is specified as: jinja | yaml.

Other renderer combinations are possible:

- **yaml** i.e. just YAML, no templating.
- **mako | yaml** pass the input to the mako renderer, whose output is then fed into the yaml renderer.
- **jinja | mako | yaml** This one allows you to use both jinja and mako templating syntax in the input and then parse the final rendered output as YAML.

The following is a contrived example SLS file using the jinja | mako | yaml renderer:

```yaml
#!jinja|mako|yaml
An Example:
- name: |
  - echo "Using Salt ${grains['saltversion']}" \ 
    "from path {{grains['saltpath']}}." 
- cwd: /

<%doc> ${...} is Mako's notation, and so is this comment. </%doc>
{%# Similarly, {{...}} is Jinja's notation, and so is this comment. %}
```

For backward compatibility, jinja | yaml can also be written as yaml_jinja, and similarly, the yaml_mako, yaml_wempy, json_jinja, json_mako, and json_wempy renderers are all supported.

Keep in mind that not all renderers can be used alone or with any other renderers. For example, the template renderers shouldn’t be used alone as their outputs are just strings, which still need to be parsed by another renderer to turn them into highstate data structures.

For example, it doesn’t make sense to specify yaml | jinja because the output of the YAML renderer is a highstate data structure (a dict in Python), which cannot be used as the input to a template renderer. Therefore, when combining renderers, you should know what each renderer accepts as input and what it returns as output.

31.22.3 Writing Renderers

A custom renderer must be a Python module placed in the renderers directory and the module implement the render function.

The render function will be passed the path of the SLS file as an argument.

The purpose of the render function is to parse the passed file and to return the Python data structure derived from the file.

Custom renderers must be placed in a `_renderers` directory within the file_roots specified by the master config file.

Custom renderers are distributed when any of the following are run: state.highstate

```
saltutil.sync_renderers
saltutil.sync_all
```

Any custom renderers which have been synced to a minion, that are named the same as one of Salt’s default set of renderers, will take the place of the default renderer with the same name.
31.22.4 Examples

The best place to find examples of renderers is in the Salt source code. Documentation for renderers included with Salt can be found here:

https://github.com/saltstack/salt/blob/develop/salt/renderers

Here is a simple YAML renderer example:

```python
import yaml
def render(yaml_data, env='', sls='', **kws):
    if not isinstance(yaml_data, basestring):
        yaml_data = yaml_data.read()
    data = yaml.load(yaml_data)
    return data if data else {}
```

31.22.5 Full List of Renderers

Full list of builtin renderer modules

<table>
<thead>
<tr>
<th>_renderer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>cheetah</strong></td>
<td>Cheetah Renderer for Salt</td>
</tr>
<tr>
<td><strong>genshi</strong></td>
<td>Genshi Renderer for Salt</td>
</tr>
<tr>
<td><strong>gpg</strong></td>
<td>Renderer that will decrypt GPG ciphers</td>
</tr>
<tr>
<td><strong>hjson</strong></td>
<td>Hjson Renderer for Salt</td>
</tr>
<tr>
<td><strong>jinja</strong></td>
<td>Jinja loading utils to enable a more powerful backend for jinja templates</td>
</tr>
<tr>
<td><strong>json</strong></td>
<td>JSON Renderer for Salt</td>
</tr>
<tr>
<td><strong>mako</strong></td>
<td>Mako Renderer for Salt</td>
</tr>
<tr>
<td><strong>msgpack</strong></td>
<td></td>
</tr>
<tr>
<td><strong>py</strong></td>
<td>Pure python state renderer</td>
</tr>
<tr>
<td><strong>pydsl</strong></td>
<td>A Python-based DSL</td>
</tr>
<tr>
<td><strong>pyobjects</strong></td>
<td>Python renderer that includes a Pythonic Object based interface</td>
</tr>
<tr>
<td><strong>stateconf</strong></td>
<td>A flexible renderer that takes a templating engine and a data format</td>
</tr>
<tr>
<td><strong>wempy</strong></td>
<td></td>
</tr>
<tr>
<td><strong>yaml</strong></td>
<td>YAML Renderer for Salt</td>
</tr>
<tr>
<td><strong>yamlex</strong></td>
<td></td>
</tr>
</tbody>
</table>

```
salt.renderers.cheetah

Cheetah Renderer for Salt

salt.renderers.cheetah.render(cheetah_data, saltenv='base', sls='', method='xml', **kws)

    Render a Cheetah template.

    **Return type** A Python data structure

salt.renderers.genshi

Genshi Renderer for Salt

salt.renderers.genshi.render(genshi_data, saltenv='base', sls='', method='xml', **kws)

    Render a Genshi template. A method should be passed in as part of the kwargs. If no method is passed in, xml is assumed. Valid methods are:
```
Note that the text method will call NewTextTemplate. If oldtext is desired, it must be called explicitly

**Return type**  A Python data structure

**salt.renderers.gpg**

Renderer that will decrypt GPG ciphers

Any key in the SLS file can be a GPG cipher, and this renderer will decrypt it before passing it off to Salt. This allows you to safely store secrets in source control, in such a way that only your Salt master can decrypt them and distribute them only to the minions that need them.

The typical use-case would be to use ciphers in your pillar data, and keep a secret key on your master. You can put the public key in source control so that developers can add new secrets quickly and easily.

This renderer requires the python-gnupg package. Be careful to install the python-gnupg package, not the gnupg package, or you will get errors.

To set things up, you will first need to generate a keypair. On your master, run:

```
# gpg --gen-key --homedir /etc/salt/gpgkeys
```

Do not supply a password for your keypair, and use a name that makes sense for your application. Be sure to back up your gpg directory someplace safe!

**Note:** Unfortunately, there are some scenarios - for example, on virtual machines which don’t have real hardware - where insufficient entropy causes key generation to be extremely slow. If you come across this problem, you should investigate means of increasing the system entropy. On virtualised Linux systems, this can often be achieved by installing the rng-tools package.

To retrieve the public key:

```
# gpg --armor --homedir /etc/salt/gpgkeys --armor --export <KEY-NAME> > exported_pubkey.gpg
```

Now, to encrypt secrets, copy the public key to your local machine and run:

```
$ gpg --import exported_pubkey.gpg
```

To generate a cipher from a secret:

```
$ echo -n "supersecret" | gpg --homedir ~/.gnupg --armor --encrypt -r <KEY-name>
```

There are two ways to configure salt for the usage of this renderer:

1. **Set up the renderer on your master by adding something like this line to your config:**

   ```
   renderer: jinja | yaml | gpg
   ```

   This will apply the renderers to all pillars and states while requiring python-gnupg to be installed on all minions since the decryption will happen on the minions.

2. **To apply the renderer on a file-by-file basis add the following line to the top of any pillar with gpg data in it:**

   ```
   #!yaml|gpg
   ```

Now with your renderers configured, you can include your ciphers in your pillar data like so:
salt.renderers.gpg.decrypt_ciphertext(cypher, gpg, safe=False)

Given a block of ciphertext as a string, and a gpg object, try to decrypt the cipher and return the decrypted string. If the cipher cannot be decrypted, log the error, and return the ciphertext back out.

Parameters safe -- Raise an exception on failure instead of returning the ciphertext

salt.renderers.gpg.decrypt_object(obj, gpg)

Recurrsively try to decrypt any object. If the object is a string, and it contains a valid GPG header, decrypt it, otherwise keep going until a string is found.

salt.renderers.gpg.render(gpg_data, saltenv='base', sls='`, argline='`, **kwargs)

Create a gpg object given a gpg_keydir, and then use it to try to decrypt the data to be rendered.

salt.renderers.hjson

Hjson Renderer for Salt http://laktak.github.io/hjson/

salt.renderers.hjson.render(hjson_data, saltenv='base', sls='`, `kws)

Accepts HJSON as a string or as a file object and runs it through the HJSON parser.

Return type A Python data structure

salt.renderers.jinja

Jinja loading util to enable a more powerful backend for jinja templates

Jinja in States The most basic usage of Jinja in state files is using control structures to wrap conditional or redundant state elements:

```jinja
{% if grains['os'] != 'FreeBSD' %}
tcs:
    pkg:
        - installed
{% endif %}

motd:
    file.managed:
        {% if grains['os'] == 'FreeBSD' %}
            - name: /etc/motd
        {% elif grains['os'] == 'Debian' %}
            - name: /etc/motd.tail
        {% endif %}
```
In this example, the first if block will only be evaluated on minions that aren't running FreeBSD, and the second block changes the file name based on the os grain.

Writing if-else blocks can lead to very redundant state files however. In this case, using pillars, or using a previously defined variable might be easier:

```py
{% set motd = ['/etc/motd'] %}
{% if grains['os'] == 'Debian' %}
    {% set motd = ['/etc/motd.tail', '/var/run/motd'] %}
{% endif %}

{% for motdfile in motd %}
    {{ motdfile }}:
        file.managed:
            - source: salt://motd
{% endfor %}
```

Using a variable set by the template, the for loop will iterate over the list of MOTD files to update, adding a state block for each file.

**Include and Import** Includes and imports can be used to share common, reusable state configuration between state files and between files.

```py
{% from 'lib.sls' import test %}
```

This would import the test template variable or macro, not the test state element, from the file lib.sls. In the case that the included file performs checks again grains, or something else that requires context, passing the context into the included file is required:

```py
{% from 'lib.sls' import test with context %}
```

**Macros** Macros are helpful for eliminating redundant code, however stripping whitespace from the template block, as well as contained blocks, may be necessary to emulate a variable return from the macro.

```py
# init.sls
{% from 'lib.sls' import pythonpkg with context %}

python-virtualenv:
    pkg.installed:
        - name: {{ pythonpkg('virtualenv') }}

python-fabric:
    pkg.installed:
        - name: {{ pythonpkg('fabric') }}

# lib.sls
{% macro pythonpkg(pkg) -%}
    {%- if grains['os'] == 'FreeBSD' -%}
        py27-{{ pkg }}
    {%- elif grains['os'] == 'Debian' -%}
        python-{{ pkg }}
    {%- endif -%}
{%- endmacro %}
```

31.22. Renderers
This would define a macro that would return a string of the full package name, depending on the packaging system’s naming convention. The whitespace of the macro was eliminated, so that the macro would return a string without line breaks, using whitespace control.

Template Inheritance  Template inheritance works fine from state files and files. The search path starts at the root of the state tree or pillar.

Filters  Saltstack extends builtin filters with these custom filters:

strftime  Converts any time related object into a time based string. It requires a valid strftime directives. An exhaustive list can be found in the official Python documentation.

```%
% set curtime = None | strftime() %

Fuzzy dates require the timelib Python module is installed.

```{% %
{{ "2002/12/25|strftime("%y") }}
{{ "1040814000|strftime("%Y-%m-%d") }}
{{ datetime|strftime("%u") }}
{{ "tomorrow|strftime" }}

sequence  Ensure that parsed data is a sequence.

yaml_encode  Serializes a single object into a YAML scalar with any necessary handling for escaping special characters. This will work for any scalar YAML data type: ints, floats, timestamps, booleans, strings, unicode. It will not work for multi-objects such as sequences or maps.

```{%-% %
{%- set bar = 7 %}
{%- set baz = none %}
{%- set zip = true %}
{%- set zap = 'The word of the day is "salty"' %}

{%- load_yaml as foo %}
bar: {{ bar|yaml_encode }}
baz: {{ baz|yaml_encode }}
baz: {{ zip|yaml_encode }}
baz: {{ zap|yaml_encode }}
{%- endload %}

In the above case ''{{ bar }}'' and ''{{ foo.bar }}'' should be identical and ''{{ baz }}'' and ''{{ foo.baz }}'' should be identical.

yaml_dquote  Serializes a string into a properly-escaped YAML double-quoted string. This is useful when the contents of a string are unknown and may contain quotes or unicode that needs to be preserved. The resulting string will be emitted with opening and closing double quotes.

```{%-% %
{%- set bar = "The quick brown fox . . ." %}
{%- set baz = 'The word of the day is "salty".' %}

{%- load_yaml as foo %}
bar: {{ bar|yaml_dquote }}
baz: {{ baz|yaml_dquote }}
{%- endload %}

In the above case ''{{ bar }}'' and ''{{ foo.bar }}'' should be identical and ''{{ baz }}'' and ''{{ foo.baz }}'' should be identical. If variable contents are not guaranteed to be a string
then it is better to use `yaml_encode` which handles all YAML scalar types.

**yaml_squote** Similar to the `yaml_dquote` filter but with single quotes. Note that YAML only allows special escapes inside double quotes so `yaml_squote` is not nearly as useful (viz. you likely want to use `yaml_encode` or `yaml_dquote`).

### Jinja in Files

Jinja can be used in the same way in managed files:

```bash
# redis.sls
/etc/redis/redis.conf:
  file.managed:
    - source: salt://redis.conf
    - template: jinja
    - context:
      bind: 127.0.0.1

# lib.sls
{% set port = 6379 %}

# redis.conf
{% from 'lib.sls' import port with context %}
port {{ port }}
bind {{ bind }}
```

As an example, configuration was pulled from the file context and from an external template file.

**Note:** Macros and variables can be shared across templates. They should not be starting with one or more underscores, and should be managed by one of the following tags: `macro`, `set`, `load_yaml`, `load_json`, `import_yaml` and `import_json`.

### Calling Salt Functions

The Jinja renderer provides a shorthand lookup syntax for the `salt` dictionary of execution function.

New in version 2014.7.0.

```bash
# The following two function calls are equivalent.
{{ salt['cmd.run']('whoami') }}
{{ salt.cmd.run('whoami') }}
```

### Debugging

The `show_full_context` function can be used to output all variables present in the current Jinja context.

New in version 2014.7.0.

```python
Context is: {{ show_full_context() }}
```

```python
salt.renderers.jinja.render(template_file, saltenv='base', sls='', argline='', context=None, tmplpath=None, **kws)
```

Render the template_file, passing the functions and grains into the Jinja rendering system.

**Return type** string

class salt.utils.jinja.SerializerExtension(environment)

Yaml and Json manipulation.
Format filters

Allows to jsonify or yamlify any data structure. For example, this dataset:

```python
data = {
    'foo': True,
    'bar': 42,
    'baz': [1, 2, 3],
    'qux': 2.0
}
```

yaml = {{ data|yaml }}
jjson = {{ data|json }}
python = {{ data|python }}

will be rendered as:

```yaml
yaml = {bar: 42, baz: [1, 2, 3], foo: true, qux: 2.0}
jjson = {'baz': [1, 2, 3], 'foo': true, 'bar': 42, 'qux': 2.0}
python = {'bar': 42, 'baz': [1, 2, 3], 'foo': True, 'qux': 2.0}
```

The yaml filter takes an optional flow_style parameter to control the default-flow-style parameter of the YAML dumper.

```python
{{ data|yaml(False) }}
```

will be rendered as:

```yaml
bar: 42
baz:
  - 1
  - 2
  - 3
foo: true
qux: 2.0
```

Load filters

Strings and variables can be deserialized with load_yaml and load_json tags and filters. It allows one to manipulate data directly in templates, easily:

```python
{% set yaml_src = "[foo: it works]|load_yaml %}  
{% set json_src = "[bar: 'for real']|load_json %}  
Dude, {{ yaml_src.foo }} {{ json_src.bar }}!
```

will be rendered as:

Dude, it works for real!

Load tags

Salt implements import_yaml and import_json tags. They work like the import tag, except that the document is also deserialized.

Syntaxes are [% load_yaml as [VARIABLE] %][YOUR DATA][% endload %] and [% load_json as [VARIABLE] %][YOUR DATA][% endload %]

For example:

```python
{% load_yaml as yaml_src %}  
foo: it works
```
Dude, {{ yaml_src.foo }} {{ json_src.bar }}!

will be rendered as:

Dude, it works for real!

Import tags

External files can be imported and made available as a Jinja variable.

Catalog

`import_*` and `load_` tags will automatically expose their target variable to import. This feature makes catalog of data to handle.

for example:

```
# doc1.sls
{% load_yaml as var1 %}
  foo: it works
{% endload %}
{% load_yaml as var2 %}
  bar: for real
{% endload %}
```

```
# doc2.sls
{% from "doc1.sls" import var1, var2 as local2 %}
  {{ var1.foo }} {{ local2.bar }}
```

salt.renderers.json

JSON Renderer for Salt

`salt.renderers.json.render(json_data, saltenv='base', sls='`, **kws)`

Accepts JSON as a string or as a file object and runs it through the JSON parser.

Return type A Python data structure

salt.renderers.mako

Mako Renderer for Salt

`salt.renderers.mako.render(template_file, saltenv='base', sls='`, context=None, tmplpath=None, **kws)`

Render the template_file, passing the functions and grains into the Mako rendering system.

Return type string
salt.renderers.msgpack

salt.renderers.msgpack.render(msgpack_data, saltenv='base', sls='*', **kws)

Accepts a message pack string or a file object, renders said data back to a Python dict.

Return type  A Python data structure

salt.renderers.py

Pure python state renderer

The SLS file should contain a function called run which returns high state data.

In this module, a few objects are defined for you, giving access to Salt’s execution functions, grains, pillar, etc. They are:

• __salt__ - Execution functions (i.e. __salt__['test.echo']('foo'))
• __grains__ - Grains (i.e. __grains__['os'])
• __pillar__ - Pillar data (i.e. __pillar__['foo'])
• __opts__ - Minion configuration options
• __env__ - The effective salt fileserver environment (i.e. base). Also referred to as a ‘saltenv’. __env__ should not be modified in a pure python SLS file. To use a different environment, the environment should be set when executing the state. This can be done in a couple different ways:
  - Using the saltenv argument on the salt CLI (i.e. salt '*' state.sls foo.bar.baz saltenv=env_name).
  - By adding a saltenv argument to an individual state within the SLS file. In other words, adding a line like this to the state’s data structure: {'saltenv': 'env_name'}
• __sls__ - The SLS path of the file. For example, if the root of the base environment is /srv/salt, and the SLS file is /srv/salt/foo/bar/baz.sls, then __sls__ in that file will be foo.bar.baz.

```python
# !/py

def run():
    config = {}

    if __grains__['os'] == 'Ubuntu':
        user = 'ubuntu'
        group = 'ubuntu'
        home = '/home/{}'.format(user)
    else:
        user = 'root'
        group = 'root'
        home = '/root/'

    config['s3cmd'] = {
        'pkg': [
            'installed',
            {'name': 's3cmd'},
        ],
    }

    config[home + '/.s3cfg'] = {
        'file.managed': [
```
salt.renderers.pydsl

A Python-based DSL

maintainer  Jack Kuan <kjkuan@gmail.com>
maturity   new
platform   all

The pydsl renderer allows one to author salt formulas (.sls files) in pure Python using a DSL that's easy to write and easy to read. Here's an example:

```python
# !pydsl

apache = state('apache')
apache.pkg.installed()
apache.service.running()
state('/var/www/index.html') |
  .file('managed',
      source='salt://webserver/index.html') |
  .require(pkg='apache')
```

Notice that any Python code is allow in the file as it's really a Python module, so you have the full power of Python at your disposal. In this module, a few objects are defined for you, including the usual (with __ added) __salt__ dictionary, __grains__, __pillar__, __opts__, __env__, and __sls__, plus a few more:

```
__file__
    local file system path to the sls module.

__pydsl__
    Salt PyDSL object, useful for configuring DSL behavior per sls rendering.
include
    Salt PyDSL function for creating Include declaration's.
extend
```
Salt PyDSL function for creating `Extend declaration`'s.

state

Salt PyDSL function for creating `ID declaration`'s.

A state `ID declaration` is created with a `state(id)` function call. Subsequent `state(id)` call with the same id returns the same object. This singleton access pattern applies to all declaration objects created with the DSL.

```
state('example')
assert state('example') is state('example')
assert state('example').cmd is state('example').cmd
assert state('example').cmd.running is state('example').cmd.running
```

The `id` argument is optional. If omitted, an UUID will be generated and used as the `id`.

```
state(id) returns an object under which you can create a State declaration object by accessing an attribute named after any state module available in Salt.
```

```
state('example').cmd
state('example').file
state('example').pkg
...
```

Then, a Function declaration object can be created from a State declaration object by one of the following two ways:

1. by calling a method named after the state function on the State declaration object.

```
state('example').file.managed(...)
```

2. by directly calling the attribute named for the State declaration, and supplying the state function name as the first argument.

```
state('example').file('managed', ...)
```

With either way of creating a Function declaration object, any Function arg declaration's can be passed as keyword arguments to the call. Subsequent calls of a Function declaration will update the arg declarations.

```
state('example').file('managed', source='salt://webserver/index.html')
state('example').file.managed(source='salt://webserver/index.html')
```

As a shortcut, the special `name` argument can also be passed as the first or second positional argument depending on the first or second way of calling the State declaration object. In the following two examples `ls -la` is the `name` argument.

```
state('example').cmd.run('ls -la', cwd='/')
state('example').cmd('run', 'ls -la', cwd='/')
```

Finally, a Requisite declaration object with its Requisite reference's can be created by invoking one of the requisite methods (see State Requisites) on either a Function declaration object or a State declaration object. The return value of a requisite call is also a Function declaration object, so you can chain several requisite calls together.

Arguments to a requisite call can be a list of State declaration objects and/or a set of keyword arguments whose names are state modules and values are IDs of ID declaration's or names of Name declaration's.

```
apache2 = state('apache2')
apache2.pkg.installed()
state('libapache2-mod-wsgi').pkg.installed()

# you can call requisites on function declaration
apache2.service.running() \
```

...
.require(apache2.pkg, pkg='libapache2-mod-wsgi') \
.watch(file='/etc/apache2/httpd.conf')

# or you can call requisites on state declaration.
# this actually creates an anonymous function declaration object
# to add the requisites.
apache2.service.require(state('libapache2-mod-wsgi').pkg, pkg='apache2') \n.watch(file='/etc/apache2/httpd.conf')

# we still need to set the name of the function declaration.
apache2.service.running()

Include declaration objects can be created with the include function, while Extend declaration objects can be created with the extend function, whose arguments are just Function declaration objects.

include('edit.vim', 'http.server')
extend(state('apache2')).service.watch(file='/etc/httpd/httpd.conf')

The include function, by default, causes the included sls file to be rendered as soon as the include function is called. It returns a list of rendered module objects; sls files not rendered with the pydsl renderer return None’s. This behavior creates no Include declaration’s in the resulting high state data structure.

import types

# including multiple sls returns a list.
_, mod = include('a-non-pydsl-sls', 'a-pydsl-sls')

assert _ is None
assert isinstance(slsmods[1], types.ModuleType)

# including a single sls returns a single object
mod = include('a-pydsl-sls')

# myfunc is a function that calls state(...) to create more states.
mod.myfunc(1, 2, "three")

Notice how you can define a reusable function in your pydsl sls module and then call it via the module returned by include.

It's still possible to do late includes by passing the delayed=True keyword argument to include.

include('edit.vim', 'http.server', delayed=True)

Above will just create a Include declaration in the rendered result, and such call always returns None.

Special integration with the cmd state Taking advantage of rendering a Python module, PyDSL allows you to declare a state that calls a pre-defined Python function when the state is executed.

greeting = "hello world"
def helper(something, *args, **kws):
    print greeting  # hello world
    print something, args, kws  # test123 ['a', 'b', 'c'] {'x': 1, 'y': 2}

state().cmd.call(helper, "test123", 'a', 'b', 'c', x=1, y=2)
The `cmd.call` state function takes care of calling our helper function with the arguments we specified in the states, and translates the return value of our function into a structure expected by the state system. See `salt.states.cmd.call()` for more information.

**Implicit ordering of states** Salt states are explicitly ordered via `Requisite declaration`'s. However, with `pydsl` it's possible to let the renderer track the order of creation for `Function declaration` objects, and implicitly add `require` requisites for your states to enforce the ordering. This feature is enabled by setting the `ordered` option on `__pydsl__`.

Note: this feature is only available if your minions are using Python >= 2.7.

```python
include('some.sls.file')
A = state('A').cmd.run(cwd='/var/tmp')
extend(A)
__pydsl__.set(ordered=True)
for i in range(10):
    i = str(i)
    state(i).cmd.run('echo '+i, cwd='/')
state('1').cmd.run('echo one')
state('2').cmd.run(name='echo two')
```

Notice that the `ordered` option needs to be set after any `extend` calls. This is to prevent `pydsl` from tracking the creation of a state function that's passed to an `extend` call.

Above example should create states from 0 to 9 that will output 0, one, two, 3, ... 9, in that order.

It's important to know that `pydsl` tracks the `creations of Function declaration` objects, and automatically adds a `require` requisite to a `Function declaration` object that requires the last `Function declaration` object created before it in the sls file.

This means later calls (perhaps to update the function's `Function arg declaration`) to a previously created function declaration will not change the order.

**Render time state execution** When Salt processes a salt formula file, the file is rendered to Salt's high state data representation by a renderer before the states can be executed. In the case of the `pydsl` renderer, the `sls` file is executed as a python module as it is being rendered which makes it easy to execute a state at render time. In `pydsl`, executing one or more states at render time can be done by calling a configured `ID declaration` object.

```bash
#!pydsl
s = state()  # save for later invocation
# configure it
s.cmd.run('echo at render time', cwd='/')
s.file.managed('target.txt', source='salt://source.txt')
```

Once an `ID declaration` is called at render time it is detached from the sls module as if it was never defined.

Note: If `implicit ordering` is enabled (i.e., via `__pydsl__.set(ordered=True)) then the first invocation of a `ID declaration` object must be done before a new `Function declaration` is created.
Integration with the stateconf renderer  The `salt.renderers.stateconf` renderer offers a few interesting features that can be leveraged by the `pydsl` renderer. In particular, when using with the `pydsl` renderer, we are interested in `stateconf`’s sls namespaces feature (via dot-prefixed id declarations), as well as, the automatic `start` and `goal` states generation.

Now you can use `pydsl` with `stateconf` like this:

```python
#pydsl|stateconf -ps
include('xxx', 'yyy')
# ensure that states in xxx run BEFORE states in this file.
extend(state('start').stateconf.require(stateconf='xxx::goal'))
# ensure that states in yyy run AFTER states in this file.
extend(state('goal').stateconf.require_in(stateconf='yyy::start'))
__pydsl__.set(ordered=True)
```

`-s` enables the generation of a stateconf `start` state, and `-p` lets us pipe high state data rendered by `pydsl` to `stateconf`. This example shows that by `require-ing` or `require_in-ing` the included sls' `start` or `goal` states, it’s possible to ensure that the included sls files can be made to execute before or after a state in the including sls file.

Importing custom Python modules  To use a custom Python module inside a PyDSL state, place the module somewhere that it can be loaded by the Salt loader, such as `_modules` in the `/srv/salt` directory.

Then, copy it to any minions as necessary by using `saltutil.sync_modules`.

To import into a PyDSL SLS, one must bypass the Python importer and insert it manually by getting a reference from Python’s `sys.modules` dictionary.

For example:

```python
#pydsl|stateconf -ps
def main():
  my_mod = sys.modules['salt.loaded.ext.module.my_mod']
salt.renderers.pydsl.render(template, saltenv='base', sls='''), tmplpath=None, rendered_sls=None, **kws)
```

`salt.renderers.pyobjects`

Python renderer that includes a Pythonic Object based interface

```python
maintainer  Evan Borgstrom <evan@borgstrom.ca>
```

Let's take a look at how you use `pyobjects` in a state file. Here's a quick example that ensures the `/tmp` directory is in the correct state.

```python
#pyobjects
File.managed("/tmp", user='root', group='root', mode='1777')
```

Nice and Pythonic!
By using the "shebang" syntax to switch to the pyobjects renderer we can now write our state data using an object based interface that should feel at home to python developers. You can import any module and do anything that you’d like (with caution, importing sqlalchemy, django or other large frameworks has not been tested yet). Using the pyobjects renderer is exactly the same as using the built-in Python renderer with the exception that pyobjects provides you with an object based interface for generating state data.

Creating state data  Pyobjects takes care of creating an object for each of the available states on the minion. Each state is represented by an object that is the CamelCase version of its name (i.e. File, Service, User, etc), and these objects expose all of their available state functions (i.e. File.managed, Service.running, etc).

The name of the state is split based upon underscores (_), then each part is capitalized and finally the parts are joined back together.

Some examples:
- postgres_user becomes PostgresUser
- ssh_known_hosts becomes SshKnownHosts

Context Managers and requisites  How about something a little more complex. Here we’re going to get into the core of how to use pyobjects to write states.

```python
# pyobjects

with Pkg.installed("nginx"):  
    Service.running("nginx", enable=True)

with Service("nginx", "watch_in"):  
    File.managed("/etc/nginx/conf.d/mysite.conf",  
                owner='root', group='root', mode='0444',  
                source='salt://nginx/mysite.conf')
```

The objects that are returned from each of the magic method calls are setup to be used a Python context managers (with) and when you use them as such all declarations made within the scope will automatically use the enclosing state as a requisite!

The above could have also been written use direct requisite statements as.

```python
# pyobjects

Pkg.installed("nginx")  
Service.running("nginx", enable=True, require=Pkg("nginx"))
File.managed("/etc/nginx/conf.d/mysite.conf",  
            owner='root', group='root', mode='0444',  
            source='salt://nginx/mysite.conf')
watch_in=Service("nginx")
```

You can use the direct requisite statement for referencing states that are generated outside of the current file.

```python
# pyobjects

# some-other-package is defined in some other state file
Pkg.installed("nginx", require=Pkg("some-other-package"))
```

The last thing that direct requisites provide is the ability to select which of the SaltStack requisites you want to use (require, require_in, watch, watch_in, use & use_in) when using the requisite as a context manager.
with Service("my-service", "watch_in"):
...

The above example would cause all declarations inside the scope of the context manager to automatically have their `watch_in` set to `Service("my-service")`.

Including and Extending To include other states use the `include()` function. It takes one name per state to include.

To extend another state use the `extend()` function on the name when creating a state.

```python
include('http', 'ssh')
Service.running(extend('apache'),
          watch=[File('/etc/httpd/extra/httpd-vhosts.conf')])
```

Importing from other state files Like any Python project that grows you will likely reach a point where you want to create reusability in your state tree and share objects between state files, Map Data (described below) is a perfect example of this.

To facilitate this Python's `import` statement has been augmented to allow for a special case when working with a Salt state tree. If you specify a Salt url (`salt://...`) as the target for importing from then the pyobjects renderer will take care of fetching the file for you, parsing it with all of the pyobjects features available and then place the requested objects in the global scope of the template being rendered.

This works for all types of import statements; `import X`, `from X import Y`, and `from X import Y as Z`.

```python
import salt://myfile.sls
from salt://something/data.sls import Object
from salt://something/data.sls import Object as Other
```

See the Map Data section for a more practical use.

Caveats:

- Imported objects are ALWAYS put into the global scope of your template, regardless of where your import statement is.

Salt object In the spirit of the object interface for creating state data pyobjects also provides a simple object interface to the `_salt_` object.

A function named `salt` exists in scope for your sls files and will dispatch its attributes to the `_salt_` dictionary.

The following lines are functionally equivalent:

```python
ret = salt.cmd.run(bar)
ret = __salt__['cmd.run'](bar)
```
Pillar, grain, mine & config data  Pyobjects provides shortcut functions for calling pillar.get, grains.get, mine.get & config.get on the __salt__ object. This helps maintain the readability of your state files.

Each type of data can be accessed by a function of the same name: pillar(), grains(), mine() and config().

The following pairs of lines are functionally equivalent:

```python
# !pyobjects
value = pillar('foo:bar:baz', 'qux')
value = __salt__['pillar.get']('foo:bar:baz', 'qux')
value = grains('pkg:apache')
value = __salt__['grains.get']('pkg:apache')
value = mine('os:Fedora', 'network.interfaces', 'grain')
value = __salt__['mine.get']('os:Fedora', 'network.interfaces', 'grain')
value = config('foo:bar:baz', 'qux')
value = __salt__['config.get']('foo:bar:baz', 'qux')
```

Map Data  When building complex states or formulas you often need a way of building up a map of data based on grain data. The most common use of this is tracking the package and service name differences between distributions.

To build map data using pyobjects we provide a class named Map that you use to build your own classes with inner classes for each set of values for the different grain matches.

```python
# !pyobjects
class Samba(Map):
    merge = 'samba:lookup'

    class Debian:
        server = 'samba'
        client = 'samba-client'
        service = 'samba'

    class Ubuntu:
        __grain__ = 'os'
        service = 'smbd'

    class RedHat:
        server = 'samba'
        client = 'samba'
        service = 'smb'
```

To use this new data you can import it into your state file and then access your attributes. To access the data in the map you simply access the attribute name on the base class that is extending Map. Assuming the above Map was in the file samba/map.sls, you could do the following.

```python
# !pyobjects
from salt://samba/map.sls import Samba
with Pkg.installed("samba", names=[Samba.server, Samba.client]):
    Service.running("samba", name=Samba.service)
```

TODO
• Interface for working with reactor files

salt.renderers.pyobjects.load_states()
   This loads our states into the salt __context__

salt.renderers.pyobjects.render(template, saltenv='base', sls='`, salt_data=True, **kwargs)

salt.renderers.stateconf

   maintainer  Jack Kuan <kjkuan@gmail.com>
   maturity   new
   platform   all

This module provides a custom renderer that processes a salt file with a specified templating engine (e.g. Jinja) and a chosen data renderer (e.g. YAML), extracts arguments for any stateconf.set state, and provides the extracted arguments (including Salt-specific args, such as require, etc) as template context. The goal is to make writing reusable/configurable/parameterized salt files easier and cleaner.

To use this renderer, either set it as the default renderer via the renderer option in master/minion's config, or use the shebang line in each individual sls file, like so: !stateconf. Note, due to the way this renderer works, it must be specified as the first renderer in a render pipeline. That is, you cannot specify !mako|yaml|stateconf, for example. Instead, you specify them as renderer arguments: !stateconf mako . yaml.

Here's a list of features enabled by this renderer.

• Prefixes any state id (declaration or reference) that starts with a dot (.) to avoid duplicated state ids when the salt file is included by other salt files.

   For example, in the salt://some/file.sls, a state id such as .sls_params will be turned into some.file::sls_params. Example:

   ```
   #!stateconf yaml . jinja
   .vim:
      pkg.installed
   ```

   Above will be translated into:

   ```
   some.file::vim:
      pkg.installed:
         - name: vim
   ```

   Notice how that if a state under a dot-prefixed state id has no name argument then one will be added automatically by using the state id with the leading dot stripped off.

The leading dot trick can be used with extending state ids as well, so you can include relatively and extend relatively. For example, when extending a state in salt://some/other_file.sls, e.g:

   ```
   #!stateconf yaml . jinja
   include:
      - .file

   extend:
      .file::sls_params:
         stateconf.set:
            - name1: something
   ```
Above will be pre-processed into:

```python
include:
  - some.file

extend:
  some.file::sls_params:
    stateconf.set:
      - name1: something
```

- Adds a `sls_dir` context variable that expands to the directory containing the rendering salt file. So, you can write `salt://{{sls_dir}}/...` to reference templates files used by your salt file.

- Recognizes the special state function, `stateconf.set`, that configures a default list of named arguments usable within the template context of the salt file. Example:

```python
#!stateconf yaml . jinja

.sls_params:
  stateconf.set:
    - name1: value1
    - name2: value2
    - name3:
      - value1
      - value2
      - value3
    - require_in:
      - cmd: output

# --- end of state config ---

.output:
  cmd.run:
    - name: |
      echo 'name1={{sls_params.name1}}
      name2={{sls_params.name2}}
      name3[1]={{sls_params.name3[1]}}'
```

This even works with `include + extend` so that you can override the default configured arguments by including the salt file and then extend the `stateconf.set` states that come from the included salt file. (*IMPORTANT: Both the included and the extending sls files must use the stateconf renderer for this `extend` to work!*)

Notice that the end of configuration marker (# --- end of state config --) is needed to separate the use of `stateconf.set` form the rest of your salt file. The regex that matches such marker can be configured via the `stateconf_end_marker` option in your master or minion config file.

Sometimes, it is desirable to set a default argument value that’s based on earlier arguments in the same `stateconf.set`. For example, it may be tempting to do something like this:

```python
#!stateconf yaml . jinja

.apache:
  stateconf.set:
    - host: localhost
    - port: 1234
    - url: 'http://{{host}}:{{port}}/'

# --- end of state config ---
```
However, this won't work. It can however be worked around like so:

```python
# !stateconf yaml . jinja

.apache:
    stateconf.set:
        - host: localhost
        - port: 1234
        {# - url: 'http://{{host}}:{{port}}/' #}

# --- end of state config ---
# {{ apache.setdefault('url', "http://%(host)s:%(port)s/" % apache) }}

.test:
    cmd.run:
        - name: echo '{{apache.url}}'
        - cwd: /
```

- Adds support for relative include and exclude of .sls files. Example:

```python
# !stateconf yaml . jinja

include:
    - .apache
    - .db.mysql
    - ..app.django

exclude:
    - sls: .users
```

If the above is written in a salt file at `salt://some/where.sls` then it will include `salt://some/apache.sls`, `salt://some/db/mysql.sls` and `salt://app/django.sls`, and exclude `salt://some/users.sls`. Actually, it does that by rewriting the above include and exclude into:

```python
include:
    - some.apache
    - some.db.mysql
    - app.django

exclude:
    - sls: some.users
```

- Optionally (enabled by default, `disable` via the `-G` renderer option, e.g. in the shebang line: `#!stateconf -G`), generates a `stateconf.set` goal state (state id named as `.goal` by default, configurable via the master/minion config option, `stateconf_goal_state`) that requires all other states in the salt file. Note, the `.goal` state id is subject to dot-prefix rename rule mentioned earlier.

Such goal state is intended to be required by some state in an including salt file. For example, in your webapp salt file, if you include a sls file that is supposed to setup Tomcat, you might want to make sure that all states in the Tomcat sls file will be executed before some state in the webapp sls file.

- Optionally (enable via the `-o` renderer option, e.g. in the shebang line: `#!stateconf -o`), orders the states in a sls file by adding a `require` requisite to each state such that every state requires the state defined just before it. The order of the states here is the order they are defined in the sls file. (Note: this feature is only available if
your minions are using Python >= 2.7. For Python2.6, it should also work if you install the `ordereddict` module from PyPI

By enabling this feature, you are basically agreeing to author your sls files in a way that gives up the explicit (or implicit?) ordering imposed by the use of `require`, `watch`, `require_in` or `watch_in` requisites, and instead, you rely on the order of states you define in the sls files. This may or may not be a better way for you. However, if there are many states defined in a sls file, then it tends to be easier to see the order they will be executed with this feature.

You are still allowed to use all the requisites, with a few restrictions. You cannot `require` or `watch` a state defined after the current state. Similarly, in a state, you cannot `require_in` or `watch_in` a state defined before it. Breaking any of the two restrictions above will result in a state loop. The renderer will check for such incorrect uses if this feature is enabled.

Additionally, `names` declarations cannot be used with this feature because the way they are compiled into low states make it impossible to guarantee the order in which they will be executed. This is also checked by the renderer. As a workaround for not being able to use `names`, you can achieve the same effect, by generate your states with the template engine available within your sls file.

Finally, with the use of this feature, it becomes possible to easily make an included sls file execute all its states after some state (say, with id `X`) in the including sls file. All you have to do is to make state, `X`, `require_in` the first state defined in the included sls file.

When writing sls files with this renderer, one should avoid using what can be defined in a `name` argument of a state as the state's id. That is, avoid writing states like this:

```
/path/to/some/file:
  file.managed:
    - source: salt://some/file

cp /path/to/some/file file2:
  cmd.run:
    - cwd: /
    - require:
      - file: /path/to/some/file
```

Instead, define the state id and the `name` argument separately for each state. Also, the ID should be something meaningful and easy to reference within a requisite (which is a good habit anyway, and such extra indirection would also makes the sls file easier to modify later). Thus, the above states should be written like this:

```
add-some-file:
  file.managed:
    - name: /path/to/some/file
    - source: salt://some/file

copy-files:
  cmd.run:
    - name: cp /path/to/some/file file2
    - cwd: /
    - require:
      - file: add-some-file
```

Moreover, when referencing a state from a requisite, you should reference the state's id plus the state name rather than the state name plus its `name` argument. (Yes, in the above example, you can actually `require` the file: `/path/to/some/file`, instead of the file: `add-some-file`). The reason is that this renderer will re-write or rename state id's and their references for state id's prefixed with .. So, if you reference `name` then there's no way to reliably rewrite such reference.
salt.renderers.wempy

salt.renderers.wempy.render(template_file, saltenv='base', sls='`, argline='`, context=None, **kws)

    Render the data passing the functions and grains into the rendering system

    Return type  string

salt.renderers.yaml

Understanding YAML  The default renderer for SLS files is the YAML renderer. YAML is a markup language with many powerful features. However, Salt uses a small subset of YAML that maps over very commonly used data structures, like lists and dictionaries. It is the job of the YAML renderer to take the YAML data structure and compile it into a Python data structure for use by Salt.

Though YAML syntax may seem daunting and terse at first, there are only three very simple rules to remember when writing YAML for SLS files.

**Rule One: Indentation**  YAML uses a fixed indentation scheme to represent relationships between data layers. Salt requires that the indentation for each level consists of exactly two spaces. Do not use tabs.

**Rule Two: Colons**  Python dictionaries are, of course, simply key-value pairs. Users from other languages may recognize this data type as hashes or associative arrays.

Dictionary keys are represented in YAML as strings terminated by a trailing colon. Values are represented by either a string following the colon, separated by a space:

my_key: my_value

In Python, the above maps to:

`{my_key: 'my_value'}`

Dictionaries can be nested:

first_level_dict_key:
    second_level_dict_key: value_in_second_level_dict

And in Python:

`{first_level_dict_key: {second_level_dict_key: 'value_in_second_level_dict' }}`

**Rule Three: Dashes**  To represent lists of items, a single dash followed by a space is used. Multiple items are a part of the same list as a function of their having the same level of indentation.

- list_value_one
- list_value_two
- list_value_three

Lists can be the value of a key-value pair. This is quite common in Salt:

my_dictionary:
    - list_value_one
    - list_value_two
    - list_value_three
YAML Renderer for Salt

```python
salt.renderers.yaml.get_yaml_loader(argline)
```

Return the ordered dict yaml loader

```python
salt.renderers.yaml.render(yaml_data, saltenv='base', sls='`, argline='`, **kws)
```

Accepts YAML as a string or as a file object and runs it through the YAML parser.

**Return type** A Python data structure

YAMLEX Renderer is a replacement of the YAML renderer. It’s 100% YAML with a pinch of Salt magic:

- All mappings are automatically OrderedDict
- All strings are automatically str obj
- data aggregation with !aggregation yaml tag, based on the `salt.utils.aggregation` module.
- data aggregation over documents for pillar

Instructed aggregation within the !aggregation and the !reset tags:

```yaml
#!yamlex
foo: !aggregate first
foo: !aggregate second
bar: !aggregate {first: foo}
bar: !aggregate {second: bar}
baz: !aggregate 42
qux: !aggregate default
!reset qux: !aggregate my custom data
```

is roughly equivalent to

```python
foo: [first, second]
bar: {first: foo, second: bar}
baz: [42]
qux: [my custom data]
```

By default the return values of the commands sent to the Salt minions are returned to the Salt master, however anything at all can be done with the results data.

By using a Salt returner, results data can be redirected to external data stores for analysis and archival.

Returners pull their configuration values from the Salt minions. Returners are only configured once, which is generally at load time.

The returner interface allows the return data to be sent to any system that can receive data. This means that return data can be sent to a Redis server, a MongoDB server, a MySQL server, or any system.
See also:

*Full list of builtin returners*

### 31.23.1 Using Returners

All Salt commands will return the command data back to the master. Specifying returners will ensure that the data is also sent to the specified returner interfaces.

Specifying what returners to use is done when the command is invoked:

```
salt '*' test.ping --return redis_return
```

This command will ensure that the redis_return returner is used.

It is also possible to specify multiple returners:

```
salt '*' test.ping --return mongo_return,redis_return,cassandra_return
```

In this scenario all three returners will be called and the data from the test.ping command will be sent out to the three named returners.

### 31.23.2 Writing a Returner

A returner is a Python module containing at minimum a `returner` function. Other optional functions can be included to add support for `master_job_cache`, `external_job_cache`, and `Event Returners`. Salt’s `master_job_cache` allows returners to be used as a pluggable replacement for the Default Job Cache. In order to do so, a returner must implement the following functions:

```python
import redis
import json

def returner(ret):
    ":"""
    Return information to a redis server
    ":"""
    # Get a redis connection
    serv = redis.Redis(
        host='redis-serv.example.com',
        port=6379,
        db=0
    )
    serv.sadd("%(id)s:jobs" % ret, ret['jid'])
    serv.set("%(jid)s:%(id)s" % ret, json.dumps(ret['return']))
    serv.sadd('jobs', ret['jid'])
    serv.sadd(ret['jid'], ret['id'])
```

The above example of a returner set to send the data to a Redis server serializes the data as JSON and sets it in redis.

**Master Job Cache Support**

*master_job_cache*, *external_job_cache*, and *Event Returners*. Salt’s `master_job_cache` allows returners to be used as a pluggable replacement for the Default Job Cache. In order to do so, a returner must implement the following functions:
Note: The code samples contained in this section were taken from the cassandra_cql returner.

**prep_jid** Ensures that job ids (jid) don’t collide, unless passed_jid is provided.

nochache is an optional boolean that indicates if return data should be cached. passed_jid is a caller provided jid which should be returned unconditionally.

```python
def prep_jid(nocache, passed_jid=None):  # pylint: disable=unused-argument
    Do any work necessary to prepare a JID, including sending a custom id
    
    return passed_jid if passed_jid is not None else salt.utils.jid.gen_jid()
```

**save_load** Save job information. The jid is generated by prep_jid and should be considered a unique identifier for the job. The jid, for example, could be used as the primary/unique key in a database. The load is what is returned to a Salt master by a minion. The following code example stores the load as a JSON string in the salt.jids table.

```python
def save_load(jid, load):
    
    Save the load to the specified jid id
    
    query = '''INSERT INTO salt.jids (jid, load)
      ) VALUES (
        '{0}', '{1}'
      );'''.format(jid, json.dumps(load))

    # cassandra_cql.cql_query may raise a CommandExecutionError
    try:
      __salt__['cassandra_cql.cql_query'](query)
    except CommandExecutionError:
      log.critical('Could not save load in jids table.
    raise
    except Exception as e:
      log.critical('Unexpected error while inserting into jids: {0}''.format(str(e)))
    raise
```

**get_load** must accept a job id (jid) and return the job load stored by save_load, or an empty dictionary when not found.

```python
def get_load(jid):
    
    Return the load data that marks a specified jid
    
    query = '''SELECT load FROM salt.jids WHERE jid = '{0}';'''.format(jid)
    
    ret = {}

    # cassandra_cql.cql_query may raise a CommandExecutionError
    try:
      data = __salt__['cassandra_cql.cql_query'](query)
      if data:
        load = data[0].get('load')
        if load:
          ret = json.loads(load)
    except CommandExecutionError:
      ```
Salt Documentation, Release 2015.8.0

$\log$.critical('Could not get load from jids table.')
$\raise$
$\except$ Exception as e:
$log$.critical('Could not get load from jids: {0}'.format(str(e))
$\raise$

return ret

### External Job Cache Support

Salt's external_job_cache extends the master_job_cache. External Job Cache support requires the following functions in addition to what is required for Master Job Cache support:

**get_jid** Return a dictionary containing the information (load) returned by each minion when the specified job id was executed.

Sample:

```python
{
    "local": {
        "master_minion": {
            "fun_args": [],
            "jid": "20150330121011408195",
            "return": true,
            "retcode": 0,
            "success": true,
            "cmd": "_return",
            "stamp": "2015-03-30T12:10:12.708663",
            "fun": "test.ping",
            "id": "master_minion"
        }
    }
}
```

**get_fun** Return a dictionary of minions that called a given Salt function as their last function call.

Sample:

```python
{
    "local": {
        "minion1": "test.ping",
        "minion3": "test.ping",
        "minion2": "test.ping"
    }
}
```

**get_jids** Return a list of all job ids.

Sample:

```python
{
    "local": [
        "20150330121011408195",
        "20150330195922139916"
    ]
}
```

**get_minions** Returns a list of minions
Sample:

```json
{
    "local": [
        "minion3",
        "minion2",
        "minion1",
        "master_minion"
    ]
}
```

Please refer to one or more of the existing returners (i.e. mysql, cassandra_cql) if you need further clarification.

### Event Support

An `event_return` function must be added to the returner module to allow events to be logged from a master via the returner. A list of events are passed to the function by the master.

The following example was taken from the MySQL returner. In this example, each event is inserted into the `salt_events` table keyed on the event tag. The tag contains the jid and therefore is guaranteed to be unique.

```python
def event_return(events):
    
    Return event to mysql server

    Requires that configuration be enabled via 'event_return'
    option in master config.

    with _get_serv(events, commit=True) as cur:
        for event in events:
            tag = event.get('tag', '')
            data = event.get('data', '')
            sql = '''INSERT INTO `salt_events` (`tag`, `data`, `master_id` )
                VALUES (%s, %s, %s)'''
            cur.execute(sql, (tag, json.dumps(data), __opts__['id']))
```

### Custom Returners

Place custom returners in a `_returners` directory within the `file_roots` specified by the master config file.

Custom returners are distributed when any of the following are called: `state.highstate`

- `saltutil.sync_returners`
- `saltutil.sync_all`

Any custom returners which have been synced to a minion that are named the same as one of Salt's default set of returners will take the place of the default returner with the same name.

### Naming the Returner

Note that a returner's default name is its filename (i.e. `foo.py` becomes returner `foo`), but that its name can be overridden by using a `__virtual__` function. A good example of this can be found in the `redis` returner, which is named `redis_return.py` but is loaded as simply `redis`: 
try:
    import redis
    HAS_REDIS = True
except ImportError:
    HAS_REDIS = False
__virtualname__ = 'redis'

def __virtual__():
    if not HAS_REDIS:
        return False
    return __virtualname__

Testing the Returner

The returner, prep_jid, save_load, get_load, and event_return functions can be tested by configuring the master_job_cache and Event Returners in the master config file and submitting a job to test.ping each minion from the master.

Once you have successfully exercised the Master Job Cache functions, test the External Job Cache functions using the ret execution module.

    salt-call ret.get_jids cassandra_cql --output=json
    salt-call ret.get_fun cassandra_cql test.ping --output=json
    salt-call ret.get_minions cassandra_cql --output=json
    salt-call ret.get_jid cassandra_cql 20150330121011408195 --output=json

31.23.3 Event Returners

For maximum visibility into the history of events across a Salt infrastructure, all events seen by a salt master may be logged to a returner.

To enable event logging, set the event_return configuration option in the master config to returner which should be designated as the handler for event returns.

Note: Not all returners support event returns. Verify a returner has an event_return() function before using.

Note: On larger installations, many hundreds of events may be generated on a busy master every second. Be certain to closely monitor the storage of a given returner as Salt can easily overwhelm an underpowered server with thousands of returns.

31.23.4 Full List of Returners

Full list of builtin returner modules

<table>
<thead>
<tr>
<th>Returner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>carbon_return</td>
<td>Take data from salt and &quot;return&quot; it into a carbon receiver</td>
</tr>
<tr>
<td>cassandra_cql_return</td>
<td>Return data to a cassandra server</td>
</tr>
<tr>
<td>cassandra_return</td>
<td>Return data to a Cassandra ColumnFamily</td>
</tr>
<tr>
<td>couchbase_return</td>
<td>Simple returner for Couchbase.</td>
</tr>
<tr>
<td>couchdb_return</td>
<td>Simple returner for CouchDB.</td>
</tr>
</tbody>
</table>

Continued on next page
Table 31.11 -- continued from previous page

<table>
<thead>
<tr>
<th>Returner</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>django_return</td>
<td>A returner that will inform a Django system that returns are available using Django's signal system.</td>
</tr>
<tr>
<td>elasticsearch_return</td>
<td>Return data to an elasticsearch server for indexing.</td>
</tr>
<tr>
<td>etcd_return</td>
<td>Return data to an etcd server or cluster</td>
</tr>
<tr>
<td>hipchat_return</td>
<td>Return salt data via hipchat.</td>
</tr>
<tr>
<td>influxdb_return</td>
<td>Return data to an influxdb server.</td>
</tr>
<tr>
<td>kafka_return</td>
<td>Return data to a Kafka topic</td>
</tr>
<tr>
<td>local</td>
<td>The local returner is used to test the returner interface, it just prints the</td>
</tr>
<tr>
<td>local_cache</td>
<td>Return data to local job cache</td>
</tr>
<tr>
<td>memcache_return</td>
<td>Return data to a memcache server</td>
</tr>
<tr>
<td>mongo_future_return</td>
<td>Return data to a mongodb server</td>
</tr>
<tr>
<td>mongo_return</td>
<td>Return data to a mongodb server</td>
</tr>
<tr>
<td>multi_returner</td>
<td>Read/Write multiple returners</td>
</tr>
<tr>
<td>mysql</td>
<td>Return data to a mysql server</td>
</tr>
<tr>
<td>nagios_return</td>
<td>Return salt data to Nagios</td>
</tr>
<tr>
<td>odbc</td>
<td>Return data to an ODBC compliant server.</td>
</tr>
<tr>
<td>pgjsonb</td>
<td>Return data to a PostgreSQL server with json data stored in Pg's jsonb data type</td>
</tr>
<tr>
<td>postgres</td>
<td>Return data to a postgresql server</td>
</tr>
<tr>
<td>postgres_local_cache</td>
<td>Use a postgreSQL server for the master job cache.</td>
</tr>
<tr>
<td>pushover_returner</td>
<td>Return salt data via pushover (<a href="http://www.pushover.net">http://www.pushover.net</a>)</td>
</tr>
<tr>
<td>redis_return</td>
<td>Return data to a redis server</td>
</tr>
<tr>
<td>sentry_return</td>
<td>Salt returner that reports execution results back to sentry.</td>
</tr>
<tr>
<td>slack_returner</td>
<td>Return salt data via slack</td>
</tr>
<tr>
<td>sms_return</td>
<td>Return data by SMS.</td>
</tr>
<tr>
<td>smtp_return</td>
<td>Return salt data via email</td>
</tr>
<tr>
<td>sqlite3_return</td>
<td>Insert minion return data into a sqlite3 database</td>
</tr>
<tr>
<td>syslog_return</td>
<td>Return data to the host operating system's syslog facility</td>
</tr>
<tr>
<td>xmpp_return</td>
<td>Return salt data via xmpp</td>
</tr>
</tbody>
</table>

**salt.returners.carbon_return**

Take data from salt and "return" it into a carbon receiver.

Add the following configuration to the minion configuration file:

```yaml
 carbon.host: <server ip address>
carbon.port: 2003
```

Errors when trying to convert data to numbers may be ignored by setting `carbon.skip_on_error` to `True`:

```
carbon.skip_on_error: True
```

By default, data will be sent to carbon using the plaintext protocol. To use the pickle protocol, set `carbon.mode` to `pickle`:

```
carbon.mode: pickle
```

You can also specify the pattern used for the metric base path (except for virt modules metrics):

```
carbon.metric_base_pattern: carbon.[minion_id].[module].[function]
```

**These tokens can used:** module, salt module, function, salt function, minion id, minion id

**Default is:** carbon.metric_base_pattern: [module],[function],[minion_id]

Carbon settings may also be configured as:
carbon:
  host: <server IP or hostname>
  port: <carbon port>
  skip_on_error: True
  mode: (pickle|text)
  metric_base_pattern: <pattern> | [module].[function].[minion_id]

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

alternative.carbon:
  host: <server IP or hostname>
  port: <carbon port>
  skip_on_error: True
  mode: (pickle|text)

To use the carbon returner, append `--return carbon` to the salt command.

\texttt{salt '* test.ping --return carbon}

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

\texttt{salt '* test.ping --return carbon --return_config alternative}

\begin{Verbatim}
\texttt{salt.returners.carbon_return.event_return(events)}
\end{Verbatim}

Return event data to remote carbon server

\begin{Verbatim}
\texttt{salt.returners.carbon_return.prep_jid(nocache=False, passed_jid=None)}
\end{Verbatim}

Do any work necessary to prepare a JID, including sending a custom id

\begin{Verbatim}
\texttt{salt.returners.carbon_return.returner(ret)}
\end{Verbatim}

Return data to a remote carbon server using the text metric protocol

Each metric will look like:

\begin{Verbatim}
[module].[function].[minion_id].[metric path [...]].[metric name]
\end{Verbatim}

\begin{Verbatim}
\texttt{salt.returners.cassandra_cql_return}
\end{Verbatim}

Return data to a cassandra server

New in version 2015.5.0.

\begin{itemize}
  \item \textbf{maintainer} Corin Kochenower<ckochenower@saltstack.com>
  \item \textbf{maturity} new as of 2015.2
  \item \textbf{depends} salt.modules.cassandra_cql
  \item \textbf{depends} DataStax Python Driver for Apache Cassandra [https://github.com/datastax/python-driver]
  \item install cassandra-driver
  \item \textbf{platform} all
  \item \textbf{configuration} To enable this returner, the minion will need the DataStax Python Driver for Apache Cassandra ([https://github.com/datastax/python-driver](https://github.com/datastax/python-driver)) installed and the following values configured in the minion or master config. The list of cluster IPs must include at least one cassandra node
\end{itemize}
IP address. No assumption or default will be used for the cluster IPs. The cluster IPs will be tried in the order listed. The port, username, and password values shown below will be the assumed defaults if you do not provide values:

```yaml
cassandra:
  cluster:
  - 192.168.50.11
  - 192.168.50.12
  - 192.168.50.13
  port: 9042
  username: salt
  password: salt
```

Use the following cassandra database schema:

```sql
CREATE KEYSPACE IF NOT EXISTS salt
  WITH replication = {'class': 'SimpleStrategy', 'replication_factor' : 1};
CREATE USER IF NOT EXISTS salt WITH PASSWORD 'salt' NOSUPERUSER;
GRANT ALL ON KEYSPACE salt TO salt;
USE salt;
CREATE TABLE IF NOT EXISTS salt.salt_returns (
  jid text,
  minion_id text,
  fun text,
  alter_time timestamp,
  full_ret text,
  return text,
  success boolean,
  PRIMARY KEY (jid, minion_id, fun)
) WITH CLUSTERING ORDER BY (minion_id ASC, fun ASC);
CREATE TABLE IF NOT EXISTS salt.jids (jid text PRIMARY KEY,
  load text);
CREATE TABLE IF NOT EXISTS salt.minions (minion_id text PRIMARY KEY,
  last_fun text);
CREATE INDEX IF NOT EXISTS minions_last_fun ON salt.minions (last_fun);
CREATE TABLE IF NOT EXISTS salt.salt_events (id timeuuid,
  tag text,
  alter_time timestamp,
  data text,
  master_id text,
  PRIMARY KEY (id, tag)
) WITH CLUSTERING ORDER BY (tag ASC);
CREATE INDEX tag ON salt.salt_events (tag);
```

Required python modules: cassandra-driver
To use the cassandra returner, append `--return cassandra' to the salt command. ex:

```bash
salt '*' test.ping --return cassandra
```

salt.returners.cassandra_cql_return.event_return(events)
Return event to one of potentially many clustered cassandra nodes

Requires that configuration be enabled via 'event_return' option in master config.

Cassandra does not support an auto-increment feature due to the highly inefficient nature of creating a mono-
tonically increasing number across all nodes in a distributed database. Each event will be assigned a uuid by
the connecting client.

salt.returners.cassandra_cql_return.get_fun(fun)
Return a dict of the last function called for all minions

salt.returners.cassandra_cql_return.get_jid(jid)
Return the information returned when the specified job id was executed

salt.returners.cassandra_cql_return.get_jids()
Return a list of all job ids

salt.returners.cassandra_cql_return.get_load(jid)
Return the load data that marks a specified jid

salt.returners.cassandra_cql_return.get_minions()
Return a list of minions

salt.returners.cassandra_cql_return.prep_jid(nocache=False, passed_jid=None)
Do any work necessary to prepare a JID, including sending a custom id

salt.returners.cassandra_cql_return.returner(ret)
Return data to one of potentially many clustered cassandra nodes

salt.returners.cassandra_cql_return.save_load(jid, load)
Save the load to the specified jid id

salt.returners.cassandra_return

Return data to a Cassandra ColumnFamily

Here's an example Keyspace / ColumnFamily setup that works with this returner:

```sql
create keyspace salt;
use salt;
create column family returns
    with key_validation_class='UTF8Type'
    and comparator='UTF8Type'
    and default_validation_class='UTF8Type';
```

Required python modules: pycassa

To use the cassandra returner, append `--return cassandra' to the salt command. ex:

```bash
salt '*' test.ping --return cassandra
```

salt.returners.cassandra_cql_return.prep_jid(nocache=False, passed_jid=None)
Do any work necessary to prepare a JID, including sending a custom id

salt.returners.cassandra_cql_return.returner(ret)
Return data to a Cassandra ColumnFamily
salt.returners.couchbase_return

Simple returner for Couchbase. Optional configuration settings are listed below, along with sane defaults.

couchbase.host: 'salt'
couchbase.port: 8091
couchbase.bucket: 'salt'
couchbase.skip_verify_views: False

To use the couchbase returner, append `--return couchbase` to the salt command. Example:

```bash
salt '*' test.ping --return couchbase
```

All of the return data will be stored in documents as follows:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JID</td>
<td>load: load obj tgt_minions: list of minions targeted nocache: should we not cache the return data</td>
</tr>
<tr>
<td>JID/MINION_ID</td>
<td>return: return_data out: out_data</td>
</tr>
</tbody>
</table>

salt.returners.couchbase_return.get_jid(jid)

Return the information returned when the specified job id was executed

salt.returners.couchbase_return.get_jids()

Return a list of all job ids

salt.returners.couchbase_return.get_load(jid)

Return the load data that marks a specified jid

salt.returners.couchbase_return.prep_jid(nocache=False, passed_jid=None)

Return a job id and prepare the job id directory. This is the function responsible for making sure jids don't collide (unless its passed a jid) So do what you have to do to make sure that stays the case.

salt.returners.couchbase_return.returner(load)

Return data to the local job cache

salt.returners.couchbase_return.save_load(jid, clear_load)

Save the load to the specified jid

salt.returners.couchdb_return

Simple returner for CouchDB. Optional configuration settings are listed below, along with sane defaults:

couchdb.db: 'salt'
couchdb.url: 'http://salt:5984/'

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

alternative.couchdb.db: 'salt'
alternative.couchdb.url: 'http://salt:5984/'

To use the couchdb returner, append `--return couchdb` to the salt command. Example:

```bash
salt '*' test.ping --return couchdb
```

To use the alternative configuration, append `--return_config alternative` to the salt command. New in version 2015.5.0.

```bash
salt '*' test.ping --return couchdb --return_config alternative
```
On concurrent database access  As this returner creates a couchdb document with the salt job id as document id and as only one document with a given id can exist in a given couchdb database, it is advised for most setups that every minion be configured to write to its own database (the value of couchdb.db may be suffixed with the minion id), otherwise multi-minion targetting can lead to losing output:

- the first returning minion is able to create a document in the database
- other minions fail with {'error': 'HTTP Error 409: Conflict'}

salt.returners.couchdb_return.ensure_views()
This function makes sure that all the views that should exist in the design document do exist.

salt.returners.couchdb_return.get_fun(fun)
Return a dict with key being minion and value being the job details of the last run of function `fun`.

salt.returners.couchdb_return.get_jid(jid)
Get the document with a given JID.

salt.returners.couchdb_return.get_jids()
List all the jobs that we have.

salt.returners.couchdb_return.get_minions()
Return a list of minion identifiers from a request of the view.

salt.returners.couchdb_return.get_valid_salt_views()
Returns a dict object of views that should be part of the salt design document.

salt.returners.couchdb_return.prep_jid(nocache=False, passed_jid=None)
Do any work necessary to prepare a JID, including sending a custom id

salt.returners.couchdb_return.returner(ret)
Take in the return and shove it into the couchdb database.

salt.returners.couchdb_return.set_salt_view()
Helper function that sets the salt design document. Uses get_valid_salt_views and some hardcoded values.

salt.returners.django_return

A returner that will inform a Django system that returns are available using Django’s signal system.

https://docs.djangoproject.com/en/dev/topics/signals/

It is up to the Django developer to register necessary handlers with the signals provided by this returner and process returns as necessary.

The easiest way to use signals is to import them from this returner directly and then use a decorator to register them.

An example Django module that registers a function called `returner_callback` with this module’s `returner` function:

```python
import salt.returners.django_return
from django.dispatch import receiver

@receiver(salt.returners.django_return, sender=returner)
def returner_callback(sender, ret):
    print('I received {0} from {1}'.format(ret, sender))

salt.returners.django_return.prep_jid(nocache=False, passed_jid=None)
    Do any work necessary to prepare a JID, including sending a custom ID

salt.returners.django_return.returner(ret)
    Signal a Django server that a return is available
```
salt.returners.django_return.save_load(jid, load)

Save the load to the specified jid

salt.returners.elasticsearch_return

Return data to an elasticsearch server for indexing.

maintainer Jurnell Cockhren <jurnell.cockhren@sophicware.com>, Arnold Bechtoldt
<mail@arnoldbechtoldt.com>
maturity New
depends elasticsearch-py
platform all

To enable this returner the elasticsearch python client must be installed on the desired minions (all or some subset).
Please see documentation of elasticsearch execution module for a valid connection configuration.

Warning: The index that you wish to store documents will be created by Elasticsearch automatically if doesn’t exist yet. It is highly recommended to create predefined index templates with appropriate mapping(s) that will be used by Elasticsearch upon index creation. Otherwise you will have problems as described in #20826.

To use the returner per salt call:

```
salt '*' test.ping --return elasticsearch
```

In order to have the returner apply to all minions:

```
ext_job_cache: elasticsearch
```

salt.returners.elasticsearch_return.get_load(jid)

Return the load data that marks a specified jid


salt.returners.elasticsearch_return.prep_jid(nocache=False, passed_jid=None)

Do any work necessary to prepare a JID, including sending a custom id

salt.returners.elasticsearch_return.returner(ret)

Process the return from Salt

salt.returners.elasticsearch_return.save_load(jid, load)

Save the load to the specified jid id


salt.returners.etcd_return

Return data to an etcd server or cluster

depends

• python-etcd

In order to return to an etcd server, a profile should be created in the master configuration file:
my_etcd_config:
  etcd.host: 127.0.0.1
  etcd.port: 4001

It is technically possible to configure etcd without using a profile, but this is not considered to be a best practice, especially when multiple etcd servers or clusters are available.

Additionally, two more options must be specified in the top-level configuration in order to use the etcd returner:

etcd.host: 127.0.0.1
etcd.port: 4001

e etcd.returner: my_etcd_config
etcd.returner_root: /salt/return

The `etcd.returner` option specifies which configuration profile to use. The `etcd.returner_root` option specifies the path inside etcd to use as the root of the returner system.

Once the etcd options are configured, the returner may be used:

CLI Example:

```
salt '*' test.ping --return etcd
```

```
salt.returners.etcd_return.get_fun()
  Return a dict of the last function called for all minions
```

```
salt.returners.etcd_return.get_jid(jid)
  Return the information returned when the specified job id was executed
```

```
salt.returners.etcd_return.get_jids()
  Return a list of all job ids
```

```
salt.returners.etcd_return.get_load(jid)
  Return the load data that marks a specified jid
```

```
salt.returners.etcd_return.get_minions()
  Return a list of minions
```

```
salt.returners.etcd_return.prep_jid(nocache=False, passed_jid=None)
  Do any work necessary to prepare a JID, including sending a custom id
```

```
salt.returners.etcd_return.returner(ret)
  Return data to an etcd server or cluster
```

```
salt.returners.etcd_return.save_load(jid, load)
  Save the load to the specified jid
```

salt.returners.hipchat_return

Return salt data via hipchat.

New in version 2015.5.0.

The following fields can be set in the minion conf file:

```
hipchat.room_id (required)
hipchat.api_key (required)
hipchat.api_version (required)
hipchat.from_name (required)
hipchat.color (optional)
```

31.23. Returners
hipchat.notify (optional)
hipchat.profile (optional)

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

- `hipchat.room_id`
- `hipchat.api_key`
- `hipchat.api_version`
- `hipchat.from_name`

Hipchat settings may also be configured as:

```yaml
hipchat:
  room_id: RoomName
  api_key: xxxxxxxxxxxxxxxxxxxxxxxxxxxx
  api_version: v1
  from_name: user@email.com

alternative.hipchat:
  room_id: RoomName
  api_key: xxxxxxxxxxxxxxxxxxxxxxxxxxxx
  api_version: v1
  from_name: user@email.com

hipchat_profile:
  api_key: xxxxxxxxxxxxxxxxxxxxxxxxxxxx
  api_version: v1
  from_name: user@email.com

hipchat:
  profile: hipchat_profile
  room_id: RoomName

alternative.hipchat:
  profile: hipchat_profile
  room_id: RoomName
```

To use the HipChat returner, append `--return hipchat` to the salt command.

```bash
salt '*' test.ping --return hipchat
```

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

```bash
salt '*' test.ping --return hipchat --return_config alternative
```

salt.returners.hipchat_return.event_return(events)
   Return event data to hipchat

salt.returners.hipchat_return.returner(ret)
   Send an hipchat message with the return data from a job

salt.returners.influxdb_return

Return data to an influxdb server.

New in version 2015.8.0.
To enable this returner the minion will need the python client for influxdb installed and the following values configured in the minion or master config, these are the defaults:

```
influxdb.db: 'salt'
influxdb.user: 'salt'
influxdb.password: 'salt'
influxdb.host: 'localhost'
influxdb.port: 8086
```

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

```
alternative.influxdb.db: 'salt'
alternative.influxdb.user: 'salt'
alternative.influxdb.password: 'salt'
alternative.influxdb.host: 'localhost'
alternative.influxdb.port: 6379
```

To use the influxdb returner, append `--return influxdb` to the salt command.

```
salt '*' test.ping --return influxdb
```

To use the alternative configuration, append `--return_config alternative` to the salt command.

```
salt '*' test.ping --return influxdb --return_config alternative
```

```
salt.returners.influxdb_return.get_fun(fun)
    Return a dict of the last function called for all minions

salt.returners.influxdb_return.get_jid(jid)
    Return the information returned when the specified job id was executed

salt.returners.influxdb_return.get_jids()
    Return a list of all job ids

salt.returners.influxdb_return.get_load(jid)
    Return the load data that marks a specified jid

salt.returners.influxdb_return.get_minions()
    Return a list of minions

salt.returners.influxdb_return.prep_jid(nocache=False, passed_jid=None)
    Do any work necessary to prepare a JID, including sending a custom id

salt.returners.influxdb_return.returner(ret)
    Return data to a influxdb data store

salt.returners.influxdb_return.save_load(jid, load)
    Save the load to the specified jid
```

```
salt.returners.kafka_return
```

Return data to a Kafka topic

- maintainer Chris ter Edwards (christer.edwards@gmail.com)
- maturity 0.1
- depends kafka-python
- platform all
To enable this returner install kafka-python and enable the following settings in the minion config:

```python
returner.kafka.hostnames:
    - "server1"
    - "server2"
    - "server3"

returner.kafka.topic: 'topic'
```

To use the kafka returner, append `--return kafka` to the Salt command, eg:

```bash
salt '*' test.ping --return kafka
```

salt.returners.kafka_return

Return information to a Kafka server

salt.returners.local

The local returner is used to test the returner interface, it just prints the return data to the console to verify that it is being passed properly.

To use the local returner, append `--return local` to the salt command. ex:

```bash
salt '*' test.ping --return local
```

salt.returners.local.event_return

Print event return data to the terminal to verify functionality

salt.returners.local.returner

Print the return data to the terminal to verify functionality

salt.returners.local_cache

Return data to local job cache

salt.returners.local_cache.clean_old_jobs()

Clean out the old jobs from the job cache

salt.returners.local_cache.get_endtime(jid)

Retrieve the stored endtime for a given job

Returns False if no endtime is present

salt.returners.local_cache.get_jid(jid)

Return the information returned when the specified job id was executed

salt.returners.local_cache.get_jids()

Return a dict mapping all job ids to job information

salt.returners.local_cache.get_jids_filter(count, filter_find_job=True)

Return a list of all jobs information filtered by the given criteria.

- param int count: show not more than the count of most recent jobs
- param bool filter_find_jobs: filter out `saltutil.find_job` jobs

salt.returners.local_cache.get_load(jid)

Return the load data that marks a specified jid

salt.returners.local_cache.prep_jid(nocache=False, passed_jid=None, recurse_count=0)

Return a job id and prepare the job id directory. This is the function responsible for making sure jids don’t collide (unless its passed a jid.) So do what you have to do to make sure that stays the case
salt.returners.local_cache.returner(load)
    Return data to the local job cache

salt.returners.local_cache.save_load(jid, clear_load)
    Save the load to the specified jid

salt.returners.local_cache.update_endtime(jid, time)
    Update (or store) the end time for a given job
    Endtime is stored as a plain text string

salt.returners.memcache_return

Return data to a memcache server

To enable this returner the minion will need the python client for memcache installed and the following values
configured in the minion or master config, these are the defaults.

<table>
<thead>
<tr>
<th>memcache.host: 'localhost'</th>
</tr>
</thead>
<tbody>
<tr>
<td>memcache.port: '11211'</td>
</tr>
</tbody>
</table>

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative
configuration will be pulled from the default location.

<table>
<thead>
<tr>
<th>alternative.memcache.host: 'localhost'</th>
</tr>
</thead>
<tbody>
<tr>
<td>alternative.memcache.port: '11211'</td>
</tr>
</tbody>
</table>

python2-memcache uses 'localhost' and '11211' as syntax on connection.

To use the memcache returner, append `--return memcache` to the salt command.

```bash
salt '*' test.ping --return memcache
```

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

```bash
salt '*' test.ping --return memcache --return_config alternative
```

salt.returners.memcache_return.get_fun(fun)
    Return a dict of the last function called for all minions

salt.returners.memcache_return.get_jid(jid)
    Return the information returned when the specified job id was executed

salt.returners.memcache_return.get_jids()
    Return a list of all job ids

salt.returners.memcache_return.get_load(jid)
    Return the load data that marks a specified jid

salt.returners.memcache_return.get_minions()
    Return a list of minions

salt.returners.memcache_return.prep_jid(nocache=False, passed_jid=None)
    Do any work necessary to prepare a JID, including sending a custom id

salt.returners.memcache_return.returner(ret)
    Return data to a memcache data store

salt.returners.memcache_return.save_load(jid, load)
    Save the load to the specified jid
salt.returners.mongo_future_return

Return data to a mongodb server

Required python modules: pymongo

This returner will send data from the minions to a MongoDB server. To configure the settings for your MongoDB server, add the following lines to the minion config files:

```
    mongo.db: <database name>
    mongo.host: <server ip address>
    mongo.user: <MongoDB username>
    mongo.password: <MongoDB user password>
    mongo.port: 27017
```

You can also ask for indexes creation on the most common used fields, which should greatly improve performance. Indexes are not created by default.

```
    mongo.indexes: true
```

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

```
    alternative.mongo.db: <database name>
    alternative.mongo.host: <server ip address>
    alternative.mongo.user: <MongoDB username>
    alternative.mongo.password: <MongoDB user password>
    alternative.mongo.port: 27017
```

This mongo returner is being developed to replace the default mongodb returner in the future and should not be considered API stable yet.

To use the mongo returner, append `--return mongo` to the salt command.

```
salt '*' test.ping --return mongo
```

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

```
salt '*' test.ping --return mongo --return_config alternative
```

salt.returners.mongo_future_return.get_fun(fun)

Return the most recent jobs that have executed the named function

salt.returners.mongo_future_return.get_jid(jid)

Return the return information associated with a jid

salt.returners.mongo_future_return.get_jids()

Return a list of jid ids

salt.returners.mongo_future_return.get_load(jid)

Return the load associated with a given job id

salt.returners.mongo_future_return.get_minions()

Return a list of minions

salt.returners.mongo_future_return.prep_jid(nocache=False, passed_jid=None)

Do any work necessary to prepare a JID, including sending a custom id

salt.returners.mongo_future_return.returner(ret)

Return data to a mongodb server
salt.returners.mongo_future_return.save_load(jid, load)
Save the load for a given job id

salt.returners.mongo_return

Return data to a mongodb server
Required python modules: pymongo
This returner will send data from the minions to a MongoDB server. To configure the settings for your MongoDB server, add the following lines to the minion config files.

mongo.db: <database name>
mongo.host: <server ip address>
mongo.user: <MongoDB username>
mongo.password: <MongoDB user password>
mongo.port: 27017

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location.

alternative.mongo.db: <database name>
alternative.mongo.host: <server ip address>
alternative.mongo.user: <MongoDB username>
alternative.mongo.password: <MongoDB user password>
alternative.mongo.port: 27017

To use the mongo returner, append `--return mongo` to the salt command.

salt '*' test.ping --return mongo_return

To use the alternative configuration, append `--return_config alternative` to the salt command.
New in version 2015.5.0.
salt '*' test.ping --return mongo_return --return_config alternative

salt.returners.mongo_return.get_fun(fun)
Return the most recent jobs that have executed the named function

salt.returners.mongo_return.get_jid(jid)
Return the return information associated with a jid

salt.returners.mongo_return.prep_jid(nocache=False, passed_jid=None)
Do any work necessary to prepare a JID, including sending a custom id

salt.returners.mongo_return.returner(ret)
Return data to a mongodb server

salt.returners.multi_returner

Read/Write multiple returners

salt.returners.multi_returner.clean_old_jobs()
Clean out the old jobs from all returners (if you have it)
salt.returners.multi_returner.get_jid(jid)
Merge the return data from all returners
salt.returners.multi_returner.get_jids()
    Return all job data from all returners

salt.returners.multi_returner.get_load(jid)
    Merge the load data from all returners

salt.returners.multi_returner.prep_jid(nocache=False, passed_jid=None)
    Call both with prep_jid on all returners in multi_returner
    TODO: finish this, what do do when you get different jids from 2 returners... since our jids are time based, this
    make this problem hard, because they aren't unique, meaning that we have to make sure that no one else got
    the jid and if they did we spin to get a new one, which means ``locking`` the jid in 2 returners is non-trivial

salt.returners.multi_returner.returner(load)
    Write return to all returners in multi_returner

salt.returners.multi_returner.save_load(jid, clear_load)
    Write load to all returners in multi_returner

salt.returners.mysql

Return data to a mysql server

    maintainer  Dave Boucha <dave@saltstack.com>, Seth House <shouse@saltstack.com>
    maturity    new
    depends     python-mysqldb
    platform    all

To enable this returner, the minion will need the python client for mysql installed and the following values configured
in the minion or master config. These are the defaults:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mysql.host</td>
<td>'salt'</td>
</tr>
<tr>
<td>mysql.user</td>
<td>'salt'</td>
</tr>
<tr>
<td>mysql.pass</td>
<td>'salt'</td>
</tr>
<tr>
<td>mysql.db</td>
<td>'salt'</td>
</tr>
<tr>
<td>mysql.port</td>
<td>3306</td>
</tr>
</tbody>
</table>

SSL is optional. The defaults are set to None. If you do not want to use SSL, either exclude these options or set them
to None.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>mysql.ssl_ca</td>
<td>None</td>
</tr>
<tr>
<td>mysql.ssl_cert</td>
<td>None</td>
</tr>
<tr>
<td>mysql.ssl_key</td>
<td>None</td>
</tr>
</tbody>
</table>

Alternative configuration values can be used by prefacing the configuration with `alternative`. Any values not found in
the alternative configuration will be pulled from the default location. As stated above, SSL configuration is optional.
The following ssl options are simply for illustration purposes:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>alternative.mysql.host</td>
<td>'salt'</td>
</tr>
<tr>
<td>alternative.mysql.user</td>
<td>'salt'</td>
</tr>
<tr>
<td>alternative.mysql.pass</td>
<td>'salt'</td>
</tr>
<tr>
<td>alternative.mysql.db</td>
<td>'salt'</td>
</tr>
<tr>
<td>alternative.mysql.port</td>
<td>3306</td>
</tr>
<tr>
<td>alternative.mysql.ssl_ca</td>
<td>'/etc/pki/mysql/certs/localhost.pem'</td>
</tr>
<tr>
<td>alternative.mysql.ssl_cert</td>
<td>'/etc/pki/mysql/certs/localhost.crt'</td>
</tr>
<tr>
<td>alternative.mysql.ssl_key</td>
<td>'/etc/pki/mysql/certs/localhost.key'</td>
</tr>
</tbody>
</table>
Use the following mysql database schema:

```
CREATE DATABASE `salt`
    DEFAULT CHARACTER SET utf8
    DEFAULT COLLATE utf8_general_ci;

USE `salt`;

-- Table structure for table `jids`
--

DROP TABLE IF EXISTS `jids`;
CREATE TABLE `jids` (  
jid varchar(255) NOT NULL,  
load mediumtext NOT NULL,  
UNIQUE KEY `jid` (`jid`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
CREATE INDEX jid ON jids(jid) USING BTREE;

-- Table structure for table `salt_returns`
--

DROP TABLE IF EXISTS `salt_returns`;
CREATE TABLE `salt_returns` (  
fun varchar(50) NOT NULL,  
jid varchar(255) NOT NULL,  
return mediumtext NOT NULL,  
id varchar(255) NOT NULL,  
success varchar(10) NOT NULL,  
full_ret mediumtext NOT NULL,  
alter_time TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
KEY `id` (`id`),  
KEY `jid` (`jid`),  
KEY `fun` (`fun`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;

-- Table structure for table `salt_events`
--

DROP TABLE IF EXISTS `salt_events`;
CREATE TABLE `salt_events` (  
id BIGINT NOT NULL AUTO_INCREMENT,  
tag varchar(255) NOT NULL,  
data varchar(1024) NOT NULL,  
alter_time TIMESTAMP DEFAULT CURRENT_TIMESTAMP,  
master_id varchar(255) NOT NULL,  
PRIMARY KEY (`id`),  
KEY `tag` (`tag`)  
) ENGINE=InnoDB DEFAULT CHARSET=utf8;
```

Required python modules: MySQLdb

To use the mysql returner, append `--return mysql` to the salt command.

```
salt '*' test.ping --return mysql
```

To use the alternative configuration, append `--return_config alternative` to the salt command.
New in version 2015.5.0.

```
salt '*' test.ping --return mysql --return_config alternative
```

```
salt.returners.mysql.event_return(events)
    Return event to mysql server
    Requires that configuration be enabled via `event_return' option in master config.
```

```
salt.returners.mysql.get_fun(fun)
    Return a dict of the last function called for all minions
```

```
salt.returners.mysql.get_jid(jid)
    Return the information returned when the specified job id was executed
```

```
salt.returners.mysql.get_jids()
    Return a list of all job ids
```

```
salt.returners.mysql.get_jids_filter(count, filter_find_job=True)
    Return a list of all job ids :param int count: show not more than the count of most recent jobs :param bool filter_find_jobs: filter out `saltutil.find_job' jobs
```

```
salt.returners.mysql.get_load(jid)
    Return the load data that marks a specified jid
```

```
salt.returners.mysql.get_minions()
    Return a list of minions
```

```
salt.returners.mysql.prep_jid(nocache=False, passed_jid=None)
    Do any work necessary to prepare a JID, including sending a custom id
```

```
salt.returners.mysql.returner(ret)
    Return data to a mysql server
```

```
salt.returners.mysql.save_load(jid, load)
    Save the load to the specified jid id
```

```
salt.returners.nagios_return
```

Return salt data to Nagios

The following fields can be set in the minion conf file:

```
nagios.url (required)
nagios.token (required)
nagios.service (optional)
nagios.check_type (optional)
```

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

```
nagios.url
nagios.token
nagios.service
```

Nagios settings may also be configured as:

```
nagios:
    url: http://localhost/nrdp
    token: r4nd0mt0k3n
    service: service-check
```
alternative.nagios:
  url: http://localhost/nrdp
  token: r4nd0mt0k3n
  service: another-service-check

To use the Nagios returner, append ' --return nagios' to the salt command. ex:

```bash
.. code-block:: bash
  salt '*' test.ping --return nagios
```

To use the alternative configuration, append ' --return_config alternative' to the salt command. ex:

```bash
  salt '*' test.ping --return nagios --return_config alternative
```

salt.returners.nagios_return.**returner**(ret)

Send a message to Nagios with the data

**salt.returners.odbc**

Return data to an ODBC compliant server. This driver was developed with Microsoft SQL Server in mind, but theoretically could be used to return data to any compliant ODBC database as long as there is a working ODBC driver for it on your minion platform.

**maintainer**

3. (a) Oldham (cr@saltstack.com)

**maturity** New

**depends** unixodbc, pyodbc, freetds (for SQL Server)

**platform** all

To enable this returner the minion will need

On Linux:


On Windows:

TBD

unixODBC and FreeTDS need to be configured via /etc/odbcinst.ini and /etc/odbc.ini.

/etc/odbcinst.ini:

```
[TDS]
Description=TDS
Driver=/usr/lib/x86_64-linux-gnu/odbc/libtdsodbc.so
```

(Note the above Driver line needs to point to the location of the FreeTDS shared library. This example is for Ubuntu 14.04.)

/etc/odbc.ini:

```
[TS]
Description = "Salt Returner"
Driver=TDS
```

31.23. **Returners**
Server = <your server ip or fqdn>
Port = 1433
Database = salt
Trace = No

Also you need the following values configured in the minion or master config. Configure as you see fit:

returner.odbc.dsn: 'TS'
returner.odbc.user: 'salt'
returner.odbc.passwd: 'salt'

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

alternative.returner.odbc.dsn: 'TS'
alternative.returner.odbc.user: 'salt'
alternative.returner.odbc.passwd: 'salt'

Running the following commands against Microsoft SQL Server in the desired database as the appropriate user should create the database tables correctly. Replace with equivalent SQL for other ODBC-compliant servers

```sql
--
-- Table structure for table 'jids'
--

if OBJECT_ID('dbo.jids', 'U') IS NOT NULL
    DROP TABLE dbo.jids

CREATE TABLE dbo.jids (    jid varchar(255) PRIMARY KEY,    load varchar(MAX) NOT NULL)
;

--
-- Table structure for table 'salt_returns'
--

IF OBJECT_ID('dbo.salt_returns', 'U') IS NOT NULL
    DROP TABLE dbo.salt_returns;

CREATE TABLE dbo.salt_returns (    added datetime not null default (getdate()),    fun varchar(100) NOT NULL,    jid varchar(255) NOT NULL,    retval varchar(MAX) NOT NULL,    id varchar(255) NOT NULL,    success bit default(0) NOT NULL,    full_ret varchar(MAX)
);

CREATE INDEX salt_returns_added on dbo.salt_returns(added);
CREATE INDEX salt_returns_id on dbo.salt_returns(id);
CREATE INDEX salt_returns_jid on dbo.salt_returns(jid);
CREATE INDEX salt_returns_fun on dbo.salt_returns(fun);

To use this returner, append '--return odbc' to the salt command.

.. code-block:: bash

    salt '*' status.diskusage --return odbc
To use the alternative configuration, append `--return_config alternative` to the salt command.

.. versionadded:: 2015.5.0

.. code-block:: bash

    salt '*' test.ping --return odbc --return_config alternative

salt.returners.odbc.get_fun(fun)
    Return a dict of the last function called for all minions

salt.returners.odbc.get_jid(jid)
    Return the information returned when the specified job id was executed

salt.returners.odbc.get_jids()
    Return a list of all job ids

salt.returners.odbc.get_load(jid)
    Return the load data that marks a specified jid

salt.returners.odbc.get_minions()
    Return a list of minions

salt.returners.odbc.prep_jid(nocache=False, passed_jid=None)
    Do any work necessary to prepare a JID, including sending a custom id

salt.returners.odbc.returner(ret)
    Return data to an odbc server

salt.returners.odbc.save_load(jid, load)
    Save the load to the specified jid id

salt.returners.pgjsonb

Return data to a PostgreSQL server with json data stored in Pg's jsonb data type

maintainer  Dave Boucha <dave@saltstack.com>, Seth House <shouse@saltstack.com>, C. R. Oldham <cr@saltstack.com>

maturity  new

depends  python-psycopg2

platform  all

To enable this returner, the minion will need the python client for PostgreSQL installed and the following values configured in the minion or master config. These are the defaults:

returner.pgjsonb.host: 'salt'
returner.pgjsonb.user: 'salt'
returner.pgjsonb.pass: 'salt'
returner.pgjsonb.db: 'salt'
returner.pgjsonb.port: 5432

SSL is optional. The defaults are set to None. If you do not want to use SSL, either exclude these options or set them to None.

returner.pgjsonb.ssl_ca: None
returner.pgjsonb.ssl_cert: None
returner.pgjsonb.ssl_key: None
Alternative configuration values can be used by prefacing the configuration with `alternative`. Any values not found in the alternative configuration will be pulled from the default location. As stated above, SSL configuration is optional.

The following SSL options are simply for illustration purposes:

```plaintext
alternative.pgjsonb.host: 'salt'
alternative.pgjsonb.user: 'salt'
alternative.pgjsonb.pass: 'salt'
alternative.pgjsonb.db: 'salt'
alternative.pgjsonb.port: 5432
alternative.pgjsonb.ssl_ca: '/etc/pki/mysql/certs/localhost.pem'
alternative.pgjsonb.ssl_cert: '/etc/pki/mysql/certs/localhost.crt'
alternative.pgjsonb.ssl_key: '/etc/pki/mysql/certs/localhost.key'
```

Use the following Pg database schema:

```sql
CREATE DATABASE salt
    WITH ENCODING 'utf-8';

-- Table structure for table `jids`
--
DROP TABLE IF EXISTS jids;
CREATE OR REPLACE TABLE jids (  jid varchar(255) NOT NULL primary key
    load jsonb NOT NULL
);
CREATE INDEX idx_jids_jsonb on jids
    USING gin (load)
    WITH (fastupdate=on);

-- Table structure for table `salt_returns`
--
DROP TABLE IF EXISTS salt_returns;
CREATE TABLE salt_returns (  fun varchar(50) NOT NULL,
    jid varchar(255) NOT NULL,
    return jsonb NOT NULL,
    id varchar(255) NOT NULL,
    success varchar(10) NOT NULL,
    full_ret jsonb NOT NULL,
    alter_time TIMESTAMP WITH TIME ZONE DEFAULT NOW()));
CREATE INDEX idx_salt_returns_id ON salt_returns (id);
CREATE INDEX idx_salt_returns_jid ON salt_returns (jid);
CREATE INDEX idx_salt_returns_fun ON salt_returns (fun);
CREATE INDEX idx_salt_returns_return ON salt_returns
    USING gin (return) with (fastupdate=on);
CREATE INDEX idx_salt_returns_full_ret ON salt_returns
    USING gin (full_ret) with (fastupdate=on);

-- Table structure for table `salt_events`
--
DROP TABLE IF EXISTS salt_events;
DROP SEQUENCE IF EXISTS seq_salt_events_id;
CREATE SEQUENCE seq_salt_events_id;
```
CREATE TABLE salt_events (  
id BIGINT NOT NULL UNIQUE DEFAULT nextval('seq_salt_events_id'),  
tag varchar(255) NOT NULL,  
data jsonb NOT NULL,  
alter_time TIMESTAMPTZ WITH TIME ZONE DEFAULT NOW(),  
master_id varchar(255) NOT NULL);

CREATE INDEX idx_salt_events_tag on salt_events (tag);
CREATE INDEX idx_salt_events_data ON salt_events  
USING gin (data) with (fastupdate=on);

Required python modules: Psycopg2

To use this returner, append `--return pgjsonb` to the salt command.

salt '*' test.ping --return pgjsonb

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

salt '*' test.ping --return pgjsonb --return_config alternative

salt.returners.pgjsonb.event_return(events)  
Return event to Pg server

  Requires that configuration be enabled via `event_return` option in master config.

salt.returners.pgjsonb.get_fun(fun)  
Return a dict of the last function called for all minions

salt.returners.pgjsonb.get_jid(jid)  
Return the information returned when the specified job id was executed

salt.returners.pgjsonb.get_jids()  
Return a list of all job ids

salt.returners.pgjsonb.get_load(jid)  
Return the load data that marks a specified jid

salt.returners.pgjsonb.get_minions()  
Return a list of minions

salt.returners.pgjsonb.prep_jid(nocache=False, passed_jid=None)  
Do any work necessary to prepare a JID, including sending a custom id

salt.returners.pgjsonb.returner(ret)  
Return data to a Pg server

salt.returners.pgjsonb.save_load(jid, load)  
Save the load to the specified jid id

salt.returners.postgres

Return data to a postgresql server

  maintainer None
  maturity New
  depends psycopg2
platform all

To enable this returner the minion will need the psycopg2 installed and the following values configured in the minion or master config:

```python
returner.postgres.host: 'salt'
returner.postgres.user: 'salt'
returner.postgrespasswd: 'salt'
returner.postgres.db: 'salt'
returner.postgres.port: 5432
```

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

```python
alternative.returner.postgres.host: 'salt'
alternative.returner.postgres.user: 'salt'
alternative.returner.postgrespasswd: 'salt'
alternative.returner.postgres.db: 'salt'
alternative.returner.postgres.port: 5432
```

Running the following commands as the postgres user should create the database correctly:

```
psql << EOF
CREATE ROLE salt WITH PASSWORD 'salt';
CREATE DATABASE salt WITH OWNER salt;
EOF

psql -h localhost -U salt << EOF
--
-- Table structure for table 'jids'
--

DROP TABLE IF EXISTS jids;
CREATE TABLE jids (jid varchar(20) PRIMARY KEY, load text NOT NULL);
--
-- Table structure for table 'salt_returns'
--

DROP TABLE IF EXISTS salt_returns;
CREATE TABLE salt_returns (added TIMESTAMP WITH TIME ZONE DEFAULT now(), fun text NOT NULL, jid varchar(20) NOT NULL, return text NOT NULL, id text NOT NULL, success boolean);
CREATE INDEX ON salt_returns (added);
CREATE INDEX ON salt_returns (id);
CREATE INDEX ON salt_returns (jid);
CREATE INDEX ON salt_returns (fun);
EOF
```

Required python modules: psycopg2

To use the postgres returner, append `--return postgres` to the salt command.
salt '*' test.ping --return postgres

To use the alternative configuration, append `--return_config alternative' to the salt command.

New in version 2015.5.0.

```
salt '*' test.ping --return postgres --return_config alternative
```

```
salt.returners.postgres.get_fun(fun)
   Return a dict of the last function called for all minions

salt.returners.postgres.get_jid(jid)
   Return the information returned when the specified job id was executed

salt.returners.postgres.get_jids()
   Return a list of all job ids

salt.returners.postgres.get_load(jid)
   Return the load data that marks a specified jid

salt.returners.postgres.get_minions()
   Return a list of minions

salt.returners.postgres.prep_jid(nocache=False, passed_jid=None)
   Do any work necessary to prepare a JID, including sending a custom id

salt.returners.postgres.returner(ret)
   Return data to a postgres server

salt.returners.postgres.save_load(jid, load)
   Save the load to the specified jid id
```

```
salt.returners.postgres_local_cache
```

Use a postgresql server for the master job cache. This helps the job cache to cope with scale.

```
maintainer  gjredelinghuys@gmail.com
maturity    New
depends     psycopg2
platform    all
```

To enable this returner the minion will need the psycopg2 installed and the following values configured in the master config:

```
master_job_cache: postgres_local_cache
master_job_cache.postgres.host: 'salt'
master_job_cache.postgres.user: 'salt'
master_job_cache.postgres.passwd: 'salt'
master_job_cache.postgres.db: 'salt'
master_job_cache.postgres.port: 5432
```

Running the following command as the postgres user should create the database correctly:

```
psql << EOF
CREATE ROLE salt WITH PASSWORD 'salt';
CREATE DATABASE salt WITH OWNER salt;
EOF
```
and then:

```bash
psql -h localhost -U salt << EOF
```

```sql
-- Table structure for table 'jids'
```

```sql
DROP TABLE IF EXISTS jids;
CREATE TABLE jids (
  jid       varchar(20) PRIMARY KEY,
  started    TIMESTAMP WITH TIME ZONE DEFAULT now(),
  tgt_type   text NOT NULL,
  cmd        text NOT NULL,
  tgt        text NOT NULL,
  kwargs     text NOT NULL,
  ret        text NOT NULL,
  username   text NOT NULL,
  arg        text NOT NULL,
  fun        text NOT NULL
);

-- Table structure for table 'salt_returns'
```

```sql
DROP TABLE IF EXISTS salt_returns;
CREATE TABLE salt_returns (
  added    TIMESTAMP WITH TIME ZONE DEFAULT now(),
  fun       text NOT NULL,
  jid       varchar(20) NOT NULL,
  return    text NOT NULL,
  id        text NOT NULL,
  success   boolean
);
CREATE INDEX ON salt_returns (added);
CREATE INDEX ON salt_returns (id);
CREATE INDEX ON salt_returns (jid);
CREATE INDEX ON salt_returns (fun);
```

EOF

Required python modules: psycopg2

```python
salt.returners.postgres_local_cache.clean_old_jobs()
```

Clean out the old jobs from the job cache

```python
salt.returners.postgres_local_cache.get_jid(jid)
```

Return the information returned when the specified job id was executed

```python
salt.returners.postgres_local_cache.get_jids()
```

Return a list of all job ids. For master job cache this also formats the output and returns a string

```python
salt.returners.postgres_local_cache.get_load(jid)
```

Return the load data that marks a specified jid

```python
salt.returners.postgres_local_cache.prep_jid(nocache=False, passed_jid=None)
```

Return a job id and prepare the job id directory. This is the function responsible for making sure jids don't collide (unless its passed a jid). So do what you have to do to make sure that stays the case

```python
salt.returners.postgres_local_cache.returner(load)
```

Return data to a postgres server
salt.returners.postgres_local_cache.save_load(jid, clear_load)

Save the load to the specified jid id

salt.returners.pushover_returner

Return salt data via pushover (http://www.pushover.net)

New in version Boron.

The following fields can be set in the minion conf file:

```
pushover.user (required)
pushover.token (required)
pushover.title (optional)
pushover.device (optional)
pushover.priority (optional)
pushover.expire (optional)
pushover.retry (optional)
pushover.profile (optional)
```

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

```
alternative.pushover.user
alternative.pushover.token
alternative.pushover.title
alternative.pushover.device
alternative.pushover.priority
alternative.pushover.expire
alternative.pushover.retry
```

PushOver settings may also be configured as:

```
pusher:
  user: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  token: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  title: Salt Returner
  device: phone
  priority: -1
  expire: 3600
  retry: 5

alternative.pushover:
  user: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  token: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  title: Salt Returner
  device: phone
  priority: 1
  expire: 4800
  retry: 2

pushover_profile:
  token: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

pushover:
  user: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  profile: pushover_profile
```
alternative.pushover:
  user: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
  profile: pushover_profile

To use the PushOver returner, append `--return pushover` to the salt command. ex:
.. code-block:: bash
   
salt '*' test.ping --return pushover

To use the alternative configuration, append `--return_config alternative` to the salt command. ex:
   
salt '*' test.ping --return pushover --return_config alternative

salt.returners.pushover_returner.returner(ret)
  Send an PushOver message with the data

salt.returners.redis_return

Return data to a redis server

To enable this returner the minion will need the python client for redis installed and the following values configured in the minion or master config, these are the defaults:

redis.db: '0'
redis.host: 'salt'
redis.port: 6379

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

alternative.redis.db: '0'
alternative.redis.host: 'salt'
alternative.redis.port: 6379

To use the redis returner, append `--return redis` to the salt command.

salt '*' test.ping --return redis

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

salt '*' test.ping --return redis --return_config alternative

salt.returners.redis_return.get_fun(fun)
  Return a dict of the last function called for all minions

salt.returners.redis_return.get_jid(jid)
  Return the information returned when the specified job id was executed

salt.returners.redis_return.get_jids()
  Return a list of all job ids

salt.returners.redis_return.get_load(jid)
  Return the load data that marks a specified jid

salt.returners.redis_return.get_minions()
  Return a list of minions
salt.returners.redis_return.prep_jid(nocache=False, passed_jid=None)
Do any work necessary to prepare a JID, including sending a custom id

salt.returners.redis_return.returner(ret)
Return data to a redis data store

salt.returners.redis_return.save_load(jid, load)
Save the load to the specified jid

class salt.returners.sentry_return

Salt returner that report execution results back to sentry. The returner will inspect the payload to identify errors and flag them as such.

Pillar needs something like:
raven:
    servers:
    - http://192.168.1.1
    - https://sentry.example.com
    public_key: deadbeefdeadbeefdeadbeefdeadbeef
    secret_key: beefdeadbeefdeadbeefdeadbeefdeadbeefdead
    project: 1
    tags:
    - os
    - master
    - saltversion
    - cpuarch

and https://pypi.python.org/pypi/raven installed

The tags list (optional) specifies grains items that will be used as sentry tags, allowing tagging of events in the sentry UI.

salt.returners.sentry_return.prep_jid(nocache=False, passed_jid=None)
Do any work necessary to prepare a JID, including sending a custom id

salt.returners.sentry_return.returner(ret)
Log outcome to sentry. The returner tries to identify errors and report them as such. All other messages will be reported at info level.

class salt.returners.slack_returner

Return salt data via slack

New in version 2015.5.0.

The following fields can be set in the minion conf file:

slack.channel (required)
slack.api_key (required)
slack.username (required)
slack.as_user (required to see the profile picture of your bot)
slack.profile (optional)

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:
Slack settings may also be configured as:

```python
slack:
    channel: RoomName
    api_key: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    username: user
    as_user: true

alternative.slack:
    room_id: RoomName
    api_key: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    from_name: user@email.com

slack_profile:
    api_key: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    from_name: user@email.com

slack:
    profile: slack_profile
    channel: RoomName

alternative.slack:
    profile: slack_profile
    channel: RoomName
```

To use the Slack returner, append `--return slack` to the salt command.

```bash
salt '*' test.ping --return slack
```

To use the alternative configuration, append `--return_config alternative` to the salt command.

```bash
salt '*' test.ping --return slack --return_config alternative
```

`salt.returners.slack_returner.returner(ret)`

Send an slack message with the data

`salt.returners.sms_return`

Return data by SMS.

New in version 2015.5.0.

- **maintainer**  Damian Myerscough
- **maturity**  new
- **depends**  twilio
- **platform**  all

To enable this returner the minion will need the python twilio library installed and the following values configured in the minion or master config:
twilio.sid: 'XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX'
twilio.token: 'XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX'
twilio.to: '+1415XXXXXXX'
twilio.from: '+1650XXXXXXX'

To use the sms returner, append `--return sms` to the salt command.

```shell
salt '*' test.ping --return sms
```

```python
salt.returners.sms_return.returner(ret)

Return a response in an SMS message
```

```python
salt.returners.smtp_return

Return salt data via email
```

The following fields can be set in the minion conf file:

- smtp.from (required)
- smtp.to (required)
- smtp.host (required)
- smtp.port (optional, defaults to 25)
- smtp.username (optional)
- smtp.password (optional)
- smtp.tls (optional, defaults to False)
- smtp.subject (optional, but helpful)
- smtp.gpgowner (optional)
- smtp.fields (optional)
- smtp.template (optional)
- smtp.renderer (optional)

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

```python
alternative.smtp.from
alternative.smtp.to
alternative.smtp.host
alternative.smtp.port
alternative.smtp.username
alternative.smtp.password
alternative.smtp.tls
alternative.smtp.subject
alternative.smtp.gpgowner
alternative.smtp.fields
alternative.smtp.template
alternative.smtp.renderer
```

There are a few things to keep in mind:

- If a username is used, a password is also required. It is recommended (but not required) to use the TLS setting when authenticating.
- You should at least declare a subject, but you don’t have to.
- The use of encryption, i.e. setting gpgowner in your settings, requires python-gnupg to be installed.
- The field gpgowner specifies a user’s ~/.gpg directory. This must contain a gpg public key matching the address the mail is sent to. If left unset, no encryption will be used.
Smtp Documentation, Release 2015.8.0

- smtp.fields lets you include the value(s) of various fields in the subject line of the email. These are comma-delimited. For instance:

```bash
smtp.fields: id,fun
```

...will display the id of the minion and the name of the function in the subject line. You may also use `jid` (the job id), but it is generally recommended not to use `return`, which contains the entire return data structure (which can be very large). Also note that the subject is always unencrypted.

To use the SMTP returner, append `--return smtp` to the salt command.

```bash
salt '*' test.ping --return smtp
```

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

```bash
salt '*' test.ping --return smtp --return_config alternative
```

salt.returners.smtp_return.prep_jid(nocache=False, passed_jid=None)
Do any work necessary to prepare a JID, including sending a custom id

salt.returners.smtp_return.returner(ret)
Send an email with the data

salt.returners.sqlite3

Insert minion return data into a sqlite3 database

 maintainer Mickey Malone <mickey.malone@gmail.com>
maturity New
depends None
platform All

SQLite is a serverless database that lives in a single file. In order to use this returner the database file must exist, have the appropriate schema defined, and be accessible to the user whom the minion process is running as. This returner requires the following values configured in the master or minion config:

```bash
returner.sqlite3.database: /usr/lib/salt/salt.db
returner.sqlite3.timeout: 5.0
```

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

```bash
alternative.returner.sqlite3.database: /usr/lib/salt/salt.db
alternative.returner.sqlite3.timeout: 5.0
```

Use the commands to create the sqlite3 database and tables:

```bash
sqlite3 /usr/lib/salt/salt.db << EOF
CREATE TABLE jids (   jid TEXT PRIMARY KEY,   load TEXT NOT NULL
```

1522 Chapter 31. Reference
```sql
CREATE TABLE salt_returns (
    fun TEXT KEY,
    jid TEXT KEY,
    id TEXT KEY,
    fun_args TEXT,
    date TEXT NOT NULL,
    full_ret TEXT NOT NULL,
    success TEXT NOT NULL
);
EOF
```

To use the sqlite returner, append `--return sqlite3` to the salt command.

```
salt '*' test.ping --return sqlite3
```

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

```
salt '*' test.ping --return sqlite3 --return_config alternative
```

```
salt.returners.sqlite3_return.get_fun(fun)
    Return a dict of the last function called for all minions

salt.returners.sqlite3_return.get_jid(jid)
    Return the information returned from a specified jid

salt.returners.sqlite3_return.get_jids()
    Return a list of all job ids

salt.returners.sqlite3_return.get_load(jid)
    Return the load from a specified jid

salt.returners.sqlite3_return.get_minions()
    Return a list of minions

salt.returners.sqlite3_return.prep_jid(nocache=False, passed_jid=None)
    Do any work necessary to prepare a JID, including sending a custom id

salt.returners.sqlite3_return.returner(ret)
    Insert minion return data into the sqlite3 database

salt.returners.sqlite3_return.save_load(jid, load)
    Save the load to the specified jid

salt.returners.syslog_return

Return data to the host operating system's syslog facility

Required python modules: syslog, json

The syslog returner simply reuses the operating system's syslog facility to log return data

To use the syslog returner, append `--return syslog` to the salt command.
"salt '*' test.ping --return syslog"

**Note:** Syslog server implementations may have limits on the maximum record size received by the client. This may lead to job return data being truncated in the syslog server's logs. For example, for rsyslog on RHEL-based systems, the default maximum record size is approximately 2KB (which return data can easily exceed). This is configurable in rsyslog.conf via the $MaxMessageSize config parameter. Please consult your syslog implementation's documentation to determine how to adjust this limit.

```python
salt.returners.syslog_return.prep_jid(nocache=False, passed_jid=None)
```

Do any work necessary to prepare a JID, including sending a custom id

```python
salt.returners.syslog_return.returner(ret)
```

Return data to the local syslog

**salt.returners.xmpp_return**

Return salt data via xmpp

The following fields can be set in the minion conf file:

- `xmpp.jid` (required)
- `xmpp.password` (required)
- `xmpp.recipient` (required)
- `xmpp.profile` (optional)

Alternative configuration values can be used by prefacing the configuration. Any values not found in the alternative configuration will be pulled from the default location:

- `xmpp.jid`
- `xmpp.password`
- `xmpp.recipient`
- `xmpp.profile`

XMPP settings may also be configured as:

```python
xmpp:
  jid: user@xmpp.domain.com/resource
  password: password
  recipient: user@xmpp.example.com
```

```python
alternative.xmpp:
  jid: user@xmpp.domain.com/resource
  password: password
  recipient: someone@xmpp.example.com
```

```python
xmpp_profile:
  jid: user@xmpp.domain.com/resource
  password: password
```

```python
xmpp:
  profile: xmpp_profile
  recipient: user@xmpp.example.com
```

```python
alternative.xmpp:
  profile: xmpp_profile
  recipient: someone-else@xmpp.example.com
```
To use the XMPP returner, append `--return xmpp` to the salt command.

```bash
salt '*' test.ping --return xmpp
```

To use the alternative configuration, append `--return_config alternative` to the salt command.

New in version 2015.5.0.

```bash
salt '*' test.ping --return xmpp --return_config alternative
```

class `salt.returners.xmpp_return`.SendMsgBot(jid, password, recipient, msg)

```python
start(event)
```

class `salt.returners.xmpp_return`.returner(ret)

Send an xmpp message with the data

### 31.24 Full list of builtin roster modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ansible</td>
<td>Read in an Ansible inventory file or script</td>
</tr>
<tr>
<td>cache</td>
<td>Use the minion cache on the master to derive IP addresses based on minion ID.</td>
</tr>
<tr>
<td>cloud</td>
<td>Use the cloud cache on the master to derive IPv4 addresses based on minion ID.</td>
</tr>
<tr>
<td>clustershell</td>
<td>This roster resolves hostname in a pdsh/clustershell style.</td>
</tr>
<tr>
<td>flat</td>
<td>Read in the roster from a flat file using the renderer system</td>
</tr>
<tr>
<td>scan</td>
<td>Scan a netmask or ipaddr for open ssh ports</td>
</tr>
</tbody>
</table>

#### 31.24.1 salt.roster.ansible

Read in an Ansible inventory file or script

Flat inventory files should be in the regular ansible inventory format.

```
[servers]
salt.gtmanfred.com ansible_ssh_user=gtmanfred ansible_ssh_host=127.0.0.1 ansible_ssh_port=22 ansible_ssh_pass='password'

[desktop]
home ansible_ssh_user=gtmanfred ansible_ssh_host=12.34.56.78 ansible_ssh_port=23 ansible_ssh_pass='password'

[computers:children]
desktop
servers

[names:vars]
http_port=80
```

then salt-ssh can be used to hit any of them

```
[~]# salt-ssh all test.ping
salt.gtmanfred.com: True
desktop: True
home: True

[~]# salt-ssh desktop test.ping
home: True
```

31.24. Full list of builtin roster modules
There is also the option of specifying a dynamic inventory, and generating it on the fly

```bash
#!/bin/bash
echo '{
  "servers": {
    "hosts": [
      "salt.gtmanfred.com"
    ],
  },
  "desktop": {
    "hosts": [
      "home"
    ],
  },
  "computers": {
    "hosts":{},
    "children": [
      "desktop",
      "servers"
    ],
  },
  "_meta": {
    "hostvars": {
      "salt.gtmanfred.com": {
        "ansible_ssh_user": "gtmanfred",
        "ansible_ssh_host": "127.0.0.1",
        "ansible_sudo_pass": "password",
        "ansible_ssh_port": 22
      },
      "home": {
        "ansible_ssh_user": "gtmanfred",
        "ansible_ssh_host": "12.34.56.78",
        "ansible_sudo_pass": "password",
        "ansible_ssh_port": 23
      }
    }
  }
}'
```

This is the format that an inventory script needs to output to work with ansible, and thus here.

Any of the [groups] or direct hostnames will return. The `all' is special, and returns everything.

```python
class salt.roster.ansible.Inventory(tgt, tgt_type='glob', inventory_file='/etc/salt/roster')
    Matcher for static inventory files
class salt.roster.ansible.Script(tgt, tgt_type='glob', inventory_file='/etc/salt/roster')
```
Matcher for Inventory scripts

class salt.roster.ansible.Target

    get_glob()
    Return minions that match via glob

targets()
    Execute the correct tgt_type routine and return

salt.roster.ansible.targets(tgt, tgt_type='glob', **kwargs)
    Return the targets from the ansible inventory file Default: /etc/salt/roster

31.24.2 salt.roster.cache

Use the minion cache on the master to derive IP addresses based on minion ID.
Currently only contains logic to return an IPv4 address; does not handle IPv6, or authentication (passwords, keys, etc).

It is possible to configure this roster to prefer a particular type of IP over another. To configure the order, set the roster_order in the master config file. The default for this is:

    roster_order:
    - public
    - private
    - local

    salt.roster.cache.extract_ipv4(roster_order, ipv4)
    Extract the preferred IP address from the ipv4 grain

    salt.roster.cache.targets(tgt, tgt_type='glob', **kwargs)
    Return the targets from the flat yaml file, checks opts for location but defaults to /etc/salt/roster

31.24.3 salt.roster.cloud

Use the cloud cache on the master to derive IPv4 addresses based on minion ID.

This roster requires that the minion in question was created using at least the 2015.5.0 version of Salt Cloud. Starting with the 2015.5.0 release, Salt Cloud maintains an index of minions that it creates and deletes. This index tracks the provider and profile configuration used to provision the minion, including authentication information. So long as this configuration remains current, it can be used by Salt SSH to log into any minion in the index.

    salt.roster.cloud.extract_ipv4(roster_order, ipv4)
    Extract the preferred IP address from the ipv4 grain

    salt.roster.cloud.targets(tgt, tgt_type='glob', **kwargs)
    Return the targets from the flat yaml file, checks opts for location but defaults to /etc/salt/roster

31.24.4 salt.roster.clustershell

This roster resolves hostname in a pdsh/clustershell style.

    depends clustershell, https://github.com/cea-hpc/clustershell

When you want to use host globs for target matching, use --roster clustershell. For example:
salt-ssh --roster clustershell 'server_[1-10,21-30],test_server[5,7,9]' test.ping

salt.roster.clustershell.targets(tgt, tgt_type='glob', **kwargs)
    Return the targets

31.24.5 salt.roster.flat

Read from the roster file using the renderers system

class salt.roster.flat.RosterMatcher (raw, tgt, tgt_type, ipv='ipv4')
    Matcher for the roster data structure

    get_data (minion)
        Return the configured ip

    ret_glob_minions()
        Return minions that match via glob

    ret_list_minions()
        Return minions that match via list

    ret_pcre_minions()
        Return minions that match via pcre

    targets()
        Execute the correct tgt_type routine and return

salt.roster.flat.targets(tgt, tgt_type='glob', **kwargs)
    Return the targets from the flat yaml file, checks opts for location but defaults to /etc/salt/roster

31.24.6 salt.roster.scan

Scan a netmask or ipaddr for open ssh ports

class salt.roster.scan.RosterMatcher (tgt, tgt_type)
    Matcher for the roster data structure

    targets()
        Return ip addrs based on netmask, sitting in the `glob` spot because it is the default

salt.roster.scan.targets(tgt, tgt_type='glob', **kwargs)
    Return the targets from the flat yaml file, checks opts for location but defaults to /etc/salt/roster

31.25 Salt Runners

Salt runners are convenience applications executed with the salt-run command.
Salt runners work similarly to Salt execution modules however they execute on the Salt master itself instead of remote Salt minions.
A Salt runner can be a simple client call or a complex application.

See also:

The full list of runners
### 31.25.1 Full list of runner modules

<table>
<thead>
<tr>
<th>Salt Runners</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cache</td>
<td>Return cached data from minions</td>
</tr>
<tr>
<td>cloud</td>
<td>The Salt Cloud Runner</td>
</tr>
<tr>
<td>doc</td>
<td>A runner module to collect and display the inline documentation from the</td>
</tr>
<tr>
<td>drac</td>
<td>Manage Dell DRAC from the Master</td>
</tr>
<tr>
<td>error</td>
<td>Error generator to enable integration testing of salt runner error handling</td>
</tr>
<tr>
<td>f5</td>
<td>Runner to provide F5 Load Balancer functionality</td>
</tr>
<tr>
<td>fileserver</td>
<td>Directly manage the Salt fileserver plugins</td>
</tr>
<tr>
<td>git_pillar</td>
<td>Directly manage the salt git_pillar plugin</td>
</tr>
<tr>
<td>http</td>
<td>Module for making various web calls.</td>
</tr>
<tr>
<td>jobs</td>
<td>A convenience system to manage jobs, both active and already run</td>
</tr>
<tr>
<td>launchd</td>
<td>Manage launchd plist files</td>
</tr>
<tr>
<td>lxc</td>
<td>Control Linux Containers via Salt</td>
</tr>
<tr>
<td>manage</td>
<td>General management functions for salt, tools like seeing what hosts are up</td>
</tr>
<tr>
<td>mine</td>
<td>A runner to access data from the salt mine</td>
</tr>
<tr>
<td>nacl</td>
<td>This runner helps create encrypted passwords that can be included in pillars.</td>
</tr>
<tr>
<td>network</td>
<td>Network tools to run from the Master</td>
</tr>
<tr>
<td>pagerduty</td>
<td>Runner Module for Firing Events via PagerDuty</td>
</tr>
<tr>
<td>pillar</td>
<td>Functions to interact with the pillar compiler on the master</td>
</tr>
<tr>
<td>pkg</td>
<td>Package helper functions using <code>salt.modules.pkg</code></td>
</tr>
<tr>
<td>queue</td>
<td>General management and processing of queues.</td>
</tr>
<tr>
<td>sdb</td>
<td>Runner for setting and querying data via the sdb API on the master</td>
</tr>
<tr>
<td>ssh</td>
<td>A Runner module interface on top of the salt-ssh Python API.</td>
</tr>
<tr>
<td>search</td>
<td>Runner frontend to search system</td>
</tr>
<tr>
<td>state</td>
<td>Execute orchestration functions</td>
</tr>
<tr>
<td>survey</td>
<td>A general map/reduce style salt runner for aggregating results returned by several different minions.</td>
</tr>
<tr>
<td>test</td>
<td>This runner is used only for test purposes and servers no production purpose</td>
</tr>
<tr>
<td>thin</td>
<td>The thin runner is used to manage the salt thin systems.</td>
</tr>
<tr>
<td>virt</td>
<td>Control virtual machines via Salt</td>
</tr>
<tr>
<td>winrepo</td>
<td>Runner to manage Windows software repo</td>
</tr>
</tbody>
</table>

#### salt.runners.cache

Return cached data from minions

- `salt.runners.cache.clear_all(tgt=None, expr_form='glob')`
  - Clear the cached pillar, grains, and mine data of the targeted minions
  - CLI Example:
    ```
    salt-run cache.clear_all
    ```

- `salt.runners.cache.clear_grains(tgt=None, expr_form='glob')`
  - Clear the cached grains data of the targeted minions
  - CLI Example:
    ```
    salt-run cache.clear_grains
    ```

- `salt.runners.cache.clear_mine(tgt=None, expr_form='glob')`
  - Clear the cached mine data of the targeted minions
  - CLI Example:
salt-run cache.clear_mine

salt.runners.cache.clear_mine_func(tgt=None, expr_form='glob', clear_mine_func_flag=None)
    Clear the cached mine function data of the targeted minions
    CLI Example:
    
salt-run cache.clear_mine_func tgt='*' clear_mine_func='network.interfaces'

salt.runners.cache.clear_pillar(tgt=None, expr_form='glob')
    Clear the cached pillar data of the targeted minions
    CLI Example:
    
salt-run cache.clear_pillar

salt.runners.cache.grains(tgt=None, expr_form='glob', outputter=None, **kwargs)
    Return cached grains of the targeted minions
    CLI Example:
    
salt-run cache.grains

salt.runners.cache.mine(tgt=None, expr_form='glob', outputter=None, **kwargs)
    Return cached mine data of the targeted minions
    CLI Example:
    
salt-run cache.mine

salt.runners.cache.pillar(tgt=None, expr_form='glob', outputter=None, **kwargs)
    Return cached pillars of the targeted minions
    CLI Example:
    
salt-run cache.pillar

salt.runners.cloud

The Salt Cloud Runner

This runner wraps the functionality of salt cloud making salt cloud routines available to all internal apis via the runner system

salt.runners.cloud.action(func=None, cloudmap=None, instances=None, provider=None, instance=None, **kwargs)
    Execute a single action on the given map/provider-instance

salt.runners.cloud.create(provider, instances, **kwargs)
    Create an instance using Salt Cloud
    CLI Example:
    
salt-run cloud.create my-ec2-config myinstance image=ami-1624987f size=t1.micro

salt.runners.cloud.destroy(instances)
    Destroy the named vm(s)

salt.runners.cloud.full_query(query_type='list_nodes_full')
    List all available cloud provider data
salt.runners.cloud.list_images(provider='all')
List cloud provider images for the given providers

salt.runners.cloud.list_locations(provider='all')
List cloud provider sizes for the given providers

salt.runners.cloud.list_sizes(provider='all')
List cloud provider sizes for the given providers

salt.runners.cloud.map_run(path, **kwargs)
Execute a salt cloud map file

salt.runners.cloud.profile(prof=None, instances=None, **kwargs)
Create a cloud vm with the given profile and instances, instances can be a list or comma-delimited string

CLI Example:
```bash
salt-run cloud.profile prof=my-ec2 instances=node1,node2,node3
```

salt.runners.cloud.query(query_type='list_nodes')
List cloud provider data for all providers

salt.runners.cloud.select_query(query_type='list_nodes_select')
List selected nodes

salt.runners.doc

A runner module to collect and display the inline documentation from the various module types

salt.runners.doc.execution()
Collect all the sys.doc output from each minion and return the aggregate

CLI Example:
```bash
salt-run doc.execution
```

salt.runners.doc.runner()
Return all inline documentation for runner modules

CLI Example:
```bash
salt-run doc.runner
```

salt.runners.doc.wheel()
Return all inline documentation for wheel modules

CLI Example:
```bash
salt-run doc.wheel
```

salt.runners.drac

Manage Dell DRAC from the Master
The login credentials need to be configured in the Salt master configuration file.

salt.runners.drac.poweroff(hostname, timeout=20)
Power server off

CLI Example:
salt.run drac.poweroff example.com

salt.runners.drac.poweron(hostname, timeout=20)
  Power server on
  CLI Example:
      salt-run drac.poweron example.com

salt.runners.drac.pxe(hostname, timeout=20)
  Connect to the Dell DRAC and have the boot order set to PXE and power cycle the system to PXE boot
  CLI Example:
      salt-run drac.pxe example.com

salt.runners.drac.reboot(hostname, timeout=20)
  Reboot a server using the Dell DRAC
  CLI Example:
      salt-run drac.reboot example.com

salt.runners.drac.version(hostname, timeout=20)
  Display the version of DRAC
  CLI Example:
      salt-run drac.version example.com

salt.runners.error

Error generator to enable integration testing of salt runner error handling
salt.runners.error.error(name=None, message='')
  If name is None Then return empty dict
  Otherwise raise an exception with __name__ from name, message from message
  CLI Example:
      salt-run error
      salt-run error.error name="Exception" message="This is an error."

salt.runners.f5

Runner to provide F5 Load Balancer functionality

  depends
    • pycontrol Python module

  configuration In order to connect to a F5 Load Balancer, you must specify in the Salt master configuration the currently available load balancers

      load_balancers:
        bigip1.example.com
        username: admin
        password: secret
bigip2.example.com:
  username: admin
  password: secret

class salt.runners.f5.F5Mgmt(lb, username, password)

  add_pool_member(name, port, pool_name)
  Add a node to a pool

  check_member_pool(member, pool_name)
  Check a pool member exists in a specific pool

  check_pool(name)
  Check to see if a pool exists

  check_virtualserver(name)
  Check to see if a virtual server exists

  create_pool(name, method='ROUND_ROBIN')
  Create a pool on the F5 load balancer

  create_vs(name, ip, port, protocol, profile, pool_name)
  Create a virtual server

  lbmethods()
  List all the load balancer methods

salt.runners.f5.add_pool_member(lb, name, port, pool_name)
  Add a node to a pool

  CLI Examples:
  
  salt-run f5.add_pool_member load_balancer 10.0.0.1 80 my_pool

salt.runners.f5.check_member_pool(lb, member, pool_name)
  Check a pool member exists in a specific pool

  CLI Examples:
  
  salt-run f5.check_member_pool load_balancer 10.0.0.1 my_pool

salt.runners.f5.check_pool(lb, name)
  Check to see if a pool exists

  CLI Examples:
  
  salt-run f5.check_pool load_balancer pool_name

salt.runners.f5.check_virtualserver(lb, name)
  Check to see if a virtual server exists

  CLI Examples:
  
  salt-run f5.check_virtualserver load_balancer virtual_server

salt.runners.f5.create_pool(lb, name, method='ROUND_ROBIN')
  Create a pool on the F5 load balancer

  CLI Examples:
  
  salt-run f5.create_pool load_balancer pool_name loadbalance_method
  salt-run f5.create_pool load_balancer my_pool ROUND_ROBIN
salt.runners.f5.create_vs(lb, name, ip, port, protocol, profile, pool_name)

Create a virtual server

CLI Examples:

```
salt-run f5.create_vs lb balancer vs_name 10.0.0.1 80 tcp http poolname
```

salt.runners.fileserver

Directly manage the Salt fileserver plugins

salt.runners.fileserver.clear_cache(backend=None)

New in version 2015.5.0.

Clear the fileserver cache from VCS fileserver backends (git, hg, svn). Executing this runner with no arguments will clear the cache for all enabled VCS fileserver backends, but this can be narrowed using the backend argument.

**backend** Only clear the update lock for the specified backend(s). If all passed backends start with a minus sign (-), then these backends will be excluded from the enabled backends. However, if there is a mix of backends with and without a minus sign (ex: backend=-roots,git) then the ones starting with a minus sign will be disregarded.

CLI Example:

```
salt-run fileserver.clear_cache
salt-run fileserver.clear_cache backend=git,hg
salt-run fileserver.clear_cache hg
salt-run fileserver.clear_cache -roots
```

salt.runners.fileserver.clear_lock(backend=None, remote=None)

New in version 2015.5.0.

Clear the fileserver update lock from VCS fileserver backends (git, hg, svn). This should only need to be done if a fileserver update was interrupted and a remote is not updating (generating a warning in the Master's log file). Executing this runner with no arguments will remove all update locks from all enabled VCS fileserver backends, but this can be narrowed by using the following arguments:

**backend** Only clear the update lock for the specified backend(s).

**remote** If not None, then any remotes which contain the passed string will have their lock cleared. For example, a remote value of github will remove the lock from all github.com remotes.

CLI Example:

```
salt-run fileserver.clear_lock
salt-run fileserver.clear_lock backend=git,hg
salt-run fileserver.clear_lock backend=git remote=github
salt-run fileserver.clear_lock remote=bitbucket
```

salt.runners.fileserver.dir_list(saltenv='base', backend=None, outputter=None)

Return a list of directories in the given environment

**saltenv** [base] The salt fileserver environment to be listed

**backend** Narrow fileserver backends to a subset of the enabled ones. If all passed backends start with a minus sign (-), then these backends will be excluded from the enabled backends. However, if there is a mix of backends with and without a minus sign (ex: backend=-roots,git) then the ones starting with a minus sign will be disregarded.

New in version 2015.5.0.
CLI Example:

```bash
salt-run fileserver.dir_list
salt-run fileserver.dir_list saltenv=prod
salt-run fileserver.dir_list saltenv=dev backend=git
salt-run fileserver.dir_list base hg,roots
salt-run fileserver.dir_list -git
```

**salt.runners.fileserver.empty_dir_list**

New in version 2015.5.0.

Return a list of empty directories in the given environment

**saltenv** [base] The salt fileserver environment to be listed

**backend** Narrow fileserver backends to a subset of the enabled ones. If all passed backends start with a minus sign (\(-\)), then these backends will be excluded from the enabled backends. However, if there is a mix of backends with and without a minus sign (ex: `backend=-roots,git`) then the ones starting with a minus sign will be disregarded.

**Note:** Some backends (such as `git` and `hg`) do not support empty directories. So, passing `backend=git` or `backend=hg` will result in an empty list being returned.

CLI Example:

```bash
salt-run fileserver.empty_dir_list
salt-run fileserver.empty_dir_list saltenv=prod
salt-run fileserver.empty_dir_list backend=roots
```

**salt.runners.fileserver.envs**

Return the available fileserver environments. If no backend is provided, then the environments for all configured backends will be returned.

**backend** Narrow fileserver backends to a subset of the enabled ones.

Changed in version 2015.5.0: If all passed backends start with a minus sign (\(-\)), then these backends will be excluded from the enabled backends. However, if there is a mix of backends with and without a minus sign (ex: `backend=-roots,git`) then the ones starting with a minus sign will be disregarded.

Additionally, fileserver backends can now be passed as a comma-separated list. In earlier versions, they needed to be passed as a python list (ex: `backend=[\'roots\', \'git\']")

CLI Example:

```bash
salt-run fileserver.envs
salt-run fileserver.envs backend=roots,git
salt-run fileserver.envs git
```

**salt.runners.fileserver.file_list**

Return a list of files from the salt fileserver

**saltenv** [base] The salt fileserver environment to be listed

**backend** Narrow fileserver backends to a subset of the enabled ones. If all passed backends start with a minus sign (\(-\)), then these backends will be excluded from the enabled backends. However, if there is a mix of backends with and without a minus sign (ex: `backend=-roots,git`) then the ones starting with a minus sign will be disregarded.

New in version 2015.5.0.

CLI Examples:
salt-run fileserver.file_list
salt-run fileserver.file_list saltenv=prod
salt-run fileserver.file_list saltenv=dev backend=git
salt-run fileserver.file_list base hg,roots
salt-run fileserver.file_list -git

salt.runners.fileserver.lock(backend=None, remote=None)

New in version 2015.5.0.

Set a fileserver update lock for VCS fileserver backends (git, hg, svn).

Note: This will only operate on enabled backends (those configured in fileserver_backend).

backend Only set the update lock for the specified backend(s).
remote If not None, then any remotes which contain the passed string will have their lock cleared. For example, a remote value of *github.com* will remove the lock from all github.com remotes.

CLI Example:

salt-run fileserver.lock
salt-run fileserver.lock backend=git,hg
salt-run fileserver.lock backend=git remote='*github.com*'
salt-run fileserver.lock remote=bitbucket

salt.runners.fileserver.symlink_list(saltenv='base', backend=None, outputter=None)

Return a list of symlinked files and dirs

saltenv [base] The salt fileserver environment to be listed

backend Narrow fileserver backends to a subset of the enabled ones. If all passed backends start with a minus sign (-), then these backends will be excluded from the enabled backends. However, if there is a mix of backends with and without a minus sign (ex: backend=-roots,git) then the ones starting with a minus sign will be disregarded.

New in version 2015.5.0.

CLI Example:

salt-run fileserver.symlink_list
salt-run fileserver.symlink_list saltenv=prod
salt-run fileserver.symlink_list saltenv=dev backend=git
salt-run fileserver.symlink_list base hg,roots
salt-run fileserver.symlink_list -git

salt.runners.fileserver.update(backend=None)

Update the fileserver cache. If no backend is provided, then the cache for all configured backends will be updated.

backend Narrow fileserver backends to a subset of the enabled ones.

Changed in version 2015.5.0: If all passed backends start with a minus sign (-), then these backends will be excluded from the enabled backends. However, if there is a mix of backends with and without a minus sign (ex: backend=-roots,git) then the ones starting with a minus sign will be disregarded.

Additionally, fileserver backends can now be passed as a comma-separated list. In earlier versions, they needed to be passed as a python list (ex: backend=['roots', 'git'])

CLI Example:
salt-run fileserver.update
salt-run fileserver.update backend=roots,git

**salt.runners.git_pillar**

Directly manage the salt git_pillar plugin

```python
salt.runners.git_pillar.update(branch, repo)
    Execute an update for the configured git fileserver backend for Pillar
```

**CLI Example:**

```bash
salt-run git_pillar.update branch='branch' repo='location'
```

**salt.runners.http**

Module for making various web calls. Primarily designed for webhooks and the like, but also useful for basic http testing.

New in version 2015.5.0.

```python
salt.runners.http.query(url, output=True, **kwargs)
    Query a resource, and decode the return data
```

**CLI Example:**

```bash
salt-run http.query http://somelink.com/
salt-run http.query http://somelink.com/ method=POST params='key1=val1&key2=val2'
salt-run http.query http://somelink.com/ method=POST data='<xml>somecontent</xml>'
```

**salt.runners.http.update_ca_bundle**  
(target=None, source=None, merge_files=None)

Update the local CA bundle file from a URL

New in version 2015.5.0.

**CLI Example:**

```bash
salt-run http.update_ca_bundle
tsalt-run http.update_ca_bundle target=/path/to/cacerts.pem
tsalt-run http.update_ca_bundle source=https://example.com/cacerts.pem
```

If the `target` is not specified, it will be pulled from the `ca_cert` configuration variable available to the master. If it cannot be found there, it will be placed at `<<FILE_ROOTS>>/cacerts.pem`.

If the `source` is not specified, it will be pulled from the `ca_cert_url` configuration variable available to the master. If it cannot be found, it will be downloaded from the cURL website, using an http (not https) URL. **USING THE DEFAULT URL SHOULD BE AVOIDED!**

`merge_files` may also be specified, which includes a string or list of strings representing a file or files to be appended to the end of the CA bundle, once it is downloaded.

**CLI Example:**

```bash
salt-run http.update_ca_bundle merge_files=/path/to/mycert.pem
```
salt.runners.jobs

A convenience system to manage jobs, both active and already run

salt.runners.jobs.active(outputter=None, display_progress=False)
Return a report on all actively running jobs from a job id centric perspective
CLI Example:
salt-run jobs.active

salt.runners.jobs.last_run(ext_source=None, outputter=None, metadata=None, function=None, target=None, display_progress=False)
List all detectable jobs and associated functions
New in version 2015.8.0.
CLI Example:
salt-run jobs.last_run
salt-run jobs.last_run target=nodename
data-run jobs.last_run function='cmd.run'
salt-run jobs.last_run metadata="{'foo': 'bar'}"

salt.runners.jobs.list_job(jid, ext_source=None, outputter=None)
List a specific job given by its jid
CLI Example:
salt-run jobs.list_job 20130916125524463507

salt.runners.jobs.list_jobs(ext_source=None, outputter=None, search_metadata=None, search_function=None, search_target=None, start_time=None, end_time=None, display_progress=False)
List all detectable jobs and associated functions
ext_source The external job cachet to use. Default: None.
search_metadata Search the metadata of a job for the provided string of dictionary. Default: 'None'.
search_function Search the function of a job for the provided string. Default: 'None'.
search_target Search the target of a job for the provided minion name. Default: 'None'.
start_time Search for jobs where the start time of the job is greater than or equal to the provided time stamp. Any timestamp supported by the Dateutil (required) module can be used. Default: 'None'.
end_time Search for jobs where the start time of the job is less than or equal to the provided time stamp. Any timestamp supported by the Dateutil (required) module can be used. Default: 'None'.

CLI Example:
salt-run jobs.list_jobs
salt-run jobs.list_jobs search_function='test.*' search_target='localhost' search_metadata='"{"bar": "foo"}"'
salt-run jobs.list_jobs start_time='2015, Mar 16 19:00' end_time='2015, Mar 18 22:00'"'

salt.runners.jobs.list_jobs_filter(count, filter_find_job=True, ext_source=None, outputter=None, display_progress=False)
List all detectable jobs and associated functions
The external job cache to use. Default: None.

CLI Example:
```
salt-run jobs.list_jobs_filter 50
salt-run jobs.list_jobs_filter 100 filter_find_job=False
```

salt.runners.jobs.lookup_jid(jid, ext_source=None, returned=True, missing=False, outputter=None, display_progress=False)

Return the printout from a previously executed job.

**jid** The jid to look up.

**ext_source** The external job cache to use. Default: None.

**returned** When set to True, adds the minions that did return from the command. Default: True.

New in version 2015.8.0.

**missing** When set to True, adds the minions that did NOT return from the command. Default: False.

**display_progress** Displays progress events when set to True. Default: False.

New in version 2015.5.0.

CLI Example:
```
salt-run jobs.lookup_jid 20130916125524463507
salt-run jobs.lookup_jid 20130916125524463507 outputter=highstate
```

salt.runners.jobs.print_job(jid, ext_source=None, outputter=None)

Print a specific job's detail given by it's jid, including the return data.

CLI Example:
```
salt-run jobs.print_job 20130916125524463507
```

**salt.runners.launchd**

Manage launchd plist files.

salt.runners.launchd.write_launchd_plist(program)

Write a launchd plist for managing salt-master or salt-minion

CLI Example:
```
salt-run launchd.write_launchd_plist salt-master
```

**salt.runners.lxc**

Control Linux Containers via Salt

**depends** lxc execution module

salt.runners.lxc.cloud_init(names, host=None, quiet=False, **kwargs)

Wrapper for using lxc.init in saltcloud compatibility mode.

**names** Name of the containers, supports a single name or a comma delimited list of names.

**host** Minion to start the container on. Required.
**path** path to the container parent default: `/var/lib/lxc` (system default)

New in version 2015.8.0.

**saltcloud_mode** init the container with the saltcloud opts format instead

```python
salt.runners.lxc.find_guest(name, quiet=False, path=None)
```

Returns the host for a container.

**path** path to the container parent default: `/var/lib/lxc` (system default)

New in version 2015.8.0.

```python
salt-run lxc.find_guest name
```

```python
salt.runners.lxc.find_guests(names, path=None)
```

Return a dict of hosts and named guests

**path** path to the container parent default: `/var/lib/lxc` (system default)

New in version 2015.8.0.

```python
salt-run lxc.find_guests name
```

```python
salt.runners.lxc.freeze(name, quiet=False, path=None)
```

Freeze the named container

**path** path to the container parent default: `/var/lib/lxc` (system default)

New in version 2015.8.0.

```python
salt-run lxc.freeze name
```

```python
salt.runners.lxc.info(name, quiet=False, path=None)
```

Returns information about a container.

**path** path to the container parent default: `/var/lib/lxc` (system default)

New in version 2015.8.0.

```python
salt-run lxc.info name
```

```python
salt.runners.lxc.init(names, host=None, saltcloud_mode=False, quiet=False, **kwargs)
```

Initialize a new container

```python
salt-run lxc.init name host=minion_id [cpuset=cgroups_cpuset] \n[cpushare=cgroups_cpushare] [memory=cgroups_memory] \n[template=lxc_template_name] [clone=original name] \n[profile=lxc_profile] [network_profile=network_profile] \n[nic=network_profile] [nic_opts=nic_opts] \n[start=(true|false)] [seed=(true|false)] \n[install=(true|false)] [config=minion_config] \n[snapshot=(true|false)]
```

**names** Name of the containers, supports a single name or a comma delimited list of names.

**host** Minion on which to initialize the container (required)

**path** path to the container parent default: `/var/lib/lxc` (system default)

New in version 2015.8.0.

**saltcloud_mode** init the container with the saltcloud opts format instead See lxc.init_interface module documentation

**cpuset** cgroups cpuset.
cpushare  cgroups cpu shares.

memory  cgroups memory limit, in MB

Changed in version 2015.5.0: If no value is passed, no limit is set. In earlier Salt versions, not passing this value causes a 1024MB memory limit to be set, and it was necessary to pass `memory=0` to set no limit.

template  Name of LXC template on which to base this container

clone  Clone this container from an existing container

profile  A LXC profile (defined in config or pillar).

network_profile  Network profile to use for the container

New in version 2015.5.2.

nic  Deprecated since version 2015.5.0: Use `network_profile` instead

nic_opts  Extra options for network interfaces. E.g.:

```json
{"eth0": {"mac": "aa:bb:cc:dd:ee:ff", "ipv4": "10.1.1.1", "ipv6": "2001:db8::ff00:42:8329"}}
```

start  Start the newly created container.

seed  Seed the container with the minion config and autsign its key. Default: true

install  If salt-minion is not already installed, install it. Default: true

config  Optional config parameters. By default, the id is set to the name of the container.

```
salt.runners.lxc.list(host=None, quiet=False, path=None)
List defined containers (running, stopped, and frozen) for the named (or all) host(s).

path  path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

salt-run lxc.list [host=minion_id]
```

```
salt.runners.lxc.purge(name, delete_key=True, quiet=False, path=None)
Purge the named container and delete its minion key if present. WARNING: Destroys all data associated with the container.

path  path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

salt-run lxc.purge name
```

```
salt.runners.lxc.start(name, quiet=False, path=None)
Start the named container.

path  path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

salt-run lxc.start name
```

```
salt.runners.lxc.stop(name, quiet=False, path=None)
Stop the named container.

path  path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.
```
salt runners.lxc.unfreeze(name, quiet=False, path=None)

Unfreeze the named container.

path: path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

salt runners.lxc.unfreeze name

salt runners.manage

General management functions for salt, tools like seeing what hosts are up and what hosts are down.

salt runners.manage.alived(subset=None, show_ipv4=False)

New in version 2015.8.0.

Print a list of all minions that are up according to Salt's presence detection (no commands will be sent to minions).

subset [None] Pass a CIDR range to filter minions by IP address.

show_ipv4 [False] Also show the IP address each minion is connecting from.

CLI Example:
salt-run manage.alived

salt runners.manage.allowed(subset=None, show_ipv4=False)

New in version 2015.8.0.

Print a list of all minions that are up according to Salt's presence detection (no commands will be sent to minions).

subset [None] Pass a CIDR range to filter minions by IP address.

show_ipv4 [False] Also show the IP address each minion is connecting from.

CLI Example:
salt-run manage.allowed

salt runners.manage.bootstrap(version='develop', script=None, hosts=' ', root_user=True)

Bootstrap minions with salt-bootstrap.

version [develop] Git tag of version to install

script [https://bootstrap.saltstack.com] Script to execute

hosts Comma-separated hosts [example: hosts='host1.local,host2.local']

root_user [True] Prepend root@ to each host.

CLI Example:
salt-run manage.bootstrap hosts='host1,host2'
salt-run manage.bootstrap hosts='host1,host2' version='v0.17'
salt-run manage.bootstrap hosts='host1,host2' version='v0.17' script='https://bootstrap.saltstack.com/develop'
salt-run manage.bootstrap hosts='ec2-user@host1,ec2-user@host2' root_user=False
salt.runners.manage.bootstrap_psexec(hosts=’, master=None, version=None, arch='win32', installer_url=None, username=None, password=None)

Bootstrap Windows minions via PsExec.

**hosts** Comma separated list of hosts to deploy the Windows Salt minion.

**master** Address of the Salt master passed as an argument to the installer.

**version** Point release of installer to download. Defaults to the most recent.

**arch** Architecture of installer to download. Defaults to win32.

**installer_url** URL of minion installer executable. Defaults to the latest version from https://repo.saltstack.com/windows/

**username** Optional user name for login on remote computer.

**password** Password for optional username. If omitted, PsExec will prompt for one to be entered for each host.

CLI Example:

```bash
salt-run manage.bootstrap_psexec hosts='host1,host2'
salt-run manage.bootstrap_psexec hosts='host1,host2' version='0.17' username='DOMAIN\Administrator'
salt-run manage.bootstrap_psexec hosts='host1,host2' installer_url='http://exampledomain/salt-installer.exe'
```

salt.runners.manage.down(removekeys=False)

Print a list of all the down or unresponsive salt minions Optionally remove keys of down minions

CLI Example:

```bash
salt-run manage.down
salt-run manage.down removekeys=True
```

salt.runners.manage.get_stats(estate=None, stack='road')

Print the stack stats

**estate** [None] The name of the target estate. Master stats would be requested by default

**stack** ['road'] Show stats on either road or lane stack Allowed values are `road` or `lane`.

CLI Example:

```bash
salt-run manage.get_stats [estate=alpha_minion] [stack=lane]
```

salt.runners.manage.joined(subset=None, show_ipv4=False)

New in version 2015.8.0.

Print a list of all minions that are up according to Salt’s presence detection (no commands will be sent to minions)

**subset** [None] Pass in a CIDR range to filter minions by IP address.

**show_ipv4** [False] Also show the IP address each minion is connecting from.

CLI Example:

```bash
salt-run manage.joined
```

salt.runners.manage.key_regen()

This routine is used to regenerate all keys in an environment. This is invasive! ALL KEYS IN THE SALT ENVIRONMENT WILL BE REGENERATED‼

The key_regen routine sends a command out to minions to revoke the master key and remove all minion keys, it then removes all keys from the master and prompts the user to restart the master. The minions will all reconnect and keys will be placed in pending.
After the master is restarted and minion keys are in the pending directory execute a `salt-key -A` command to accept the regenerated minion keys.

The master must be restarted within 60 seconds of running this command or the minions will think there is something wrong with the keys and abort.

Only Execute this runner after upgrading minions and master to 0.15.1 or higher!

CLI Example:

```
salt-run manage.key_regen
```

```
salt.runners.manage.lane_stats(estate=None)
Print the estate manor lane stack stats

estate [None] The name of the target estate. Master stats would be requested by default

CLI Example:

```
salt-run manage.lane_stats [estate=alpha_minion]
```

```
salt.runners.manage.list_not_state(subset=None, show_ipv4=False, state=None)
New in version 2015.8.0.
Print a list of all minions that are NOT up according to Salt’s presence detection (no commands will be sent to minions)

subset [None] Pass in a CIDR range to filter minions by IP address.
show_ipv4 [False] Also show the IP address each minion is connecting from.
state ['available'] Show minions being in specific state that is one of 'available', 'joined', 'allowed', 'alived' or 'reaped'.

CLI Example:

```
salt-run manage.list_not_state
```

```
salt.runners.manage.list_state(subset=None, show_ipv4=False, state=None)
New in version 2015.8.0.
Print a list of all minions that are up according to Salt’s presence detection (no commands will be sent to minions)

subset [None] Pass in a CIDR range to filter minions by IP address.
show_ipv4 [False] Also show the IP address each minion is connecting from.
state ['available'] Show minions being in specific state that is one of 'available', 'joined', 'allowed', 'alived' or 'reaped'.

CLI Example:

```
salt-run manage.list_state
```

```
salt.runners.manage.not_alived(subset=None, show_ipv4=False)
New in version 2015.8.0.
Print a list of all minions that are NOT up according to Salt’s presence detection (no commands will be sent)

subset [None] Pass in a CIDR range to filter minions by IP address.
show_ipv4 [False] Also show the IP address each minion is connecting from.

CLI Example:

```
salt-run manage.not_alived

salt.runners.manage.not_allowed(subset=None, show_ipv4=False)

New in version 2015.8.0.
Print a list of all minions that are NOT up according to Salt's presence detection (no commands will be sent)

subset [None] Pass in a CIDR range to filter minions by IP address.
show_ipv4 [False] Also show the IP address each minion is connecting from.

CLI Example:
salt-run manage.not_allowed

salt.runners.manage.not_joined(subset=None, show_ipv4=False)

New in version 2015.8.0.
Print a list of all minions that are NOT up according to Salt's presence detection (no commands will be sent)

subset [None] Pass in a CIDR range to filter minions by IP address.
show_ipv4 [False] Also show the IP address each minion is connecting from.

CLI Example:
salt-run manage.not_joined

salt.runners.manage.not_present(subset=None, show_ipv4=False)

New in version 2015.5.0.
Print a list of all minions that are NOT up according to Salt's presence detection (no commands will be sent)

subset [None] Pass in a CIDR range to filter minions by IP address.
show_ipv4 [False] Also show the IP address each minion is connecting from.

CLI Example:
salt-run manage.not_present

salt.runners.manage.not_reaped(subset=None, show_ipv4=False)

New in version 2015.8.0.
Print a list of all minions that are NOT up according to Salt's presence detection (no commands will be sent)

subset [None] Pass in a CIDR range to filter minions by IP address.
show_ipv4 [False] Also show the IP address each minion is connecting from.

CLI Example:
salt-run manage.not_reaped

salt.runners.manage.present(subset=None, show_ipv4=False)

Print a list of all minions that are up according to Salt's presence detection (no commands will be sent to minions)

subset [None] Pass in a CIDR range to filter minions by IP address.
show_ipv4 [False] Also show the IP address each minion is connecting from.

CLI Example:
salt-run manage.present

salt.runners.manage.reaped(subset=None, show_ipv4=False)
   New in version 2015.8.0.
   Print a list of all minions that are up according to Salt’s presence detection (no commands will be sent to minions)
   subset [None] Pass in a CIDR range to filter minions by IP address.
   show_ipv4 [False] Also show the IP address each minion is connecting from.
   CLI Example:
   salt-run manage.reaped

salt.runners.manage.road_stats(estate=None)
   Print the estate road stack stats
   estate [None] The name of the target estate. Master stats would be requested by default
   CLI Example:
   salt-run manage.road_stats [estate=alpha_minion]

salt.runners.manage.safe_accept(target, expr_form='glob')
   Accept a minion’s public key after checking the fingerprint over salt-ssh
   CLI Example:
   salt-run manage.safe_accept my_minion
   salt-run manage.safe_accept minion1,minion2 expr_form=list

salt.runners.manage.status(output=True)
   Print the status of all known salt minions
   CLI Example:
   salt-run manage.status

salt.runners.manage.up()
   Print a list of all of the minions that are up
   CLI Example:
   salt-run manage.up

salt.runners.manage.versions()
   Check the version of active minions
   CLI Example:
   salt-run manage.versions

salt.runners.mine
A runner to access data from the salt mine

salt.runners.mine.get(tgt, fun, tgt_type='glob')
   Gathers the data from the specified minions’ mine, pass in the target, function to look up and the target type
   CLI Example:
salt-run mine.get 

### salt.runners.nacl

This runner helps create encrypted passwords that can be included in pillars.

**depends** libnacl, https://github.com/saltstack/libnacl

This is often useful if you wish to store your pillars in source control or share your pillar data with others that you trust. I don't advise making your pillars public regardless if they are encrypted or not.

The following configurations can be defined in the master config so your users can create encrypted passwords using the runner nacl:

```bash
cat /etc/salt/master.d/nacl.conf
nacl.config:
  key: None
  keyfile: /root/.nacl
```

Now with the config in the master you can use the runner nacl like:

```bash
salt-run nacl.enc 'data'
```

**salt.runners.nacl.dec(data, **kwargs)**

Takes a key generated from `nacl.keygen` and decrypt some data.

CLI Examples:

```bash
salt-run nacl.dec pEXHQM6cuaF7A=
salt-run nacl.dec data='pEXHQM6cuaF7A=' keyfile=/root/.nacl
salt-run nacl.dec data='pEXHQM6cuaF7A=' key='cKEzd4kXsbeCE7/nLTIqXwnU1ulg4NoeeYcCFpd9k='
```

**salt.runners.nacl.enc(data, **kwargs)**

Takes a key generated from `nacl.keygen` and encrypt some data.

CLI Examples:

```bash
salt-run nacl.enc datatoenc
salt-run nacl.enc datatoenc keyfile=/root/.nacl
salt-run nacl.enc datatoenc key='cKEzd4kXsbeCE7/nLTIqXwnU1ulg4NoeeYcCFpd9k='
```

**salt.runners.nacl.keygen(keyfile=None)**

Use libnacl to generate a private key

CLI Examples:

```bash
salt-run nacl.keygen
salt-run nacl.keygen keyfile=/root/.nacl
salt-run --out=newline_values_only nacl.keygen > /root/.nacl
```

### salt.runners.network

Network tools to run from the Master

**salt.runners.network.wol(mac, bcast='255.255.255.255', destport=9)**

Send a ”Magic Packet” to wake up a Minion

CLI Example:
salt.runners.network.wollist(\texttt{maclist, bcast=`255.255.255.255', destport=9})

Send a "Magic Packet" to wake up a list of Minions. This list must contain one MAC hardware address per line

CLI Example:

\begin{verbatim}
salt-run network.wollist `/path/to/maclist'
salt-run network.wollist `/path/to/maclist' 255.255.255.255 7
salt-run network.wollist `/path/to/maclist' 255.255.255.255 7
\end{verbatim}

salt.runners.pagerduty

Runner Module for Firing Events via PagerDuty

New in version 2014.1.0.

\textbf{configuration} This module can be used by specifying the name of a configuration profile in the master config.

For example:

\begin{verbatim}
my-pagerduty-account:
pagerduty.api_key: F3RbyjIVE43RFfWf2214
pagerduty.subdomain: mysubdomain
\end{verbatim}

salt.runners.pagerduty.create_event(service_key=None, description=None, details=None, incident_key=None, profile=None)

Create an event in PagerDuty. Designed for use in states.

CLI Example:

\begin{verbatim}
salt-run pagerduty.create_event <service_key> <description> <details> profile=my-pagerduty-account
\end{verbatim}

The following parameters are required:

\textbf{service_key} This key can be found by using pagerduty.list_services.

\textbf{description} This is a short description of the event.

\textbf{details} This can be a more detailed description of the event.

\textbf{profile} This refers to the configuration profile to use to connect to the PagerDuty service.

salt.runners.pagerduty.list_escalation_policies(profile=None, api_key=None)

List escalation policies belonging to this account

CLI Example:

\begin{verbatim}
salt-run pagerduty.list_policies my-pagerduty-account
salt-run pagerduty.list_escalation_policies my-pagerduty-account
\end{verbatim}

salt.runners.pagerduty.list_incidents(profile=None, api_key=None)

List incidents belonging to this account

CLI Example:

\begin{verbatim}
salt-run pagerduty.list_incidents my-pagerduty-account
\end{verbatim}
salt.runners.pagerduty.list_maintenance_windows(\texttt{profile=None, api\_key=None})
\begin{itemize}
\item List maintenance windows belonging to this account
\end{itemize}

CLI Example:
\begin{verbatim}
salt-run pagerduty.list_windows my-pagerduty-account
salt-run pagerduty.list_maintenance_windows my-pagerduty-account
\end{verbatim}

salt.runners.pagerduty.list_policies(\texttt{profile=None, api\_key=None})
\begin{itemize}
\item List escalation policies belonging to this account
\end{itemize}

CLI Example:
\begin{verbatim}
salt-run pagerduty.list_policies my-pagerduty-account
salt-run pagerduty.list_escalation_policies my-pagerduty-account
\end{verbatim}

salt.runners.pagerduty.list_schedules(\texttt{profile=None, api\_key=None})
\begin{itemize}
\item Listschedulesbelongingtothisaccount
\end{itemize}

CLI Example:
\begin{verbatim}
salt-run pagerduty.list_schedules my-pagerduty-account
\end{verbatim}

salt.runners.pagerduty.list_services(\texttt{profile=None, api\_key=None})
\begin{itemize}
\item Listservicesbelongingtothisaccount
\end{itemize}

CLI Example:
\begin{verbatim}
salt-run pagerduty.list_services my-pagerduty-account
\end{verbatim}

salt.runners.pagerduty.list_users(\texttt{profile=None, api\_key=None})
\begin{itemize}
\item Listusersbelongingtothisaccount
\end{itemize}

CLI Example:
\begin{verbatim}
salt-run pagerduty.list_users my-pagerduty-account
\end{verbatim}

salt.runners.pagerduty.list_windows(\texttt{profile=None, api\_key=None})
\begin{itemize}
\item List maintenance windows belonging to this account
\end{itemize}

CLI Example:
\begin{verbatim}
salt-run pagerduty.list_windows my-pagerduty-account
salt-run pagerduty.list_maintenance_windows my-pagerduty-account
\end{verbatim}

\textbf{salt.runners.pillar}

Functions to interact with the pillar compiler on the master

salt.runners.pillar.show_pillar(\texttt{minion='*', **kwargs})
\begin{itemize}
\item Returns the compiled pillar either of a specific minion or just the global available pillars. This function assumes that no minion has the id *.
\end{itemize}

CLI Example:
\begin{verbatim}
shows minion specific pillar:
salt-run pillar.show_pillar 'www.example.com'
\end{verbatim}

shows global pillar:
\begin{verbatim}
salt-run pillar.show_pillar
\end{verbatim}

shows global pillar for `dev' pillar environment:
API Example:

```python
import salt.config
import salt.runner
opts = salt.config.master_config('/etc/salt/master')
runner = salt.runner.RunnerClient(opts)
pillar = runner.cmd('pillar.show_pillar', [])
print(pillar)
```

```
salt.runners.pillar.show_top(minion=None, saltenv='base')
```

Returns the compiled top data for pillar for a specific minion. If no minion is specified, we use the first minion we find.

CLI Example:

```
salt-run pillar.show_top
```

---

**salt.runners.pkg**

Package helper functions using `salt.modules.pkg`

New in version 2015.8.0.

```
salt.runners.pkg.list_upgrades(jid, style='group', outputter='nested', ext_source=None)
```

Show list of available pkg upgrades using a specified format style

CLI Example:

```
salt-run pkg.list_upgrades jid=20141120114114417719 style=group
```

---

**salt.runners.queue**

General management and processing of queues.

This runner facilitates interacting with various queue backends such as the included sqlite3 queue or the planned AWS SQS and Redis queues.

The queue functions such as `insert`, `delete`, and `pop` can be used for typical management of the queue.

The `process_queue` function pops the requested number of items from the queue and creates a Salt Event that can then be processed by a Reactor. The `process_queue` function can be called manually, or can be configured to run on a schedule with the Salt Scheduler or regular system cron. It is also possible to use the peer system to allow a minion to call the runner.

This runner, as well as the Queues system, is not api stable at this time.

There are many things that could potentially be done with queues within Salt. For the time being the focus will be on queueing infrastructure actions on specific minions. The queues generally will be populated with minion IDs. When the `process_queue` runner function is called events are created on the Salt Event bus that indicate the queue and a list of one or more minion IDs. The reactor is set up to match on event tags for a specific queue and then take infrastructure actions on those minion IDs. These actions might be to delete the minion’s key from the master, use salt-cloud to destroy the vm, or some other custom action.

```
salt.runners.queue.delete(queue, items, backend='sqlite')
```

Delete an item or items from a queue

CLI Example:
<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
<th>CLI Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>salt-run queue.delete myqueue myitem</code></td>
<td>Delete an item from a queue.</td>
<td><code>salt-run queue.delete myqueue myitem</code></td>
</tr>
<tr>
<td><code>salt-run queue.delete myqueue myitem backend=sqlite</code></td>
<td>Delete an item from a queue with a specific backend.</td>
<td><code>salt-run queue.delete myqueue myitem backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.delete myqueue myitem backend=sqlite</code></td>
<td>Delete all items from a queue with a specific backend.</td>
<td><code>salt-run queue.delete myqueue myitem backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.insert myqueue myitem</code></td>
<td>Add an item or items to a queue.</td>
<td><code>salt-run queue.insert myqueue myitem</code></td>
</tr>
<tr>
<td><code>salt-run queue.insert myqueue myitem backend=sqlite</code></td>
<td>Add an item or items to a queue with a specific backend.</td>
<td><code>salt-run queue.insert myqueue myitem backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.insert myqueue myitem backend=sqlite</code></td>
<td>Add an item or items to a queue with a specific backend.</td>
<td><code>salt-run queue.insert myqueue myitem backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.list_items myqueue backend=sqlite</code></td>
<td>List contents of a queue.</td>
<td><code>salt-run queue.list_items myqueue backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.list_length myqueue backend=sqlite</code></td>
<td>Provide the number of items in a queue.</td>
<td><code>salt-run queue.list_length myqueue backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.pop myqueue</code></td>
<td>Pop one or more items from a queue.</td>
<td><code>salt-run queue.pop myqueue</code></td>
</tr>
<tr>
<td><code>salt-run queue.pop myqueue quantity=1 backend=sqlite</code></td>
<td>Pop one item from a queue with a specific backend.</td>
<td><code>salt-run queue.pop myqueue quantity=1 backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.pop myqueue quantity=1 backend=sqlite</code></td>
<td>Pop one item from a queue with a specific backend.</td>
<td><code>salt-run queue.pop myqueue quantity=1 backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.pop myqueue quantity=6 backend=sqlite</code></td>
<td>Pop six items from a queue with a specific backend.</td>
<td><code>salt-run queue.pop myqueue quantity=6 backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.pop myqueue quantity=all backend=sqlite</code></td>
<td>Pop all items from a queue with a specific backend.</td>
<td><code>salt-run queue.pop myqueue quantity=all backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.pop myqueue quantity=all backend=sqlite</code></td>
<td>Pop all items from a queue with a specific backend.</td>
<td><code>salt-run queue.pop myqueue quantity=all backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.process_queue myqueue</code></td>
<td>Pop items from a queue and create an event on the Salt event bus.</td>
<td><code>salt-run queue.process_queue myqueue</code></td>
</tr>
<tr>
<td><code>salt-run queue.process_queue myqueue quantity=1 backend=sqlite</code></td>
<td>Pop items from a queue and create an event on the Salt event bus with a specific backend.</td>
<td><code>salt-run queue.process_queue myqueue quantity=1 backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.process_queue myqueue quantity=6 backend=sqlite</code></td>
<td>Pop items from a queue and create an event on the Salt event bus with a specific backend.</td>
<td><code>salt-run queue.process_queue myqueue quantity=6 backend=sqlite</code></td>
</tr>
<tr>
<td><code>salt-run queue.pop myqueue quantity=all backend=sqlite</code></td>
<td>Pop items from a queue and create an event on the Salt event bus with a specific backend.</td>
<td><code>salt-run queue.pop myqueue quantity=all backend=sqlite</code></td>
</tr>
</tbody>
</table>
salt.runners.sdb

Runner for setting and querying data via the sdb API on the master

**salt.runners.sdb.get(uri)**

Get a value from a db, using a uri in the form of sdb://<profile>/<key>. If the uri provided does not start with sdb://, then it will be returned as-is.

CLI Example:
```
salt '*' sdb.get sdb://mymemcached/foo
```

**salt.runners.sdb.set(uri, value)**

Set a value in a db, using a uri in the form of sdb://<profile>/<key>. If the uri provided does not start with sdb:// or the value is not successfully set, return False.

CLI Example:
```
salt '*' sdb.set sdb://mymemcached/foo bar
```

salt.runners.ssh

A Runner module interface on top of the salt-ssh Python API.

This allows for programmatic use from salt-api, the Reactor, Orchestrate, etc.

**salt.runners.ssh.cmd(tgt, fun, arg=(), timeout=None, expr_form='glob', kwarg=None)**

Execute a single command via the salt-ssh subsystem and return all routines at once

New in version 2015.2.

A wrapper around the SSHClient.cmd method.

salt.runners.search

Runner frontend to search system

**salt.runners.search.query(term)**

Query the search system

CLI Example:
```
salt-run search.query foo
```

salt.runners.state

Execute orchestration functions

**salt.runners.state.event(tagmatch='*', count=-1, quiet=False, sock_dir=None, pretty=False)**

Watch Salt’s event bus and block until the given tag is matched

New in version 2014.7.0.

This is useful for utilizing Salt’s event bus from shell scripts or for taking simple actions directly from the CLI.

Enable debug logging to see ignored events.

**Parameters**
• **tagmatch** -- the event is written to stdout for each tag that matches this pattern; uses the same matching semantics as Salt's Reactor.

• **count** -- this number is decremented for each event that matches the `tagmatch` parameter; pass -1 to listen forever.

• **quiet** -- do not print to stdout; just block

• **sock_dir** -- path to the Salt master's event socket file.

• **pretty** -- Output the JSON all on a single line if False (useful for shell tools); pretty-print the JSON output if True.

CLI Examples:

```
# Reboot a minion and run highstate when it comes back online
salt 'jerry' system.reboot &&
    salt-run state.event 'salt/minion/jerry/start' count=1 quiet=True &&
    salt 'jerry' state.highstate
# Reboot multiple minions and run highstate when all are back online
salt -L 'kevin,stewart,dave' system.reboot &&
    salt-run state.event 'salt/minion/*/start' count=3 quiet=True &&
    salt -L 'kevin,stewart,dave' state.highstate
# Watch the event bus forever in a shell while-loop.
salt-run state.event | while read -r tag data; do
echo $tag
    echo $data | jq -colour-output .
done
```

See also:

See https://github.com/saltstack/salt/blob/develop/tests/eventlisten.sh for an example of usage within a shell script.

salt.runners.state.orchestratemotionds, saltenv='base', test=None, exclude=None, pillar=None)

New in version 0.17.0.

Execute a state run from the master, used as a powerful orchestration system.

See also:

More Orchestratedocumentation

• [Full Orchestrator Tutorial](#)

• Docs for the master-side state module

CLI Examples:

```
salt-run state.orchestraterunserver
salt-run state.orchestraterunserver saltenv=dev test=True
```

Changed in version 2014.1.1: Runner renamed from state.sls to state.orchestraterun

Changed in version 2014.7.0: Runner uses the pillar variable

salt.runners.state.orchestraterunhigh(data, test=None, queue=False, pillar=None, **kwargs)

Execute a single state orchestration routine

New in version 2015.5.0.

CLI Example:
salt-run state.orchestrate_high '{
  stage_one:
    {salt.state: [{tgt: "db*"}, {sls: postgres_setup}]},
  stage_two:
    {salt.state: [{tgt: "web*"}, {sls: apache_setup}, {
      require: [[salt: stage_one]],
    }],}
}'

salt.runners.state.orchestrate_single(fun, name, test=None, queue=False, pillar=None, **kwargs)

Execute a single state orchestration routine

New in version 2015.5.0.

CLI Example:

```
salt-run state.orchestrate_single fun=salt.wheel name=key.list_all
```

salt.runners.survey

A general map/reduce style salt runner for aggregating results returned by several different minions.

New in version 2014.7.0.

Aggregated results are sorted by the size of the minion pools which returned matching results.

Useful for playing the game: "some of these things are not like the others..." when identifying discrepancies in a large infrastructure managed by salt.

salt.runners.survey.diff(*args, **kwargs)

Return the DIFFERENCE of the result sets returned by each matching minion pool

New in version 2014.7.0.

These pools are determined from the aggregated and sorted results of a salt command. This command displays the "difs" as a series of 2-way differences-- namely the difference between the FIRST displayed minion pool (according to sort order) and EACH SUBSEQUENT minion pool result set. Differences are displayed according to the Python `difflib.unified_diff()` as in the case of the salt execution module `file.get_diff`.

This command is submitted via a salt runner using the general form:

```
salt-run survey.diff [survey_sort=up/down] <target> <salt-execution-module> <salt-execution-module parameters>
```

Optionally accept a `survey_sort=" parameter. Default: `survey_sort=down``

CLI Example #1: (Example to display the "differences of files")

```
salt-run survey.diff survey_sort=up "*" cp.get_file_str file:///etc/hosts
```

salt.runners.survey.hash(*args, **kwargs)

Return the MATCHING minion pools from the aggregated and sorted results of a salt command

New in version 2014.7.0.

This command is submitted via a salt runner using the general form:

```
salt-run survey.hash [survey_sort=up/down] <target> <salt-execution-module> <salt-execution-module parameters>
```
Optionally accept a `survey_sort=` parameter. Default: `survey_sort=down`

CLI Example #1: (functionally equivalent to `salt-run manage.up`)

```
salt-run survey.hash "*" test.ping
```

CLI Example #2: (find an `outlier` minion config file)

```
salt-run survey.hash "*" file.get_hash /etc/salt/minion survey_sort=up
```

**salt.runners.test**

This runner is used only for test purposes and servers no production purpose

```
salt.runners.test.arg(*args, **kwargs)
```

Output the given args and kwargs

Kwargs will be filtered for `private` keynames.

```
salt.runners.test.raw_arg(*args, **kwargs)
```

Output the given args and kwargs

```
salt.runners.test.sleep(s_time=10)
```

Sleep t seconds, then return True

```
salt.runners.test.stdout_print()
```

Print `foo` and return `bar`

```
salt.runners.test.stream()
```

Return True

**salt.runners.thin**

The thin runner is used to manage the salt thin systems.

Salt Thin is a transport-less version of Salt that can be used to run routines in a standalone way. This runner has tools which generate the standalone salt system for easy consumption.

```
salt.runners.thin.generate(extra_mods='', overwrite=False, so_mods='')
```

Generate the salt-thin tarball and print the location of the tarball Optional additional mods to include (e.g. mako) can be supplied as a comma delimited string. Permits forcing an overwrite of the output file as well.

CLI Example:

```
salt-run thin.generate
salt-run thin.generate mako
salt-run thin.generate mako,wempy 1
salt-run thin.generate overwrite=1
```

**salt.runners.virt**

Control virtual machines via Salt

```
salt.runners.virt.force_off(name)
```

Force power down the named virtual machine

```
salt.runners.virt.hyper_info(hyper=None)
```

Return information about the hypervisors connected to this master
salt.runners.virt.init(name, cpu, mem, image, hyper=``None``, seed=``True``, nic=``'default'``, install=``True``)
This routine is used to create a new virtual machine. This routine takes a number of options to determine what the newly created virtual machine will look like.

**name**  The mandatory name of the new virtual machine. The name option is also the minion id, all minions must have an id.

**cpu**  The number of cpus to allocate to this new virtual machine.

**mem**  The amount of memory to allocate to this virtual machine. The number is interpreted in megabytes.

**image**  The network location of the virtual machine image, commonly a location on the salt fileserver, but http, https and ftp can also be used.

**hyper**  The hypervisor to use for the new virtual machine, if this is omitted Salt will automatically detect what hypervisor to use.

**seed**  Set to False to prevent Salt from seeding the new virtual machine.

**nic**  The nic profile to use, defaults to the `default` nic profile which assumes a single network interface per vm associated with the `br0` bridge on the master.

**install**  Set to False to prevent Salt from installing a minion on the new vm before it spins up.

salt.runners.virt.list(hyper=``None``, quiet=``False``)
List the virtual machines on each hyper, this is a simplified query, showing only the virtual machine names belonging to each hypervisor. A single hypervisor can be passed in to specify an individual hypervisor to list.

salt.runners.virt.migrate(name, target='``
Migrate a vm from one hypervisor to another. This routine will just start the migration and display information on how to look up the progress.

salt.runners.virt.next_hyper()
Return the hypervisor to use for the next autodeployed vm. This queries the available hypervisors and executes some math the determine the most `available` next hypervisor.

salt.runners.virt.pause(name)
Pause the named vm

salt.runners.virt.purge(name, delete_key=``True``)
Destroy the named vm

salt.runners.virt.query(hyper=``None``, quiet=``False``)
Query the virtual machines. When called without options all hypervisors are detected and a full query is returned. A single hypervisor can be passed in to specify an individual hypervisor to query.

salt.runners.virt.reset(name)
Force power down and restart an existing vm

salt.runners.virt.resume(name)
Resume a paused vm

salt.runners.virt.start(name)
Start a named virtual machine

salt.runners.virt.vm_info(name, quiet=``False``)
Return the information on the named vm

salt.runners.winrepo
Runner to manage Windows software repo
salt.runners.winrepo.genrepo(*opts=None, fire_event=True*)
Generate winrepo_cachefile based on sls files in the winrepo_dir

- **opts** Specify an alternate opts dict. Should not be used unless this function is imported into an execution module.
- **fire_event** [True] Fire an event on failure. Only supported on the master.

CLI Example:
```
salt-run winrepo.genrepo
```

salt.runners.winrepo.update_git_repos(*opts=None, clean=False, masterless=False*)
Checkout git repos containing Windows Software Package Definitions

- **opts** Specify an alternate opts dict. Should not be used unless this function is imported into an execution module.
- **clean** [False] Clean repo cachedirs which are not configured under `winrepo_remotes`.

**Warning**: This argument should not be set to True if a mix of git and non-git repo definitions are being used, as it will result in the non-git repo definitions being removed.

New in version 2015.8.0.

CLI Examples:
```
salt-run winrepo.update_git_repos
salt-run winrepo.update_git_repos clean=True
```

### 31.25.2 Writing Salt Runners

A Salt runner is written in a similar manner to a Salt execution module. Both are Python modules which contain functions and each public function is a runner which may be executed via the `salt-run` command.

For example, if a Python module named `test.py` is created in the runners directory and contains a function called `foo`, the `test` runner could be invoked with the following command:

```
# salt-run test.foo
```

Runners have several options for controlling output.

Any `print` statement in a runner is automatically also fired onto the master event bus where. For example:

```python
def a_runner(outputter=None, display_progress=False):
    print('Hello world')
    ...
```

The above would result in an event fired as follows:

```
Event fired at Tue Jan 13 15:26:45 2015
*************************
Tag: salt/run/20150113152644070246/print
Data:
{'_stamp': '2015-01-13T15:26:45.078707',
'data': 'hello',
'outputter': 'pprint'}
```
A runner may also send a progress event, which is displayed to the user during runner execution and is also passed across the event bus if the `display_progress` argument to a runner is set to True.

A custom runner may send its own progress event by using the `__jid_event__.fire_event()` method as shown here:

```python
if display_progress:
    __jid_event__.fire_event({'message': 'A progress message', 'progress'}
```

The above would produce output on the console reading: A progress message as well as an event on the event similar to:

```
Event fired at Tue Jan 13 15:21:20 2015
************************************************
Tag: salt/run/20150113152118341421/progress
Data:
'message': "A progress message"}
```

A runner could use the same approach to send an event with a customized tag onto the event bus by replacing the second argument (`progress`) with whatever tag is desired. However, this will not be shown on the command-line and will only be fired onto the event bus.

### 31.25.3 Synchronous vs. Asynchronous

A runner may be fired asynchronously which will immediately return control. In this case, no output will be display to the user if `salt-run` is being used from the command-line. If used programatically, no results will be returned. If results are desired, they must be gathered either by firing events on the bus from the runner and then watching for them or by some other means.

**Note:** When running a runner in asynchronous mode, the `--progress` flag will not deliver output to the salt-run CLI. However, progress events will still be fired on the bus.

In synchronous mode, which is the default, control will not be returned until the runner has finished executing.

To add custom runners, put them in a directory and add it to `runner_dirs` in the master configuration file.

### 31.25.4 Examples

Examples of runners can be found in the Salt distribution:

https://github.com/saltstack/salt/blob/develop/salt/runners

A simple runner that returns a well-formatted list of the minions that are responding to Salt calls could look like this:

```python
# Import salt modules
import salt.client

def up():
    '''
    Print a list of all of the minions that are up
    '''
    client = salt.client.LocalClient(__opts__['conf_file'])
    minions = client.cmd('!', 'test.ping', timeout=1)
    for minion in sorted(minions):
        print minion
```
31.26 State Enforcement

Salt offers an optional interface to manage the configuration or "state" of the Salt minions. This interface is a fully capable mechanism used to enforce the state of systems from a central manager.

31.26.1 Mod Aggregate State Runtime Modifications

New in version 2014.7.0.

The mod_aggregate system was added in the 2014.7.0 release of Salt and allows for runtime modification of the executing state data. Simply put, it allows for the data used by Salt’s state system to be changed on the fly at runtime, kind of like a configuration management JIT compiler or a runtime import system. All in all, it makes Salt much more dynamic.

How it Works

The best example is the pkg state. One of the major requests in Salt has long been adding the ability to install all packages defined at the same time. The mod_aggregate system makes this a reality. While executing Salt’s state system, when a pkg state is reached the mod_aggregate function in the state module is called. For pkg this function scans all of the other states that are slated to run, and picks up the references to name and pkgs, then adds them to pkgs in the first state. The result is a single call to yum, apt-get, pacman, etc as part of the first package install.

How to Use it

Note: Since this option changes the basic behavior of the state runtime, after it is enabled states should be executed using test=True to ensure that the desired behavior is preserved.

In config files

The first way to enable aggregation is with a configuration option in either the master or minion configuration files. Salt will invoke mod_aggregate the first time it encounters a state module that has aggregate support.

If this option is set in the master config it will apply to all state runs on all minions, if set in the minion config it will only apply to said minion.

Enable for all states:

```
state_aggregate: True
```

Enable for only specific state modules:

```
state_aggregate:
  - pkg
```

In states

The second way to enable aggregation is with the state-level aggregate keyword. In this configuration, Salt will invoke the mod_aggregate function the first time it encounters this keyword. Any additional occurrences of the keyword will be ignored as the aggregation has already taken place.
The following example will trigger `mod_aggregate` when the `lamp_stack` state is processed resulting in a single call to the underlying package manager.

```yaml
lamp_stack:
  pkg.installed:
    - php
    - mysql-client
    - aggregate: True

memcached:
  pkg.installed:
    - name: memcached
```

## Adding `mod_aggregate` to a State Module

Adding a `mod_aggregate` routine to an existing state module only requires adding an additional function to the state module called `mod_aggregate`.

The `mod_aggregate` function just needs to accept three parameters and return the low data to use. Since `mod_aggregate` is working on the state runtime level it does need to manipulate low data.

The three parameters are `low`, `chunks`, and `running`. The `low` option is the low data for the state execution which is about to be called. The `chunks` is the list of all of the low data dictionaries which are being executed by the runtime and the `running` dictionary is the return data from all of the state executions which have already be executed.

This example, simplified from the pkg state, shows how to create `mod_aggregate` functions:

```python
def mod_aggregate(low, chunks, running):
    # The `mod_aggregate` function which looks up all packages in the available
    # low chunks and merges them into a single pkgs ref in the present low data
    pkgs = []
    # What functions should we aggregate?
    agg_enabled = ['installed',
                   'latest',
                   'removed',
                   'purged',
                   ]
    # The `low` data is just a dict with the state, function (fun) and
    # arguments passed in from the sls
    if low.get('fun') not in agg_enabled:
        return low
    # Now look into what other things are set to execute
    for chunk in chunks:
        # The state runtime uses "tags" to track completed jobs, it may
        # look familiar with the _|-_
        tag = salt.utils.gen_state_tag(chunk)
        if tag in running:
            # Already ran the pkg state, skip aggregation
            continue
        if chunk.get('state') == 'pkg':
            if '__agg__' in chunk:
                continue
        # Check for the same function
        if chunk.get('fun') != low.get('fun'):
            continue
```
```python
        continue
    # Pull out the pkg names!
    if 'pkgs' in chunk:
        pkgs.extend(chunk['pkgs'])
        chunk['__agg__'] = True
    elif 'name' in chunk:
        pkgs.append(chunk['name'])
        chunk['__agg__'] = True
    if pkgs:
        if 'pkgs' in low:
            low['pkgs'].extend(pkgs)
        else:
            low['pkgs'] = pkgs
    # The low has been modified and needs to be returned to the state
    # runtime for execution
    return low
```

31.26.2 Altering States

Note: This documentation has been moved [here](#).

31.26.3 File State Backups

In 0.10.2 a new feature was added for backing up files that are replaced by the file.managed and file.recurse states. The new feature is called the backup mode. Setting the backup mode is easy, but it can be set in a number of places. The backup_mode can be set in the minion config file:

```
backup_mode: minion
```

Or it can be set for each file:

```
/etc/ssh/sshd_config:
    file.managed:
        - source: salt://ssh/sshd_config
        - backup: minion
```

Backed-up Files

The files will be saved in the minion cachedir under the directory named file_backup. The files will be in the location relative to where they were under the root filesystem and be appended with a timestamp. This should make them easy to browse.

Interacting with Backups

Starting with version 0.17.0, it will be possible to list, restore, and delete previously-created backups.

Listing

The backups for a given file can be listed using `file.list_backups`: 

31.26. State Enforcement
# salt foo.bar.com file.list_backups /tmp/foo.txt

foo.bar.com:

0:

---

Backup Time: 
Sat Jul 27 2013 17:48:41.738027
Location: 
/var/cache/salt/minion/file_backup/tmp/foo.txt_Sat_Jul_27_17:48:41_738027_2013
Size:
13

1:

---

Backup Time: 
Sat Jul 27 2013 17:48:28.369804
Location: 
Size:
35

Restoring

Restoring is easy using `file.restore_backup`, just pass the path and the numeric id found with `file.list_backups`:

# salt foo.bar.com file.restore_backup /tmp/foo.txt 1

foo.bar.com:

---

comment: 
Successfully restored /var/cache/salt/minion/file_backup/tmp/foo.txt_Sat_Jul_27_17:48:28_369804_2013 to /tmp/foo.txt
result: 
True

The existing file will be backed up, just in case, as can be seen if `file.list_backups` is run again:

# salt foo.bar.com file.list_backups /tmp/foo.txt

foo.bar.com:

0:

---

Backup Time: 
Sat Jul 27 2013 18:00:19.822550
Location: 
/var/cache/salt/minion/file_backup/tmp/foo.txt_Sat_Jul_27_18:00:19_822550_2013
Size:
53

1:

---

Backup Time: 
Sat Jul 27 2013 17:48:41.738027
Location: 
/var/cache/salt/minion/file_backup/tmp/foo.txt_Sat_Jul_27_17:48:41_738027_2013
Size:
13

2:

---

Backup Time:
Deleting backups can be done using `file.delete_backup`:

```
# salt foo.bar.com file.delete_backup /tmp/foo.txt 0
```

foo.bar.com:

```
----------
comment:  Successfully removed /var/cache/salt/minion/file_backup/tmp/foo.txt_Sat_Jul_27_18:00:19_822550_2013
result:   True
```

31.26.4 Understanding State Compiler Ordering

**Note:** This tutorial is an intermediate level tutorial. Some basic understanding of the state system and writing Salt Formulas is assumed.

Salt’s state system is built to deliver all of the power of configuration management systems without sacrificing simplicity. This tutorial is made to help users understand in detail just how the order is defined for state executions in Salt.

This tutorial is written to represent the behavior of Salt as of version 0.17.0.

**Compiler Basics**

To understand ordering in depth some very basic knowledge about the state compiler is very helpful. No need to worry though, this is very high level!

**High Data and Low Data**

When defining Salt Formulas in YAML the data that is being represented is referred to by the compiler as High Data. When the data is initially loaded into the compiler it is a single large python dictionary, this dictionary can be viewed raw by running:

```
salt '*' state.show_highstate
```

This "High Data" structure is then compiled down to "Low Data". The Low Data is what is matched up to create individual executions in Salt’s configuration management system. The low data is an ordered list of single state calls to execute. Once the low data is compiled the evaluation order can be seen.

The low data can be viewed by running:
salt '*' state.show_lowstate

Note: The state execution module contains MANY functions for evaluating the state system and is well worth a read! These routines can be very useful when debugging states or to help deepen one's understanding of Salt's state system.

As an example, a state written thusly:

```
apache:
pkg.installed:
  - name: httpd
service.running:
  - name: httpd
  - watch:
    - file: apache_conf
    - pkg: apache

apache_conf:
file.managed:
  - name: /etc/httpd/conf.d/httpd.conf
  - source: salt://apache/httpd.conf
```

Will have High Data which looks like this represented in json:

```
{
  "apache": {
    "pkg": [
      {
        "name": "httpd",
        "installed",
        {
          "order": 10000
        }
      },
      "service": [
        {
          "name": "httpd",
          {
            "watch": [
              {
                "file": "apache_conf"
              },
              {
                "pkg": "apache"
              }
            ]
          },
          "running",
          {
            "order": 10001
          }
        },
        "__sls__": "blah",
        "__env__": "base"
      },
      "apache_conf": {
```
The subsequent Low Data will look like this:

```
[
    {
      "name": "httpd",
      "state": "pkg",
      "__id__": "apache",
      "fun": "installed",
      "__env__": "base",
      "__sls__": "blah",
      "order": 10000
    },
    {
      "name": "apache",
      "watch": [
        {
          "file": "apache_conf"
        },
        {
          "pkg": "apache"
        }
      ],
      "state": "service",
      "__id__": "apache",
      "fun": "running",
      "__env__": "base",
      "__sls__": "blah",
      "order": 10001
    },
    {
      "name": "/etc/httpd/conf.d/httpd.conf",
      "source": "salt://apache/httpd.conf",
      "state": "file",
      "__id__": "apache_conf",
      "fun": "managed",
      "__env__": "base",
      "__sls__": "blah",
      "order": 10002
    }
]
```

This tutorial discusses the Low Data evaluation and the state runtime.
Ordering Layers

Salt defines 2 order interfaces which are evaluated in the state runtime and defines these orders in a number of passes.

Definition Order

---

**Note:** The Definition Order system can be disabled by turning the option `state_auto_order` to `False` in the master configuration file.

---

The top level of ordering is the **Definition Order**. The Definition Order is the order in which states are defined in salt formulas. This is very straightforward on basic states which do not contain `include` statements or a `top` file, as the states are just ordered from the top of the file, but the include system starts to bring in some simple rules for how the Definition Order is defined.

Looking back at the 'Low Data' and 'High Data' shown above, the order key has been transparently added to the data to enable the Definition Order.

**The Include Statement** Basically, if there is an include statement in a formula, then the formulas which are included will be run BEFORE the contents of the formula which is including them. Also, the include statement is a list, so they will be loaded in the order in which they are included.

In the following case:

```yaml
foo.sls
  include:
    - bar
    - baz

bar.sls
  include:
    - quo

baz.sls
  include:
    - qux
```

In the above case if `state.sls foo` were called then the formulas will be loaded in the following order:

1. quo
2. bar
3. qux
4. baz
5. foo

**The order Flag**

The Definition Order happens transparently in the background, but the ordering can be explicitly overridden using the `order` flag in states:
This order flag will over ride the definition order, this makes it very simple to create states that are always executed first, last or in specific stages, a great example is defining a number of package repositories that need to be set up before anything else, or final checks that need to be run at the end of a state run by using `order: last` or `order: -1`.

When the order flag is explicitly set the Definition Order system will omit setting an order for that state and directly use the order flag defined.

**Lexicographical Fall-back**

Salt states were written to ALWAYS execute in the same order. Before the introduction of Definition Order in version 0.17.0 everything was ordered lexicographically according to the name of the state, then function then id.

This is the way Salt has always ensured that states always run in the same order regardless of where they are deployed, the addition of the Definition Order method makes this finite ordering easier to follow.

The lexicographical ordering is still applied but it only has any effect when two order statements collide. This means that if multiple states are assigned the same order number that they will fall back to lexicographical ordering to ensure that every execution still happens in a finite order.

---

**Note:** If running with `state_auto_order: False` the `order` key is not set automatically, since the Lexicographical order can be derived from other keys.

---

**Requisite Ordering**

Salt states are fully declarative, in that they are written to declare the state in which a system should be. This means that components can require that other components have been set up successfully. Unlike the other ordering systems, the Requisite system in Salt is evaluated at runtime.

The requisite system is also built to ensure that the ordering of execution never changes, but is always the same for a given set of states. This is accomplished by using a runtime that processes states in a completely predictable order instead of using an event loop based system like other declarative configuration management systems.

---

**Runtime Requisite Evaluation**

The requisite system is evaluated as the components are found, and the requisites are always evaluated in the same order. This explanation will be followed by an example, as the raw explanation may be a little dizzying at first as it creates a linear dependency evaluation sequence.

The `Low Data` is an ordered list or dictionaries, the state runtime evaluates each dictionary in the order in which they are arranged in the list. When evaluating a single dictionary it is checked for requisites, requisites are evaluated in order, `require` then `watch` then `prereq`.

---

**Note:** If using requisite in statements like `require_in` and `watch_in` these will be compiled down to `require` and `watch` statements before runtime evaluation.

---

Each requisite contains an ordered list of requisites, these requisites are looked up in the list of dictionaries and then executed. Once all requisites have been evaluated and executed then the requiring state can safely be run (or not run if requisites have not been met).
This means that the requisites are always evaluated in the same order, again ensuring one of the core design principals of Salt's State system to ensure that execution is always finite is intact.

**Simple Runtime Evaluation Example**

Given the above `Low Data` the states will be evaluated in the following order:

1. The pkg.installed is executed ensuring that the apache package is installed, it contains no requisites and is therefore the first defined state to execute.
2. The service.running state is evaluated but NOT executed, a watch requisite is found, therefore they are read in order, the runtime first checks for the file, sees that it has not been executed and calls for the file state to be evaluated.
3. The file state is evaluated AND executed, since it, like the pkg state does not contain any requisites.
4. The evaluation of the service state continues, it next checks the pkg requisite and sees that it is met, with all requisites met the service state is now executed.

**Best Practice**

The best practice in Salt is to choose a method and stick with it, official states are written using requisites for all associations since requisites create clean, traceable dependency trails and make for the most portable formulas. To accomplish something similar to how classical imperative systems function all requisites can be omitted and the failhard option then set to True in the master configuration, this will stop all state runs at the first instance of a failure.

In the end, using requisites creates very tight and fine grained states, not using requisites makes full sequence runs and while slightly easier to write, and gives much less control over the executions.

### 31.26.5 Extending External SLS Data

Sometimes a state defined in one SLS file will need to be modified from a separate SLS file. A good example of this is when an argument needs to be overwritten or when a service needs to watch an additional state.

**The Extend Declaration**

The standard way to extend is via the extend declaration. The extend declaration is a top level declaration like include and encapsulates ID declaration data included from other SLS files. A standard extend looks like this:

```yaml
include:
  - http
  - ssh

extend:
  apache:
    file:
      - name: /etc/httpd/conf/httpd.conf
      - source: salt://http/httpd2.conf
  ssh-server:
    service:
      - watch:
        - file: /etc/ssh/banner
```
/etc/ssh/banner:
  file.managed:
    - source: salt://ssh/banner

A few critical things happened here, first off the SLS files that are going to be extended are included, then the extend dec is defined. Under the extend dec 2 IDs are extended, the apache ID's file state is overwritten with a new name and source. Than the ssh server is extended to watch the banner file in addition to anything it is already watching.

**Extend is a Top Level Declaration**

This means that extend can only be called once in an sls, if if is used twice then only one of the extend blocks will be read. So this is WRONG:

```yaml
include:
  - http
  - ssh

extend:
  apache:
    file:
      - name: /etc/httpd/conf/httpd.conf
      - source: salt://http/httpd2.conf
# Second extend will overwrite the first!! Only make one
extend:
  ssh-server:
    service:
      - watch:
        - file: /etc/ssh/banner
```

**The Requisite ``in'' Statement**

Since one of the most common things to do when extending another SLS is to add states for a service to watch, or anything for a watcher to watch, the requisite in statement was added to 0.9.8 to make extending the watch and require lists easier. The ssh-server extend statement above could be more cleanly defined like so:

```yaml
include:
  - ssh

/etc/ssh/banner:
  file.managed:
    - source: salt://ssh/banner
    - watch_in:
      - service: ssh-server
```

**Rules to Extend By**

There are a few rules to remember when extending states:

1. Always include the SLS being extended with an include declaration
2. Requisites (watch and require) are appended to, everything else is overwritten
3. extend is a top level declaration, like an ID declaration, cannot be declared twice in a single SLS
4. Many IDs can be extended under the extend declaration
31.26.6 Failhard Global Option

Normally, when a state fails Salt continues to execute the remainder of the defined states and will only refuse to execute states that require the failed state.

But the situation may exist, where you would want all state execution to stop if a single state execution fails. The capability to do this is called failing hard.

State Level Failhard

A single state can have a failhard set, this means that if this individual state fails that all state execution will immediately stop. This is a great thing to do if there is a state that sets up a critical config file and setting a require for each state that reads the config would be cumbersome. A good example of this would be setting up a package manager early on:

```bash
/etc/yum.repos.d/company.repo:
    file.managed:
        - source: salt://company/yumrepo.conf
        - user: root
        - group: root
        - mode: 644
        - order: 1
        - failhard: True
```

In this situation, the yum repo is going to be configured before other states, and if it fails to lay down the config file, than no other states will be executed.

Global Failhard

It may be desired to have failhard be applied to every state that is executed, if this is the case, then failhard can be set in the master configuration file. Setting failhard in the master configuration file will result in failing hard when any minion gathering states from the master have a state fail.

This is NOT the default behavior, normally Salt will only fail states that require a failed state.

Using the global failhard is generally not recommended, since it can result in states not being executed or even checked. It can also be confusing to see states failhard if an admin is not actively aware that the failhard has been set.

To use the global failhard set failhard: True in the master configuration file.

31.26.7 Global State Arguments

Note: This documentation has been moved here.

31.26.8 Highstate data structure definitions

The Salt State Tree

A state tree is a collection of SLS files and directories that live under the directory specified in file_roots.

Note: Directory names or filenames in the state tree cannot contain a period, with the exception of the period in the .sls file suffix.
Top file

The main state file that instructs minions what environment and modules to use during state execution. Configurable via state_top.

See also:

*A detailed description of the top file*

Include declaration

Defines a list of Module reference strings to include in this SLS. Occurs only in the top level of the highstate structure.

Example:

```
include:
  - edit.vim
  - http.server
```

Module reference

The name of a SLS module defined by a separate SLS file and residing on the Salt Master. A module named edit.vim is a reference to the SLS file *salt://edit/vim.sls*.

ID declaration

Defines an individual highstate component. Always references a value of a dictionary containing keys referencing State declaration and Requisite declaration. Can be overridden by a Name declaration or a Names declaration. Occurs on the top level or under the Extend declaration.

Must be unique across entire state tree. If the same ID declaration is used twice, only the first one matched will be used. All subsequent ID declarations with the same name will be ignored.

Note: Naming gotchas

In Salt versions earlier than 0.9.7, ID declarations containing dots would result in unpredictable highstate output.

Extend declaration

Extends a Name declaration from an included SLS module. The keys of the extend declaration always refer to an existing ID declaration which have been defined in included SLS modules. Occurs only in the top level and defines a dictionary.

States cannot be extended more than once in a single state run.

Extend declarations are useful for adding-to or overriding parts of a State declaration that is defined in another SLS file. In the following contrived example, the shown mywebsite.sls file is include -ing and extend
-ing the apache.sls module in order to add a watch declaration that will restart Apache whenever the Apache configuration file, mywebsite changes.

```
include:
  - apache

extend:
  apache:
    service:
      - watch:
        - file: mywebsite

mywebsite:
  file.managed:
    - name: /var/www/mysite
```

See also:

watch_in and require_in

Sometimes it is more convenient to use the watch_in or require_in syntax instead of extending another SLS file.

**State Requisites**

**State declaration**

A list which contains one string defining the Function declaration and any number of Function arg declaration dictionaries.

Can, optionally, contain a number of additional components like the name override components — name and names. Can also contain requisite declarations.

Occurs under an ID declaration.

**Requisite declaration**

A list containing requisite references.

Used to build the action dependency tree. While Salt states are made to execute in a deterministic order, this order is managed by requiring and watching other Salt states.

Occurs as a list component under a State declaration or as a key under an ID declaration.

**Requisite reference**

A single key dictionary. The key is the name of the referenced State declaration and the value is the ID of the referenced ID declaration.

Occurs as a single index in a Requisite declaration list.

**Function declaration**

The name of the function to call within the state. A state declaration can contain only a single function declaration.

For example, the following state declaration calls the installed function in the pkg state module:
The function can be declared inline with the state as a shortcut. The actual data structure is compiled to this form:

```yaml
httpd:
  pkg:
    - installed
```

Where the function is a string in the body of the state declaration. Technically when the function is declared in dot notation the compiler converts it to be a string in the state declaration list. Note that the use of the first example more than once in an ID declaration is invalid yaml.

Invalid:

```yaml
httpd:
  pkg.installed
  service.running
```

When passing a function without arguments and another state declaration within a single ID declaration, then the long or "standard" format needs to be used since otherwise it does not represent a valid data structure.

Valid:

```yaml
httpd:
  pkg.installed: []
  service.running: []
```

Occurs as the only index in the `State declaration` list.

**Function arg declaration**

A single key dictionary referencing a Python type which is to be passed to the named `Function declaration` as a parameter. The type must be the data type expected by the function.

Occurs under a `Function declaration`.

For example in the following state declaration `user`, `group`, and `mode` are passed as arguments to the `managed` function in the `file` state module:

```yaml
/etc/http/conf/http.conf:
  file.managed:
    - user: root
    - group: root
    - mode: 644
```

**Name declaration**

Overrides the `name` argument of a `State declaration`. If `name` is not specified the `ID declaration` satisfies the `name` argument.

The name is always a single key dictionary referencing a string.

Overriding `name` is useful for a variety of scenarios.

For example, avoiding clashing ID declarations. The following two state declarations cannot both have `/etc/motd` as the ID declaration:
motd_perms:
  file.managed:
    - name: /etc/motd
    - mode: 644

motd_quote:
  file.append:
    - name: /etc/motd
    - text: "Of all smells, bread; of all tastes, salt."

Another common reason to override name is if the ID declaration is long and needs to be referenced in multiple places. In the example below it is much easier to specify mywebsite than to specify /etc/apache2/sites-available/mywebsite.com multiple times:

mywebsite:
  file.managed:
    - name: /etc/apache2/sites-available/mywebsite.com
    - source: salt://mywebsite.com

a2ensite mywebsite.com:
  cmd.wait:
    - unless: test -L /etc/apache2/sites-enabled/mywebsite.com
    - watch:
      - file: mywebsite

apache2:
  service.running:
    - watch:
      - file: mywebsite

Names declaration

Expands the contents of the containing State declaration into multiple state declarations, each with its own name.

For example, given the following state declaration:

```
python-pkgs:
  pkg.installed:
    - names: 
      - python-django
      - python-crypto
      - python-yaml
```

Once converted into the lowstate data structure the above state declaration will be expanded into the following three state declarations:

```
python-django:
  pkg.installed

python-crypto:
  pkg.installed

python-yaml:
  pkg.installed
```

Other values can be overridden during the expansion by providing an additional dictionary level.

New in version 2014.7.0.
**ius:**

pkgrepo.managed:
- humanname: IUS Community Packages for Enterprise Linux 6 - $basearch
- gpgcheck: 1
- gpgkey: http://dl.iuscommunity.org/pub/ius/IUS-COMMUNITY-GPG-KEY
- names:
  - ius
  - ius-devel:
    - baseurl: http://mirror.rackspace.com/ius/development/CentOS/6/$basearch

**Large example**

Here is the layout in yaml using the names of the highdata structure components.

```
<Include Declaration>:
  - <Module Reference>
  - <Module Reference>

<Extend Declaration>:
  <ID Declaration>:
    [<overrides>] 

# standard declaration

<ID Declaration>:
  <State Module>:
    - <Function>
    - <Function Arg>
    - <Function Arg>
    - <Function Arg>
    - <Name>: <name>
    - <Requisite Declaration>:
      - <Requisite Reference>
      - <Requisite Reference>

# inline function and names

<ID Declaration>:
  <State Module>.<Function>:
    - <Function Arg>
    - <Function Arg>
    - <Function Arg>
    - <Names>:
      - <name>
      - <name>
      - <name>
      - <Requisite Declaration>:
        - <Requisite Reference>
        - <Requisite Reference>

# multiple states for single id

<ID Declaration>:
```

31.26. State Enforcement 1575
31.26.9 Include and Exclude

Salt SLS files can include other SLS files and exclude SLS files that have been otherwise included. This allows for an SLS file to easily extend or manipulate other SLS files.

Include

When other SLS files are included, everything defined in the included SLS file will be added to the state run. When including define a list of SLS formulas to include:

```yaml
include:
  - http
  - libvirt
```

The include statement will include SLS formulas from the same environment that the including SLS formula is in. But the environment can be explicitly defined in the configuration to override the running environment, therefore if an SLS formula needs to be included from an external environment named `dev` the following syntax is used:

```yaml
include:
  - dev: http
```

NOTE: include does not simply inject the states where you place it in the SLS file. If you need to guarantee order of execution, consider using requisites.

Do not use dots in SLS file names or their directories

The initial implementation of top.sls and Include declaration followed the python import model where a slash is represented as a period. This means that a SLS file with a period in the name (besides the suffix period) can not be referenced. For example, webserver_1.0.sls is not referenceable because webserver_1.0 would refer to the directory/file webserver_1/0.sls

The same applies for any subdirectories, this is especially `tricky' when git repos are created. Another command that typically can't render it's output is `state.show_sls` of a file in a path that contains a dot.

Relative Include

In Salt 0.16.0, the capability to include SLS formulas which are relative to the running SLS formula was added. Simply precede the formula name with a .:
In Salt 2015.8, the ability to include SLS formulas which are relative to the parents of the running SLS formula was added. In order to achieve this, precede the formula name with more than one . (dot). Much like Python’s relative import abilities, two or more leading dots represent a relative include of the parent or parents of the current package, with each . representing one level after the first.

The following SLS configuration, if placed within example.dev.virtual, would result in example.http and base being included respectively:

```
include:
- ..http
- ...base
```

**Exclude**

The exclude statement, added in Salt 0.10.3, allows an SLS to hard exclude another SLS file or a specific id. The component is excluded after the high data has been compiled, so nothing should be able to override an exclude.

Since the exclude can remove an id or an SLS the type of component to exclude needs to be defined. An exclude statement that verifies that the running highstate does not contain the http SLS and the /etc/vimrc id would look like this:

```
exclude:
- sls: http
- id: /etc/vimrc
```

### 31.26.10 State System Layers

The Salt state system is comprised of multiple layers. While using Salt does not require an understanding of the state layers, a deeper understanding of how Salt compiles and manages states can be very beneficial.

**Function Call**

The lowest layer of functionality in the state system is the direct state function call. State executions are executions of single state functions at the core. These individual functions are defined in state modules and can be called directly via the `state.single` command.

```
salt '*' state.single pkg.installed name='vim'
```

**Low Chunk**

The low chunk is the bottom of the Salt state compiler. This is a data representation of a single function call. The low chunk is sent to the state caller and used to execute a single state function.

A single low chunk can be executed manually via the `state.low` command.

```
salt '*' state.low '{name: vim, state: pkg, fun: installed}'
```

The passed data reflects what the state execution system gets after compiling the data down from sls formulas.
Low State

The Low State layer is the list of low chunks ``evaluated'' in order. To see what the low state looks like for a highstate, run:

```shell
salt '*' state.show_lowstate
```

This will display the raw lowstate in the order which each low chunk will be evaluated. The order of evaluation is not necessarily the order of execution, since requisites are evaluated at runtime. Requisite execution and evaluation is finite; this means that the order of execution can be ascertained with 100% certainty based on the order of the low state.

High Data

High data is the data structure represented in YAML via SLS files. The High data structure is created by merging the data components rendered inside sls files (or other render systems). The High data can be easily viewed by executing the `state.show_highstate` or `state.show_sls` functions. Since this data is a somewhat complex data structure, it may be easier to read using the json, yaml, or pprint outputters:

```shell
salt '*' state.show_highstate --out yaml
salt '*' state.show_sls edit.vim --out pprint
```

SLS

Above ``High Data'', the logical layers are no longer technically required to be executed, or to be executed in a hierarchy. This means that how the High data is generated is optional and very flexible. The SLS layer allows for many mechanisms to be used to render sls data from files or to use the fileservice backend to generate sls and file data from external systems.

The SLS layer can be called directly to execute individual sls formulas.

Note: SLS Formulas have historically been called ``SLS files''. This is because a single SLS was only constituted in a single file. Now the term ``SLS Formula'' better expresses how a compartmentalized SLS can be expressed in a much more dynamic way by combining pillar and other sources, and the SLS can be dynamically generated.

To call a single SLS formula named `edit.vim`, execute `state.sls`:

```shell
salt '*' state.sls edit.vim
```

HighState

Calling SLS directly logically assigns what states should be executed from the context of the calling minion. The Highstate layer is used to allow for full contextual assignment of what is executed where to be tied to groups of, or individual, minions entirely from the master. This means that the environment of a minion, and all associated execution data pertinent to said minion, can be assigned from the master without needing to execute or configure anything on the target minion. This also means that the minion can independently retrieve information about its complete configuration from the master.

To execute the High State call `state.highstate`:

```shell
salt '*' state.highstate
```
OverState

The overstate layer expresses the highest functional layer of Salt’s automated logic systems. The Overstate allows for stateful and functional orchestration of routines from the master. The overstate defines in data execution stages which minions should execute states, or functions, and in what order using requisite logic.

31.26.11 The Orchestrate Runner

Note: This documentation has been moved here.

31.26.12 Ordering States

The way in which configuration management systems are executed is a hotly debated topic in the configuration management world. Two major philosophies exist on the subject, to either execute in an imperative fashion where things are executed in the order in which they are defined, or in a declarative fashion where dependencies need to be mapped between objects.

Imperative ordering is finite and generally considered easier to write, but declarative ordering is much more powerful and flexible but generally considered more difficult to create.

Salt has been created to get the best of both worlds. States are evaluated in a finite order, which guarantees that states are always executed in the same order, and the states runtime is declarative, making Salt fully aware of dependencies via the requisite system.

State Auto Ordering

Salt always executes states in a finite manner, meaning that they will always execute in the same order regardless of the system that is executing them. But in Salt 0.17.0, the state_auto_order option was added. This option makes states get evaluated in the order in which they are defined in sls files.

The evaluation order makes it easy to know what order the states will be executed in, but it is important to note that the requisite system will override the ordering defined in the files, and the order option described below will also override the order in which states are defined in sls files.

If the classic ordering is preferred (lexicographic), then set state_auto_order to False in the master configuration file.

Requisite Statements

Note: This document represents behavior exhibited by Salt requisites as of version 0.9.7 of Salt.

Often when setting up states any single action will require or depend on another action. Salt allows for the building of relationships between states with requisite statements. A requisite statement ensures that the named state is evaluated before the state requiring it. There are three types of requisite statements in Salt, require, watch, and prereq.

These requisite statements are applied to a specific state declaration:

```
httpd:
  pkg.installed: []
  file.managed:
    - name: /etc/httpd/conf/httpd.conf
```
In this example, the require requisite is used to declare that the file /etc/httpd/conf/httpd.conf should only be set up if the pkg state executes successfully.

The requisite system works by finding the states that are required and executing them before the state that requires them. Then the required states can be evaluated to see if they have executed correctly.

Require statements can refer to any state defined in Salt. The basic examples are pkg, service, and file, but any used state can be referenced.

In addition to state declarations such as pkg, file, etc., sls type requisites are also recognized, and essentially allow ‘chaining’ of states. This provides a mechanism to ensure the proper sequence for complex state formulas, especially when the discrete states are split or groups into separate sls files:

```yaml
include:
  - network

httpd:
  pkg.installed: []
  service.running:
    - require:
      - pkg: httpd
      - sls: network
```

In this example, the httpd service running state will not be applied (i.e., the httpd service will not be started) unless both the httpd package is installed AND the network state is satisfied.

**Note:** Requisite matching

Requisites match on both the ID Declaration and the name parameter. Therefore, if using the pkgs or sources argument to install a list of packages in a pkg state, it’s important to note that it is impossible to match an individual package in the list, since all packages are installed as a single state.

**Multiple Requisites**

The requisite statement is passed as a list, allowing for the easy addition of more requisites. Both requisite types can also be separately declared:

```yaml
httpd:
  pkg.installed: []
  service.running:
    - enable: True
    - watch:
      - file: /etc/httpd/conf/httpd.conf
        require:
          - pkg: httpd
          - user: httpd
          - group: httpd
  file.managed:
    - name: /etc/httpd/conf/httpd.conf
      source: salt://httpd/httpd.conf
      require:
        - pkg: httpd
```
user.present: []
group.present: []

In this example, the httpd service is only going to be started if the package, user, group, and file are executed successfully.

Requisite Documentation

For detailed information on each of the individual requisites, please look here.

The Order Option

Before using the order option, remember that the majority of state ordering should be done with a Requisite declaration, and that a requisite declaration will override an order option, so a state with order option should not require or required by other states.

The order option is used by adding an order number to a state declaration with the option order:

```
vim:
  pkg.installed:
    - order: 1
```

By adding the order option to 1 this ensures that the vim package will be installed in tandem with any other state declaration set to the order 1.

Any state declared without an order option will be executed after all states with order options are executed.

But this construct can only handle ordering states from the beginning. Certain circumstances will present a situation where it is desirable to send a state to the end of the line. To do this, set the order to last:

```
vim:
  pkg.installed:
    - order: last
```

31.26.13 OverState System

Note: This documentation has been moved here.

31.26.14 State Providers

New in version 0.9.8.

Salt predetermines what modules should be mapped to what uses based on the properties of a system. These determinations are generally made for modules that provide things like package and service management.

Sometimes in states, it may be necessary to use an alternative module to provide the needed functionality. For instance, an older Arch Linux system may not be running systemd, so instead of using the systemd service module, you can revert to the default service module:

```
httpd:
  service.running:
    - enable: True
    - provider: service
```
In this instance, the basic `service` module (which manages `sysvinit`-based services) will replace the `systemd` module which is used by default on Arch Linux.

However, if it is necessary to make this override for most or every service, it is better to just override the provider in the minion config file, as described in the section below.

**Setting a Provider in the Minion Config File**

Sometimes, when running Salt on custom Linux spins, or distribution that are derived from other distributions, Salt does not successfully detect providers. The providers which are most likely to be affected by this are:

- `pkg`
- `service`
- `user`
- `group`

When something like this happens, rather than specifying the provider manually in each state, it easier to use the `providers` parameter in the minion config file to set the provider.

If you end up needing to override a provider because it was not detected, please let us know! File an issue on the [issue tracker](#), and provide the output from the `grains.items` function, taking care to sanitize any sensitive information.

Below are tables that should help with deciding which provider to use if one needs to be overridden.

**Provider: pkg**

<table>
<thead>
<tr>
<th>Execution Module</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>apt</code></td>
<td>Debian/Ubuntu-based distros which use <code>apt-get(8)</code> for package management</td>
</tr>
<tr>
<td><code>brew</code></td>
<td>Mac OS software management using Homebrew</td>
</tr>
<tr>
<td><code>ebuild</code></td>
<td>Gentoo-based systems (utilizes the <code>portage python module as well as emerge(1)</code></td>
</tr>
<tr>
<td><code>freenbsdpkg</code></td>
<td>FreeBSD-based OSes using <code>pkg_add(1)</code></td>
</tr>
<tr>
<td><code>openbsdpkg</code></td>
<td>OpenBSD-based OSes using <code>pkg_add(1)</code></td>
</tr>
<tr>
<td><code>pacman</code></td>
<td>Arch Linux-based distros using <code>pacman(8)</code></td>
</tr>
<tr>
<td><code>pkgin</code></td>
<td>NetBSD-based OSes using <code>pkgin(1)</code></td>
</tr>
<tr>
<td><code>pkgng</code></td>
<td>FreeBSD-based OSes using <code>pkg(8)</code></td>
</tr>
<tr>
<td><code>pkgutil</code></td>
<td>Solaris-based OSes using OpenCSW's <code>pkgutil(1)</code></td>
</tr>
<tr>
<td><code>solarispkg</code></td>
<td>Solaris-based OSes using <code>pkgadd(1M)</code></td>
</tr>
<tr>
<td><code>solarisips</code></td>
<td>Solaris-based OSes using IPS <code>pkg(1)</code></td>
</tr>
<tr>
<td><code>win_pkg</code></td>
<td>Windows</td>
</tr>
<tr>
<td><code>yumpkg</code></td>
<td>Red Hat-based distros and derivatives (wraps <code>yum(8)</code></td>
</tr>
<tr>
<td><code>zypper</code></td>
<td>SUSE-based distros using <code>zypper(8)</code></td>
</tr>
</tbody>
</table>
**Provider: service**

<table>
<thead>
<tr>
<th>Execution Module</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>debian_service</td>
<td>Debian (non-systemd)</td>
</tr>
<tr>
<td>freebsd_service</td>
<td>FreeBSD-based OSes using <code>service(8)</code></td>
</tr>
<tr>
<td>gentoo_service</td>
<td>Gentoo Linux using <code>sysvinit</code> and <code>rc-update(8)</code></td>
</tr>
<tr>
<td>launchctl</td>
<td>Mac OS hosts using <code>launchctl(1)</code></td>
</tr>
<tr>
<td>netbsd_service</td>
<td>NetBSD-based OSes</td>
</tr>
<tr>
<td>openbsd_service</td>
<td>OpenBSD-based OSes</td>
</tr>
<tr>
<td>rh_service</td>
<td>RedHat-based distros and derivatives using <code>service(8)</code> and <code>chkconfig(8)</code>. Supports both pure sysvinit and mixed sysvinit/upstart systems.</td>
</tr>
<tr>
<td>service</td>
<td>Fallback which simply wraps sysvinit scripts</td>
</tr>
<tr>
<td>smf</td>
<td>Solaris-based OSes which use SMF</td>
</tr>
<tr>
<td>systemd</td>
<td>Linux distros which use systemd</td>
</tr>
<tr>
<td>upstart</td>
<td>Ubuntu-based distros using upstart</td>
</tr>
<tr>
<td>win_service</td>
<td>Windows</td>
</tr>
</tbody>
</table>

**Provider: user**

<table>
<thead>
<tr>
<th>Execution Module</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>useradd</td>
<td>Linux, NetBSD, and OpenBSD systems using <code>useradd(8)</code>, <code>userdel(8)</code>, and <code>usermod(8)</code></td>
</tr>
<tr>
<td>pw_user</td>
<td>FreeBSD-based OSes using <code>pw(8)</code></td>
</tr>
<tr>
<td>solaris_user</td>
<td>Solaris-based OSes using <code>useradd(1M)</code>, <code>userdel(1M)</code>, and <code>usermod(1M)</code></td>
</tr>
<tr>
<td>win_useradd</td>
<td>Windows</td>
</tr>
</tbody>
</table>

**Provider: group**

<table>
<thead>
<tr>
<th>Execution Module</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>groupadd</td>
<td>Linux, NetBSD, and OpenBSD systems using <code>groupadd(8)</code>, <code>groupdel(8)</code>, and <code>groupmod(8)</code></td>
</tr>
<tr>
<td>pw_group</td>
<td>FreeBSD-based OSes using <code>pw(8)</code></td>
</tr>
<tr>
<td>solaris_group</td>
<td>Solaris-based OSes using <code>groupadd(1M)</code>, <code>groupdel(1M)</code>, and <code>groupmod(1M)</code></td>
</tr>
<tr>
<td>win_groupadd</td>
<td>Windows</td>
</tr>
</tbody>
</table>

**Arbitrary Module Redirects**

The provider statement can also be used for more powerful means, instead of overwriting or extending the module used for the named service an arbitrary module can be used to provide certain functionality.

```
emacs:
  pkg.installed:
```
In this example, the state is being instructed to use a custom module to invoke commands. Arbitrary module redirects can be used to dramatically change the behavior of a given state.

### 31.26.15 Requisites and Other Global State Arguments

#### Fire Event Notifications

New in version 2015.8.0.

The `fire_event` option in a state will cause the minion to send an event to the Salt Master upon completion of that individual state.

The following example will cause the minion to send an event to the Salt Master with a tag of `salt/state_result/20150505121517276431/dasalt/nano` and the result of the state will be the data field of the event. Notice that the name of the state gets added to the tag.

```yaml
nano_stuff:
  pkg.installed:
    - name: nano
    - fire_event: True
```

In the following example instead of setting `fire_event` to `True`, `fire_event` is set to an arbitrary string, which will cause the event to be sent with this tag: `salt/state_result/20150505121725642845/dasalt/custom/tag/nano/finished`

```yaml
nano_stuff:
  pkg.installed:
    - name: nano
    - fire_event: custom/tag/nano/finished
```

#### Requisites

The Salt requisite system is used to create relationships between states. The core idea being that, when one state is dependent somehow on another, that inter-dependency can be easily defined.

Requisites come in two types: Direct requisites (such as `require`), and requisite_ins (such as `require_in`). The relationships are directional: a direct requisite requires something from another state. However, a requisite_in inserts a requisite into the targeted state pointing to the targeting state. The following example demonstrates a direct requisite:

```yaml
vim:
  pkg.installed: []

/etc/vimrc:
  file.managed:
    - source: salt://edit/vimrc
    - require:
      - pkg: vim
```

In the example above, the file `/etc/vimrc` depends on the vim package.

Requisite_in statements are the opposite. Instead of saying ```"I depend on something"``` requisite_ins say ```"Someone depends on me"```:
vim:
  pkg.installed:
    - require_in:
      - file: /etc/vimrc

/etc/vimrc:
  file.managed:
    - source: salt://edit/vimrc

So here, with a requisite_in, the same thing is accomplished as in the first example, but the other way around. The vim package is saying `~/etc/vimrc depends on me`. This will result in a `require` being inserted into the `/etc/vimrc` state which targets the `vim` state.

In the end, a single dependency map is created and everything is executed in a finite and predictable order.

Note: Requisite matching

Requisites match on both the ID Declaration and the `name` parameter. This means that, in the example above, the `require_in` requisite would also have been matched if the `/etc/vimrc` state was written as follows:

vimrc:
  file.managed:
    - name: /etc/vimrc
    - source: salt://edit/vimrc

Direct Requisite and Requisite_in types

There are several direct requisite statements that can be used in Salt:

- `require`
- `watch`
- `prereq`
- `use`
- `onchanges`
- `onfail`

Each direct requisite also has a corresponding requisite_in:

- `require_in`
- `watch_in`
- `prereq_in`
- `use_in`
- `onchanges_in`
- `onfail_in`

All of the requisites define specific relationships and always work with the dependency logic defined above.

`require` The use of `require` demands that the dependent state executes before the depending state. The state containing the `require` requisite is defined as the depending state. The state specified in the `require` statement is defined as the dependent state. If the dependent state’s execution succeeds, the depending state will then execute.
If the dependent state's execution fails, the depending state will not execute. In the first example above, the file `/etc/vimrc` will only execute after the `vim` package is installed successfully.

**Require an entire sls file**  As of Salt 0.16.0, it is possible to require an entire sls file. Do this first by including the sls file and then setting a state to `require` the included sls file:

```
include:
  - foo

bar:
  pkg.installed:
    - require:
      - sls: foo
```

**watch**  `watch` statements are used to add additional behavior when there are changes in other states.

**Note:** If a state should only execute when another state has changes, and otherwise do nothing, the new `on-changes` requisite should be used instead of `watch`. `watch` is designed to add *additional* behavior when there are changes, but otherwise execute normally.

The state containing the `watch` requisite is defined as the watching state. The state specified in the `watch` statement is defined as the watched state. When the watched state executes, it will return a dictionary containing a key named `'changes'`. Here are two examples of state return dictionaries, shown in json for clarity:

```json
"local": {
  "file_|-/tmp/foo_|-/tmp/foo_|-directory": {
    "comment": "Directory /tmp/foo updated",
    "__run_num__": 0,
    "changes": {
      "user": "bar"
    },
    "name": "/tmp/foo",
    "result": true
  }
}

"local": {
  "pkgrepo_|-salt-minion_|-salt-minion_|-managed": {
    "comment": "Package repo 'salt-minion' already configured",
    "__run_num__": 0,
    "changes": {},
    "name": "salt-minion",
    "result": true
  }
}
```

If the `"result"` of the watched state is `true`, the watching state will *execute normally*. This part of `watch` mirrors the functionality of the `require` requisite. If the `"result"` of the watched state is `false`, the watching state will never run, nor will the watching state's `mod_watch` function execute.

However, if the `"result"` of the watched state is `true`, and the `"changes"` key contains a populated dictionary (changes occurred in the watched state), then the `watch` requisite can add additional behavior. This additional behavior is defined by the `mod_watch` function within the watching state module. If the `mod_watch` function exists in the watching state module, it will be called *in addition* to the normal watching state. The return data from the `mod_watch` function is what will be returned to the master in this case; the return data from the main watching function is discarded.
If the "changes" key contains an empty dictionary, the watch requisite acts exactly like the require requisite (the watching state will execute if "result" is True, and fail if "result" is False in the watched state).

**Note:** Not all state modules contain mod_watch. If mod_watch is absent from the watching state module, the watch requisite behaves exactly like a require requisite.

A good example of using watch is with a service.running state. When a service watches a state, then the service is reloaded/restarted when the watched state changes, in addition to Salt ensuring that the service is running.

```
ntpd:
  service.running:
    - watch:
      - file: /etc/ntp.conf
  file.managed:
    - name: /etc/ntp.conf
    - source: salt://ntp/files/ntp.conf
```

prereq  New in version 0.16.0.

prereq allows for actions to be taken based on the expected results of a state that has not yet been executed. The state containing the prereq requisite is defined as the pre-requiring state. The state specified in the prereq statement is defined as the pre-required state.

When a prereq requisite is evaluated, the pre-required state reports if it expects to have any changes. It does this by running the pre-required single state as a test-run by enabling test=True. This test-run will return a dictionary containing a key named "changes". (See the watch section above for examples of "changes" dictionaries.)

If the "changes" key contains a populated dictionary, it means that the pre-required state expects changes to occur when the state is actually executed, as opposed to the test-run. The pre-requiring state will now actually run. If the pre-requiring state executes successfully, the pre-required state will then execute. If the pre-requiring state fails, the pre-required state will not execute.

If the "changes" key contains an empty dictionary, this means that changes are not expected by the pre-required state. Neither the pre-required state nor the pre-requiring state will run.

The best way to define how prereq operates is displayed in the following practical example: When a service should be shut down because underlying code is going to change, the service should be off-line while the update occurs. In this example, graceful-down is the pre-requiring state and site-code is the pre-required state.

```
graceful-down:
  cmd.run:
    - name: service apache graceful
    - prereq:
      - file: site-code

site-code:
  file.recurse:
    - name: /opt/site_code
    - source: salt://site/code
```

In this case the apache server will only be shutdown if the site-code state expects to deploy fresh code via the file.recurse call. The site-code deployment will only be executed if the graceful-down run completes successfully.

onfail  New in version 2014.7.0.

The onfail requisite allows for reactions to happen strictly as a response to the failure of another state. This can be used in a number of ways, such as executing a second attempt to set up a service or begin to execute a separate
thread of states because of a failure.

The onfail requisite is applied in the same way as require as watch:

```yaml
primary_mount:
  mount.mounted:
    - name: /mnt/share
    - device: 10.0.0.45:/share
    - fstype: nfs

backup_mount:
  mount.mounted:
    - name: /mnt/share
    - device: 192.168.40.34:/share
    - fstype: nfs
    - onfail:
      - mount: primary_mount
```

onchanges  New in version 2014.7.0.

The onchanges requisite makes a state only apply if the required states generate changes, and if the watched state's `result` is True. This can be a useful way to execute a post hook after changing aspects of a system.

If a state has multiple onchanges requisites then the state will trigger if any of the watched states changes.

use  The use requisite is used to inherit the arguments passed in another id declaration. This is useful when many files need to have the same defaults.

```yaml
/etc/foo.conf:
  file.managed:
    - source: salt://foo.conf
    - template: jinja
    - mkdirs: True
    - user: apache
    - group: apache
    - mode: 755

/etc/bar.conf
  file.managed:
    - source: salt://bar.conf
    - use:
      - file: /etc/foo.conf
```

The use statement was developed primarily for the networking states but can be used on any states in Salt. This makes sense for the networking state because it can define a long list of options that need to be applied to multiple network interfaces.

The use statement does not inherit the requisites arguments of the targeted state. This means also a chain of use requisites would not inherit inherited options.

The _in versions of requisites  All of the requisites also have corresponding requisite_in versions, which do the reverse of their normal counterparts. The examples below all use require_in as the example, but note that all of the _in requisites work the same way: They result in a normal requisite in the targeted state, which targets the state which has defines the requisite_in. Thus, a require_in causes the target state to require the targeting state. Similarly, a watch_in causes the target state to watch the targeting state. This pattern continues for the rest of the requisites.
If a state declaration needs to be required by another state declaration then `require_in` can accommodate it. Therefore, these two sls files would be the same in the end:

Using `require`

```yaml
httpd:
  pkg.installed: []
  service.running:
    - require:
      - pkg: httpd
```

Using `require_in`

```yaml
httpd:
  pkg.installed:
    - require_in:
      - service: httpd
  service.running: []
```

The `require_in` statement is particularly useful when assigning a require in a separate sls file. For instance it may be common for `httpd` to require components used to set up PHP or mod_python, but the HTTP state does not need to be aware of the additional components that require it when it is set up:

```yaml
http.sls
httpd:
  pkg.installed: []
  service.running:
    - require:
      - pkg: httpd
```

```yaml
php.sls
include:
  - http

php:
  pkg.installed:
    - require_in:
      - service: httpd
```

```yaml
mod_python.sls
include:
  - http

mod_python:
  pkg.installed:
    - require_in:
      - service: httpd
```

Now the `httpd` server will only start if `php` or `mod_python` are first verified to be installed. Thus allowing for a requisite to be defined `after the fact`.

**Altering States**

The state altering system is used to make sure that states are evaluated exactly as the user expects. It can be used to double check that a state preformed exactly how it was expected to, or to make 100% sure that a state only runs
under certain conditions. The use of unless or onlyif options help make states even more stateful. The check_cmds option helps ensure that the result of a state is evaluated correctly.

**Unless**

New in version 2014.7.0.

The `unless` requisite specifies that a state should only run when any of the specified commands return `False`. The `unless` requisite operates as NOR and is useful in giving more granular control over when a state should execute.

**NOTE:** Under the hood `unless` calls `cmd.retcode` with `python_shell=True`. This means the commands referenced by unless will be parsed by a shell, so beware of side-effects as this shell will be run with the same privileges as the salt-minion.

```plaintext
deploy_app:
  cmd.run:
    - names:
      - first_deploy_cmd
      - second_deploy_cmd
      - unless: ls /usr/bin/vim
```

In the example above, the state will only run if either the vim-enhanced package is not installed (returns `False`) or if `/usr/bin/vim` does not exist (returns `False`). The state will run if both commands return `False`.

However, the state will not run if both commands return `True`.

**NOTE:** Under the hood `unless` calls `cmd.retcode` with `python_shell=True`. This means the commands referenced by unless will be parsed by a shell, so beware of side-effects as this shell will be run with the same privileges as the salt-minion.

```plaintext
deploy_app:
  cmd.run:
    - names:
      - first_deploy_cmd
      - second_deploy_cmd
      - unless: ls /usr/bin/vim
```

In the above case, `some_check` will be run prior to `_each_ name` -- once for `first_deploy_cmd` and a second time for `second_deploy_cmd`.

**Onlyif**

New in version 2014.7.0.

`onlyif` is the opposite of `unless`. If all of the commands in `onlyif` return `True`, then the state is run. If any of the specified commands return `False`, the state will not run.

**NOTE:** Under the hood `onlyif` calls `cmd.retcode` with `python_shell=True`. This means the commands referenced by unless will be parsed by a shell, so beware of side-effects as this shell will be run with the same privileges as the salt-minion.

```plaintext
stop-volume:
  module.run:
    - name: glusterfs.stop_volume
    - m_name: work
    - onlyif:
      - gluster volume status work
    - order: 1
```
```
remove-volume:
  module.run:
    - name: glusterfs.delete
    - m_name: work
    - onlyif:
      - gluster volume info work
    - watch:
      - cmd: stop-volume
```

The above example ensures that the stop_volume and delete modules only run if the gluster commands return a 0 ret value.

### Listen/Listen_in

New in version 2014.7.0.

listen and its counterpart listen_in trigger mod_wait functions for states, when those states succeed and result in changes, similar to how watch its counterpart watch_in. Unlike watch and watch_in, listen, and listen_in will not modify the order of states and can be used to ensure your states are executed in the order they are defined. All listen/listen_in actions will occur at the end of a state run, after all states have completed.

```
restart-apache2:
  service.running:
    - name: apache2
    - listen:
      - file: /etc/apache2/apache2.conf

configure-apache2:
  file.managed:
    - name: /etc/apache2/apache2.conf
    - source: salt://apache2/apache2.conf
```

This example will cause apache2 to be restarted when the apache2.conf file is changed, but the apache2 restart will happen at the end of the state run.

```
restart-apache2:
  service.running:
    - name: apache2

configure-apache2:
  file.managed:
    - name: /etc/apache2/apache2.conf
    - source: salt://apache2/apache2.conf
    - listen_in:
      - service: apache2
```

This example does the same as the above example, but puts the state argument on the file resource, rather than the service resource.

### check_cmd

New in version 2014.7.0.

Check Command is used for determining that a state did or did not run as expected.
NOTE: Under the hood check_cmd calls cmd.retcode with python_shell=True. This means the commands referenced by unless will be parsed by a shell, so beware of side-effects as this shell will be run with the same privileges as the salt-minion.

```
comment-repo:
  file.replace:
    - name: /etc/yum.repos.d/fedora.repo
      pattern: ^enabled=0
      repl: enabled=1
      check_cmd:
        - grep 'enabled=0' /etc/yum.repos.d/fedora.repo && return 1 || return 0
```

This will attempt to do a replace on all enabled=0 in the .repo file, and replace them with enabled=1. The check_cmd is just a bash command. It will do a grep for enabled=0 in the file, and if it finds any, it will return a 0, which will prompt the && portion of the command to return a 1, causing check_cmd to set the state as failed. If it returns a 1, meaning it didn't find any `enabled=0' it will hit the || portion of the command, returning a 0, and declaring the function succeeded.

Overriding Checks

There are two commands used for the above checks.

mod_run_check is used to check for onlyif and unless. If the goal is to override the global check for these to variables, include a mod_run_check in the salt/states/ file.

mod_run_check_cmd is used to check for the check_cmd options. To override this one, include a mod_run_check_cmd in the states file for the state.

31.26.16 Startup States

Sometimes it may be desired that the salt minion execute a state run when it is started. This alleviates the need for the master to initiate a state run on a new minion and can make provisioning much easier.

As of Salt 0.10.3 the minion config reads options that allow for states to be executed at startup. The options are startup_states, sls_list, and top_file.

The startup_states option can be passed one of a number of arguments to define how to execute states. The available options are:

highstate Execute state.highstate

sls Read in the sls_list option and execute the named sls files

top Read in the top_file option and execute states based on that top file on the Salt Master

Examples:

Execute state.highstate when starting the minion:

```
startup_states: highstate
```

Execute the sls files edit.vim and hyper:

```
startup_states: sls

sls_list:
```
31.26.17 State Testing

Executing a Salt state run can potentially change many aspects of a system and it may be desirable to first see what a state run is going to change before applying the run.

Salt has a test interface to report on exactly what will be changed, this interface can be invoked on any of the major state run functions:

```bash
salt '*' state.highstate test=True
salt '*' state.sls test=True
salt '*' state.single test=True
```

The test run is mandated by adding the `test=True` option to the states. The return information will show states that will be applied in yellow and the result is reported as `None`.

Default Test

If the value `test` is set to `True` in the minion configuration file then states will default to being executed in test mode. If this value is set then states can still be run by calling `test=False`:

```bash
salt '*' state.highstate test=False
salt '*' state.sls test=False
salt '*' state.single test=False
```

31.26.18 The Top File

Introduction

Most infrastructures are made up of groups of machines, each machine in the group performing a role similar to others. Those groups of machines work in concert with each other to create an application stack.

To effectively manage those groups of machines, an administrator needs to be able to create roles for those groups. For example, a group of machines that serve front-end web traffic might have roles which indicate that those machines should all have the Apache webserver package installed and that the Apache service should always be running.

In Salt, the file which contains a mapping between groups of machines on a network and the configuration roles that should be applied to them is called a top file.

Top files are named `top.sls` by default and they are so-named because they always exist in the ```top``` of a directory hierarchy that contains state files. That directory hierarchy is called a state tree.

A Basic Example

Top files have three components:

- Environment: A state tree directory containing a set of state files to configure systems.
- Target: A grouping of machines which will have a set of states applied to them.
- State files: A list of state files to apply to a target. Each state file describes one or more states to be configured and enforced on the targeted machines.
The relationship between these three components is nested as follows:

- Environments contain targets
- Targets contain states

Putting these concepts together, we can describe a scenario in which all minions with an ID that begins with `web` have an `apache` state applied to them:

```
base: # Apply SLS files from the directory root for the 'base' environment
    'web*': # All minions with a minion_id that begins with 'web'
        - apache # Apply the state file named 'apache.sls'
```

## Environments

Environments are directory hierarchies which contain a top files and a set of state files.

Environments can be used in many ways, however there is no requirement that they be used at all. In fact, the most common way to deploy Salt is with a single environment, called `base`. It is recommended that users only create multiple environments if they have a use case which specifically calls for multiple versions of state trees.

### Getting Started with Top Files

Each environment is defined inside a salt master configuration variable called, `file_roots`.

In the most common single-environment setup, only the `base` environment is defined in `file_roots` along with only one directory path for the state tree.

```
file_roots:
    base:
        - /srv/salt
```

In the above example, the top file will only have a single environment to pull from.

Next is a simple single-environment top file placed in `/srv/salt/top.sls`, illustrating that for the environment called `base`, all minions will have the state files named `core.sls` and `edit.sls` applied to them.

```
base:
    '*':
        - core
        - edit
```

Assuming the `file_roots` configuration from above, Salt will look in the `/srv/salt` directory for `core.sls` and `edit.sls`.

### Multiple Environments

In some cases, teams may wish to create versioned state trees which can be used to test Salt configurations in isolated sets of systems such as a staging environment before deploying states into production.

For this case, multiple environments can be used to accomplish this task.

To create multiple environments, the `file_roots` option can be expanded:

```
file_roots:
    dev:
        - /srv/salt/dev
    qa:
```

1594 Chapter 31. Reference
In the above, we declare three environments: dev, qa and prod. Each environment has a single directory assigned to it.

Our top file references the environments:

```bash
dev:
  'webserver*':
    - webserver
  'db*':
    - db
qa:
  'webserver*':
    - webserver
  'db*':
    - db
prod:
  'webserver*':
    - webserver
  'db*':
    - db
```

As seen above, the top file now declares the three environments and for each, targets are defined to map globs of minion IDs to state files. For example, all minions which have an ID beginning with the string webserver will have the webserver state from the requested environment assigned to it.

In this manner, a proposed change to a state could first be made in a state file in /srv/salt/dev and the applied to development web servers before moving the state into QA by copying the state file into /srv/salt/qa.

Choosing an Environment to Target

The top file is used to assign a minion to an environment unless overridden using the methods described below. The environment in the top file must match an environment in file_roots in order for any states to be applied to that minion. The states that will be applied to a minion in a given environment can be viewed using the state.show_top execution function.

Minions may be pinned to a particular environment by setting the environment value in the minion configuration file. In doing so, a minion will only request files from the environment to which it is assigned.

The environment to use may also be dynamically selected at the time that a salt, salt-call or salt-ssh by passing passing a flag to the execution module being called. This is most commonly done with functions in the state module by using the saltenv= argument. For example, to run a highstate on all minions, using the state files in the prod state tree, run: salt '*' state.highstate saltenv=prod.

Note: Not all functions accept saltenv as an argument. See individual function documentation to verify.

Shorthand

If you assign only one SLS to a system, as in this example, a shorthand is also available:

```bash
base:
  '*': global
dev:
```
Advanced Minion Targeting

In addition to globs, minions can be specified in top files a few other ways. Some common ones are compound matches and node groups.

Below is a slightly more complex top file example, showing the different types of matches you can perform:

```
# All files will be taken from the file path specified in the base
# environment in the `file_roots` configuration value.

base:
  # All minions get the following three state files applied
  '*':
  - ldap-client
  - networking
  - salt.minion

  # All minions which have an ID that begins with the phrase
  # 'salt-master' will have an SLS file applied that is named
  # 'master.sls' and is in the 'salt' directory, underneath
  # the root specified in the `base` environment in the
  # configuration value for `file_roots`.

  'salt-master*':
  - salt.master

  # Minions that have an ID matching the following regular
  # expression will have the state file called 'web.sls' in the
  # nagios/mon directory applied. Additionally, minions matching
  # the regular expression will also have the 'server.sls' file
  # in the apache/ directory applied.

  # NOTE!
  #
  # Take note of the 'match' directive here, which tells Salt
  # to treat the target string as a regex to be matched!

  '^\(memcache\|web\).\(qa\|prod\).\(loc\)\$':
  - match: pcre
  - nagios.mon.web
  - apache.server

  # Minions that have a grain set indicating that they are running
  # the Ubuntu operating system will have the state file called
  # 'ubuntu.sls' in the 'repos' directory applied.

  #
  # Again take note of the 'match' directive here which tells
```
# Salt to match against a grain instead of a minion ID.

'os:Ubuntu':
  - match: grain
  - repos.ubuntu

# Minions that are either RedHat or CentOS should have the 'epel.sls' # state applied, from the 'repos/' directory.

'os:(RedHat|CentOS)'
  - match: grain_pcre
  - repos.epel

# The three minions with the IDs of 'foo', 'bar' and 'baz' should # have 'database.sls' applied.

'foo,bar,baz:
  - match: list
  - database

# Any minion for which the pillar key 'somekey' is set and has a value # of that key matching 'abc' will have the 'xyz.sls' state applied.

'somekey:abc':
  - match: pillar
  - xyz

# All minions which begin with the strings 'nag1' or any minion with # a grain set called 'role' with the value of 'monitoring' will have # the 'server.sls' state file applied from the 'nagios/' directory.

'nag1* or G@role:monitoring':
  - match: compound
  - nagios.server

---

How Top Files Are Compiled

When using multiple environments, it is not necessary to create a top file for each environment. The most common approach, and the easiest to maintain, is to use a single top file placed in only one environment.

However, some workflows do call for multiple top files. In this case, top files may be merged together to create high data for the state compiler to use as a source to compile states on a minion.

For the following discussion of top file compilation, assume the following configuration:

/etc/salt/master
/srv/salt/first/top.sls: ...

```yaml
first_env:
  '*':
    - first

second_env:
  '*':
    - second
```
The astute reader will ask how the state compiler resolves which should be an obvious conflict if a minion is not pinned to a particular environment and if no environment argument is passed into a state function.

Given the above, it is initially unclear whether `first.sls` will be applied or whether `second.sls` will be applied in a `salt '*' state.highstate` command.

When conflicting keys arise, there are several configuration options which control the behaviour of salt:

- **env_order** Setting `env_order` will set the order in which environments are processed by the state compiler.

- **top_file_merging_strategy** Can be set to `same`, which will process only the top file from the environment that the minion belongs to via the environment configuration setting or the environment that is requested via the `saltenv` argument supported by some functions in the `state` module.

  Can also be set to `merge`. This is the default. When set to `merge`, top files will be merged together. The order in which top files are merged together can be controlled with `env_order`.

- **default_top** If `top_file_merging_strategy` is set to `same` and an environment does not contain a top file, the top file in the environment specified by `default_top` will be used instead.

### 31.26.19 SLS Template Variable Reference

The template engines available to sls files and file templates come loaded with a number of context variables. These variables contain information and functions to assist in the generation of templates. See each variable below for its availability -- not all variables are available in all templating contexts.

**Salt**

The `salt` variable is available to abstract the salt library functions. This variable is a python dictionary containing all of the functions available to the running salt minion. It is available in all salt templates.

```python
{% for file in salt['cmd.run']('ls -1 /opt/to_remove').splitlines() %}
/opt/to_remove/{{ file }}:
   file.absent
{% endfor %}
```

**Opts**

The `opts` variable abstracts the contents of the minion’s configuration file directly to the template. The `opts` variable is a dictionary. It is available in all templates.

```python
{{ opts['cachedir'] }}
```

The `config.get` function also searches for values in the `opts` dictionary.

**Pillar**

The `pillar` dictionary can be referenced directly, and is available in all templates:

```python
{{ pillar['key'] }}
```

Using the `pillar.get` function via the `salt` variable is generally recommended since a default can be safely set in the event that the value is not available in pillar and dictionaries can be traversed directly:
Grains

The grains dictionary makes the minion's grains directly available, and is available in all templates:

```yaml
{{ grains['os'] }}
```

The grains.get function can be used to traverse deeper grains and set defaults:

```yaml
{{ salt['grains.get']('os') }}
```

env

The env variable is available in only in sls files when gathering the sls from an environment.

```yaml
{{ env }}
```

sls

The sls variable contains the sls reference value, and is only available in the actual SLS file (not in any files referenced in that SLS). The sls reference value is the value used to include the sls in top files or via the include option.

```yaml
{{ sls }}
```

31.26.20 State Modules

State Modules are the components that map to actual enforcement and management of Salt states.

States are Easy to Write!

State Modules should be easy to write and straightforward. The information passed to the SLS data structures will map directly to the states modules.

Mapping the information from the SLS data is simple, this example should illustrate:

```
/etc/salt/master: # maps to "name"
file.managed: # maps to <filename>.<function> - e.g. "managed" in https://github.com/saltstack/salt/tree/develop/salt/states/file.py
- user: root # one of many options passed to the manage function
- group: root
- mode: 644
- source: salt://salt/master
```

Therefore this SLS data can be directly linked to a module, function, and arguments passed to that function.

This does issue the burden, that function names, state names and function arguments should be very human readable inside state modules, since they directly define the user interface.

Keyword Arguments

Salt passes a number of keyword arguments to states when rendering them, including the environment, a unique identifier for the state, and more. Additionally, keep in mind that the requisites for a state are part of the keyword arguments.
arguments. Therefore, if you need to iterate through the keyword arguments in a state, these must be considered
and handled appropriately. One such example is in the pkgrepo.managed state, which needs to be able to handle
arbitrary keyword arguments and pass them to module execution functions. An example of how these keyword
arguments can be handled can be found here.

Using Custom State Modules

Place your custom state modules inside a _states directory within the file_roots specified by the master
config file. These custom state modules can then be distributed in a number of ways. Custom state modules
are distributed when state.highstate is run, or by executing the saltutil.sync_states or
saltutil.sync_all functions.

Any custom states which have been synced to a minion, that are named the same as one of Salt’s default set of
states, will take the place of the default state with the same name. Note that a state’s default name is its filename (i.e.
foo.py becomes state foo), but that its name can be overridden by using a __virtual__ function.

Cross Calling Execution Modules from States

As with Execution Modules, State Modules can also make use of the __salt__ and __grains__ data. See cross
calling execution modules.

It is important to note that the real work of state management should not be done in the state module unless it is
needed. A good example is the pkg state module. This module does not do any package management work, it just
calls the pkg execution module. This makes the pkg state module completely generic, which is why there is only one
pkg state module and many backend pkg execution modules.

On the other hand some modules will require that the logic be placed in the state module, a good example of this
is the file module. But in the vast majority of cases this is not the best approach, and writing specific execution
modules to do the backend work will be the optimal solution.

Cross Calling State Modules

All of the Salt state modules are available to each other and state modules can call functions available in other state
modules.

The variable __states__ is packed into the modules after they are loaded into the Salt minion.

The __states__ variable is a Python dictionary containing all of the state modules. Dictionary keys are strings
representing the names of the modules and the values are the functions themselves.

Salt state modules can be cross-called by accessing the value in the __states__ dict:

```python
ret = __states__['file.managed'](name='/tmp/myfile', source='salt://myfile')
```

This code will call the managed function in the file state module and pass the arguments name and source to it.

Return Data

A State Module must return a dict containing the following keys/values:

- **name**: The same value passed to the state as `name`.
- **changes**: A dict describing the changes made. Each thing changed should be a key, with its value being another
dict with keys called `old` and `new` containing the old/new values. For example, the pkg state’s changes
dict has one key for each package changed, with the "old" and "new" keys in its sub-dict containing the old and new versions of the package.

- **result**: A tristate value. `True` if the action was successful, `False` if it was not, or `None` if the state was run in test mode, `test=True`, and changes would have been made if the state was not run in test mode.

<table>
<thead>
<tr>
<th></th>
<th>live mode</th>
<th>test mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>no changes</td>
<td><code>True</code></td>
<td><code>True</code></td>
</tr>
<tr>
<td>successful</td>
<td><code>True</code></td>
<td><code>None</code></td>
</tr>
<tr>
<td>changes</td>
<td><code>False</code></td>
<td><code>None</code></td>
</tr>
</tbody>
</table>

**Note**: Test mode does not predict if the changes will be successful or not.

- **comment**: A string containing a summary of the result.

**Test State**

All states should check for and support `test` being passed in the options. This will return data about what changes would occur if the state were actually run. An example of such a check could look like this:

```python
# Return comment of changes if test.
if __opts__['test']:
    ret['result'] = None
    ret['comment'] = 'State Foo will execute with param {0}'.format(bar)
    return ret
```

Make sure to test and return before performing any real actions on the minion.

**Watcher Function**

If the state being written should support the watch requisite then a watcher function needs to be declared. The watcher function is called whenever the watch requisite is invoked and should be generic to the behavior of the state itself.

The watcher function should accept all of the options that the normal state functions accept (as they will be passed into the watcher function).

A watcher function typically is used to execute state specific reactive behavior, for instance, the watcher for the service module restarts the named service and makes it useful for the watcher to make the service react to changes in the environment.

The watcher function also needs to return the same data that a normal state function returns.

**Mod_init Interface**

Some states need to execute something only once to ensure that an environment has been set up, or certain conditions global to the state behavior can be predefined. This is the realm of the mod_init interface.

A state module can have a function called `mod_init` which executes when the first state of this type is called. This interface was created primarily to improve the pkg state. When packages are installed the package metadata needs to be refreshed, but refreshing the package metadata every time a package is installed is wasteful. The `mod_init` function for the pkg state sets a flag down so that the first, and only the first, package installation attempt will refresh the package database (the package database can of course be manually called to refresh via the `refresh` option in the pkg state).

The `mod_init` function must accept the [Low State Data](#) for the given executing state as an argument. The low state data is a dict and can be seen by executing the state.show_lowstate function. Then the `mod_init` function must return
a bool. If the return value is True, then the mod_init function will not be executed again, meaning that the needed behavior has been set up. Otherwise, if the mod_init function returns False, then the function will be called the next time.

A good example of the mod_init function is found in the pkg state module:

```python
def mod_init(low):
    '''
    Refresh the package database here so that it only needs to happen once
    '''
    if low['fun'] == 'installed' or low['fun'] == 'latest':
        rtag = __gen_rtag()
        if not os.path.exists(rtag):
            open(rtag, 'w+').write('')
        return True
    else:
        return False
```

The mod_init function in the pkg state accepts the low state data as low and then checks to see if the function being called is going to install packages, if the function is not going to install packages then there is no need to refresh the package database. Therefore if the package database is prepared to refresh, then return True and the mod_init will not be called the next time a pkg state is evaluated, otherwise return False and the mod_init will be called next time a pkg state is evaluated.

**Log Output**

You can call the logger from custom modules to write messages to the minion logs. The following code snippet demonstrates writing log messages:

```python
import logging

log = logging.getLogger(__name__)

log.info('Here is Some Information')
log.warning('You Should Not Do That')
log.error('It Is Busted')
```

**Full State Module Example**

The following is a simplistic example of a full state module and function. Remember to call out to execution modules to perform all the real work. The state module should only perform ``before`` and ``after`` checks.

1. Make a custom state module by putting the code into a file at the following path: `/srv/salt/_states/my_custom_state.py`.
2. Distribute the custom state module to the minions:

```bash
salt '*' saltutil.sync_states
```
3. Write a new state to use the custom state by making a new state file, for instance `/srv/salt/my_custom_state.sls`.
4. Add the following SLS configuration to the file created in Step 3:

```yaml
human_friendly_state_id:  # An arbitrary state ID declaration.
    my_custom_state:      # The custom state module name.
        - enforce_custom_thing  # The function in the custom state module.
```
Example state module

```python
import salt.exceptions

def enforce_custom_thing(name, foo, bar=True):
    
    Enforce the state of a custom thing

    This state module does a custom thing. It calls out to the execution module `my_custom_module` in order to check the current system and perform any needed changes.

    name
        The thing to do something to
    foo
        A required argument
    bar : True
        An argument with a default value
    
    ret = {'name': name, 'changes': {}, 'result': False, 'comment': ''}

    # Start with basic error-checking. Do all the passed parameters make sense and agree with each-other?
    if bar == True and foo.startswith('Foo'):
        raise salt.exceptions.SaltInvocationError('Argument "foo" cannot start with "Foo" if argument "bar" is True."

    # Check the current state of the system. Does anything need to change?
    current_state = __salt__['my_custom_module.current_state'](name)

    if current_state == foo:
        ret['result'] = True
        ret['comment'] = 'System already in the correct state'
        return ret

    # The state of the system does need to be changed. Check if we're running in ``test=true`` mode.
    if __opts__['test'] == True:
        ret['comment'] = 'The state of "{0}" will be changed.'.format(name)
        ret['changes'] = {
            'old': current_state,
            'new': 'Description, diff, whatever of the new state',
        }

        # Return ``None`` when running with ``test=true``.
        ret['result'] = None

        return ret

    # Finally, make the actual change and return the result.
    new_state = __salt__['my_custom_module.change_state'](name, foo)
```

```
- name: a_value  # Maps to the ``name`` parameter in the custom function.
- foo: Foo       # Specify the required ``foo`` parameter.
- bar: False     # Override the default value for the ``bar`` parameter.
```
State management, also frequently called Software Configuration Management (SCM), is a program that puts and keeps a system into a predetermined state. It installs software packages, starts or restarts services or puts configuration files in place and watches them for changes.

Having a state management system in place allows one to easily and reliably configure and manage a few servers or a few thousand servers. It allows configurations to be kept under version control.

Salt States is an extension of the Salt Modules that we discussed in the previous remote execution tutorial. Instead of calling one-off executions the state of a system can be easily defined and then enforced.

### 31.26.22 Understanding the Salt State System Components

The Salt state system is comprised of a number of components. As a user, an understanding of the SLS and renderer systems are needed. But as a developer, an understanding of Salt states and how to write the states is needed as well.

**Note:** States are compiled and executed only on minions that have been targeted. To execute functions directly on masters, see runners.

#### Salt SLS System

The primary system used by the Salt state system is the SLS system. SLS stands for Salt State.

The Salt States are files which contain the information about how to configure Salt minions. The states are laid out in a directory tree and can be written in many different formats.

The contents of the files and the way they are laid out is intended to be as simple as possible while allowing for maximum flexibility. The files are laid out in states and contains information about how the minion needs to be configured.

#### SLS File Layout

SLS files are laid out in the Salt file server.

A simple layout can look like this:

```
top.sls
ssh.sls
sshd_config
users/init.sls
users/admin.sls
```
The `top.sls` file is a key component. The `top.sls` files is used to determine which SLS files should be applied to which minions.

The rest of the files with the `.sls` extension in the above example are state files.

Files without a `.sls` extensions are seen by the Salt master as files that can be downloaded to a Salt minion.

States are translated into dot notation. For example, the `ssh.sls` file is seen as the ssh state and the `users/admin.sls` file is seen as the users.admin state.

Files named `init.sls` are translated to be the state name of the parent directory, so the `web/init.sls` file translates to the `web` state.

In Salt, everything is a file; there is no "magic translation" of files and file types. This means that a state file can be distributed to minions just like a plain text or binary file.

### SLS Files

The Salt state files are simple sets of data. Since SLS files are just data they can be represented in a number of different ways.

The default format is YAML generated from a Jinja template. This allows for the states files to have all the language constructs of Python and the simplicity of YAML.

State files can then be complicated Jinja templates that translate down to YAML, or just plain and simple YAML files.

The State files are simply common data structures such as dictionaries and lists, constructed using a templating language such as YAML.

Here is an example of a Salt State:

```bash
vim:
  pkg.installed: []
salt:
  pkg.latest:
    - name: salt
  service.running:
    - names:
      - salt-master
      - salt-minion
    - require:
      - pkg: salt
    - watch:
      - file: /etc/salt/minion

/etc/salt/minion:
  file.managed:
    - source: salt://salt/minion
    - user: root
    - group: root
    - mode: 644
    - require:
      - pkg: salt
```
This short stanza will ensure that vim is installed, Salt is installed and up to date, the salt-master and salt-minion daemons are running and the Salt minion configuration file is in place. It will also ensure everything is deployed in the right order and that the Salt services are restarted when the watched file updated.

**The Top File**

The top file controls the mapping between minions and the states which should be applied to them.

The top file specifies which minions should have which SLS files applied and which environments they should draw those SLS files from.

The top file works by specifying environments on the top-level.

Each environment contains globs to match minions. Finally, each glob contains a list of lists of Salt states to apply to matching minions:

```
base:
  '*':
    - salt
    - users
    - users.admin
  'saltmaster.*':
    - match: pcre
    - salt.master
```

This above example uses the base environment which is built into the default Salt setup.

The base environment has two globs. First, the "*" glob contains a list of SLS files to apply to all minions.

The second glob contains a regular expression that will match all minions with an ID matching saltmaster.* and specifies that for those minions, the salt.master state should be applied.

**Reloading Modules**

Some Salt states require that specific packages be installed in order for the module to load. As an example the pip state module requires the pip package for proper name and version parsing.

In most of the common cases, Salt is clever enough to transparently reload the modules. For example, if you install a package, Salt reloads modules because some other module or state might require just that package which was installed.

On some edge-cases salt might need to be told to reload the modules. Consider the following state file which we'll call pep8.sls:

```python
python-pip:
  cmd.run:
    - name: |
      easy_install --script-dir=/usr/bin -U pip
    - cwd: /

pep8:
  pip.installed:
    - require:
      - cmd: python-pip
```

The above example installs pip using easy_install from setuptools and installs pep8 using pip, which, as told earlier, requires pip to be installed system-wide. Let's execute this state:
salt-call state.sls pep8

The execution output would be something like:

```
----------
State: - pip
Name:  pep8
Function: installed
        Result: False
        Comment: State pip.installed found in sls pep8 is unavailable

Changes:

Summary
--------
Succeeded: 1
Failed:  1
--------
Total:   2
```

If we executed the state again the output would be:

```
----------
State: - pip
Name:  pep8
Function: installed
        Result: True
        Comment: Package was successfully installed
Changes: pep8==1.4.6: Installed

Summary
--------
Succeeded: 2
Failed:  0
--------
Total:   2
```

Since we installed pip using cmd, Salt has no way to know that a system-wide package was installed.

On the second execution, since the required pip package was installed, the state executed correctly.

**Note:** Salt does not reload modules on every state run because doing so would greatly slow down state execution.

So how do we solve this *edge-case*? **reload_modules**!

**reload_modules** is a boolean option recognized by salt on all available states which forces salt to reload its modules once a given state finishes.

The modified state file would now be:

```
python-pip:
    cmd.run:
        - name: |
          easy_install --script-dir=/usr/bin -U pip
        - cwd: /
          - reload_modules: true

pep8:
    pip.installed:
```
- require:
  - cmd: python-pip

Let's run it, once:

```
salt-call state.sls pep8
```

The output is:

```
---------
State: - pip
Name:   pep8
Function: installed
  Result: True
  Comment: Package was successfully installed
  Changes: pep8==1.4.6: Installed

Summary
---------
Succeeded: 2
Failed: 0
---------
Total: 2
```

### 31.27 Full list of built-in state modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>alias</td>
<td>Configuration of email aliases</td>
</tr>
<tr>
<td>alternatives</td>
<td>Configuration of the alternatives system</td>
</tr>
<tr>
<td>apache</td>
<td>Apache state</td>
</tr>
<tr>
<td>apache_module</td>
<td>Manage Apache Modules</td>
</tr>
<tr>
<td>aptpkg</td>
<td>Package management operations specific to APT- and DEB-based systems</td>
</tr>
<tr>
<td>archive</td>
<td>Extract an archive</td>
</tr>
<tr>
<td>artifactory</td>
<td>This state downloads artifacts from artifactory.</td>
</tr>
<tr>
<td>at</td>
<td>Configuration disposable regularly scheduled tasks for at.</td>
</tr>
<tr>
<td>augeas</td>
<td>Configuration management using Augeas</td>
</tr>
<tr>
<td>aws_sqs</td>
<td>Manage SQS Queues</td>
</tr>
<tr>
<td>beacon</td>
<td>Management of the Salt beacons</td>
</tr>
<tr>
<td>bigip</td>
<td>A state module designed to enforce load-balancing configurations for F5 Big-IP entities.</td>
</tr>
<tr>
<td>blockdev</td>
<td>Management of Block Devices</td>
</tr>
<tr>
<td>boto_asg</td>
<td>Manage Autoscale Groups</td>
</tr>
<tr>
<td>boto_cfn</td>
<td>Connection module for Amazon Cloud Formation</td>
</tr>
<tr>
<td>boto_cloudwatch_alarm</td>
<td>Manage Cloudwatch alarms</td>
</tr>
<tr>
<td>boto_dynamodb</td>
<td>Manage DynamoDB Tables</td>
</tr>
<tr>
<td>boto_ec2</td>
<td>Manage EC2</td>
</tr>
<tr>
<td>boto_elasticache</td>
<td>Manage Elasticache</td>
</tr>
<tr>
<td>boto_elb</td>
<td>Manage ELBs</td>
</tr>
<tr>
<td>boto_iam</td>
<td>Manage IAM roles</td>
</tr>
<tr>
<td>boto_iam_role</td>
<td>Manage IAM roles</td>
</tr>
<tr>
<td>boto_kms</td>
<td>Manage KMS keys, key policies and grants.</td>
</tr>
<tr>
<td>boto_lc</td>
<td>Manage Launch Configurations</td>
</tr>
<tr>
<td>boto_rds</td>
<td>Manage RDSs</td>
</tr>
<tr>
<td>Module</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>boto_route53</td>
<td>Manage Route53 records</td>
</tr>
<tr>
<td>boto_secgroun</td>
<td>Manage Security Groups</td>
</tr>
<tr>
<td>boto_sns</td>
<td>Manage SNS Topics</td>
</tr>
<tr>
<td>boto_sqs</td>
<td>Manage SQS Queues</td>
</tr>
<tr>
<td>boto_vpc</td>
<td>Manage VPCs</td>
</tr>
<tr>
<td>bower</td>
<td>Installation of Bower Packages</td>
</tr>
<tr>
<td>cabal</td>
<td>Installation of Cabal Packages</td>
</tr>
<tr>
<td>chef</td>
<td>Execute Chef client runs</td>
</tr>
<tr>
<td>cloud</td>
<td>Using states instead of maps to deploy clouds</td>
</tr>
<tr>
<td>cmd</td>
<td>Execution of arbitrary commands</td>
</tr>
<tr>
<td>composer</td>
<td>Installation of Composer Packages</td>
</tr>
<tr>
<td>cron</td>
<td>Management of cron, the Unix command scheduler</td>
</tr>
<tr>
<td>cyg</td>
<td>Installation of Cygwin packages.</td>
</tr>
<tr>
<td>ddns</td>
<td>Dynamic DNS updates</td>
</tr>
<tr>
<td>debconfmod</td>
<td>Management of debconf selections</td>
</tr>
<tr>
<td>disk</td>
<td>Disk monitoring state</td>
</tr>
<tr>
<td>dockerio</td>
<td>Manage Docker containers</td>
</tr>
<tr>
<td>dockerng</td>
<td>Management of Docker containers</td>
</tr>
<tr>
<td>drac</td>
<td>Management of Deli DRAC</td>
</tr>
<tr>
<td>elasticsearch_index</td>
<td>State module to manage Elasticsearch indices</td>
</tr>
<tr>
<td>elasticsearch_index_template</td>
<td>State module to manage Elasticsearch index templates</td>
</tr>
<tr>
<td>environ</td>
<td>Support for getting and setting the environment variables of the current salt process.</td>
</tr>
<tr>
<td>eselect</td>
<td>Management of Gentoo configuration using eselect</td>
</tr>
<tr>
<td>etcd_mod</td>
<td>Manage etcd Keys</td>
</tr>
<tr>
<td>event</td>
<td>Send events through Salt's event system during state runs</td>
</tr>
<tr>
<td>file</td>
<td>Operations on regular files, special files, directories, and symlinks</td>
</tr>
<tr>
<td>firewallld</td>
<td>Management of firewalld</td>
</tr>
<tr>
<td>gem</td>
<td>Installation of Ruby modules packaged as gems</td>
</tr>
<tr>
<td>git</td>
<td>States to manage git repositories and git configuration</td>
</tr>
<tr>
<td>glusterfs</td>
<td>Manage glusterfs pool</td>
</tr>
<tr>
<td>gnomedesktop</td>
<td>Configuration of the GNOME desktop</td>
</tr>
<tr>
<td>grafana</td>
<td>Manage Grafana Dashboards</td>
</tr>
<tr>
<td>grains</td>
<td>Manage grains on the minion</td>
</tr>
<tr>
<td>group</td>
<td>Management of user groups</td>
</tr>
<tr>
<td>hg</td>
<td>Interaction with Mercurial repositories</td>
</tr>
<tr>
<td>hipchat</td>
<td>Send a message to Hipchat</td>
</tr>
<tr>
<td>host</td>
<td>Management of addresses and names in hosts file</td>
</tr>
<tr>
<td>htpasswd</td>
<td>Support for htpasswd module</td>
</tr>
<tr>
<td>http</td>
<td>HTTP monitoring states</td>
</tr>
<tr>
<td>ifttt</td>
<td>Trigger an event in IFTTT</td>
</tr>
<tr>
<td>incron</td>
<td>Management of incron, the inotify cron</td>
</tr>
<tr>
<td>influxdb_database</td>
<td>Management of InfluxDB databases</td>
</tr>
<tr>
<td>influxdb_user</td>
<td>Management of InfluxDB users</td>
</tr>
<tr>
<td>ini_manage</td>
<td>Manage ini files</td>
</tr>
<tr>
<td>ipmi</td>
<td>Manage IPMI devices over LAN</td>
</tr>
<tr>
<td>ipset</td>
<td>Management of ipsets</td>
</tr>
<tr>
<td>iptables</td>
<td>Management of iptables</td>
</tr>
<tr>
<td>jboss7</td>
<td>Manage JBoss 7 Application Server via CLI interface</td>
</tr>
<tr>
<td>keyboard</td>
<td>Management of keyboard layouts</td>
</tr>
<tr>
<td>keystone</td>
<td>Management of Keystone users</td>
</tr>
</tbody>
</table>
Table 31.14 -- continued from previous page

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>kmod</td>
<td>Loading and unloading of kernel modules</td>
</tr>
<tr>
<td>layman</td>
<td>Management of Gentoo Overlays using layman</td>
</tr>
<tr>
<td>libvirt</td>
<td>Manage libvirt certificates</td>
</tr>
<tr>
<td>linux_acl</td>
<td>Linux File Access Control Lists</td>
</tr>
<tr>
<td>locale</td>
<td>Management of languages/locales</td>
</tr>
<tr>
<td>lvm</td>
<td>Management of Linux logical volumes</td>
</tr>
<tr>
<td>lvs_server</td>
<td>Management of LVS (Linux Virtual Server) Real Server</td>
</tr>
<tr>
<td>lvs_service</td>
<td>Management of LVS (Linux Virtual Server) Service</td>
</tr>
<tr>
<td>lxc</td>
<td>Manage Linux Containers</td>
</tr>
<tr>
<td>makeconf</td>
<td>Management of Gentoo make.conf</td>
</tr>
<tr>
<td>mdadm</td>
<td>Managing software RAID with mdadm</td>
</tr>
<tr>
<td>memcached</td>
<td>States for Management of Memcached Keys</td>
</tr>
<tr>
<td>modjk</td>
<td>State to control Apache modjk</td>
</tr>
<tr>
<td>modjk_worker</td>
<td>Manage modjk workers</td>
</tr>
<tr>
<td>module</td>
<td>Execution of Salt modules from within states</td>
</tr>
<tr>
<td>mongodb_database</td>
<td>Management of Mongodb databases</td>
</tr>
<tr>
<td>mongodb_user</td>
<td>Management of Mongodb users</td>
</tr>
<tr>
<td>monit</td>
<td>Monit state</td>
</tr>
<tr>
<td>mount</td>
<td>Mounting of filesystems</td>
</tr>
<tr>
<td>mysql_database</td>
<td>Management of MySQL databases (schemas)</td>
</tr>
<tr>
<td>mysql_grants</td>
<td>Management of MySQL grants (user permissions)</td>
</tr>
<tr>
<td>mysql_query</td>
<td>Execution of MySQL queries</td>
</tr>
<tr>
<td>mysql_user</td>
<td>Management of MySQL users</td>
</tr>
<tr>
<td>network</td>
<td>Configuration of network interfaces</td>
</tr>
<tr>
<td>nftables</td>
<td>Management of nftables</td>
</tr>
<tr>
<td>npm</td>
<td>Installation of NPM Packages</td>
</tr>
<tr>
<td>ntp</td>
<td>Management of NTP servers</td>
</tr>
<tr>
<td>openstack_config</td>
<td>Manage OpenStack configuration file settings.</td>
</tr>
<tr>
<td>pagerduty</td>
<td>Create an Event in PagerDuty</td>
</tr>
<tr>
<td>pagerduty_escalation_policy</td>
<td>Manage PagerDuty escalation policies.</td>
</tr>
<tr>
<td>pagerduty_schedule</td>
<td>Manage PagerDuty schedules.</td>
</tr>
<tr>
<td>pagerduty_service</td>
<td>Manage PagerDuty services</td>
</tr>
<tr>
<td>pagerduty_user</td>
<td>Manage PagerDuty users</td>
</tr>
<tr>
<td>pecl</td>
<td>Installation of PHP Extensions Using pecl</td>
</tr>
<tr>
<td>pip_state</td>
<td>Installation of Python Packages Using pip</td>
</tr>
<tr>
<td>pkg</td>
<td>Installation of packages using OS package managers such as yum or apt-get</td>
</tr>
<tr>
<td>pkgbuild</td>
<td>The pkgbuild state is the front of Salt package building backend.</td>
</tr>
<tr>
<td>pkngr</td>
<td>Manage package remote repo using FreeBSD pkgng</td>
</tr>
<tr>
<td>pkgrepo</td>
<td>Management of APT/YUM package repos</td>
</tr>
<tr>
<td>portage_config</td>
<td>Management of Portage package configuration on Gentoo</td>
</tr>
<tr>
<td>ports</td>
<td>Manage software from FreeBSD ports</td>
</tr>
<tr>
<td>postgres_database</td>
<td>Management of PostgreSQL databases</td>
</tr>
<tr>
<td>postgres_extension</td>
<td>Management of PostgreSQL extensions (e.g.: postgis)</td>
</tr>
<tr>
<td>postgres_group</td>
<td>Management of PostgreSQL groups (roles)</td>
</tr>
<tr>
<td>postgres_schema</td>
<td>Management of PostgreSQL schemas</td>
</tr>
<tr>
<td>postgres_tablespace</td>
<td>Management of PostgreSQL tablespace</td>
</tr>
<tr>
<td>postgres_user</td>
<td>Management of PostgreSQL users (roles)</td>
</tr>
<tr>
<td>powerpath</td>
<td>Powerpath configuration support</td>
</tr>
<tr>
<td>process</td>
<td>Process Management</td>
</tr>
<tr>
<td>pushover</td>
<td>Send a message to PushOver</td>
</tr>
<tr>
<td>Module</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>pyenv</td>
<td>Managing python installations with pyenv</td>
</tr>
<tr>
<td>pyrax_queues</td>
<td>Manage Rackspace Queues</td>
</tr>
<tr>
<td>quota</td>
<td>Management of POSIX Quotas</td>
</tr>
<tr>
<td>rabbitmq_cluster</td>
<td>Manage RabbitMQ Clusters</td>
</tr>
<tr>
<td>rabbitmq_plugin</td>
<td>Manage RabbitMQ Plugins</td>
</tr>
<tr>
<td>rabbitmq_policy</td>
<td>Manage RabbitMQ Policies</td>
</tr>
<tr>
<td>rabbitmq_user</td>
<td>Manage RabbitMQ Users</td>
</tr>
<tr>
<td>rabbitmq_vhost</td>
<td>Manage RabbitMQ Virtual Hosts</td>
</tr>
<tr>
<td>rbenv</td>
<td>Managing Ruby installations with rbenv</td>
</tr>
<tr>
<td>rdp</td>
<td>Manage RDP Service on Windows servers</td>
</tr>
<tr>
<td>redismod</td>
<td>Management of Redis server</td>
</tr>
<tr>
<td>reg</td>
<td></td>
</tr>
<tr>
<td>rvm</td>
<td>Managing Ruby installations and gemsets with Ruby Version Manager (RVM)</td>
</tr>
<tr>
<td>saltmod</td>
<td>Control the Salt command interface</td>
</tr>
<tr>
<td>schedule</td>
<td>Management of the Salt scheduler</td>
</tr>
<tr>
<td>selinux</td>
<td>Management of SELinux rules</td>
</tr>
<tr>
<td>serverdensity_device</td>
<td>Monitor Server with Server Density</td>
</tr>
<tr>
<td>service</td>
<td>Starting or restarting of services and daemons</td>
</tr>
<tr>
<td>slack</td>
<td>Send a message to Slack</td>
</tr>
<tr>
<td>smtp</td>
<td>Sending Messages via SMTP</td>
</tr>
<tr>
<td>splunk_search</td>
<td>Splunk Search State Module</td>
</tr>
<tr>
<td>ssh_auth</td>
<td>Control of entries in SSH authorized_key files</td>
</tr>
<tr>
<td>ssh_known_hosts</td>
<td>Control of SSH known_hosts entries</td>
</tr>
<tr>
<td>stateconf</td>
<td>Stateconf System</td>
</tr>
<tr>
<td>status</td>
<td>Minion status monitoring</td>
</tr>
<tr>
<td>stormpath_account</td>
<td>Support for Stormpath.</td>
</tr>
<tr>
<td>supervisord</td>
<td>Interaction with the Supervisor daemon</td>
</tr>
<tr>
<td>svn</td>
<td>Manage SVN repositories</td>
</tr>
<tr>
<td>sysctl</td>
<td>Configuration of the Linux kernel using sysctl</td>
</tr>
<tr>
<td>syslog_ng</td>
<td>State module for syslog_ng</td>
</tr>
<tr>
<td>sysrc</td>
<td></td>
</tr>
<tr>
<td>test</td>
<td>Test States</td>
</tr>
<tr>
<td>timezone</td>
<td>Management of timezones</td>
</tr>
<tr>
<td>tls</td>
<td>Enforce state for SSL/TLS</td>
</tr>
<tr>
<td>tomcat</td>
<td>This state uses the manager webapp to manage Apache tomcat webapps</td>
</tr>
<tr>
<td>trafficserver</td>
<td>Control Apache Traffic Server</td>
</tr>
<tr>
<td>tuned</td>
<td>Interface to Red Hat tuned-adm module</td>
</tr>
<tr>
<td>uptime</td>
<td>Monitor Web Server with Uptime</td>
</tr>
<tr>
<td>user</td>
<td>Management of user accounts</td>
</tr>
<tr>
<td>vbox_guest</td>
<td>VirtualBox Guest Additions installer state</td>
</tr>
<tr>
<td>victorops</td>
<td>Create an Event in VictorOps</td>
</tr>
<tr>
<td>virtualenv_mod</td>
<td>Setup of Python virtualenv sandboxes</td>
</tr>
<tr>
<td>win_dacl</td>
<td>Windows Object Access Control Lists</td>
</tr>
<tr>
<td>win_dns_client</td>
<td>Module for configuring DNS Client on Windows systems</td>
</tr>
<tr>
<td>win_firewall</td>
<td>State for configuring Windows Firewall</td>
</tr>
<tr>
<td>win_network</td>
<td>Configuration of network interfaces on Windows hosts</td>
</tr>
<tr>
<td>win_path</td>
<td>Manage the Windows System PATH</td>
</tr>
<tr>
<td>win_powercfg</td>
<td>This module allows you to control the power settings of a windows minion via powercfg</td>
</tr>
<tr>
<td>win_servermanager</td>
<td>Manage Windows features via the ServerManager powershell module</td>
</tr>
<tr>
<td>win_system</td>
<td>Management of Windows system information</td>
</tr>
</tbody>
</table>
31.27.1 salt.states.alias

Configuration of email aliases

The mail aliases file can be managed to contain definitions for specific email aliases:

<table>
<thead>
<tr>
<th>username</th>
<th>alias.present</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- target: <a href="mailto:user@example.com">user@example.com</a></td>
</tr>
<tr>
<td>thomas</td>
<td>alias.present</td>
</tr>
<tr>
<td></td>
<td>- target: <a href="mailto:thomas@example.com">thomas@example.com</a></td>
</tr>
</tbody>
</table>

salt.states.alias.absent(name)

Ensure that the named alias is absent

name The alias to remove

salt.states.alias.present(name, target)

Ensures that the named alias is present with the given target or list of targets. If the alias exists but the target differs from the previous entry, the target(s) will be overwritten. If the alias does not exist, the alias will be created.

name The local user/address to assign an alias to
target The forwarding address

31.27.2 salt.states.alternatives

Configuration of the alternatives system

Control the alternatives system

{% set my_hadoop_conf = '/opt/hadoop/conf' %}

{{ my_hadoop_conf }}:
file.directory

hadoop-0.20-conf:
alternatives.install:
- name: hadoop-0.20-conf
- link: /etc/hadoop-0.20/conf
- path: {{ my_hadoop_conf }}
- priority: 30
- require:
  - file: {{ my_hadoop_conf }}

hadoop-0.20-conf:
alternatives.remove:
  - name: hadoop-0.20-conf
  - path: {{ my_hadoop_conf }}

salt.states.alternatives.auto(name)
New in version 0.17.0.
Instructions alternatives to use the highest priority path for <name>

name is the master name for this link group (e.g. pager)

salt.states.alternatives.install(name, link, path, priority)
Install new alternative for defined <name>

name is the master name for this link group (e.g. pager)
link is the symlink pointing to /etc/alternatives/<name>. (e.g. /usr/bin/pager)
path is the location of the new alternative target. NB: This file / directory must already exist. (e.g. /usr/bin/less)
priority is an integer; options with higher numbers have higher priority in automatic mode.

salt.states.alternatives.remove(name, path)
Removes installed alternative for defined <name> and <path> or fallback to default alternative, if some defined before.

name is the master name for this link group (e.g. pager)
path is the location of one of the alternative target files. (e.g. /usr/bin/less)

salt.states.alternatives.set(name, path)
New in version 0.17.0.
Sets alternative for <name> to <path>, if <path> is defined as an alternative for <name>.

name is the master name for this link group (e.g. pager)
path is the location of one of the alternative target files. (e.g. /usr/bin/less)

31.27.3 salt.states.apache

Apache state
New in version 2014.7.0.
Allows for inputting a yaml dictionary into a file for apache configuration files.
The variable this is special and signifies what should be included with the above word between angle brackets (<>).

```
/etc/httpd/conf.d/website.com.conf:
apache.configfile:
  - config:
    VirtualHost:
      this: '*:80'
    ServerName:
      - website.com
    ServerAlias:
      - www.website.com
      - dev.website.com
    ErrorLog: logs/website.com-error_log
    CustomLog: logs/website.com-access_log combined
    DocumentRoot: /var/www/vhosts/website.com
    Directory:
```
this: /var/www/vhosts/website.com
Order: Deny,Allow
Deny from: all
Allow from:
- 127.0.0.1
- 192.168.100.0/24
Options:
- +Indexes
- FollowSymlinks
AllowOverride: All

salt.states.apache.configfile(name, config)

31.27.4 salt.states.apache_module

Manage Apache Modules

New in version 2014.7.0.

Enable and disable apache modules.

Enable cgi module:
  apache_module.enable:
    - name: cgi

Disable cgi module:
  apache_module.disable:
    - name: cgi

salt.states.apache_module.disable(name)
  Ensure an Apache module is disabled.
  
  name  Name of the Apache module

salt.states.apache_module.enable(name)
  Ensure an Apache module is enabled.
  
  name  Name of the Apache module

31.27.5 salt.states.aptpkg

Package management operations specific to APT- and DEB-based systems

salt.states.aptpkg.held(name)
  Set package in `hold' state, meaning it will not be upgraded.
  
  name  The name of the package, e.g., `tmux'

31.27.6 salt.states.archive

Extract an archive

New in version 2014.1.0.
salt.states.archive.extracted(name, source, archive_format, archive_user=None, user=None, group=None, tar_options=None, source_hash=None, if_missing=None, keep=False)

New in version 2014.1.0.

State that make sure an archive is extracted in a directory. The downloaded archive is erased if successfully extracted. The archive is downloaded only if necessary.

**Note:** If `if_missing` is not defined, this state will check for `name` instead. If `name` exists, it will assume the archive was previously extracted successfully and will not extract it again.

Example, tar with flag for lmza compression:

```yaml
graylog2-server:
  archive.extracted:
    - name: /opt/
    - source: https://github.com/downloads/Graylog2/graylog2-server/graylog2-server-0.9.6p1.tar.lzma
    - source_hash: md5=499ae16dca71eeb7c3a38c75ea7a1a6
    - tar_options: J
    - archive_format: tar
    - if_missing: /opt/graylog2-server-0.9.6p1/
```

Example, tar with flag for verbose output:

```yaml
graylog2-server:
  archive.extracted:
    - name: /opt/
    - source: https://github.com/downloads/Graylog2/graylog2-server/graylog2-server-0.9.6p1.tar.gz
    - source_hash: md5=499ae16dca71eeb7c3a38c75ea7a1a6
    - archive_format: tar
    - tar_options: v
    - user: root
    - group: root
    - if_missing: /opt/graylog2-server-0.9.6p1/
```

**name** Directory name where to extract the archive

**source** Archive source, same syntax as file.managed source argument.

**source_hash** Hash of source file, or file with list of hash-to-file mappings. It uses the same syntax as the file.managed source_hash argument.

**archive_format** tar, zip or rar

**archive_user** The user to own each extracted file.

Deprecation since version 2014.7.2: replaced by standardized `user` parameter.

**user** The user to own each extracted file.

**group** The group to own each extracted file.

**if_missing** Some archives, such as tar, extract themselves in a subfolder. This directive can be used to validate if the archive had been previously extracted.

**tar_options** Required if used with `archive_format`: tar, otherwise optional. It needs to be the tar argument specific to the archive being extracted, such as ‘J’ for LZMA or ‘v’ to verbosely list files processed. Using this option means that the tar executable on the target will be used, which is less platform independent. Main operators like ‘x’, ‘-extract’, ‘--get’, ‘-c’ and ‘-f’/’--file should not be used here. If `archive_format` is zip or rar and this option is not set, then the Python tarfile module is used. The tarfile module supports gzip and bzip2 in Python 2.
keep  Keep the archive in the minion's cache

### 31.27.7  salt.states.artifactory

This state downloads artifacts from artifactory.

**salt.states.artifactory.downloaded**(name, artifact, target_dir='/tmp', target_file=None)

Ensures that the artifact from artifactory exists at given location. If it doesn't exist, then it will be downloaded. It it already exists then the checksum of existing file is checked against checksum in artifactory. If it is different then the step will fail.

**artifact:**

Details of the artifact to be downloaded from artifactory.

- artifact_url: URL of the artifactory instance
- repository: Repository in artifactory
- artifact_id: Artifact ID
- group_id: Group ID
- packaging: Packaging
- classifier: Classifier
- version: Version
- username: Artifactory username
- password: Artifactory password

**target_dir:** Directory where the artifact should be downloaded. By default it is downloaded to /tmp directory.

**target_file:** Target file to download artifact to. By default file name is resolved by artifactory.

Example:: Download artifact to a specific file:

```yaml
jboss_module_downloaded:
    artifactory.downloaded:
      - artifact:
          artifact_url: http://artifactory.intranet.company.com/artifactory
          repository: 'libs-release-local'
          artifact_id: 'module'
          group_id: 'com.company.module'
          packaging: 'jar'
          classifier: 'sources'
          version: '1.0'
          target_file: /opt/jboss7/modules/com/company/lib/module.jar
```

Download artifact to the folder (automatically resolves file name):

```yaml
jboss_module_downloaded:
    artifactory.downloaded:
      - artifact:
          artifact_url: http://artifactory.intranet.company.com/artifactory
          repository: 'libs-release-local'
          artifact_id: 'module'
          group_id: 'com.company.module'
          packaging: 'jar'
          classifier: 'sources'
```
31.27.8 salt.states.at

Configuration disposable regularly scheduled tasks for at.

The at state can be add disposable regularly scheduled tasks for your system.

salt.states.at.absent(name, jobid=None, **kwargs)
Remove a job from queue. The `kwargs` can include hour, minute, day, month, year

- limit Target range
- tag Job's tag
- runas Runs user-specified jobs

example1:
  at.absent:
    - limit: all

example2:
  at.absent:
    - limit: all
    - year: 13

example3:
  at.absent:
    - limit: all
    - tag: rose
    - runas: jim

example4:
  at.absent:
    - limit: all
    - tag: rose
    - day: 13
    - hour: 16

salt.states.at.present(name, timespec, tag=None, user=None, job=None)
Add a job to queue.

- job Command to run.
- timespec The `timespec` follows the format documented in the at(1) manpage.
- tag Make a tag for the job.
- user The user to run the at job

rose:
  at.present:
    - job: 'echo "I love saltstack" > love'
    - timespec: '9:09 11/09/13'
    - tag: love
    - user: jam
31.27.9 salt.states.augeas

Configuration management using Augeas

New in version 0.17.0.

This state requires the augeas Python module.

Augeas can be used to manage configuration files.

**Warning:** Minimal installations of Debian and Ubuntu have been seen to have packaging bugs with python-augeas, causing the augeas module to fail to import. If the minion has the augeas module installed, and the state fails with a comment saying that the state is unavailable, first restart the salt-minion service. If the problem persists past that, the following command can be run from the master to determine what is causing the import to fail:

```bash
salt minion-id cmd.run 'python -c "from augeas import Augeas"'
```

For affected Debian/Ubuntu hosts, installing libpython2.7 has been known to resolve the issue.

salt.states.augeas.change(name, context=None, changes=None, lens=None, **kwargs)

New in version 2014.7.0.

This state replaces setvalue().

Issue changes to Augeas, optionally for a specific context, with a specific lens.

- **name** State name

  A file path, prefixed by `/files`. Should resolve to an actual file (not an arbitrary augeas path).

  This is used to avoid duplicating the file name for each item in the changes list (for example, set bind 0.0.0.0 in the example below operates on the file specified by context). If context is not specified, a file path prefixed by `/files` should be included with the set command.

  The file path is examined to determine if the specified changes are already present.

  ```
  redis-conf:
  augeas.change:
  - context: /files/etc/redis/redis.conf
  - changes:
    - set bind 0.0.0.0
    - set maxmemory 1G
  ```

  **changes** List of changes that are issued to Augeas. Available commands are set, setm, mv/move, ins/insert, and rm/remove.

  **lens** The lens to use, needs to be suffixed with `.lns`, e.g.: `Nginx.lns`. See the list of stock lenses shipped with Augeas.

Usage examples:

Set the bind parameter in `/etc/redis/redis.conf`:

```
redis-conf:
 augeas.change:
  - changes:
    - set /files/etc/redis/redis.conf/bind 0.0.0.0
```

**Note:** Use the context parameter to specify the file you want to manipulate. This way you don't have to include this in the changes every time:
Augeas is aware of a lot of common configuration files and their syntax. It knows the difference between for example ini and yaml files, but also files with very specific syntax, like the hosts file. This is done with lenses, which provide mappings between the Augeas tree and the file.

There are many preconfigured lenses that come with Augeas by default, and they specify the common locations for configuration files. So most of the time Augeas will know how to manipulate a file. In the event that you need to manipulate a file that Augeas doesn’t know about, you can specify the lens to use like this:

```
redis-conf:
  augeas.change:
    - lens: redis
      context: /files/etc/redis/redis.conf
      changes:
        - set bind 0.0.0.0
```

Note: Even though Augeas knows that /etc/redis/redis.conf is a Redis configuration file and knows how to parse it, it is recommended to specify the lens anyway. This is because by default, Augeas loads all known lenses and their associated file paths. All these files are parsed when Augeas is loaded, which can take some time. When specifying a lens, Augeas is loaded with only that lens, which speeds things up quite a bit.

A more complex example, this adds an entry to the services file for Zabbix, and removes an obsolete service:

```
zabbix-service:
  augeas.change:
    - lens: services
      context: /files/etc/services
      changes:
        - ins service-name after service-name[last()]
        - set service-name[last()] zabbix-agent
        - set service-name[. = 'zabbix-agent']/#comment "Zabbix Agent service"
        - set service-name[. = 'zabbix-agent']/port 10050
        - set service-name[. = 'zabbix-agent']/protocol tcp
        - rm service-name[. = 'im-obsolete']
        - unless: grep "zabbix-agent" /etc/services
```

Warning: Don’t forget the unless here, otherwise a new entry will be added every time this state is run.

### 31.27.10 salt.states.aws_sqs

Manage SQS Queues

Create and destroy SQS queues. Be aware that this interacts with Amazon’s services, and so may incur charges.

This module uses the awsccli tool provided by Amazon. This can be downloaded from pip. Also check the documentation for awsccli for configuration information.
myqueue:
  aws_sqs.exists:
    - region: eu-west-1

salt.states.aws_sqs.absent(name, region, user=None, opts=False)
  Remove the named SQS queue if it exists.

    name  Name of the SQS queue.
    region  Region to remove the queue from
    user  Name of the user performing the SQS operations
    opts  Include additional arguments and options to the aws command line

salt.states.aws_sqs.exists(name, region, user=None, opts=False)
  Ensure the SQS queue exists.

    name  Name of the SQS queue.
    region  Region to create the queue
    user  Name of the user performing the SQS operations
    opts  Include additional arguments and options to the aws command line

31.27.11 salt.states.beacon

Management of the Salt beacons

New in version 2015.8.0.

ps:
  beacon.present:
    - enable: False
    - salt-master: running
    - apache2: stopped

sh:
  beacon.present:

load:
  beacon.present:
    - 1m:
      - 0.0
      - 2.0
    - 5m:
      - 0.0
      - 1.5
    - 15m:
      - 0.1
      - 1.0

salt.states.beacon.absent(name, **kwargs)
  Ensure beacon is absent.

    name  The name of the beacon ensured absent.
	salt.states.beacon.disabled(name, **kwargs)
  Disable a beacon.
**name**  The name of the beacon to enable.

```python
salt.states.beacon.enabled(name, **kwargs)
```
Enable a beacon.

**name**  The name of the beacon to enable.

```python
salt.states.beacon.present(name, **kwargs)
```
Ensure beacon is configured with the included beacon data.

**name**  The name of the beacon ensure is configured.

## 31.27.12 salt.states.bigip

A state module designed to enforce load-balancing configurations for F5 Big-IP entities.

**maturity**  develop

**platform**  f5_bigip_11.6

```python
salt.states.bigip.add_pool_member(hostname, username, password, name, member)
```
A function to connect to a bigip device and add a new member to an existing pool.

**Parameters:**
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the pool to modify
- member: The member to add to the pool

```python
salt.states.bigip.create_monitor(hostname, username, password, monitor_type, name, **kwargs)
```
A function to connect to a bigip device and create a monitor.

**Parameters:**
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- monitor_type: The type of monitor to create
- name: The name of the monitor to create

**Keyword Args:**  
`[arg=val]...` Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

```python
salt.states.bigip.create_node(hostname, username, password, name, address)
```
Create a new node if it does not already exist.

**Parameters:**
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the node to create
- address: The address of the node

```python
salt.states.bigip.create_pool(hostname, username, password, name, members=None, allow_nat=None, allow_snat=None, description=None, gateway_failsafe_device=None, ignore_persisted_weight=None, ip_tos_to_client=None, ip_tos_to_server=None, link_qos_to_client=None, link_qos_to_server=None, load_balancing_mode=None, min_active_members=None, min_up_members=None, min_up_members_action=None, min_up_members_checking=None, monitor=None, profiles=None, queue_depth_limit=None, queue_on_connection_limit=None, queue_time_limit=None, reselect_tries=None, service_down_action=None, slow_ramp_time=None)
```
Create a new node if it does not already exist.

**Parameters:**
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the pool to create
- members: List of members to be added to the pool


salt.states.bigip.create_profile(hostname, username, password, profile_type, name, **kwargs)
A function to connect to a bigip device and create a profile.

Parameters:
hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password profile_type: The type of profile to create name: The name of the profile to create

Keyword Args: [arg=val]...
Consult F5 BIGIP user guide for specific options for each profile type. Typically, tmsh arg names are used.

Special Characters: |, and [must be escaped using \ when used] within strings.

salt.states.bigip.create_virtual(hostname, username, password, name, destination, pool=None, address_status=None, auto_lasthop=None, bwc_policy=None, cmp_enabled=None, connection_limit=None, dhcp_relay=None, description=None, fallback_persistence=None, flow_eviction_policy=None, gtm_score=None, ip_forward=None, ip_protocol=None, internal=None, twelve_forward=None, last_hop_pool=None, mask=None, mirror=None, nat64=None, persist=None, profiles=None, policies=None, rate_class=None, rate_limit=None, rate_limit_mode=None, rate_limit_dst=None, rate_limit_src=None, rules=None, related_rules=None, reject=None, source=None, source_address_translation=None, source_port=None, virtual_state=None, traffic_classes=None, translate_address=None, translate_port=None, vlans=None)
A function to connect to a bigip device and create a virtual server if it does not already exists.

Parameters:
hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the virtual to create destination: [ [virtual_address_name:port] | [ipv4:port] | [ipv6:port] ]

salt.states.bigip.delete_monitor( hostname, username, password, monitor_type, name)
Modify an existing monitor. If it does exist, only the parameters specified will be enforced.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password monitor_type: The type of monitor to create name: The name of the monitor to create

Keyword Args: [arg=val]... Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

salt.states.bigip.delete_node( hostname, username, password, name)
Delete an existing node.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the node which will be deleted.

salt.states.bigip.delete_pool( hostname, username, password, name)
Delete an existing pool.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the pool which will be deleted

salt.states.bigip.delete_pool_member( hostname, username, password, name, member)
Delete an existing pool member.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the pool to be modified member: The name of the member to delete from the pool

salt.states.bigip.delete_profile( hostname, username, password, profile_type, name)
Modify an existing profile. If it does exist, only the parameters specified will be enforced.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password profile_type: The type of profile to create name: The name of the profile to create

Keyword Args: [arg=val]... Consult F5 BIGIP user guide for specific options for each profile type. Typically, tmsh arg names are used.

salt.states.bigip.delete_virtual( hostname, username, password, name)
Delete an existing virtual.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the virtual which will be deleted

salt.states.bigip.list_monitor( hostname, username, password, monitor_type, name)
A function to list an existing monitor.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password monitor_type: The type of monitor to list name: The name of the monitor to list

salt.states.bigip.list_node( hostname, username, password, name)
A function to connect to a bigip device and list a specific node.
Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the node to list.

```python
salt.states.bigip.list_pool(hostname, username, password, name)
```
A function to connect to a bigip device and list a specific pool.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the pool to list.

```python
salt.states.bigip.list_profile(hostname, username, password, profile_type, name)
```
A function to list an existing profile.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password profile_type: The type of profile to list name: The name of the profile to list

```python
salt.states.bigip.list_virtual(hostname, username, password, name)
```
A function to list a specific virtual.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the virtual to list

```python
salt.states.bigip.manage_monitor(hostname, username, password, monitor_type, name, **kwargs)
```
Create a new monitor if a monitor of this type and name does not already exists. If it does exists, only the parameters specified will be enforced.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password monitor_type: The type of monitor to create name: The name of the monitor to create

Keyword Args: [arg=val] ... Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

```python
salt.states.bigip.manage_node(hostname, username, password, name, address, connection_limit=None, description=None, dynamic_ratio=None, logging=None, monitor=None, rate_limit=None, ratio=None, session=None, node_state=None)
```
Manages a node of a given bigip device. If the node does not exist it will be created, otherwise, only the properties which are different than the existing will be updated.


```python
salt.states.bigip.manage_pool(hostname, username, password, name, allow_nat=None, allow_snat=None, description=None, gateway_failsafe_device=None, ignore_persisted_weight=None, ip_tos_to_client=None, ip_tos_to_server=None, link_qos_to_client=None, link_qos_to_server=None, load_balancing_mode=None, min_active_members=None, min_up_members=None, min_up_members_action=None, min_up_members_checking=None, monitor=None, profiles=None, queue_depth_limit=None, queue_on_connection_limit=None, queue_time_limit=None, reselect_tries=None, service_down_action=None, slow_ramp_time=None)
```
Create a new pool if it does not already exist. Pool members are managed separately. Only the parameters
specifying are enforced.

**Parameters:**
- **hostname:** The host/address of the bigip device
- **username:** The iControl REST username
- **password:** The iControl REST password
- **name:** The name of the pool to create

- **allowNat:** [yes \ or \ no]
- **allowSnat:** [yes \ or \ no]
- **description:** [string]
- **gatewayFailsafeDevice:** [string]
- **ignorePersistedWeight:** [enabled \ or \ disabled]
- **ipToSsClient:** [pass-through \ or \ [integer]]
- **ipToSsServer:** [pass-through \ or \ [integer]]
- **linkQosToClient:** [pass-through \ or \ [integer]]
- **linkQosToServer:** [pass-through \ or \ [integer]]
- **loadBalancingMode:** [dynamic-ratio-member \ or \ dynamic-ratio-node]
  - **fastest-app-response**
  - **fastest-node**
  - **least-connections-members**
  - **least-connections-node**
  - **least-connections**
  - **least-member**
  - **least-node**
  - **least-sessions**
  - **observed-member**
  - **observed-node**
  - **predictive-member**
  - **predictive-node**
  - **ratio-least-connections-member**
  - **ratio-least-connections-node**
  - **ratio-member**
  - **ratio-node**
  - **ratio-session**
  - **round-robin**
  - **weighted-least-connections-member**
  - **weighted-least-connections-node**

- **minActiveMembers:** [integer]
- **minUpMembers:** [integer]
- **minUpMembersAction:** [failover \ or \ reboot \ or \ restart-all]
- **minUpMembersChecking:** [enabled \ or \ disabled]
- **monitor:** [name]
- **profiles:** [none \ or \ profile-name]
- **queueDepthLimit:** [integer]
- **queueOnConnectionLimit:** [enabled \ or \ disabled]
- **queueTimeLimit:** [integer]
- **reselectTries:** [integer]
- **serviceDownAction:** [drop \ or \ none \ or \ reselect \ or \ reset]
- **slowRampTime:** [integer]

### salt.states.bigip.manage_pool_members

Manage the members of an existing pool. This function replaces all current pool members. Only the parameters specified are enforced.

**Parameters:**
- **hostname:** The host/address of the bigip device
- **username:** The iControl REST username
- **password:** The iControl REST password
- **name:** The name of the pool to modify
- **members:** list of pool members to manage.

### salt.states.bigip.manage_profile

Create a new profile if a monitor of this type and name does not already exists. If it does exists, only the parameters specified will be enforced.

**Parameters:**
- **hostname:** The host/address of the bigip device
- **username:** The iControl REST username
- **password:** The iControl REST password
- **profileType:** The type of profile to create
- **name:** The name of the profile to create
- **kwargs:** [arg=val]...

Consult F5 BIGIP user guide for specific options for each profile type. Typically, tmsh arg names are used.

### salt.states.bigip.manage_virtual

Manage a virtual server. If a virtual does not exist it will be created, otherwise only the parameters specified will be enforced.

**Parameters:**
- **hostname:** The host/address of the bigip device
- **username:** The iControl REST username
- **password:** The iControl REST password
- **name:** The name of the virtual to create
- **destination:** [virtual]
- **pool:** [None]
- **addressStatus:** [None]
- **autoLastHop:** [None]
- **bwcPolicy:** [None]
- **cmpEnabled:** [None]
- **connectionLimit:** [None]
- **dhcpRelay:** [None]
- **description:** [None]
- **fallbackPersistence:** [None]
- **flowEvictionPolicy:** [None]
- **gtmScore:** [None]
- **ipForward:** [None]
- **ipProtocol:** [None]
- **internal:** [None]
- **twelveForward:** [None]
- **lastHopPool:** [None]
- **mask:** [None]
- **mirror:** [None]
- **nat64:** [None]
- **persist:** [None]
- **profiles:** [None]
- **policies:** [None]
- **rateClass:** [None]
- **rateLimit:** [None]
- **rateLimitMode:** [None]
- **rateLimitDst:** [None]
- **rateLimitSrc:** [None]
- **relatedRules:** [None]
- **reject:** [None]
- **source:** [None]
- **sourceAddressTranslation:** [None]
- **sourcePort:** [None]
- **virtualState:** [None]
- **trafficClasses:** [None]
- **translateAddress:** [None]
- **translatePort:** [None]
- **vlans:** [None]
salt.states.bigip.modify_monitor

Modify an existing monitor. If it does exists, only the parameters specified will be enforced.

Parameters:
- **hostname**: The host/address of the bigip device
- **username**: The iControl REST username
- **password**: The iControl REST password
- **monitor_type**: The type of monitor to create name: The name of the monitor to create

Keyword Args: [arg=val]... Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

salt.states.bigip.modify_node

Modify an existing node. Only a node which already exists will be modified and only the parameters specified will be enforced.

Parameters:
- **hostname**: The host/address of the bigip device username: The iControl REST username password: The iControl REST password
- **name**: The name of the node to modify

salt.states.bigip.modify_pool

Modify an existing pool. Pool members are managed separately. Only the parameters specified are enforced.

Parameters:
- **hostname**: The host/address of the bigip device
- **username**: The iControl REST username
- **password**: The iControl REST password
- **name**: The name of the pool to modify
Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the pool to create


salt.states.bigip.modify_pool_member(hostname, username, password, name, member, connection_limit=None, description=None, dynamic_ratio=None, inherit_profile=None, logging=None, monitor=None, priority_group=None, profiles=None, rate_limit=None, ratio=None, session=None, member_state=None)

A function to connect to a bigip device and modify a member of an existing pool.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password name: The name of the pool to modify member: The member modify


salt.states.bigip.modify_profile(hostname, username, password, profile_type, name, **kwargs)

Modify an existing profile. If it does exists, only the parameters specified will be enforced.

Parameters: hostname: The host/address of the bigip device username: The iControl REST username password: The iControl REST password profile_type: The type of profile to create name: The name of the profile to create

Keyword Args: [arg=val] ... Consult F5 BIGIP user guide for specific options for each monitor type. Typically, tmsh arg names are used.

salt.states.bigip.modify_virtual(hostname, username, password, name, destination, pool=None, address_status=None, auto_lasthop=None, bwc_policy=None, cmp_enabled=None, connection_limit=None, dhcp_relay=None, description=None, fallback_persistence=None, flow_eviction_policy=None, gtm_score=None, ip_forward=None, ip_protocol=None, internal=None, twelve_forward=None, last_hop_pool=None, mask=None, mirror=None, nat64=None, persist=None, profiles=None, policies=None, rate_class=None, rate_limit=None, rate_limit_mode=None, rate_limit_dst=None, rate_limit_src=None, rules=None, related_rules=None, reject=None, source=None, source_address_translation=None, source_port=None, virtual_state=None, traffic_classes=None, translate_address=None, translate_port=None, vlans=None)
Modify an virtual server. modify an existing virtual. Only parameters specified will be enforced.

**Parameters:**
- hostname: The host/address of the bigip device
- username: The iControl REST username
- password: The iControl REST password
- name: The name of the virtual to create
- destination: [ [virtual_address_name:port] | [ipv4:port] | [ipv6:port] ]
- pool: [ [pool_name] | none] address_status: [yes | no]
- auto_lasthop: [default | enabled | disabled]
- bwc_policy: [none | string]
- cmp_enabled: [yes | no]
- dhcp_relay: [yes | no]
- connection_limit: [integer]
- description: [string]
- state: [disabled | enabled]
- fallback_persistence: [none | [profile name]]
- flow_eviction_policy: [none | [eviction policy name]]
- gtm_score: [integer]
- ip_forward: [yes | no]
- ip_protocol: [any | protocol]
- internal: [yes | no]
- twelve_forward(12-forward): [yes | no]
- last_hop_pool: [ [pool_name] | none]
- mask: { [ipv4] | [ipv6] }
- mirror: { [disabled | enabled | none] }
- nat64: [enabled | disabled]
- persist: [list]
- profiles: [none | default | list]
- policies: [none | default | list]
- rate_class: [name]
- rate_limit: [integer]
- rate_limit_mode: [destination | object | object-destination]
- object-source | object-source-destination | source | source-destination
- rate_limit_dst: [integer]
- rate_limit_src: [integer]
- rules: [none | list]
- relatedrules: [none | list]
- reject: [yes | no]
- source: { [ipv4[/prefixlen]] | [ipv6[/prefixlen]] }
- source_address_translation: [none | snat:pool_name | lsn | automap | dictionary]
- source_port: [change | preserve | preserve-strict]
- state: [enabled | disabled]
- traffic_classes: [none | default | list]
- translate_address: [enabled | disabled]
- translate_port: [enabled | disabled]
- vlans: [none | default | dictionary]
- vlan_ids: [list]
- enabled: [true | false]

31.27.13 salt.states.blockdev

Management of Block Devices

A state module to manage blockdevices

```
/dev/sda:
    blockdev.tuned:
        - read-only: True

master-data:
    blockdev.tuned::
         - name : /dev/vg/master-data
         - read-only: True
         - read-ahead: 1024
```

New in version 2014.7.0.

salt.states.blockdev.formatted(name, fs_type='ext4', **kwargs)
Manage filesystems of partitions.

- name The name of the block device
- fs_type The filesystem it should be formatted as

salt.states.blockdev.tuned(name, **kwargs)
Manage options of block device

- name The name of the block device

- opts:
  - read-ahead Read-ahead buffer size
  - filesystem-read-ahead Filesystem Read-ahead buffer size
  - read-only Set Read-Only
• read-write Set Read-Write

31.27.14 salt.states.boto_asg

Manage Autoscale Groups

New in version 2014.7.0.

Create and destroy autoscale groups. Be aware that this interacts with Amazon’s services, and so may incur charges.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit autoscale credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:

```yaml
asg.keyid: GKTADJGHEIQSXMKKRBJ08H
asg.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

It's also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

```yaml
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1
```

Ensure myasg exists:

```yaml
boto_asg.present:
  - name: myasg
    - launch_config_name: mylc
    - availability_zones:
      - us-east-1a
      - us-east-1b
    - min_size: 1
    - max_size: 1
    - desired_capacity: 1
    - load_balancers:
      - myelb
    - suspended_processes:
      - AddToLoadBalancer
      - AlarmNotification
    - scaling_policies
      - name: ScaleDown
        - scaling_adjustment: -1
    - region: us-east-1
    - keyid: GKTADJGHEIQSXMKKRBJ08H
    - key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

31.27. Full list of builtin state modules
# Using a profile from pillars.
Ensure myasg exists:
```
boto_asg.present:
  - name: myasg
    - launch_config_name: mylc
    - availability_zones:
        - us-east-1a
        - us-east-1b
    - min_size: 1
    - max_size: 1
    - desired_capacity: 1
    - load_balancers:
        - myelb
    - profile: myprofile
```

# Passing in a profile.
Ensure myasg exists:
```
boto_asg.present:
  - name: myasg
    - launch_config_name: mylc
    - availability_zones:
        - us-east-1a
        - us-east-1b
    - min_size: 1
    - max_size: 1
    - desired_capacity: 1
    - load_balancers:
        - myelb
    - profile:
        - keyid: GKTADJGHEIQSXMKKRBJ08H
        - key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
        - region: us-east-1
```

# Deleting an autoscale group with running instances.
Ensure myasg is deleted:
```
boto_asg.absent:
  - name: myasg
    # If instances exist, we must force the deletion of the asg.
    - force: True
```

It's possible to specify cloudwatch alarms that will be setup along with the ASG. Note the alarm name will be the
name attribute defined, plus the ASG resource name.
```
Ensure myasg exists:
  boto_asg.present:
    - name: myasg
    - launch_config_name: mylc
    - availability_zones:
        - us-east-1a
        - us-east-1b
    - min_size: 1
    - max_size: 1
    - desired_capacity: 1
    - load_balancers:
        - myelb
    - profile:
        - myprofile
    - alarms:
        - CPU:
```
You can also use alarms from pillars, and override values from the pillar alarms by setting overrides on the resource. Note that `boto_asg_alarms` will be used as a default value for all resources, if defined and can be used to ensure alarms are always set for an ASG resource.

Setting the alarms in a pillar:

```yaml
my_asg_alarm:
  CPU:
    name: 'ASG CPU **MANAGED BY SALT**'
    attributes:
      metric: CPUUtilization
      namespace: AWS/EC2
      statistic: Average
      comparison: '>=
      threshold: 65.0
      period: 60
      evaluation_periods: 30
      unit: null
      description: 'ASG CPU'
      alarm_actions: [ 'arn:aws:sns:us-east-1:12345:myalarm' ]
      insufficient_data_actions: []
      ok_actions: [ 'arn:aws:sns:us-east-1:12345:myalarm' ]
```

Overriding the alarm values on the resource:

```yaml
Ensure myasg exists:
boto_asg.present:
  - name: myasg
  - launch_config_name: mylc
  - availability_zones:
    - us-east-1a
    - us-east-1b
  - min_size: 1
  - max_size: 1
  - desired_capacity: 1
  - load_balancers:
    - myelb
  - profile: myprofile
  - alarms_from_pillar: my_asg_alarm
# override CPU:attributes:threshold
  - alarms:
    CPU:
      attributes:
        threshold: 50.0
```
salt.states.boto_asg.absent(name, force=False, region=None, key=None, keyid=None, profile=None)

Ensure the named autoscale group is deleted.

- **name**: Name of the autoscale group.
- **force**: Force deletion of autoscale group.
- **region**: The region to connect to.
- **key**: Secret key to be used.
- **keyid**: Access key to be used.
- **profile**: A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_asg.present(name, launch_config_name=None, availability_zones=None, min_size=None, max_size=None, launch_config=None, desired_capacity=None, load_balancers=None, default_cooldown=None, health_check_type=None, health_check_period=None, placement_group=None, vpc_zone_identifier=None, tags=None, termination_policies=None, suspended_processes=None, scaling_policies=None, scaling_policies_from_pillar='boto_asg_scaling_policies', alarms=None, alarms_from_pillar='boto_asg_alarms', region=None, key=None, keyid=None, profile=None, notification_arn=None, notification_arn_from_pillar='boto_asg_notification_arn', notification_types=None, notification_types_from_pillar='boto_asg_notification_types')

Ensure the autoscale group exists.

- **name**: Name of the autoscale group.
- **launch_config_name**: Name of the launch config to use for the group. Or, if launch_config is specified, this will be the launch config name's prefix. (see below)
- **launch_config**: A dictionary of launch config attributes. If specified, a launch config will be used or created, matching this set of attributes, and the autoscale group will be set to use that launch config. The launch config name will be the launch_config_name followed by a hyphen followed by a hash of the launch_config dict contents.
- **availability_zones**: List of availability zones for the group.
- **min_size**: Minimum size of the group.
- **max_size**: Maximum size of the group.
- **desired_capacity**: The desired capacity of the group.
- **load_balancers**: List of load balancers for the group. Once set this can not be updated (Amazon restriction).
- **default_cooldown**: Number of seconds after a Scaling Activity completes before any further scaling activities can start.
- **health_check_type**: The service you want the health status from, Amazon EC2 or Elastic Load Balancer (EC2 or ELB).
- **health_check_period**: Length of time in seconds after a new EC2 instance comes into service that Auto Scaling starts checking its health.
- **placement_group**: Physical location of your cluster placement group created in Amazon EC2. Once set this can not be updated (Amazon restriction).
- **vpc_zone_identifier**: A list of the subnet identifiers of the Virtual Private Cloud.
tags

A list of tags. Example:

- key: 'key' value: 'value' propagate_at_launch: true

termination_policies A list of termination policies. Valid values are: "OldestInstance", "NewestInstance", "OldestLaunchConfiguration", "ClosestToNextInstanceHour", "Default". If no value is specified, the "Default" value is used.


scaling_policies List of scaling policies. Each policy is a dict of key-values described by boto autoscale policy.

scaling_policies_from_pillar: name of pillar dict that contains scaling policy settings. Scaling policies defined for this specific state will override those from pillar.

alarms: a dictionary of name- boto cloudwatch alarm sections to be associated with this ASG. All attributes should be specified except for dimension which will be automatically set to this ASG. See the boto_cloudwatch_alarm state for information about these attributes.

alarms_from_pillar: name of pillar dict that contains alarm settings. Alarms defined for this specific state will override those from pillar.

region The region to connect to.

key Secret key to be used.

keyid Access key to be used.

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

notification_arn The aws arn that notifications will be sent to

notification_arn_from_pillar: name of the pillar dict that contains notification_arn settings. A notification_arn defined for this specific state will override the one from pillar.

notification_types A list of event names that will trigger a notification. The list of valid notification types is:

```
`autoscaling:EC2_INSTANCE_LAUNCH`, `autoscaling:EC2_INSTANCE_LAUNCH_ERROR`,
`autoscaling:EC2_INSTANCE_TERMINATE`, `autoscaling:EC2_INSTANCE_TERMINATE_ERROR`,
`autoscaling:TEST_NOTIFICATION`
```

notification_types_from_pillar name of the pillar dict that contains notification_types settings. Notification_types defined for this specific state will override those from the pillar.

31.27.15 salt.states.boto_cfn

Connection module for Amazon Cloud Formation

New in version 2015.8.0.

depends boto

configuration This module accepts explicit AWS credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at [http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/iam-roles-for-amazon-ec2.html](http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/iam-roles-for-amazon-ec2.html)

If IAM roles are not used you need to specify them either in a pillar or in the minion's config file:
keyid: GKTADJGHEIQSXMKKRBJ08H
key: askdjghsdfjkghWupUjasdflkdfklgjsdfajkghs

stack-present:
boto_cfn.present:
  - name: mystack
  - template_body: salt://base/mytemplate.json
  - disable_rollback: true
  - region: eu-west-1
  - keyid: 'AKIAJHTMIQ2ASDFLASDF'
  - key: 'fdkjsafkljsASSADFalkfjasdf'

stack-absent:
boto_cfn.absent:
  - name: mystack

salt.states.boto_cfn.absent(name, region=None, key=None, keyid=None, profile=None)
Ensure cloud formation stack is absent.

  name (string) – The name of the stack to delete.
  region (string) - Region to connect to.
  key (string) - Secret key to be used.
  keyid (string) - Access key to be used.
  profile (dict) - A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_cfn.present(name, template_body=None, template_url=None, parameters=None, notification_arns=None, disable_rollback=None, timeout_in_minutes=None, capabilities=None, tags=None, on_failure=None, stack_policy_body=None, stack_policy_url=None, use_previous_template=None, stack_policy_during_update_body=None, stack_policy_during_update_url=None, region=None, key=None, keyid=None, profile=None)
Ensure cloud formation stack is present.

  name (string) - Name of the stack.
  template_body (string) – Structure containing the template body. Can also be loaded from a file by using salt://.
  template_url (string) – Location of file containing the template body. The URL must point to a template located in an S3 bucket in the same region as the stack.
  parameters (list) – A list of key/value tuples that specify input parameters for the stack. A 3-tuple (key, value, bool) may be used to specify the UsePreviousValue option.
  notification_arns (list) – The Simple Notification Service (SNS) topic ARNs to publish stack related events. You can find your SNS topic ARNs using the `SNS console`_ or your Command Line Interface (CLI).
  disable_rollback (bool) – Indicates whether or not to rollback on failure.
  timeout_in_minutes (integer) – The amount of time that can pass before the stack status becomes CREATE_FAILED; if DisableRollback is not set or is set to False, the stack will be rolled back.
  capabilities (list) – The list of capabilities you want to allow in the stack. Currently, the only valid capability is 'CAPABILITY_IAM'.

_1634 Chapter 31. Reference
tags (dict) – A set of user-defined Tags to associate with this stack, represented by key/value pairs. Tags defined for the stack are propagated to EC2 resources that are created as part of the stack. A maximum number of 10 tags can be specified.

on_failure (string) – Determines what action will be taken if stack creation fails. This must be one of: DO_NOTHING, ROLLBACK, or DELETE. You can specify either OnFailure or DisableRollback, but not both.

stack_policy_body (string) – Structure containing the stack policy body. Can also be loaded from a file by using salt://.

stack_policy_url (string) – Location of a file containing the stack policy. The URL must point to a policy (max size: 16KB) located in an S3 bucket in the same region as the stack. If you pass StackPolicyBody and StackPolicyURL, only StackPolicyBody is used.

use_previous_template (boolean) – Used only when templates are not the same. Set to True to use the previous template instead of uploading a new one via TemplateBody or TemplateURL.

stack_policy_during_update_body (string) – Used only when templates are not the same. Structure containing the temporary overriding stack policy body. If you pass StackPolicyDuringUpdateBody and StackPolicyDuringUpdateURL, only StackPolicyDuringUpdateBody is used. Can also be loaded from a file by using salt://.

stack_policy_during_update_url (string) – Used only when templates are not the same. Location of a file containing the temporary overriding stack policy. The URL must point to a policy (max size: 16KB) located in an S3 bucket in the same region as the stack. If you pass StackPolicyDuringUpdateBody and StackPolicy-DuringUpdateURL, only StackPolicyDuringUpdateBody is used.

region (string) - Region to connect to.
key (string) - Secret key to be used.
keyid (string) - Access key to be used.
profile (dict) - A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

### 31.27.16 salt.states.boto_cloudwatch_alarm

Manage Cloudwatch alarms

New in version 2014.7.0.

Create and destroy cloudwatch alarms. Be aware that this interacts with Amazon’s services, and so may incur charges.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit credentials but can also utilize IAM roles assigned to the instance trough Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the minion’s config file:

```bash
cloudwatch.keyid: GKTADJGHEIQSXMKKRBJ08H
cloudwatch.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

It’s also possible to specify key, keyid and region via a profile, either as a passed in dict, or as a string to pull from pillars or minion config:

---

31.27. Full list of builtin state modules 1635
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1

my test alarm:
  boto_cloudwatch_alarm.present:
    - name: my test alarm
    - attributes:
        metric: ApproximateNumberOfMessagesVisible
        namespace: AWS/SQS
        statistic: Average
        comparison: ">="
        threshold: 20000.0
        period: 60
        evaluation_periods: 1
        description: test alarm via salt
        dimensions:
          QueueName:
            - the-sqs-queue-name
        alarm_actions:
          - arn:aws:sns:us-east-1:111111111111:myalerting-action

salt.states.boto_cloudwatch_alarm.absent(name, region=None, key=None, keyid=None, profile=None)

Ensure the named cloudwatch alarm is deleted.

  name  Name of the alarm.
  region  Region to connect to.
  key  Secret key to be used.
  keyid  Access key to be used.
  profile  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.
	salt.states.boto_cloudwatch_alarm.present(name, attributes, region=None, key=None, keyid=None, profile=None)

Ensure the cloudwatch alarm exists.

  name  Name of the alarm
  attributes  A dict of key/value cloudwatch alarm attributes.
  region  Region to connect to.
  key  Secret key to be used.
  keyid  Access key to be used.
  profile  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

31.27.17 salt.states.boto_dynamodb

Manage DynamoDB Tables

New in version 2015.5.0.
Create and destroy DynamoDB tables. Be aware that this interacts with Amazon's services, and so may incur charges.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit DynamoDB credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available [here](#).

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```yaml
keyid: GKTADJGHEIQSXMKKRBJ08H
key: askdjghsdfjkgWupUjasdfklkdgjsdfjajkghs
region: us-east-1
```

It's also possible to specify `key`, `keyid` and `region` via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```yaml
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkgWupUjasdfklkdgjsdfjajkghs
  region: us-east-1
```

Ensure DynamoDB table does not exist:

```yaml
salt.states.boto_dynamodb.absent:
  - table_name: new_table
  - keyid: GKTADJGHEIQSXMKKRBJ08H
  - key: askdjghsdfjkgWupUjasdfklkdgjsdfjajkghs
  - region: us-east-1
```

Ensure DynamoDB table exists:

```yaml
salt.states.boto_dynamodb.present:
  - table_name: new_table
  - read_capacity_units: 1
  - write_capacity_units: 2
  - hash_key: primary_id
  - hash_key_data_type: N
  - range_key: start_timestamp
  - range_key_data_type: N
  - keyid: GKTADJGHEIQSXMKKRBJ08H
  - key: askdjghsdfjkgWupUjasdfklkdgjsdfjajkghs
  - region: us-east-1
  - local_indexes:
    - index:
      - name: "primary_id_end_timestamp_index"
      - hash_key: primary_id
      - hash_key_data_type: N
      - range_key: end_timestamp
      - range_key_data_type: N
  - global_indexes:
    - index:
      - name: "name_end_timestamp_index"
      - hash_key: name
      - hash_key_data_type: S
      - range_key: end_timestamp
      - range_key_data_type: N
      - read_capacity_units: 3
      - write_capacity_units: 4
```

salt.states.boto_dynamodb.absent(table_name, region=None, key=None, keyid=None, profile=None)
Ensure the DynamoDB table does not exist.

**table_name**  Name of the DynamoDB table.

**region**  Region to connect to.

**key**  Secret key to be used.

**keyid**  Access key to be used.

**profile**  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

```python
salt.states.boto_dynamodb.present(table_name, region=None, key=None, keyid=None, profile=None, read_capacity_units=None, write_capacity_units=None, hash_key=None, hash_key_data_type=None, range_key=None, range_key_data_type=None, local_indexes=None, global_indexes=None)
```

Ensure the DynamoDB table exists. Note: all properties of the table can only be set during table creation. Adding or changing indexes or key schema cannot be done after table creation.

**table_name**  Name of the DynamoDB table

**region**  Region to connect to.

**key**  Secret key to be used.

**keyid**  Access key to be used.

**profile**  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

**read_capacity_units**  The read throughput for this table

**write_capacity_units**  The write throughput for this table

**hash_key**  The name of the attribute that will be used as the hash key for this table

**hash_key_data_type**  The DynamoDB datatype of the hash key

**range_key**  The name of the attribute that will be used as the range key for this table

**range_key_data_type**  The DynamoDB datatype of the range key

**local_indexes**  The local indexes you would like to create

**global_indexes**  The local indexes you would like to create

### 31.27.18  salt.states.boto_ec2

Manage EC2

New in version 2015.8.0.

This module provides an interface to the Elastic Compute Cloud (EC2) service from AWS.

The below code creates a key pair:

```yaml
create-key-pair:
  boto_ec2.key_present:
    - name: mykeypair
    - save_private: /root/
    - region: eu-west-1
```
import-key-pair:
    boto_ec2.key_present:
        name: mykeypair
        upload_public: 'ssh-rsa AAAA'
        keyid: GKTADJGHEIQSXMKKRBJ08H
        key: askdjghsdfjkghWupUjasdfklkdfklglgsdfjajkgghs

You can also use salt:// in order to define the public key.

import-key-pair:
    boto_ec2.key_present:
        name: mykeypair
        upload_public: salt://mybase/public_key.pub
        keyid: GKTADJGHEIQSXMKKRBJ08H
        key: askdjghsdfjkghWupUjasdfklkdfklglgsdfjajkgghs

The below code deletes a key pair:

delete-key-pair:
    boto_ec2.key_absent:
        name: mykeypair
        region: eu-west-1
        keyid: GKTADJGHEIQSXMKKRBJ08H
        key: askdjghsdfjkghWupUjasdfklkdfklglgsdfjajkgghs

salt.states.boto_ec2.key_absent(name, region=None, key=None, keyid=None, profile=None)

Deletes a key pair

salt.states.boto_ec2.key_present(name, save_private=None, upload_public=None, region=None,
    key=None, keyid=None, profile=None)

Ensure key pair is present.

31.27.19 salt.states.boto_elasticache

Manage Elasticache

replication_group_description .. versionadded:: 2014.7.0

Create, destroy and update Elasticache clusters. Be aware that this interacts with Amazon’s services, and so may
incur charges.

Note: This module currently only supports creation and deletion of elasticache resources and will not modify clusters
when their configuration changes in your state files.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit elasticache credentials but can also utilize IAM roles assigned to the instance through
Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration
is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

elasticache.keyid: GKTADJGHEIQSXMKKRBJ08H
elasticsearch.key: askdjghsdfjkghWupUjasdfklkdfklglgsdfjajkgghs
It's also possible to specify `key`, `keyid` and `region` via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```yaml
myprofile:
  keyid: GKTADJGHEIQXSXMKKRBJ08H
  key: askdjghsdfjghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1
```

Ensure `myelasticache` exists:
```yaml
boto_elasticache.present:
  - name: myelasticache
  - engine: redis
  - cache_node_type: cache.t1.micro
  - num_cache_nodes: 1
  - region: us-east-1
  - keyid: GKTADJGHEIQXSXMKKRBJ08H
  - key: askdjghsdfjghWupUjasdflkdfklgjsdfjajkghs
```

# Using a profile from pillars
Ensure `myelasticache` exists:
```yaml
boto_elasticache.present:
  - name: myelasticache
  - engine: redis
  - cache_node_type: cache.t1.micro
  - num_cache_nodes: 1
  - region: us-east-1
  - profile: myprofile
```

# Passing in a profile
Ensure `myelasticache` exists:
```yaml
boto_elasticache.present:
  - name: myelasticache
  - engine: redis
  - cache_node_type: cache.t1.micro
  - num_cache_nodes: 1
  - region: us-east-1
  - profile: {keyid: GKTADJGHEIQXSXMKKRBJ08H,
              key: askdjghsdfjghWupUjasdflkdfklgjsdfjajkghs}
```

salt.states.boto_elasticache.absent(name, wait=True, region=None, key=None, keyid=None, profile=None)

Ensure the named elasticache cluster is deleted.

- **name** Name of the cache cluster.
- **wait** Boolean. Wait for confirmation from boto that the cluster is in the deleting state.
- **region** Region to connect to.
- **key** Secret key to be used.
- **keyid** Access key to be used.
- **profile** A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.
salt.states.boto_elasticache.creategroup(name, primary_cluster_id, replication_group_description, wait=None, region=None, key=None, keyid=None, profile=None)

Ensure the replication group is created.

- **name** Name of the replication group
- **wait** Waits for the group to be available
- **primary_cluster_id** Name of the master cache node
- **replication_group_description** Description for the group
- **region** Region to connect to.
- **key** Secret key to be used.
- **keyid** Access key to be used.
- **profile** A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_elasticache.present(name, engine=None, cache_node_type=None, num_cache_nodes=None, preferred_availability_zone=None, port=None, cache_parameter_group_name=None, cache_security_group_names=None, replication_group_id=None, auto_minor_version_upgrade=True, security_group_ids=None, cache_subnet_group_name=None, engine_version=None, notification_topic_arn=None, preferred_maintenance_window=None, wait=None, region=None, key=None, keyid=None, profile=None)

Ensure the cache cluster exists.

- **name** Name of the cache cluster (cache cluster id).
- **engine** The name of the cache engine to be used for this cache cluster. Valid values are memcached or redis.
- **cache_node_type** The compute and memory capacity of the nodes in the cache cluster. `cache.t1.micro`, `cache.m1.small`, etc. See: http://boto.readthedocs.org/en/latest/ref/elasticache.html#boto.elasticache.layer1.ElastiCacheConnection.create_cache_cluster
- **num_cache_nodes** The number of cache nodes that the cache cluster will have.
- **preferred_availability_zone** The EC2 Availability Zone in which the cache cluster will be created. All cache nodes belonging to a cache cluster are placed in the preferred availability zone.
- **port** The port number on which each of the cache nodes will accept connections.
- **cache_parameter_group_name** The name of the cache parameter group to associate with this cache cluster. If this argument is omitted, the default cache parameter group for the specified engine will be used.
- **cache_security_group_names** A list of cache security group names to associate with this cache cluster. Use this parameter only when you are creating a cluster outside of a VPC.
- **replication_group_id** The replication group to which this cache cluster should belong. If this parameter is specified, the cache cluster will be added to the specified replication group as a read replica; otherwise, the cache cluster will be a standalone primary that is not part of any replication group.
- **auto_minor_version_upgrade** Determines whether minor engine upgrades will be applied automatically to the cache cluster during the maintenance window. A value of True allows these upgrades to occur; False disables automatic upgrades.
security_group_ids One or more VPC security groups associated with the cache cluster. Use this parameter only when you are creating a cluster in a VPC.

cache_subnet_group_name The name of the cache subnet group to be used for the cache cluster. Use this parameter only when you are creating a cluster in a VPC.

engine_version The version number of the cache engine to be used for this cluster.

notification_topic_arn The Amazon Resource Name (ARN) of the Amazon Simple Notification Service (SNS) topic to which notifications will be sent. The Amazon SNS topic owner must be the same as the cache cluster owner.

preferred_maintenance_window The weekly time range (in UTC) during which system maintenance can occur. Example: sun:05:00-sun:09:00

wait Boolean. Wait for confirmation from boto that the cluster is in the available state.

region Region to connect to.

key Secret key to be used.

keyid Access key to be used.

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_elasticache.subnet_group_absent(name, tags=None, region=None, key=None, keyid=None, profile=None)

salt.states.boto_elasticache.subnet_group_present(name, subnet_ids, description, tags=None, region=None, key=None, keyid=None, profile=None)

Ensure ElastiCache subnet group exists.

New in version 2015.8.0.

name The name for the ElastiCache subnet group. This value is stored as a lowercase string.

subnet_ids A list of VPC subnet IDs for the cache subnet group.

description Subnet group description.

tags A list of tags.

region Region to connect to.

key Secret key to be used.

keyid Access key to be used.

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

31.27.20 salt.states.boto_elb

Manage ELBs

New in version 2014.7.0.

Create and destroy ELBs. Be aware that this interacts with Amazon's services, and so may incur charges.

This module uses boto, which can be installed via package, or pip.
This module accepts explicit elb credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```yaml
elb.keyid: GKTADJGHEIQSXMKKRBJ08H
elb.key: askdjghsdfjkgHwUpUJasdfsflkdfklgjsdfjajkghs
```

It's also possible to specify `key`, `keyid` and `region` via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```yaml
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkgHwUpUJasdfsflkdfklgjsdfjajkghs
  region: us-east-1
```

Ensure myelb ELB exists:

```yaml
boto_elb.present:
  - name: myelb
  - region: us-east-1
  - availability_zones:
    - us-east-1a
    - us-east-1c
    - us-east-1d
  - keyid: GKTADJGHEIQSXMKKRBJ08H
  - key: askdjghsdfjkgHwUpUJasdfsflkdfklgjsdfjajkghs
  - listeners:
    - elb_port: 443
      instance_port: 80
      elb_protocol: HTTPS
      instance_protocol: HTTP
      certificate: 'arn:aws:iam::1111111:server-certificate/mycert'
    - elb_port: 8210
      instance_port: 8210
      elb_protocol: TCP
  - health_check:
    - target: 'HTTP:80/'
  - attributes:
    - cross_zone_load_balancing:
      enabled: true
    - access_log:
      enabled: true
    - s3_bucket_name: 'mybucket'
    - s3_bucket_prefix: 'my-logs'
    - emit_interval: 5
  - cnames:
    - name: mycname.example.com.
      zone: example.com.
      ttl: 60
    - name: myothercname.example.com.
      zone: example.com.
```

# Using a profile from pillars
Ensure myelb ELB exists:

```yaml
boto_elb.present:
  - name: myelb
  - region: us-east-1
  - profile: myelbprofile
```
# Passing in a profile

Ensure myelb ELB exists:

```yaml
boto_elb.present:
  - name: myelb
  - region: us-east-1
  - profile:
      keyid: GKTADJGHEIQXSXMKKRBJ08H
      key: askdjghsdfkjghWuupUjasdflkdflkgjsdfjajgks
```

It's possible to specify attributes from pillars by specifying a pillar. You can override the values defined in the pillard by setting the attributes on the resource. The module will use the default pillar key `boto_elb_attributes`, which allows you to set default attributes for all ELB resources.

Setting the attributes pillar:

```yaml
my_elb_attributes:
  cross_zone_load_balancing:
    enabled: true
  connection_draining:
    enabled: true
  timeout: 20
  access_log:
    enabled: true
  s3_bucket_name: 'mybucket'
  s3_bucket_prefix: 'my-logs'
  emit_interval: 5
```

Overriding the attribute values on the resource:

Ensure myelb ELB exists:

```yaml
boto_elb.present:
  - name: myelb
  - region: us-east-1
  - attributes_from_pillar: my_elb_attributes
# override cross_zone_load_balancing:enabled
  - attributes:
      cross_zone_load_balancing:
        enabled: false
  - profile: myelbprofile
```

It's possible to specify cloudwatch alarms that will be setup along with the ELB. Note the alarm name will be defined by the name attribute provided, plus the ELB resource name.

Ensure myelb ELB exists:

```yaml
boto_elb.present:
  - name: myelb
  - region: us-east-1
  - profile: myelbprofile
  - alarms:
      UnHealthyHostCount:
        name: 'ELB UnHealthyHostCount **MANAGED BY SALT**'
        attributes:
          metric: UnHealthyHostCount
          namespace: AWS/ELB
          statistic: Average
          comparison: '>='
          threshold: 1.0
          period: 600
```
You can also use alarms from pillars, and override values from the pillar alarms by setting overrides on the resource. Note that `boto_elb_alarms` will be used as a default value for all resources, if defined and can be used to ensure alarms are always set for a resource.

Setting the alarms in a pillar:

```yaml
my_elb_alarm:
  UnHealthyHostCount:
    name: 'ELB UnHealthyHostCount **MANAGED BY SALT**'
    attributes:
      metric: UnHealthyHostCount
      namespace: AWS/ELB
      statistic: Average
      comparison: '>='
      threshold: 1.0
      period: 600
      evaluation_periods: 6
      unit: null
    description: ELB UnHealthyHostCount
    insufficient_data_actions: []
    ok_actions: ['arn:aws:sns:us-east-1:12345:myalarm']
```

Overriding the alarm values on the resource:

```yaml
Ensure myelb ELB exists:
  boto_elb.present:
    - name: myelb
    - region: us-east-1
    - profile: myelbprofile
    - alarms_from_pillar: my_elb_alarm
      # override UnHealthyHostCount:attributes:threshold
      - alarms:
          UnHealthyHostCount:
            attributes:
              threshold: 2.0
```

salt.states.boto_elb.absent
(name, region=None, key=None, keyid=None, profile=None)

salt.states.boto_elb.present
(name, listeners, availability_zones=None, subnets=None, security_groups=None, scheme='internet-facing', health_check=None, attributes=None, attributes_from_pillar='boto_elb_attributes', cnames=None, alarms=None, alarms_from_pillar='boto_elb_alarms', region=None, key=None, keyid=None, profile=None, wait_for_sync=True)

Ensure the IAM role exists.

name  Name of the IAM role.

availability_zones  A list of availability zones for this ELB.

listeners  A list of listener lists; example:
[`443`, `HTTPS`, `arn:aws:iam::1111111:server-certificate/mycert`], ```8443, `80`, `HTTPS`, `HTTP', `arn:aws:iam::1111111:server-certificate/mycert' ```

```subnets``` A list of subnet IDs in your VPC to attach to your LoadBalancer.

```security_groups``` The security groups assigned to your LoadBalancer within your VPC.

```scheme``` The type of a LoadBalancer. internet-facing or internal. Once set, can not be modified.

```health_check``` A dict defining the health check for this ELB.

```attributes``` A dict defining the attributes to set on this ELB.

```attributes_from_pillar``` name of pillar dict that contains attributes. Attributes defined for this specific state will override those from pillar.

```cnames``` A list of cname dicts with attributes: name, zone, ttl, and identifier. See the boto_route53 state for information about these attributes.

```alarms``` a dictionary of name->boto_cloudwatch_alarm sections to be associated with this ELB. All attributes should be specified except for dimension which will be automatically set to this ELB. See the boto_cloudwatch_alarm state for information about these attributes.

```alarms_from_pillar``` name of pillar dict that contains alarm settings. Alarms defined for this specific state will override those from pillar.

```region``` Region to connect to.

```key``` Secret key to be used.

```keyid``` Access key to be used.

```profile``` A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

```wait_for_sync``` Wait for an INSYNC change status from Route53.

```salt.states.boto_elb.register_instances``` (**name**, **instances**, **region=NONE**, **key=NONE**, **keyid=NONE**, **profile=NONE**) 

Add instance/s to load balancer

New in version 2015.8.0.

```add-instances:
  boto_elb.register_instances:
    - name: myloadbalancer
    - instances:
      - instance-id1
      - instance-id2

31.27.21 salt.states.boto_iam

Manage IAM roles.

New in version 2015.8.0.

This module uses boto, which can be installed via package, or pip.
This module accepts explicit IAM credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available [here](#).

It's also possible to specify `key`, `keyid` and `region` via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```yaml
delete-user:
  - boto_iam.user_absent:
    - name: myuser
    - delete_keys: true

delete-keys:
  - boto_iam.keys_absent:
    - access_keys:
      - 'AKIAJHTMIQ2ASDFLASDF'
      - 'PQIAJHTMIQ2ASRTLASFR'
    - user_name: myuser

create-user:
  - boto_iam.user_present:
    - name: myuser
    - policies:
      - mypolicy: |
        {
          "Version": "2012-10-17",
          "Statement": [{
            "Effect": "Allow",
            "Action": "*",
            "Resource": "*"
          }]
        }
    - password: NewPassword$$1
    - region: eu-west-1
    - keyid: 'AKIAJHTMIQ2ASDFLASDF'
    - key: 'fdkjsafkljsASSADFalkfjasdf'

create-group:
  - boto_iam.group_present:
    - name: mygroup
    - users:
      - myuser
      - myuser1
    - policies:
      - mypolicy: |
        {
          "Version": "2012-10-17",
          "Statement": [{
            "Effect": "Allow",
            "Action": "*",
            "Resource": "*"
          }]
        }
    - region: eu-west-1
    - keyid: 'AKIAJHTMIQ2ASDFLASDF'
    - key: 'safsdfsaf;fdkjsafkljsASSADFalkfjasdf'

change-policy:
  - boto_iam.account_policy:
    - change_password: True
    - region: eu-west-1
```

31.27. Full list of builtin state modules 1647
- keyid: 'AKIAJHTMIQ2ASDFLASDF'
- key: 'safsdfsald;kjsafkljsASSADFalkfj'

create server certificate:
  boto_iam.server_cert_present:
    - name: mycert
    - public_key: salt://base/mycert.crt
    - private_key: salt://base/mycert.key
    - cert_chain: salt://base/mycert_chain.crt
    - region: eu-west-1
    - keyid: 'AKIAJHTMIQ2ASDFLASDF'
    - key: 'fdkjsafkljsASSADFalkfjasdf'

delete server certificate:
  boto_iam.server_cert_absent:
    - name: mycert

.. code-block:: yaml

create keys for user:
  boto_iam.keys_present:
    - name: myusername
    - number: 2
    - save_dir: /root
    - region: eu-west-1
    - keyid: 'AKIAJHTMIQ2ASDFLASDF'
    - key: 'fdkjsafkljsASSADF Falkfjasdf'

salt.states.boto_iam.account_policy(allow_users_to_change_password=None,
    hard_expiry=None, max_password_age=None,
    minimum_password_length=None, password_reuse_prevention=None,
    require_lowercase_characters=None, require_numbers=None,
    require_symbols=None, require_uppercase_characters=None,
    region=None, key=None, keyid=None, profile=None)

Change account policy.

allow_users_to_change_password (bool) Allows all IAM users in your account to use the AWS Management Console to change their own passwords.

hard_expiry (bool) Prevents IAM users from setting a new password after their password has expired.

max_password_age (int) The number of days that an IAM user password is valid.

minimum_password_length (int) The minimum number of characters allowed in an IAM user password.

password_reuse_prevention (int) Specifies the number of previous passwords that IAM users are prevented from reusing.

require_lowercase_characters (bool) Specifies whether IAM user passwords must contain at least one lowercase character from the ISO basic Latin alphabet (a to z).

require_numbers (bool) Specifies whether IAM user passwords must contain at least one numeric character (0 to 9).
**require_symbols (bool)** Specifies whether IAM user passwords must contain at least one of the following non-alphanumeric characters: ! @ # $ % ^ & ( ) _ + - = [ ] { } ` | 

**require_uppercase_characters (bool)** Specifies whether IAM user passwords must contain at least one uppercase character from the ISO basic Latin alphabet (A to Z).

**region (string)** Region to connect to.

**key (string)** Secret key to be used.

**keyid (string)** Access key to be used.

**profile (dict)** A dict with region, key and keyid, or a pillar key (string)

```python
salt.states.boto_iam.group_present(name, policies=None, policies_from_pillars=None, users=None, region=None, key=None, keyid=None, profile=None)
```

Ensure the IAM group is present

**name (string)** The name of the new group.

**policies (dict)** A dict of IAM group policy documents.

**policies_from_pillars (list)** A list of pillars that contain role policy dicts. Policies in the pillars will be merged in the order defined in the list and key conflicts will be handled by later defined keys overriding earlier defined keys. The policies defined here will be merged with the policies defined in the policies argument. If keys conflict, the keys in the policies argument will override the keys defined in policies_from_pillars.

**users (list)** A list of users to be added to the group.

**region (string)** Region to connect to.

**key (string)** Secret key to be used.

**keyid (string)** Access key to be used.

**profile (dict)** A dict with region, key and keyid, or a pillar key (string)

```python
salt.states.boto_iam.keys_absent(access_keys, user_name, region=None, key=None, keyid=None, profile=None)
```

Ensure the IAM user access_key_id is absent.

**access_key_id (list)** A list of access key ids

**user_name (string)** The username of the user

**region (string)** Region to connect to.

**key (string)** Secret key to be used.

**keyid (string)** Access key to be used.

**profile (dict)** A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

```python
salt.states.boto_iam.keys_present(name, number, save_dir, region=None, key=None, keyid=None, profile=None)
```

Ensure the IAM access keys are present.

**name (string)** The name of the new user.

**number (int)** Number of keys that user should have.

**save_dir (string)** The directory that the key/keys will be saved. Keys are saved to a file named according to the username provided.
**Salt Documentation, Release 2015.8.0**

region (string) Region to connect to.
key (string) Secret key to be used.
keyid (string) Access key to be used.
profile (dict) A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

```python
salt.states.boto_iam.server_cert_absent(name, region=None, key=None, keyid=None, profile=None)
```

Deletes a server certificate.

name (string) The name for the server certificate. Do not include the path in this value.
region (string) The name of the region to connect to.
key (string) The key to be used in order to connect
keyid (string) The keyid to be used in order to connect
profile (string) The profile that contains a dict of region, key, keyid

```python
salt.states.boto_iam.server_cert_present(name, public_key, private_key, cert_chain=None, path=None, region=None, key=None, keyid=None, profile=None)
```

Creates a server certificate.

name (string) The name for the server certificate. Do not include the path in this value.
public_key (string) The contents of the public key certificate in PEM-encoded format.
private_key (string) The contents of the private key in PEM-encoded format.
cert_chain (string) The contents of the certificate chain. This is typically a concatenation of the PEM-encoded public key certificates of the chain.
path (string) The path for the server certificate.
region (string) The name of the region to connect to.
key (string) The key to be used in order to connect
keyid (string) The keyid to be used in order to connect
profile (string) The profile that contains a dict of region, key, keyid

```python
salt.states.boto_iam.user_absent(name, delete_keys=None, region=None, key=None, keyid=None, profile=None)
```

Ensures the IAM user is absent. User cannot be deleted if it has keys.

name (string) The name of the new user.
delete_keys (bool) Delete all keys from user.
region (string) Region to connect to.
key (string) Secret key to be used.
keyid (string) Access key to be used.
profile (dict) A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

```python
salt.states.boto_iam.user_present(name, policies=None, policies_from_pillars=None, password=None, path=None, region=None, key=None, keyid=None, profile=None)
```

Ensures the IAM user is present.
name (string)  The name of the new user.

policies (dict)  A dict of IAM group policy documents.

policies_from_pillars (list)  A list of pillars that contain role policy dicts. Policies in the pillars will be merged in the order defined in the list and key conflicts will be handled by later defined keys overriding earlier defined keys. The policies defined here will be merged with the policies defined in the policies argument. If keys conflict, the keys in the policies argument will override the keys defined in policies_from_pillars.

password (string)  The password for the new user. Must comply with account policy.

path (string)  The path of the user. Default is `/'

region (string)  Region to connect to.

key (string)  Secret key to be used.

keyid (string)  Access key to be used.

profile (dict)  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

31.27.22  salt.states.boto_iam_role

Manage IAM roles

New in version 2014.7.0.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit IAM credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available [here](#).

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```
iam.keyid: GKTADJGHEIQSXMKKRBJ08H
iam.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

It's also possible to specify key, keyid and region via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```
myprofile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: askjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
    region: us-east-1
```

Creating a role will automatically create an instance profile and associate it with the role. This is the default behavior of the AWS console.

```
myrole:
    boto_iam_role.present:
      - region: us-east-1
      - key: GKTADJGHEIQSXMKKRBJ08H
      - keyid: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
      - policies_from_pillars:
          - shared_iam_bootstrap_policy
          - policies:
              MySQSPolicy:
                Statement:
                  - Action:  
```
- sqs:*  
  Effect: Allow  
  Resource:  
    - arn:aws:sqs:*::*:*  
  Sid: MyPolicySQS1  

MyS3Policy:  
  Statement:  
    - Action:  
      - s3:GetObject  
    Effect: Allow  
    Resource:  
      - arn:aws:s3::*::*:mybucket/*

# Using a credentials profile from pillars  
myrole:  
  boto_iam_role.present:  
    - region: us-east-1  
    - profile: myiamprofile

# Passing in a credentials profile  
myrole:  
  boto_iam_role.present:  
    - region: us-east-1  
    - profile:  
      key: GKTADJGHEIQSXMKKRBJ08H  
      keyid: askdjghsdfjkghWupUjasdfdklfdklgjsdfjajkghs

If delete_policies: False is specified, existing policies that are not in the given list of policies will not be deleted. This allows manual modifications on the IAM role to be persistent. This functionality was added in 2015.8.0.

salt.states.boto_iam_role.absent(name, region=None, key=None, keyid=None, profile=None)  
Ensure the IAM role is deleted.  

name Name of the IAM role.  

region Region to connect to.  

key Secret key to be used.  

keyid Access key to be used.  

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_iam_role.present(name, policy_document=None, path=None, policies=None, policies_from_pillars=None, create_instance_profile=True, region=None, key=None, keyid=None, profile=None, delete_policies=True)  
Ensure the IAM role exists.  

name Name of the IAM role.  

policy_document The policy that grants an entity permission to assume the role. (See http://boto.readthedocs.org/en/latest/ref/iam.html#boto.iam.connection.IAMConnection.create_role)  

path The path to the role/instance profile. (See http://boto.readthedocs.org/en/latest/ref/iam.html#boto.iam.connection.IAMConnection.create_role)  

policies A dict of IAM role policies.  

policies_from_pillars A list of pillars that contain role policy dicts. Policies in the pillars will be merged in the order defined in the list and key conflicts will be handled by later defined keys overriding earlier defined
keys. The policies defined here will be merged with the policies defined in the policies argument. If keys conflict, the keys in the policies argument will override the keys defined in policies_from_pillars.

create_instance_profile A boolean of whether or not to create an instance profile and associate it with this role.

region Region to connect to.

key Secret key to be used.

keyid Access key to be used.

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

delete_policies Deletes existing policies that are not in the given list of policies. Default value is True. If False is specified, existing policies will not be deleted allowing manual modifications on the IAM role to be persistent.

New in version 2015.8.0.

31.27.23 salt.states.boto_kms

Manage KMS keys, key policies and grants.

New in version 2015.8.0.

Be aware that this interacts with Amazon's services, and so may incur charges.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit kms credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```yaml
elb.keyid: GKTADJGHEIQSXMKKRBJ08H
elb.key: askdjghsdfjkgWupUjasdfklgjsdfjajkghs
```

It's also possible to specify key, keyid and region via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```yaml
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkgWupUjasdfklgjsdfjajkghs
  region: us-east-1
```

Ensure mykey key exists:

```yaml
boto_kms.key_present:
  - name: mykey
  - region: us-east-1
```

# Using a profile from pillars

Ensure mykey key exists:

```yaml
boto_kms.key_present:
  - name: mykey
  - region: us-east-1
  - profile: myprofile
```

# Passing in a profile
Ensure mykey key exists:

```yaml
boto_key.key_present:
  - name: mykey
  - region: us-east-1
  - profile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: asldgjhsfjkgWupUjasdfklkdfklgjsdfjajkghs
```

salt.states.boto_kms.key_present(name, policy, description=None, key_usage=None, grants=None, manage_grants=False, key_rotation=False, enabled=True, region=None, key=None, keyid=None, profile=None)

Ensure the KMS key exists. KMS keys can not be deleted, so this function must be used to ensure the key is enabled or disabled.

- **name** Name of the key.
- **policy** Key usage policy.
- **description** Description of the key.
- **key_usage** Specifies the intended use of the key. Can only be set on creation, defaults to ENCRYPT_DECRYPT, which is also the only supported option.
- **grants** A list of grants to apply to the key. Not currently implemented.
- **manage_grants** Whether or not to manage grants. False by default, which will not manage any grants.
- **key_rotation** Whether or not key rotation is enabled for the key. False by default.
- **enabled** Whether or not the key is enabled. True by default.
- **region** Region to connect to.
- **key** Secret key to be used.
- **keyid** Access key to be used.
- **profile** A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

### 31.27.24 salt.states.boto_lc

Manage Launch Configurations

New in version 2014.7.0.

Create and destroy Launch Configurations. Be aware that this interacts with Amazon’s services, and so may incur charges.

A limitation of this module is that you can not modify launch configurations once they have been created. If a launch configuration with the specified name exists, this module will always report success, even if the specified configuration doesn’t match. This is due to a limitation in Amazon’s launch configuration API, as it only allows launch configurations to be created and deleted.

Also note that a launch configuration that’s in use by an autoscale group can not be deleted until the autoscale group is no longer using it. This may affect the way in which you want to order your states.

This module uses boto, which can be installed via package, or pip.
This module accepts explicit autoscale credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion’s config file:

```
asg.keyid: GKTADJGHEIQSXMKKRBJ08H
asg.key: askdjghsdfjkgWupUjasdfklgjsdfjajkghs
```

It’s also possible to specify `key`, `keyid` and `region` via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkgWupUjasdfklgjsdfjajkghs
  region: us-east-1
```

Credential information is shared with autoscale groups as launch configurations and autoscale groups are completely dependent on each other.

Ensure mylc exists:

```
boto_lc.present:
  - name: mylc
  - image_id: ami-0b9c9f62
  - key_name: mykey
  - security_groups:
    - mygroup
  - instance_type: m1.small
  - instance_monitoring: true
  - block_device_mappings:
    - '/dev/sda1':
      size: 20
  - cloud_init:
    scripts:
      'run_salt.sh': |
      #!/bin/bash
      add-apt-repository -y ppa:saltstack/salt
      apt-get update
      apt-get install -y salt-minion
      salt-call state.highstate
  - region: us-east-1
  - keyid: GKTADJGHEIQSXMKKRBJ08H
  - key: askdjghsdfjkgWupUjasdfklgjsdfjajkghs
```

# Using a profile from pillars.
Ensure mylc exists:

```
boto_lc.present:
  - name: mylc
  - image_id: ami-0b9c9f62
  - profile: myprofile
```

# Passing in a profile.
Ensure mylc exists:

```
boto_lc.present:
  - name: mylc
  - image_id: ami-0b9c9f62
  - profile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
```

31.27. Full list of builtin state modules
salt.states.boto_lc.absent(name, region=None, key=None, keyid=None, profile=None)

Ensure the named launch configuration is deleted.

name Name of the launch configuration.
region The region to connect to.
key Secret key to be used.
keyid Access key to be used.
profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_lc.present(name, image_id, key_name=None, security_groups=None, user_data=None, cloud_init=None, instance_type='m1.small', kernel_id=None, ramdisk_id=None, block_device_mappings=None, instance_monitoring=False, spot_price=None, instance_profile_name=None, ebs_optimized=False, associate_public_ip_address=None, volume_type=None, delete_on_termination=True, iops=None, use_block_device_types=False, region=None, key=None, keyid=None, profile=None)

Ensure the launch configuration exists.

name Name of the launch configuration.
image_id AMI to use for instances. AMI must exist or creation of the launch configuration will fail.
key_name Name of the EC2 key pair to use for instances. Key must exist or creation of the launch configuration will fail.
security_groups List of Names or security group id’s of the security groups with which to associate the EC2 instances or VPC instances, respectively. Security groups must exist, or creation of the launch configuration will fail.
user_data The user data available to launched EC2 instances.
cloud_init A dict of cloud_init configuration. Currently supported values: scripts, cloud-config. Mutually exclusive with user_data.
instance_type The instance type. ex: m1.small.
kernel_id The kernel id for the instance.
ramdisk_id The RAM disk ID for the instance.
block_device_mappings A dict of block device mappings.
instance_monitoring Whether instances in group are launched with detailed monitoring.
spot_price The spot price you are bidding. Only applies if you are building an autoscaling group with spot instances.
instance_profile_name The name or the Amazon Resource Name (ARN) of the instance profile associated with the IAM role for the instance. Instance profile must exist or the creation of the launch configuration will fail.
ebs_optimized Specifies whether the instance is optimized for EBS I/O (true) or not (false).
The `associate_public_ip_address` parameter is used for Auto Scaling groups that launch instances into an Amazon Virtual Private Cloud. It specifies whether to assign a public IP address to each instance launched in an Amazon VPC.

- `volume_type`: Undocumented in boto.
- `delete_on_termination`: Undocumented in boto.
- `iops`: Undocumented in boto.
- `use_block_device_types`: Undocumented in boto.
- `region`: The region to connect to.
- `key`: Secret key to be used.
- `keyid`: Access key to be used.
- `profile`: A dict with region, key, and keyid, or a pillar key (string) that contains a dict with region, key, and keyid.

### 31.27.25 salt.states.boto_rds

#### Manage RDSs

New in version 2015.8.0.

Create and destroy RDS instances. Be aware that this interacts with Amazon's services, and so may incur charges. This module uses boto, which can be installed via package, or pip.

This module accepts explicit rds credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available [here](#).

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```bash
rds.keyid: GKTADJGHEIQSXMKKRBJ08H
rds.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

It's also possible to specify `key`, `keyid` and `region` via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```bash
myprofile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
    region: us-east-1
```

Ensure myrds RDS exists:

```bash
boto_rds.present:
    - name: myrds
    - allocated_storage: 5
    - storage_type: gp2
    - db_instance_class: db.t2.micro
    - engine: MySQL
    - master_username: myuser
    - master_user_password: mypass
    - region: us-east-1
    - keyid: GKTADJGHEIQSXMKKRBJ08H
    - key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

---

**31.27. Full list of builtin state modules** 1657
salt.states.boto_rds.absent

```
(name, skip_final_snapshot=None, final_db_snapshot_identifier=None, tags=None, region=None, key=None, keyid=None, profile=None)
```

Ensure RDS instance exists.

**name** Name of the RDS instance.

**allocated_storage** The amount of storage (in gigabytes) to be initially allocated for the database instance.

**storage_type** The storage type you want to use, available: standard, gp2 and io1

**db_instance_class** The compute and memory capacity of the Amazon RDS DB instance.

**engine** The name of the database engine to be used for this instance.

**master_username** The name of master user for the client DB instance.

**master_user_password** The password for the master database user. Can be any printable ASCII character except ‘/’, ‘‘’, or ‘@’.

**db_name** The database name for the restored DB instance.

**db_security_groups** A list of DB security groups to associate with this DB instance.

**vpc_security_group_ids** A list of EC2 VPC security groups to associate with this DB instance.

**availability_zone** The EC2 Availability Zone that the database instance will be created in.

**db_subnet_group_name** A DB subnet group to associate with this DB instance.

**preferred_maintenance_window** The weekly time range (in UTC) during which system maintenance can occur.

**backup_retention_period** The number of days for which automated backups are retained.

**preferred_backup_window** The daily time range during which automated backups are created if automated backups are enabled.

**port** The port number on which the database accepts connections.

**multi_az** Specifies if the DB instance is a Multi-AZ deployment. You cannot set the AvailabilityZone parameter if the MultiAZ parameter is set to true.

**engine_version** The version number of the database engine to use.

**auto_minor_version_upgrade** Indicates that minor engine upgrades will be applied automatically to the DB instance during the maintenance window.

**license_model** License model information for this DB instance.

**iops** The amount of Provisioned IOPS (input/output operations per second) to be initially allocated for the DB instance.

**option_group_name** Indicates that the DB instance should be associated with the specified option group.
character_set_name For supported engines, indicates that the DB instance should be associated with the specified CharacterSet.

publicly_accessible Specifies the accessibility options for the DB instance. A value of true specifies an Internet-facing instance with a publicly resolvable DNS name, which resolves to a public IP address. A value of false specifies an internal instance with a DNS name that resolves to a private IP address.

wait_status Wait for the RDS instance to reach a desired status before finishing the state. Available states: available, modifying, backing-up

tags A list of tags.

region Region to connect to.

key Secret key to be used.

keyid Access key to be used.

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

```
salt.states.boto_rds.replica_present(name, source, db_instance_class=None, availability_zone=None, port=None, auto_minor_version_upgrade=None, iops=None, option_group_name=None, publicly_accessible=None, tags=None, region=None, key=None, keyid=None, profile=None)
```

Ensure RDS replica exists.

```
Ensure myrds replica RDS exists:
    boto_rds.create_replica:
        - name: myreplica
        - source: mydb
```

```
salt.states.boto_rds.subnet_group_absent(name, tags=None, region=None, key=None, keyid=None, profile=None)
```

```
salt.states.boto_rds.subnet_group_present(name, subnet_ids, description, tags=None, region=None, key=None, keyid=None, profile=None)
```

Ensure DB subnet group exists.

name The name for the DB subnet group. This value is stored as a lowercase string.

subnet_ids The EC2 Subnet IDs for the DB subnet group.

description Subnet group description.

tags A list of tags.

region Region to connect to.

key Secret key to be used.

keyid Access key to be used.

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

31.27.26 salt.states.boto_route53

Manage Route53 records
New in version 2014.7.0.

Create and delete Route53 records. Be aware that this interacts with Amazon's services, and so may incur charges.

This module uses boto3, which can be installed via package, or pip.

This module accepts explicit route53 credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```
route53.keyid: GKTADJGHEIQSXMKKRBJ08H
route53.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

It's also possible to specify key, keyid and region via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```
myprofile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
    region: us-east-1
```

```
myrecord:
    boto_route53.present:
        name: test.example.com.
        value: my-elb.us-east-1.elb.amazonaws.com.
        zone: example.com.
        ttl: 60
        record_type: CNAME
        region: us-east-1
        keyid: GKTADJGHEIQSXMKKRBJ08H
        key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

```
# Using a profile from pillars
myarecord:
    boto_route53.present:
        name: test.example.com.
        value: 1.1.1.1
        zone: example.com.
        ttl: 60
        record_type: A
        region: us-east-1
        profile: myprofile
```

```
# Passing in a profile
myarecord:
    boto_route53.present:
        name: test.example.com.
        value: 1.1.1.1
        zone: example.com.
        ttl: 60
        record_type: A
        region: us-east-1
        profile:
            keyid: GKTADJGHEIQSXMKKRBJ08H
            key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

salt.states.boto_route53.absent(name, zone, record_type, identifier=None, region=None, key=None, keyid=None, profile=None, wait_for_sync=True, split_dns=False, private_zone=False)

Ensure the Route53 record is deleted.

name Name of the record.
zone The zone to delete the record from.
record_type The record type (A, NS, MX, TXT, etc.)
identifier An identifier to match for deletion.
region The region to connect to.
key Secret key to be used.
keyid Access key to be used.
profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.
wait_for_sync Wait for an INSYNC change status from Route53.
split_dns Route53 supports a public and private DNS zone with the same names.
private_zone If using split_dns, specify if this is the private zone.

salt.states.boto_route53.present(name, value, zone, record_type, ttl=None, identifier=None, region=None, key=None, keyid=None, profile=None, wait_for_sync=True, split_dns=False, private_zone=False)

Ensure the Route53 record is present.

name Name of the record.
value Value of the record.
zone The zone to create the record in.
record_type The record type (A, NS, MX, TXT, etc.)
ttl The time to live for the record.
identifier The unique identifier to use for this record.
region The region to connect to.
key Secret key to be used.
keyid Access key to be used.
profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.
wait_for_sync Wait for an INSYNC change status from Route53.
split_dns Route53 supports a public and private DNS zone with the same names.
private_zone If using split_dns, specify if this is the private zone.

31.27.27 salt.states.boto_secgroup

Manage Security Groups

New in version 2014.7.0.
Create and destroy Security Groups. Be aware that this interacts with Amazon's services, and so may incur charges. This module uses boto, which can be installed via package, or pip.

This module accepts explicit EC2 credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```
secgroup.keyid: GKTADJGHEIQSXMKKRBJ08H
secgroup.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

It's also possible to specify key, keyid and region via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
  region: us-east-1
```

Ensure mysecgroup exists:
```
boto_secgroup.present:
  - name: mysecgroup
  - description: My security group
  - rules:
    - ip_protocol: tcp
      from_port: 80
      to_port: 80
      cidr_ip:
        - 10.0.0.0/0
        - 192.168.0.0/0
    - ip_protocol: icmp
      from_port: -1
      to_port: -1
      source_group_name: mysecgroup
  - rules_egress:
    - ip_protocol: all
      from_port: -1
      to_port: -1
      cidr_ip:
        - 10.0.0.0/0
        - 192.168.0.0/0
    - region: us-east-1
    - keyid: GKTADJGHEIQSXMKKRBJ08H
    - key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

# Using a profile from pillars
Ensure mysecgroup exists:
```
boto_secgroup.present:
  - name: mysecgroup
  - description: My security group
  - region: us-east-1
  - profile: myprofile
```

# Passing in a profile
Ensure mysecgroup exists:
```
boto_secgroup.present:
  - name: mysecgroup
  - description: My security group
```

1662 Chapter 31. Reference
salt.states.boto_secgroup.absent(name, vpc_id=None, region=None, key=None, keyid=None, profile=None)

Ensure a security group with the specified name does not exist.

- name: Name of the security group.
- vpc_id: The ID of the VPC to create the security group in, if any.
- region: Region to connect to.
- key: Secret key to be used.
- keyid: Access key to be used.
- profile: A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_secgroup.present(name, description, vpc_id=None, rules=None, rules_egress=None, region=None, key=None, keyid=None, profile=None)

Ensure the security group exists with the specified rules.

- name: Name of the security group.
- description: A description of this security group.
- vpc_id: The ID of the VPC to create the security group in, if any.
- rules: A list of ingress rule dicts.
- rules_egress: A list of egress rule dicts.
- region: Region to connect to.
- key: Secret key to be used.
- keyid: Access key to be used.
- profile: A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

31.27.28 salt.states.boto_sns

Manage SNS Topics

Create and destroy SNS topics. Be aware that this interacts with Amazon's services, and so may incur charges.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit AWS credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```
sns.keyid: GKTADJGHEIQSXMKKRBJ08H
sns.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```
It's also possible to specify `key`, `keyid` and `region` via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```yaml
define myprofile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: askdjghsdfjkgWupUjasdklfklgjsdfjajkghs
    region: us-east-1

mytopic:
    boto_sns.present:
        - region: us-east-1
        - keyid: GKTADJGHEIQSXMKKRBJ08H
        - key: askdjghsdfjkgWupUjasdklfklgjsdfjajkghs

# Using a profile from pillars
mytopic:
    boto_sns.present:
        - region: us-east-1
        - profile: mysnsprofile

# Passing in a profile
mytopic:
    boto_sns.present:
        - region: us-east-1
        - profile:
            keyid: GKTADJGHEIQSXMKKRBJ08H
            key: askdjghsdfjkgWupUjasdklfklgjsdfjajkghs

salt.states.boto_sns.absent(name, region=None, key=None, keyid=None, profile=None)
Ensure the named sns topic is deleted.

- name Name of the SNS topic.
- region Region to connect to.
- key Secret key to be used.
- keyid Access key to be used.
- profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_sns.present(name, subscriptions=None, region=None, key=None, keyid=None, profile=None)
Ensure the SNS topic exists.

- name Name of the SNS topic.
- subscriptions List of SNS subscriptions.

Each subscription is a dictionary with a protocol and endpoint key:

```yaml
[
    {'protocol': 'https', 'endpoint': 'https://www.example.com/sns-endpoint'},
    {'protocol': 'sqs', 'endpoint': 'arn:aws:sqs:us-west-2:123456789012:MyQueue'}
]
```

- region Region to connect to.
- key Secret key to be used.
- keyid Access key to be used.
profile  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

31.27.29  salt.states.boto_sqs

Manage SQS Queues

New in version 2014.7.0.

Create and destroy SQS queues. Be aware that this interacts with Amazon's services, and so may incur charges.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit SQS credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```py
sqs.keyid: GKTADJGHEIQSXMKKRBJ08H
sqs.key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

It's also possible to specify key, keyid and region via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```py
myprofile:
    keyid: GKTADJGHEIQSXMKKRBJ08H
    key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
    region: us-east-1

myqueue:
    boto_sqs.present:
        - region: us-east-1
        - keyid: GKTADJGHEIQSXMKKRBJ08H
        - key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
        - attributes:
            ReceiveMessageWaitTimeSeconds: 20
```

# Using a profile from pillars

```py
myqueue:
    boto_sqs.present:
        - region: us-east-1
        - profile: mysqsprofile
```

# Passing in a profile

```py
myqueue:
    boto_sqs.present:
        - region: us-east-1
        - profile:
            keyid: GKTADJGHEIQSXMKKRBJ08H
            key: askdjghsdfjkghWupUjasdflkdfklgjsdfjajkghs
```

salt.states.boto_sqs.absent(name, region=, key=, keyid=, profile=)

Ensure the named sqs queue is deleted.

name  Name of the SQS queue.

region  Region to connect to.

key  Secret key to be used.
keyid  Access key to be used.

profile  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

```
salt.states.boto_sqs.present(name, attributes=None, region=None, key=None, keyid=None, profile=None)
```

Ensure the SQS queue exists.

- name  Name of the SQS queue.
- attributes  A dict of key/value SQS attributes.
- region  Region to connect to.
- key  Secret key to be used.
- keyid  Access key to be used.
- profile  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

### 31.27.30  salt.states.boto_vpc

**Manage VPCs**

New in version 2015.8.0.

Create and destroy VPCs. Be aware that this interacts with Amazon's services, and so may incur charges.

This module uses boto, which can be installed via package, or pip.

This module accepts explicit vpc credentials but can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More information available here.

If IAM roles are not used you need to specify them either in a pillar file or in the minion's config file:

```
vpc.keyid: GKTADJGHEIQSXMKKRBJ08H
vpc.key: askdjghsdfjkghWupUjasdflkdfklgjhsdkfjajkghs
```

It's also possible to specify key, keyid and region via a profile, either passed in as a dict, or as a string to pull from pillars or minion config:

```
myprofile:
  keyid: GKTADJGHEIQSXMKKRBJ08H
  key: askdjghsdfjkghWupUjasdflkdfklgjhsdkfjajkghs
  region: us-east-1
```

Ensure VPC exists:

```
boto_vpc.present:
  - name: myvpc
  - cidr_block: 10.10.11.0/24
  - dns_hostnames: True
  - region: us-east-1
  - keyid: GKTADJGHEIQSXMKKRBJ08H
  - key: askdjghsdfjkghWupUjasdflkdfklgjhsdkfjajkghs
```

Ensure subnet exists:

```
boto_vpc.subnet_present:
  - name: mysubnet
```
- vpc_id: vpc-123456
- cidr_block: 10.0.0.0/16
- region: us-east-1
- keyid: GKTADJGHEIQSXMKKRBJ08H
- key: askdjghsdfjkghWupUjasdflkdfklgjsdfajkghs

Ensure internet gateway exists:

```python
boto_vpc.internet_gateway_present:
- name: myigw
- vpc_name: myvpc
- region: us-east-1
- keyid: GKTADJGHEIQSXMKKRBJ08H
- key: askdjghsdfjkghWupUjasdflkdfklgjsdfajkghs
```

Ensure route table exists:

```python
boto_vpc.route_table_present:
- name: my_route_table
- vpc_id: vpc-123456
- routes:
  - destination_cidr_block: 0.0.0.0/0
  - instance_id: i-123456
  - interface_id: eni-123456
- subnets:
  - name: subnet1
  - name: subnet2
- region: us-east-1
- keyid: GKTADJGHEIQSXMKKRBJ08H
- key: askdjghsdfjkghWupUjasdflkdfklgjsdfajkghs
```

```python
salt.states.boto_vpc.absent(name, tags=None, region=None, key=None, keyid=None, profile=None)

Ensure VPC with passed properties is absent.

name Name of the VPC.

tags A list of tags. All tags must match.

region Region to connect to.

key Secret key to be used.

keyid Access key to be used.

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.
```

```python
salt.states.boto_vpc.internet_gateway_absent(name, detach=False, region=None, key=None, keyid=None, profile=None)

Ensure the named internet gateway is absent.

name Name of the internet gateway.

detach First detach the internet gateway from a VPC, if attached.

region Region to connect to.

key Secret key to be used.

keyid Access key to be used.

profile A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.
```
Ensure an internet gateway exists.

- **name**: Name of the internet gateway.
- **vpc_name**: Name of the VPC to which the internet gateway should be attached.
- **vpc_id**: Id of the VPC to which the internet_gateway should be attached. Only one of vpc_name or vpc_id may be provided.
- **tags**: A list of tags.
- **region**: Region to connect to.
- **key**: Secret key to be used.
- **keyid**: Access key to be used.
- **profile**: A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

Ensure VPC exists.

- **name**: Name of the VPC.
- **cidr_block**: The range of IPs in CIDR format, for example: 10.0.0.0/24. Block size must be between /16 and /28 netmask.
- **instance_tenancy**: Instances launched in this VPC will be single-tenant or dedicated hardware.
- **dns_support**: Indicates whether the DNS resolution is supported for the VPC.
- **dns_hostnames**: Indicates whether the instances launched in the VPC get DNS hostnames.
- **tags**: A list of tags.
- **region**: Region to connect to.
- **key**: Secret key to be used.
- **keyid**: Access key to be used.
- **profile**: A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

Ensure the named route table is absent.

- **name**: Name of the route table.
- **region**: Region to connect to.
- **key**: Secret key to be used.
- **keyid**: Access key to be used.
- **profile**: A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.
salt.states.boto_vpc.route_table_present(name, vpc_name=None, vpc_id=None, routes=None, subnet_ids=None, subnet_names=None, tags=None, region=None, key=None, keyid=None, profile=None)

Ensure route table with routes exists and is associated to a VPC.

Example:

```yaml
.. code-block:: yaml

   boto_vpc.route_table_present:
     - name: my_route_table
     - vpc_id: vpc-123456
     - routes: - destination_cidr_block: 0.0.0.0/0
       instance_id: i-123456 interface_id: eni-123456
     - subnet_names: - subnet1 - subnet2

name  Name of the route table.

vpc_name  Name of the VPC with which the route table should be associated.

vpc_id  Id of the VPC with which the route table should be associated. Either vpc_name or vpc_id must be provided.

routes  A list of routes.

subnet_ids  A list of subnet ids to associate

subnet_names  A list of subnet names to associate

tags  A list of tags.

region  Region to connect to.

key  Secret key to be used.

keyid  Access key to be used.

profile  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

salt.states.boto_vpc.subnet_absent(name=None, subnet_id=None, region=None, key=None, keyid=None, profile=None)

Ensure subnet with passed properties is absent.

name  Name of the subnet.

region  Region to connect to.

key  Secret key to be used.

keyid  Access key to be used.

profile  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

cidr_block  Cidr block of the subnet.

salt.states.boto_vpc.subnet_present(name, cidr_block, vpc_name=None, vpc_id=None, availability_zone=None, tags=None, region=None, key=None, keyid=None, profile=None)

Ensure a subnet exists.
name  Name of the subnet.

cidr_block  The range of IPs for the subnet, in CIDR format. For example: 10.0.0.0/24. Block size must be between /16 and /28 netmask.

vpc_name  Name of the VPC in which the subnet should be placed. Either vpc_name or vpc_id must be provided.

vpc_id  Id of the VPC in which the subnet should be placed. Either vpc_name or vpc_id must be provided.

availability_zone  AZ in which the subnet should be placed.

tags  A list of tags.

region  Region to connect to.

key  Secret key to be used.

keyid  Access key to be used.

profile  A dict with region, key and keyid, or a pillar key (string) that contains a dict with region, key and keyid.

### 31.27.31 salt.states.bower

**Installation of Bower Packages**

These states manage the installed packages using Bower. Note that npm, git and bower must be installed for these states to be available, so bower states should include requisites to pkg.installed states for the packages which provide npm and git (simply npm and git in most cases), and npm.installed state for the package which provides bower.

Example:

```
npm:
    pkg.installed
git:
    pkg.installed
bower:
    npm.installed
    require:
        - pkg: npm
        - pkg: git

underscore:
    bower.installed:
        - dir: /path/to/project
        - require:
            - npm: bower
```

**salt.states.bower.bootstrap**(name, user=None)

Bootstraps a frontend distribution.

- user  The user to run Bower with

**salt.states.bower.installed**(name, dir, pkgs=None, user=None, env=None)

Verify that the given package is installed and is at the correct version (if specified).
underscore:
  bower.installed:
    - dir: /path/to/project
    - user: someuser

jquery#2.0:
  bower.installed:
    - dir: /path/to/project

name  The package to install

dir  The target directory in which to install the package

pkgs  A list of packages to install with a single Bower invocation; specifying this argument will ignore the
       name argument

user  The user to run Bower with

env  A list of environment variables to be set prior to execution. The format is the same as the cmd.run
     state function.

salt.states.bower.removed(name, dir, user=None)
Verify that the given package is not installed.

dir  The target directory in which to install the package

user  The user to run Bower with

31.27.32  salt.states.cabal

Installation of Cabal Packages

New in version 2015.8.0.

These states manage the installed packages for Haskell using cabal. Note that cabal-install must be installed for these
states to be available, so cabal states should include a requisite to a pkg.installed state for the package which provides
cabal (cabal-install in case of Debian based distributions). Example:

.. code-block:: yaml

  cabal-install: pkg.installed

  ShellCheck:
    cabal.installed:
      - require: - pkg: cabal-install

salt.states.cabal.installed(name, pkgs=None, user=None, install_global=False, env=None)
Verify that the given package is installed and is at the correct version (if specified).

ShellCheck-0.3.5:
  cabal:
    - installed:

name  The package to install

user  The user to run cabal install with

install_global  Install package globally instead of locally
env  A list of environment variables to be set prior to execution. The format is the same as the cmd.run.

statefunction.

salt.states.cabal.removed(name, user=None, env=None)
Verify that given package is not installed.

31.27.33  salt.states.chef

Execute Chef client runs

Run chef-client or chef-solo

my-chef-run:
  chef.client:
    - override-runlist: 'demo1,demo2'
    - server: 'https://chef.domain.com'

default-chef-run:
  chef.client: []

my-solo-run:
  chef.solo:
    - environment: dev

salt.states.chef.client(name, **kwargs)

  name  Unique identifier for the state. Does not affect the Chef run.
  server  The chef server URL
  client_key  Set the client key file location
  config  The configuration file to use
  config-file-jail  Directory under which config files are allowed to be loaded (no client.rb or knife.rb outside this path will be loaded).
  environment  Set the Chef Environment on the node
  group  Group to set privilege to
  json-attributes  Load attributes from a JSON file or URL
  localmode  Point chef-client at local repository if True
  log_level  Set the log level (debug, info, warn, error, fatal)
  logfile  Set the log file location
  node-name  The node name for this client
  override-runlist  Replace current run list with specified items for a single run
  pid  Set the PID file location, defaults to /tmp/chef-client.pid
  run-lock-timeout  Set maximum duration to wait for another client run to finish, default is indefinitely.
  runlist  Permanently replace current run list with specified items
  user  User to set privilege to
  validation_key  Set the validation key file location, used for registering new clients

salt.states.chef.solo(name, **kwargs)
name  Unique identifier for the state. Does not affect the Chef run.
config  The configuration file to use
environment  Set the Chef Environment on the node
group  Group to set privilege to
json-attributes  Load attributes from a JSON file or URL
log_level  Set the log level (debug, info, warn, error, fatal)
logfile  Set the log file location
node-name  The node name for this client
override-runlist  Replace current run list with specified items for a single run
recipe-url  Pull down a remote gzipped tarball of recipes and untar it to the cookbook cache
run-lock-timeout  Set maximum duration to wait for another client run to finish, default is indefinitely.
user  User to set privilege to

31.27.34  salt.states.cloud

Using states instead of maps to deploy clouds

New in version 2014.1.0.

Use this minion to spin up a cloud instance:

my-ec2-instance:
    cloud.profile:
        my-ec2-config

salt.states.cloud.absent(name, onlyif=None, unless=None)
Ensure that no instances with the specified names exist.

    name  The name of the instance to destroy
    onlyif  Do run the state only if is unless succeed
    unless  Do not run the state at least unless succeed

salt.states.cloud.present(name, cloud_provider, onlyif=None, unless=None, **kwargs)
Spin up a single instance on a cloud provider, using salt-cloud. This state does not take a profile argument; rather, it takes the arguments that would normally be configured as part of the state.

    name  The name of the instance to create
    cloud_provider  The name of the cloud provider to use
    onlyif  Do run the state only if is unless succeed
    unless  Do not run the state at least unless succeed

31.27.  Full list of builtin state modules  1673
salt.states.cloud.profile(name, profile, onlyif=None, unless=None, **kwargs)

Create a single instance on a cloud provider, using a salt-cloud profile.

Note that while profiles used this function do take any configuration argument that would normally be used to create an instance using a profile, this state will not verify the state of any of those arguments on an existing instance. Stateful properties of an instance should be configured using their own individual state (i.e., cloud.tagged, cloud.untagged, etc).

- **name**: The name of the instance to create
- **profile**: The name of the cloud profile to use
- **onlyif**: Do run the state only if is unless succeed
- **unless**: Do not run the state at least unless succeed
- **kwargs**: Any profile override or addition

salt.states.cloud.volume_absent(name, provider=None, **kwargs)

Check that a block volume exists.

salt.states.cloud.volume_attached(name, server_name, provider=None, **kwargs)

Check if a block volume is attached.

salt.states.cloud.volume_detached(name, server_name=None, provider=None, **kwargs)

Check if a block volume is attached.

Returns True if server or Volume do not exist.

salt.states.cloud.volume_present(name, provider=None, **kwargs)

Check that a block volume exists.

### 31.27.35 salt.states.cmd

**Execution of arbitrary commands**

The cmd state module manages the enforcement of executed commands, this state can tell a command to run under certain circumstances.

A simple example to execute a command:

date > /tmp/salt-run:

    cmd.run

Only run if another execution failed, in this case truncate syslog if there is no disk space:

> /var/log/messages:

    cmd.run:
        - unless: echo 'foo' > /tmp/.test && rm -f /tmp/.test

Only run if the file specified by creates does not exist, in this case touch /tmp/foo if it does not exist.

    touch /tmp/foo:

    cmd.run:
        - creates: /tmp/foo

**Note**: The creates option was added to version 2014.7.0

Salt determines whether the cmd state is successfully enforced based on the exit code returned by the command. If the command returns a zero exit code, then salt determines that the state was successfully enforced. If the script
returns a non-zero exit code, then salt determines that it failed to successfully enforce the state. If a command returns a non-zero exit code but you wish to treat this as a success, then you must place the command in a script and explicitly set the exit code of the script to zero.

Please note that the success or failure of the state is not affected by whether a state change occurred nor the stateful argument.

When executing a command or script, the state (i.e., changed or not) of the command is unknown to Salt's state system. Therefore, by default, the `cmd` state assumes that any command execution results in a changed state.

This means that if a `cmd` state is watched by another state then the state that's watching will always be executed due to the `changed` state in the `cmd` state.

Many state functions in this module now also accept a `stateful` argument. If `stateful` is specified to be true then it is assumed that the command or script will determine its own state and communicate it back by following a simple protocol described below:

1. **If there's nothing in the stdout of the command, then assume no changes.** Otherwise, the stdout must be either in JSON or its last non-empty line must be a string of key=value pairs delimited by spaces (no spaces on either side of =).

2. **If it's JSON then it must be a JSON object (e.g., {}).** If it's key=value pairs then quoting may be used to include spaces. (Python's `shlex` module is used to parse the key=value string)

   Two special keys or attributes are recognized in the output:

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>changed:</td>
<td>bool (i.e., 'yes', 'no', 'true', 'false', case-insensitive)</td>
</tr>
<tr>
<td>comment:</td>
<td>str (i.e., any string)</td>
</tr>
</tbody>
</table>

   So, only if `changed` is `True` then assume the command execution has changed the state, and any other key values or attributes in the output will be set as part of the changes.

3. **If there's a comment then it will be used as the comment of the state.**

   Here's an example of how one might write a shell script for use with a stateful command:

   ```bash
   #!/bin/bash
   
   # working hard...
   
   # writing the state line
   echo # an empty line here so the next line will be the last.
   echo "changed=yes comment='something has changed' whatever=123"
   
   And an example SLS file using this module:
   
   Run myscript:
   cmd.run:
     - name: /path/to/myscript
     - cwd: /
     - stateful: True
   
   Run only if myscript changed something:
   cmd.wait:
     - name: echo hello
     - cwd: /
     - watch:
       - cmd: Run myscript
   
   Note that if the `cmd.wait` state also specifies `stateful`: True it can then be watched by some other states as well.
4. The stateful argument can optionally include a test_name parameter.

This is used to specify a command to run in test mode. This command should return stateful data for changes that would be made by the command in the name parameter.

New in version 2015.2.0.

```yaml
Run myscript:
  cmd.run:
    - name: /path/to/myscript
    - cwd: /
    - stateful:
      - test_name: /path/to/myscript test

Run masterscript:
  cmd.script:
    - name: masterscript
    - source: salt://path/to/masterscript
    - cwd: /
    - stateful:
      - test_name: masterscript test
```

`cmd.wait` is not restricted to watching only `cmd` states. For example it can also watch a git state for changes

```yaml
# Watch for changes to a git repo and rebuild the project on updates
my-project:
  git.latest:
    - name: git@github.com/repo/foo
    - target: /opt/foo
    - rev: master
  cmd.wait:
    - name: make install
    - cwd: /opt/foo
    - watch:
      - git: my-project
```

**Should I use `cmd.run` or `cmd.wait`?**

These two states are often confused. The important thing to remember about them is that `cmd.run` states are run each time the SLS file that contains them is applied. If it is more desirable to have a command that only runs after some other state changes, then `cmd.wait` does just that. `cmd.wait` is designed to `watch` other states, and is executed when the state it is watching changes. Example:

```
/usr/local/bin/postinstall.sh:
  cmd.wait:
    - watch:
      - pkg: mycustompkg
  file.managed:
    - source: salt://utils/scripts/postinstall.sh

mycustompkg:
  pkg.installed:
    - require:
      - file: /usr/local/bin/postinstall.sh
```
How do I create an environment from a pillar map?

The map that comes from a pillar cannot be directly consumed by the env option. To use it one must convert it to a list. Example:

```python
printenv:
    cmd.run:
        - env:
            {% for key, value in pillar['keys'].iteritems() %}
                -('{{ key }}': '{{ value }}')
            {% endfor %}

salt.states.cmd.call(name, func, args=(), kws=None, onlyif=None, unless=None, creates=None, output_loglevel='debug', use_vt=False, **kwargs)

Invoke a pre-defined Python function with arguments specified in the state declaration. This function is mainly used by the salt.renderers.pydsl renderer.

The interpretation of onlyif and unless arguments are identical to those of cmd.run, and all other arguments(cwd, runas, ...) allowed by cmd.run are allowed here, except that their effects apply only to the commands specified in onlyif and unless rather than to the function to be invoked.

In addition, the stateful argument has no effects here.

The return value of the invoked function will be interpreted as follows.

If it’s a dictionary then it will be passed through to the state system, which expects it to have the usual structure returned by any salt state function.

Otherwise, the return value (denoted as result in the code below) is expected to be a JSON serializable object, and this dictionary is returned:

```python
{
    'name': name,
    'changes': {'retval': result},
    'result': True if result is None else bool(result),
    'comment': result if isinstance(result, string_types) else ''
}
```

salt.states.cmd.mod_run_check(cmd_kwargs, onlyif, unless, group, creates)

Execute the onlyif and unless logic. Return a result dict if: *group is not available* only if: failed (onlyif != 0) *unless succeeded (unless == 0) else return True

salt.states.cmd.mod_watch(name, **kwargs)

Execute a cmd function based on a watch call

salt.states.cmd.run(name, onlyif=None, unless=None, creates=None, cwd=None, user=None, group=None, shell=None, env=None, stateful=False, umask=None, output_loglevel='debug', quiet=False, timeout=None, ignore_timeout=False, use_vt=False, **kwargs)

Run a command if certain circumstances are met. Use cmd.wait if you want to use the watch requisite.

name  The command to execute, remember that the command will execute with the path and permissions of the salt-minion.

onlyif  A command to run as a check, run the named command only if the command passed to the onlyif option returns true

unless  A command to run as a check, only run the named command if the command passed to the unless option returns false

cwd  The current working directory to execute the command in, defaults to /root
user  The user name to run the command as

group  The group context to run the command as

shell  The shell to use for execution, defaults to the shell grain

env  A list of environment variables to be set prior to execution. Example:

```yaml
script-foo:
    cmd.run:
        - env:
            - BATCH: 'yes'
```

**Warning:** The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So $PATH in the following example is a literal `\$PATH`:

```yaml
script-bar:
    cmd.run:
        - env: "PATH=/some/path:$PATH"
```

One can still use the existing $PATH by using a bit of Jinja:

```python
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
    cmd.run:
        - name: ls -l /
        - env:
            - PATH: {{ current_path, '/my/special/bin'|join(':') }}
```

stateful  The command being executed is expected to return data about executing a state

umask  The umask (in octal) to use when running the command.

output_loglevel  Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

quiet  The command will be executed quietly, meaning no log entries of the actual command or its return data. This is deprecated as of the 2014.1.0 release, and is being replaced with output_loglevel: quiet.

timeout  If the command has not terminated after timeout seconds, send the subprocess sigterm, and if sigterm is ignored, follow up with sigkill

ignore_timeout  Ignore the timeout of commands, which is useful for running nohup processes.

    New in version 2015.8.0.

creates  Only run if the file specified by creates does not exist.

    New in version 2014.7.0.

use_vt  Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

    Note: cmd.run supports the usage of reload_modules. This functionality allows you to force Salt to reload all modules. You should only use reload_modules if your cmd.run does some sort of installation (such as pip), if you do not reload the modules future items in your state which rely on the software being installed will fail.
getpip:
  cmd.run:
    - name: /usr/bin/python /usr/local/sbin/get-pip.py
    - unless: which pip
    - require:
      - pkg: python
      - file: /usr/local/sbin/get-pip.py
      - reload_modules: True

salt.states.cmd.script(name, source=None, template=None, onlyif=None, unless=None, creates=None, cwd=None, user=None, group=None, shell=None, env=None, stateful=False, umask=None, timeout=None, use_vt=False, output_loglevel='debug', **kwargs)
Download a script and execute it with specified arguments.

source The location of the script to download. If the file is located on the master in the directory named spam, and is called eggs, the source string is salt://spam/eggs

template If this setting is applied then the named templating engine will be used to render the downloaded file. Currently jinja, mako, and weppy are supported

name Either `cmd arg1 arg2 arg3...` (cmd is not used) or a source `salt://...`.

onlyif Run the named command only if the command passed to the onlyif option returns true

unless Run the named command only if the command passed to the unless option returns false

cwd The current working directory to execute the command in, defaults to /root

user The name of the user to run the command as

group The group context to run the command as

shell The shell to use for execution. The default is set in grains['shell']

env A list of environment variables to be set prior to execution. Example:

salt://scripts/foo.sh:
  cmd.script:
    - env:
      - BATCH: 'yes'

Warning: The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found here.

Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH`:

salt://scripts/bar.sh:
  cmd.script:
    - env: "PATH=/some/path:$PATH"

One can still use the existing $PATH by using a bit of Jinja:

{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
  cmd.run:
    - name: ls -l /
- env:
  - PATH: {{ [current_path, '/my/special/bin']|join(':') }}

**umask**  The umask (in octal) to use when running the command.

**stateful**  The command being executed is expected to return data about executing a state

**timeout**  If the command has not terminated after timeout seconds, send the subprocess sigterm, and if sigterm is ignored, follow up with sigkill

**args**  String of command line args to pass to the script. Only used if no args are specified as part of the name argument. To pass a string containing spaces in YAML, you will need to doubly-quote it: `arg1 `arg two`arg3``

**creates**  Only run if the file specified by creates does not exist.

New in version 2014.7.0.

**use_vt**  Use VT utils (saltstack) to stream the command output more interactively to the console and the logs.

This is experimental.

**output_loglevel**  Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

```
salt.states.cmd.wait(name, onlyif=None, unless=None, creates=None, cwd=None, user=None, 
group=None, shell=None, env=(), stateful=False, umask=None, output_loglevel='debug', use_vt=False, **kwargs)
```

Run the given command only if the watch statement calls it

**name**  The command to execute, remember that the command will execute with the path and permissions of the salt-minion.

**onlyif**  A command to run as a check, run the named command only if the command passed to the onlyif option returns true

**unless**  A command to run as a check, only run the named command if the command passed to the unless option returns false

**cwd**  The current working directory to execute the command in, defaults to /root

**user**  The user name to run the command as

**group**  The group context to run the command as

**shell**  The shell to use for execution, defaults to /bin/sh

**env**  A list of environment variables to be set prior to execution. Example:

```
script-foo:
  cmd.wait:
    - env:
      - BATCH: 'yes'
```

**Warning**: The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found [here](#).

Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH`:

```
script-bar:
  cmd.wait:
    - env: "PATH=/some/path:$PATH"
```
One can still use the existing $PATH by using a bit of Jinja:

```python
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
  cmd.run:
    - name: ls -l /
    - env:
      - PATH: {{ [current_path, '/my/special/bin']|join(':') }}
```

**umask**  The umask (in octal) to use when running the command.

**stateful**  The command being executed is expected to return data about executing a state

**creates**  Only run if the file specified by creates does not exist.

  New in version 2014.7.0.

**output_loglevel**  Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

**use_vt**  Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

```python
salt.states.cmd.wait_call(name, func, args=(), kws=None, onlyif=None, unless=None, creates=None, stateful=False, use_vt=False, output_loglevel='debug', **kwargs)
```

```python
salt.states.cmd.wait_script(name, source=None, template=None, onlyif=None, unless=None, cwd=None, user=None, group=None, shell=None, env=None, stateful=False, umask=None, use_vt=False, output_loglevel='debug', **kwargs)
```

Download a script from a remote source and execute it only if a watch statement calls it.

**source**  The source script being downloaded to the minion, this source script is hosted on the salt master server. If the file is located on the master in the directory named spam, and is called eggs, the source string is `salt://spam/eggs`

**template**  If this setting is applied then the named templating engine will be used to render the downloaded file, currently jinja, mako, and wempy are supported

**name**  The command to execute, remember that the command will execute with the path and permissions of the salt-minion.

**onlyif**  A command to run as a check, run the named command only if the command passed to the onlyif option returns true

**unless**  A command to run as a check, only run the named command if the command passed to the unless option returns false

**cwd**  The current working directory to execute the command in, defaults to /root

**user**  The user name to run the command as

**group**  The group context to run the command as

**shell**  The shell to use for execution, defaults to the shell grain

**env**  A list of environment variables to be set prior to execution. Example:

```python
salt://scripts/foo.sh:
  cmd.wait_script:
    - env:
      - BATCH: 'yes'
```
Warning: The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found here.

Variables as values are not evaluated. So $PATH in the following example is a literal `$PATH':

```
salt://scripts/bar.sh:
  cmd.wait_script:
    - env: "PATH=/some/path:$PATH"
```

One can still use the existing $PATH by using a bit of Jinja:

```
{% set current_path = salt['environ.get']('PATH', '/bin:/usr/bin') %}

mycommand:
  cmd.run:
    - name: ls -l /
    - env:
      - PATH: {{ [current_path, '/my/special/bin']|join(':') }}
```

**umask**  The umask (in octal) to use when running the command.

**stateful**  The command being executed is expected to return data about executing a state

**use_vt**  Use VT utils (saltstack) to stream the command output more interactively to the console and the logs. This is experimental.

**output_loglevel**  Control the loglevel at which the output from the command is logged. Note that the command being run will still be logged (loglevel: DEBUG) regardless, unless quiet is used for this value.

### 31.27.36  salt.states.composer

**Installation of Composer Packages**

These states manage the installed packages for composer for PHP. Note that either composer is installed and accessible via a bin directory or you can pass the location of composer in the state.

**get-composer:**

```
get-composer:
  cmd.run:
    - name: 'CURL=`which curl`; $CURL -sS https://getcomposer.org/installer | php'
    - unless: test -f /usr/local/bin/composer
    - cwd: /root/
```

**install-composer:**

```
install-composer:
  cmd.wait:
    - name: mv /root/composer.phar /usr/local/bin/composer
    - cwd: /root/
    - watch:
      - cmd: get-composer
```

**/path/to/project:**

```yaml
composer.installed:
  - no_dev: true
  - require:
```

```
```
# Without composer installed in your PATH
# Note: composer.phar must be executable for state to work properly
/path/to/project:
  composer.installed:
    - composer: /path/to/composer.phar
    - php: /usr/local/bin/php
    - no_dev: true

salt.states.composer.installed(
    name, composer=None, php=None, user=None, prefer_source=None, prefer_dist=None, no_scripts=None, no_plugins=None, optimize=None, no_dev=None, quiet=False, composer_home='/root', always_check=True)

Verify that the correct versions of composer dependencies are present.

dir Directory location of the composer.json file.

composer Location of the composer.phar file. If not set composer will just execute `composer` as if it is installed globally. (i.e. /path/to/composer.phar)

php Location of the php executable to use with composer. (i.e. /usr/bin/php)

user Which system user to run composer as.

    New in version 2014.1.4.

prefer_source --prefer-source option of composer.

prefer_dist --prefer-dist option of composer.

no_scripts --no-scripts option of composer.

no_plugins --no-plugins option of composer.

optimize --optimize-autoloader option of composer. Recommended for production.

no_dev --no-dev option for composer. Recommended for production.

quiet --quiet option for composer. Whether or not to return output from composer.

composer_home $COMPOSER_HOME environment variable

always_check If True, _always_ run composer install in the directory. This is the default behavior. If False, only run composer install if there is no vendor directory present.

salt.states.composer.update(
    name, composer=None, php=None, user=None, prefer_source=None, prefer_dist=None, no_scripts=None, no_plugins=None, optimize=None, no_dev=None, quiet=False, composer_home='/root')

Composer update the directory to ensure we have the latest versions of all project dependencies.

dir Directory location of the composer.json file.

composer Location of the composer.phar file. If not set composer will just execute `composer` as if it is installed globally. (i.e. /path/to/composer.phar)

php Location of the php executable to use with composer. (i.e. /usr/bin/php)

user Which system user to run composer as.

    New in version 2014.1.4.

prefer_source --prefer-source option of composer.

prefer_dist --prefer-dist option of composer.
no_scripts  --no-scripts option of composer.
no_plugins  --no-plugins option of composer.
optimize   --optimize-autoloader option of composer. Recommended for production.
no_dev      --no-dev option for composer. Recommended for production.
quiet       --quiet option for composer. Whether or not to return output from composer.
composer_home  $COMPOSER_HOME environment variable

31.27.37  salt.states.cron

Management of cron, the Unix command scheduler

Cron declarations require a number of parameters. The following are the parameters used by Salt to define the various timing values for a cron job:

- minute
- hour
- daymonth
- month
- dayweek (0 to 6 are Sunday through Saturday, 7 can also be used for Sunday)

Warning: Any timing arguments not specified take a value of *. This means that setting hour to 5, while not defining the minute param, will result in Salt adding a job that will execute every minute between 5 and 6 A.M.!
Additionally, the default user for these states is root. Therefore, if the cron job is for another user, it is necessary to specify that user with the user parameter.

A long time ago (before 2014.2), when making changes to an existing cron job, the name declaration is the parameter used to uniquely identify the job, so if an existing cron that looks like this:

```
date > /tmp/crontest:
  cron.present:
    - user: root
    - minute: 5
```

Is changed to this:

```
date > /tmp/crontest:
  cron.present:
    - user: root
    - minute: 7
    - hour: 2
```

Then the existing cron will be updated, but if the cron command is changed, then a new cron job will be added to the user's crontab.

The current behavior is still relying on that mechanism, but you can also specify an identifier to identify your crontabs:

```
date > /tmp/crontest:
  cron.present:
    - identifier: SUPERCRON
    - user: root
```
New in version 2014.1.2.

And, some months later, you modify it:

```
superscript > /tmp/crontest:
cron.present:
  - identifier: SUPERCRON
  - user: root
  - minute: 3
  - hour: 4
```

New in version 2014.1.2.

The old `date > /tmp/crontest` will be replaced by `superscript > /tmp/crontest`.

Additionally, Salt also supports running a cron every x minutes very similarly to the Unix convention of using `*/5` to have a job run every five minutes. In Salt, this looks like:

```
date > /tmp/crontest:
cron.present:
  - user: root
  - minute: '*/5'
```

The job will now run every 5 minutes.

Additionally, the temporal parameters (minute, hour, etc.) can be randomized by using `random` instead of using a specific value. For example, by using the `random` keyword in the `minute` parameter of a cron state, the same cron job can be pushed to hundreds or thousands of hosts, and they would each use a randomly-generated minute. This can be helpful when the cron job accesses a network resource, and it is not desirable for all hosts to run the job concurrently.

```
/path/to/cron/script:
cron.present:
  - user: root
  - minute: random
  - hour: 2
```

New in version 0.16.0.

Since Salt assumes a value of * for unspecified temporal parameters, adding a parameter to the state and setting it to `random` will change that value from * to a randomized numeric value. However, if that field in the cron entry on the minion already contains a numeric value, then using the `random` keyword will not modify it.

```
salt.states.cron.absent(name, user='root', identifier=False, **kwargs)
```

Verifies that the specified cron job is absent for the specified user; only the name is matched when removing a cron job.

- `name` The command that should be absent in the user crontab.
- `user` The name of the user whose crontab needs to be modified, defaults to the root user
- `identifier` Custom-defined identifier for tracking the cron line for future crontab edits. This defaults to the state id

```
salt.states.cron.env_absent(name, user='root')
```

Verifies that the specified environment variable is absent from the crontab for the specified user

- `name` The name of the environment variable to remove from the user crontab
- `user` The name of the user whose crontab needs to be modified, defaults to the root user
salt.states.cron.env_present(name, value=None, user='root')
Verifies that the specified environment variable is present in the crontab for the specified user.

- **name** The name of the environment variable to set in the user crontab
- **user** The name of the user whose crontab needs to be modified, defaults to the root user
- **value** The value to set for the given environment variable

salt.states.cron.file(name, source_hash='`', user='root', template=None, context=None, replace=True, defaults=None, env=None, backup='`', **kwargs)
Provides file.managed-like functionality (templating, etc.) for a pre-made crontab file, to be assigned to a given user.

- **name** The source file to be used as the crontab. This source file can be hosted on either the salt master server, or on an HTTP or FTP server. For files hosted on the salt file server, if the file is located on the master in the directory named spam, and is called eggs, the source string is `salt://spam/eggs`

  If the file is hosted on a HTTP or FTP server then the source_hash argument is also required

- **source_hash** This can be either a file which contains a source hash string for the source, or a source hash string. The source hash string is the hash algorithm followed by the hash of the file:
  
  ```
  md5=e138491e9d5b97023cea823fe17bac22
  ```

- **user** The user to whom the crontab should be assigned. This defaults to root.
- **template** If this setting is applied then the named templating engine will be used to render the downloaded file. Currently, jinja and mako are supported.
- **context** Overrides default context variables passed to the template.
- **replace** If the crontab should be replaced, if False then this command will be ignored if a crontab exists for the specified user. Default is True.
- **defaults** Default context passed to the template.
- **backup** Overrides the default backup mode for the user’s crontab.

salt.states.cron.present(name, user='root', minute='*', hour='*', daymonth='*', month='*', dayweek='*', comment=None, identifier=False)
Verifies that the specified cron job is present for the specified user. For more advanced information about what exactly can be set in the cron timing parameters, check your cron system’s documentation. Most Unix-like systems’ cron documentation can be found via the crontab man page: `man 5 crontab`.

- **name** The command that should be executed by the cron job.
- **user** The name of the user whose crontab needs to be modified, defaults to the root user
- **minute** The information to be set into the minute section, this can be any string supported by your cron system’s the minute field. Default is *
- **hour** The information to be set in the hour section. Default is *
- **daymonth** The information to be set in the day of month section. Default is *
- **month** The information to be set in the month section. Default is *
- **dayweek** The information to be set in the day of week section. Default is *
- **comment** User comment to be added on line previous the cron job
- **identifier** Custom-defined identifier for tracking the cron line for future crontab edits. This defaults to the state id
31.27.38 salt.states.cyg

Installation of Cygwin packages.
A state module to manage cygwin packages. Packages can be installed or removed.

dos2unix:
  cyg.installed

class salt.states.cyg.DictDiffer(current_dict, past_dict)
  Calculate the difference between two dictionaries.
  1. items added
  2. items removed
  3. keys same in both but changed values
  4. keys same in both and unchanged values

  added()
  Return a set of additions to past_dict.

  changed()
  Return a set of the keys with changed values.

  removed()
  Return a set of things removed from past_dict.

  same()
  True if the two dicts are the same.

  unchanged()
  Return a set of the keys with unchanged values.

salt.states.cyg.installed(name, cyg_arch='x86_64', mirrors=None)
  Make sure that a package is installed.

  name  The name of the package to install

  cyg_arch  [x86_64] The cygwin architecture to install the package into. Current options are x86 and x86_64

  mirrors  [None] List of mirrors to check. None will use a default mirror (kernel.org)

  CLI Example:
  rsync:
    cyg.installed:
      - mirrors:
        - http://mirror/without/public/key: ""

salt.states.cyg.removed(name, cyg_arch='x86_64', mirrors=None)
  Make sure that a package is not installed.

  name  The name of the package to uninstall

  cyg_arch  [x86_64] The cygwin architecture to remove the package from. Current options are x86 and x86_64

  mirrors  [None] List of mirrors to check. None will use a default mirror (kernel.org)

  CLI Example:
rsync:
  cyg.removed:
  - mirrors:
    - http://mirror/without/public/key: ""

salt.states.cyg.updated(name=None, cyg_arch='x86_64', mirrors=None)
Make sure all packages are up to date.

name [None] No affect, salt fails poorly without the arg available
cyg_arch [x86_64] The cygwin architecture to update. Current options are x86 and x86_64
mirrors [None] List of mirrors to check. None will use a default mirror (kernel.org)

CLI Example:

rsync:
  cyg.updated:
  - mirrors:
    - http://mirror/without/public/key: ""

31.27.39 salt.states.ddns

Dynamic DNS updates

Ensure a DNS record is present or absent utilizing RFC 2136 type dynamic updates. Requires dnspython module.

webserver:
  ddns.present:
    - zone: example.com
    - ttl: 60
    - data: 111.222.333.444
    - nameserver: 123.234.345.456
    - keyfile: /srv/salt/tsig_key.txt

salt.states.ddns.absent(name, zone, data=None, rdtype=None, **kwargs)

Ensures that the named DNS record is absent.

name The host portion of the DNS record, e.g., `webserver`
zone The zone to check
data Data for the DNS record. E.g., the IP address for an A record. If omitted, all records matching name (and rdtype, if provided) will be purged.
rdtype DNS resource type. If omitted, all types will be purged.
**kwargs Additional arguments the ddns.delete function may need (e.g. nameserver, keyfile, keyname).

salt.states.ddns.present(name, zone, ttl, data, rdtype='A', **kwargs)

Ensures that the named DNS record is present with the given ttl.

name The host portion of the DNS record, e.g., `webserver`
zone The zone to check/update
ttl TTL for the record
data Data for the DNS record. E.g., the IP address for an A record.
**rdtype** DNS resource type. Default `A`.

**kwargs** Additional arguments the ddns.update function may need (e.g. nameserver, keyfile, keyname).

### 31.27.40 salt.states.debconfmod

**Management of debconf selections**

**depends**
- debconf-utils package

The debconfmod state module manages the enforcement of debconf selections, this state can set those selections prior to package installation.

**Available Functions**

The debconfmod state has two functions, the `set` and `set_file` functions

**set** Set debconf selections from the state itself

**set_file** Set debconf selections from a file

```yaml
nullmailer-debconf:
    debconf.set:
    - name: nullmailer
    - data:
      'shared/mailname': {'type': 'string', 'value': 'server.domain.tld'}
      'nullmailer/relayhost': {'type': 'string', 'value': 'mail.domain.tld'}

ferm-debconf:
    debconf.set:
    - name: ferm
    - data:
      'ferm/enable': {'type': 'boolean', 'value': True}
```

**Note:** Due to how PyYAML imports nested dicts (see here), the values in the `data` dict must be indented four spaces instead of two.

```yaml
salt.states.debconfmod.set(name, data)

Set debconf selections
```

```yaml
    <state_id>:
    debconf.set:
    - name: <name>
    - data:
      <question>: {'type': <type>, 'value': <value>}
      <question>: {'type': <type>, 'value': <value>}

    <state_id>:
    debconf.set:
    - name: <name>
    - data:
      <question>: {'type': <type>, 'value': <value>}
      <question>: {'type': <type>, 'value': <value>}
```

**name:** The package name to set answers for.
data: A set of questions/answers for debconf. Note that everything under this must be indented twice.

question: The question the is being pre-answered

type: The type of question that is being asked (string, boolean, select, etc.)

value: The answer to the question

salt.states.debconfmod.set_file(name, source, template=None, context=None, defaults=None, **kwargs)

Set debconf selections from a file or a template

```
<state_id>:
    debconf.set_file:
        - source: salt://path/to/pkg.selections

<state_id>:
    debconf.set_file:
        - source: salt://path/to/pkg.selections?saltenv=myenvironment

<state_id>:
    debconf.set_file:
        - source: salt://path/to/pkg.selections.jinja2
        - template: jinja
        - context:
            some_value: "false"
```

source: The location of the file containing the package selections

template If this setting is applied then the named templating engine will be used to render the package selections file, currently jinja, mako, and wempy are supported

context Overrides default context variables passed to the template.

defaults Default context passed to the template.

31.27.41 salt.states.disk

Disk monitoring state

Monitor the state of disk resources

salt.states.disk.status(name, maximum=None, minimum=None)

Return the current disk usage stats for the named mount point

31.27.42 salt.states.dockerio

Manage Docker containers

Docker is a lightweight, portable, self-sufficient software container wrapper. The base supported wrapper type is LXC, cgroups, and the Linux Kernel.

Note: This state module requires docker-py which supports Docker Remote API version 1.6.
Available Functions

- **built**
  
  ```
  corp/mysuperdocker_img:
  docker.built:
  - path: /path/to/dir/container
  ```

- **pulled**
  
  ```
  ubuntu:
  docker.pulled:
  - tag: latest
  ```

- **pushed**
  
  ```
  corp/mysuperdocker_img:
  docker.pushed
  ```

- **installed**
  
  ```
  mysuperdocker-container:
  docker.installed:
  - name: mysuperdocker
  - hostname: superdocker
  - image: corp/mysuperdocker_img
  ```

- **loaded**
  
  ```
  mysuperdocker-file:
  docker.loaded:
  - name: mysuperdocker
  - source: salt://_files/tmp/docker_image.tar
  ```

- **running**
  
  ```
  my_service:
  docker.running:
  - container: mysuperdocker
  - image: corp/mysuperdocker_img
  - port_bindings:
    - "5000/tcp":
      HostIp: ""
      HostPort: "5000"
  ```

  **Note:** The `port_bindings` argument above is a dictionary. The double indentation is required for PyYAML to load the data structure properly as a python dictionary. More information can be found [here](#).

- **absent**
  
  ```
  mys_olduperdocker:
  docker.absent
  ```

- **run**
  
  ```
  /finish-install.sh:
  docker.run:
  - cid: mysuperdocker
  ```
Use Cases

Ensures the container is running with the latest image available

```yaml
my-service-image:
docker.pulled:
  - name: registry/my-service:latest
  - force: true

my-service-container:
docker.installed:
  - image: registry/my-service:latest
  - watch:
    - docker: my-service-image

my-service:
docker.running:
  - container: my-service-container
  - watch:
    - docker: my-service-container
```

Note: The docker modules are named `dockerio` because the name `docker` would conflict with the underlying docker-py library.

`salt.states.dockerio.absent(name)`
Ensure that the container is absent; if not, it will be killed and destroyed. (docker inspect)

- **name**: Either the container name or id

`salt.states.dockerio.built(name, tag='latest', path=None, quiet=False, nocache=False, rm=True, force=False, timeout=None, **kwargs)`
Build a docker image from a path or URL to a dockerfile. (docker build)

- **name**: Name of the image
- **tag**: tag of the image (defaults to `latest`)
- **path**: URL (e.g. url/branch/docker_dir/dockerfile) or filesystem path to the dockerfile

`salt.states.dockerio.installed(name, image, tag='latest', command=None, hostname=None, user=None, detach=True, stdin_open=False, tty=False, mem_limit=None, ports=None, environment=None, dns=None, volumes=None, volumes_from=None, cpu_shares=None, cpuset=None, **kwargs)`
Ensure that a container with the given name exists; if not, build a new container from the specified image. (docker run)

- **name**: Name for the container
- **image**: Image from which to build this container
- **tag**: tag of the image (defaults to `latest`)
- **environment**: Environment variables for the container, either

---

salt Documentation, Release 2015.8.0

```bash
- unless: grep -q something /var/log/foo
- docker_unless: grep -q done /install_log
```
• a mapping of key, values
• a list of mappings of key, values

ports

List of ports definitions, either:
• a port to map
• a mapping of mapping portInHost : PortInContainer

volumes List of volumes (see notes for the running function)

For other parameters, see absolutely first the salt.modules.dockerio execution module and the docker-py python bindings for docker documentation `<https://github.com/dotcloud/docker-py#api>`_ for *docker.create_container*.

**Note:** This command does not verify that the named container is running the specified image.

```python
salt.states.dockerio.loaded(name, tag='latest', source=None, source_hash='`', force=False)
```

Load an image into the local docker registry (*docker load*)

*name* Name of the docker image

*tag* tag of the image (defaults to `latest`)

*source* The source .tar file to download to the minion, created by docker save this source file can be hosted on
either the salt master server, or on an HTTP or FTP server.

If the file is hosted on a HTTP or FTP server then the source_hash argument is also required

**Note:** See first the documentation for *salt file.managed* `<http://docs.saltstack.com/en/latest/ref/states/all/_salt.states.file.html#salt.states.file.managed>`

*source_hash*

This can be one of the following:

1. a source hash string
2. the URI of a file that contains source hash strings

**Note:** See first the documentation for *salt file.managed* `<http://docs.saltstack.com/en/latest/ref/states/all/_salt.states.file.html#salt.states.file.managed>`

*force* Load even if the image exists

```python
salt.states.dockerio.mod_watch(name, sfun=None, *args, **kw)
```

```python
salt.states.dockerio.present(name, image=None, tag='latest', is_latest=False)
```

If a container with the given name is not present, this state will fail. Supports optionally checking for specific
image/tag (*docker inspect*)

*name:* container id

*image:* image the container should be running (defaults to any)

*tag:* tag of the image (defaults to `latest`)

*is_latest:* also check if the container runs the latest version of the image ( latest defined as the latest pulled
onto the local machine)
**Pull an image from a docker registry** *(docker pull)*

```python
salt.states.dockerio.pulled(name, tag='latest', force=False, insecure_registry=False, *args, **kwargs)
```

Pull an image from a docker registry. *(docker pull)*

**Note:** See first the documentation for docker login, docker pull, docker push, and docker.import_image (docker import). NOTE that we added in SaltStack a way to authenticate yourself with the Docker Hub Registry by supplying your credentials (username, email & password) using pillars. For more information, see salt.modules.dockerio execution module.

- **name** Name of the image
- **tag** Tag of the image
- **force** Pull even if the image is already pulled
- **insecure_registry** Set to True to allow connections to non-HTTPS registries. Default False.

**Push an image from a docker registry** *(docker push)*

```python
salt.states.dockerio.pushed(name, tag='latest', insecure_registry=False)
```

Push an image from a docker registry. *(docker push)*

**Note:** See first the documentation for docker login, docker pull, docker push, and docker.import_image (docker import). NOTE that we added in SaltStack a way to authenticate yourself with the Docker Hub Registry by supplying your credentials (username, email & password) using pillars. For more information, see salt.modules.dockerio execution module.

- **name** Name of the image
- **tag** Tag of the image [Optional]
- **insecure_registry** Set to True to allow connections to non-HTTPS registries. Default False.

**Run a command in a specific container**

```python
salt.states.dockerio.run(name, cid=None, hostname=None, onlyif=None, unless=None, docked_onlyif=None, docked_unless=None, *args, **kwargs)
```

Run a command in a specific container

You can match by either name or hostname

- **name** command to run in the container
- **cid** Container id or name
- **state_id** state_id
- **onlyif** Only execute cmd if statement on the host returns 0
- **unless** Do not execute cmd if statement on the host returns 0
- **docked_onlyif** Only execute cmd if statement in the container returns 0
- **docked_unless** Do not execute cmd if statement in the container returns 0

**Ensure that a container is running**

```python
salt.states.dockerio.running(name, image, tag='latest', container=None, command=None, hostname=None, user=None, detach=True, stdin_open=False, tty=False, mem_limit=None, ports=None, environment=None, dns=None, volumes=None, volumes_from=None, start=True, cap_drop=None, privileged=None, publish_all_ports=False, network_mode=None, check_is_running=True, publish_all_ports=False, links=None, restart_policy=None, cpu_shares=None, cpuset=None, kill_signal=None, *args, **kwargs)
```

Ensure that a container is running. If the container does not exist, it will be created from the specified image.
(docker run)

**name/container**  Name for the container

**image**  Image from which to build this container

**tag**  tag of the image (defaults to "latest")

**environment**

Environment variables for the container, either

- a mapping of key, values
- a list of mappings of key, values

**ports**

List of ports definitions, either:

- a port to map
- a mapping of mapping portInHost: PortInContainer

```
- ports:
  - "5000/tcp":
    HostIp: ""
    HostPort: "5000"
```

**publish_all_ports**  Publish all ports from the port list (default is false, only meaningful if port does not contain portinhost:portincontainer mapping)

**volumes**  List of volumes to mount or create in the container (like `\-v` of docker run command), mapping host directory to container directory.

To specify a volume in the container in terse list format:

```
- volumes:
  - "/var/log/service" # container-only volume
  - "/srv/timezone:/etc/timezone" # bound volume
  - "/usr/local/etc/passwd:/etc/passwd:ro" # read-only bound volume
```

You can also use the short dictionary form (note that the notion of source:target from docker is preserved):

```
- volumes:
  - /var/log/service: /var/log/service # mandatory read-write implied
```

Or, alternatively, to specify read-only mounting, use the extended form:

```
- volumes:
  - /home/user1:
    bind: /mnt/vol2
    ro: True
  - /var/www:
    bind: /mnt/vol1
    ro: False
```

Or (for backwards compatibility) another dict style:

```
- volumes:
  - /home/user1:
    bind: /mnt/vol2
    ro: True
  - /var/www:
```

---

31.27. Full list of builtin state modules
bind: /mnt/vol1
ro: False

volumes_from  List of containers to share volumes with
dns  List of DNS servers.
    - dns:
        - 127.0.0.1

network_mode
    • `bridge`: creates a new network stack for the container on the docker bridge
    • `none`: no networking for this container
    • `container:[name|id]`: reuses another container network stack
    • `host`: use the host network stack inside the container
    - network_mode: host

restart_policy  Restart policy to apply when a container exits (no, on-failure[:max-retry], always)
    - restart_policy:
        MaximumRetryCount: 5
        Name: on-failure

cap_add  List of capabilities to add in a container.
cap_drop  List of capabilities to drop in a container.
check_is_running  Enable checking if a container should run or not. Useful for data-only containers that must be linked to another one. e.g. nginx <- static-files
cpu_shares  CPU shares (relative weight)
    - cpu_shares: 2

cpuset  CPUs in which to allow execution (`0-3` or `0,1`)
    - cpuset: '0-3'
kill_signal  If defined, its value will be sent as a kill signal to the running container. i.e. It will use client.kill(signal=kill_signal) instead of client.restart(), when the state is triggered by a watcher requisite.
    possible use case: Soft reload of nginx

nginx:
    docker.running:
        - image: some-fictional-registry.com/nginx
        - tag: latest
        - kill_signal: SIGHUP
        - watch:
            - file: /etc/nginx/nginx.conf

This state will ask nginx to reload (instead of restart) each time the /etc/nginx/nginx.conf is modified.

New in version 2015.8.0.

For other parameters, see salt.modules.dockerio execution module and the docker-py python bindings for docker documentation <https://github.com/dotcloud/docker-py#api> for docker.create_container.
Note: This command does not verify that the named container is running the specified image.

```python
salt.states.dockerio.script(*args, **kw)
```
Place holder function for a cmd.script alike.

Note: Not yet implemented. Its implementation might be very similar from salt.states.dockerio.run

### 31.27.43 `salt.states.dockerng`

Management of Docker containers

New in version 2015.8.0.

This is the state module to accompany the `dockerng` execution module.

Note: To pull from a Docker registry, authentication must be configured. See here for more information on how to configure access to docker registries in Pillar data.

```python
salt.states.dockerng.absent(name, force=False)
```
Ensure that a container is absent

- **name**: Name of the container
- **force**: [False] Set to True to remove the container even if it is running

Usage Examples:

```
mycontainer:
  dockerng.absent

multiple_containers:
  dockerng.absent:
    - names:
      - foo
      - bar
      - baz
```

```python
salt.states.dockerng.image_absent(name=None, images=None, force=False)
```
Ensure that an image is absent from the Minion. Image names can be specified either using repo:tag notation, or just the repo name (in which case a tag of latest is assumed).

- **images**: Run this state on more than one image at a time. The following two examples accomplish the same thing:

  ```
  remove_images:
    dockerng.image_absent:
      - names:
        - busybox
        - centos:6
        - nginx
  ```

  ```
  remove_images:
    dockerng.image_absent:
      - images:
        - busybox
        - centos:6
        - nginx
  ```
However, the second example will be a bit quicker since Salt will do all the deletions in a single run, rather than executing the state separately on each image (as it would in the first example).

**force** [False] Salt will fail to remove any images currently in use by a container. Set this option to true to remove the image even if it is already present.

**Note:** This option can also be overridden by Pillar data. If the Minion has a pillar variable named `dockerng.running.force` which is set to True, it will turn on this option. This pillar variable can even be set at runtime. For example:

```
salt myminion state.sls docker_stuff pillar="{dockerng.force: True}"
```

If this pillar variable is present and set to False, then it will turn off this option.

For more granular control, setting a pillar variable named `dockerng.force.image_name` will affect only the named image.

```python
salt.states.dockerng.image_present(name, build=None, load=None, force=False, insecure_registry=False, client_timeout=60)
```

Ensure that an image is present. The image can either be pulled from a Docker registry, built from a Dockerfile, or loaded from a saved image. Image names can be specified either using `repo:tag` notation, or just the repo name (in which case a tag of `latest` is assumed).

If neither of the `build` or `load` arguments are used, then Salt will pull from the configured registries. If the specified image already exists, it will not be pulled unless `force` is set to True. Here is an example of a state that will pull an image from the Docker Hub:

```salt
myuser/myimage:mytag:

dockerng.image_present
```

**build** Path to directory on the Minion containing a Dockerfile

```salt
myuser/myimage:mytag:

dockerng.image_present:
  - build: /home/myuser/docker/myimage
```

The image will be built using `dockerng.build` and the specified image name and tag will be applied to it.

**load** Loads a tar archive created with `dockerng.load` (or the `docker load` Docker CLI command), and assigns it the specified repo and tag.

```salt
myuser/myimage:mytag:

dockerng.image_present:
  - load: salt://path/to/image.tar
```

**force** [False] Set this parameter to True to force Salt to pull/build/load the image even if it is already present.

**client_timeout** Timeout in seconds for the Docker client. This is not a timeout for the state, but for receiving a response from the API.

```salt
salt.states.dockerng.mod_watch(name, sfun=None, **kwargs)
salt.states.dockerng.running(name, image=None, force=False, stop_timeout=10, validate_ip_addrs=True, watch_action='force', client_timeout=60, start=True, **kwargs)
```

Ensure that a container with a specific configuration is present and running.
name  Name of the container

image  Image to use for the container. Image names can be specified either using repo:tag notation, or just the repo name (in which case a tag of latest is assumed).

Note: This state will pull the image if it is not present. However, if the image needs to be built from a Dockerfile or loaded from a saved image, or if you would like to use requisites to trigger a replacement of the container when the image is updated, then the dockerng.image_present should be used to manage the image.

force  [False] Set this parameter to True to force Salt to re-create the container irrespective of whether or not it is configured as desired.

stop_timeout  [10] If the container needs to be replaced, the container will be stopped using dockerng.stop. The value of this parameter will be passed to dockerng.stop as the timeout value, telling Docker how long to wait for a graceful shutdown before killing the container.

validate_ip_addrs  [True] For parameters which accept IP addresses as input, IP address validation will be performed. To disable, set this to False.

watch_action  [force] Control what type of action is taken when this state watches another state that has changes. The default action is force, which runs the state with force set to True, triggering a rebuild of the container.

If any other value is passed, it will be assumed to be a kill signal. If the container matches the specified configuration, and is running, then the action will be to send that signal to the container. Kill signals can be either strings or numbers, and are defined in the Standard Signals section of the signal(7) manpage. Run man 7 signal on a Linux host to browse this manpage. For example:

```
mycontainer:
    dockerng.running:
        - image: busybox
        - watch_action: SIGHUP
        - watch:
            - file: some_file
```

Note: If the container differs from the specified configuration, or is not running, then instead of sending a signal to the container, the container will be re-created/started and no signal will be sent.

client_timeout  Timeout in seconds for the Docker client. This is not a timeout for this function, but for receiving a response from the API.

Note: This is only used if Salt needs to pull the requested image.

CONTAINER CONFIGURATION PARAMETERS

command  Command to run in the container

```
foo:
    dockerng.running:
        - image: bar/baz:latest
        - command: bash
```

hostname  Hostname of the container. If not provided, and if a name has been provided, the hostname will default to the name that was passed.

```
foo:
    dockerng.running:
```

- image: bar/baz:latest
- hostname: web1

**Warning:** hostname cannot be set if network_mode is set to host. The below example will result in an error:

```yaml
foo:
docker.run:
  - image: bar/baz:latest
  - hostname: web1
  - network_mode: host
```

domainname  Domain name of the container

```yaml
foo:
docker.run:
  - image: bar/baz:latest
  - hostname: domain.tld
```

**interactive**  [False] Leave stdin open

```yaml
foo:
docker.run:
  - image: bar/baz:latest
  - interactive: True
```

**tty**  [False] Attach TTYs

```yaml
foo:
docker.run:
  - image: bar/baz:latest
  - tty: True
```

detach  [True] If True, run command in the background (daemon mode)

```yaml
foo:
docker.run:
  - image: bar/baz:latest
  - detach: False
```

**user**  User under which to run docker

```yaml
foo:
docker.run:
  - image: bar/baz:latest
  - user: foo
```

**memory**  [0] Memory limit. Can be specified in bytes or using single-letter units (i.e. 512M, 2G, etc.). A value of 0 (the default) means no memory limit.

```yaml
foo:
docker.run:
  - image: bar/baz:latest
  - memory: 512M
```

**memory_swap**  [-1] Total memory limit (memory plus swap). Set to -1 to disable swap. A value of 0 means no swap limit.
foo:
dockerng.running:
  - image: bar/baz:latest
  - memory_swap: 1G

mac_address  MAC address to use for the container. If not specified, a random MAC address will be used.

foo:
dockerng.running:
  - image: bar/baz:latest
  - mac_address: 01:23:45:67:89:0a

network_disabled  [False] If True, networking will be disabled within the container.

foo:
dockerng.running:
  - image: bar/baz:latest
  - network_disabled: True

working_dir  Working directory inside the container.

foo:
dockerng.running:
  - image: bar/baz:latest
  - working_dir: /var/log/nginx

entrypoint  Entrypoint for the container.

foo:
dockerng.running:
  - image: bar/baz:latest
  - entrypoint:
    - mycmd
    - --arg1
    - --arg2

The entrypoint can also be specified as a list of arguments:

foo:
dockerng.running:
  - image: bar/baz:latest
  - entrypoint:
    - mycmd
    - --arg1
    - --arg2

environment  Either a list of variable/value mappings, or a list of strings in the format VARNAME=value.
The below two examples are equivalent:

foo:
dockerng.running:
  - image: bar/baz:latest
  - environment:
    - VAR1: value
    - VAR2: value

foo:
dockerng.running:
  - image: bar/baz:latest
  - environment:
    - VAR1=value
    - VAR2=value
ports  A list of ports to expose on the container. Can either be a comma-separated list or a YAML list. If the protocol is omitted, the port will be assumed to be a TCP port. The below two examples are equivalent:

```yaml
foo:
  docker.ng.running:
    - image: bar/baz:latest
    - ports: 1111,2222/udp
```

```
foo:
  docker.ng.running:
    - image: bar/baz:latest
    - ports:
      - 1111
      - 2222/udp
```

volumes  [None] List of directories to expose as volumes. Can either be a comma-separated list or a YAML list. The below two examples are equivalent:

```yaml
foo:
  docker.ng.running:
    - image: bar/baz:latest
    - volumes: /mnt/vol1,/mnt/vol2
```

```
foo:
  docker.ng.running:
    - image: bar/baz:latest
    - volumes:
      - /mnt/vol1
      - /mnt/vol2
```

cpu_shares  CPU shares (relative weight)

```yaml
foo:
  docker.ng.running:
    - image: bar/baz:latest
    - cpu_shares: 0.5
```

cpuset  CPUs on which which to allow execution, specified as a string containing a range (e.g. 0–3) or a comma-separated list of CPUs (e.g. 0,1).

```yaml
foo:
  docker.ng.running:
    - image: bar/baz:latest
    - cpuset: "0,1"
```

binds  Files/directories to bind mount. Each bind mount should be passed in the format `<host_path>:<container_path>:<read_only>`, where `<read_only>` is one of `rw` (for read-write access) or `ro` (for read-only access).

```yaml
foo:
  docker.ng.running:
    - image: bar/baz:latest
    - binds: /srv/www:/var/www:ro,
```

Binds can be passed as a YAML list instead of a comma-separated list:
```yaml
foo:
dockerNG.running:
  - image: bar/baz:latest
  - binds:
    - /srv/www:/var/www:ro
    - /home/myuser/conf/foo.conf:/etc/foo.conf:rw

Optionally, the read-only information can be left off the end and the bind mount will be assumed to be read-write. The example below is equivalent to the one above:

```yaml
foo:
dockerNG.running:
  - image: bar/baz:latest
  - binds:
    - /srv/www:/var/www:ro
    - /home/myuser/conf/foo.conf
```

**port_bindings** Bind exposed ports. Port bindings should be passed in the same way as the `--publish` argument to the `docker run` CLI command:

- `ip:hostPort:containerPort` - Bind a specific IP and port on the host to a specific port within the container.
- `ip::containerPort` - Bind a specific IP and an ephemeral port to a specific port within the container.
- `hostPort:containerPort` - Bind a specific port on all of the host's interfaces to a specific port within the container.
- `containerPort` - Bind an ephemeral port on all of the host's interfaces to a specific port within the container.

Multiple bindings can be separated by commas, or passed as a Python list. The below two examples are equivalent:

```yaml
foo:
dockerNG.running:
  - image: bar/baz:latest
  - port_bindings: "5000:5000,2123:2123/udp,8080"
```

```yaml
foo:
dockerNG.running:
  - image: bar/baz:latest
  - port_bindings:
    - 5000:5000
    - 2123:2123/udp
    - 8080
```

**Note:** When configuring bindings for UDP ports, the protocol must be passed in the `containerPort` value, as seen in the examples above.

**lxc_conf** Additional LXC configuration parameters to set before starting the container.

```yaml
foo:
dockerNG.running:
  - image: bar/baz:latest
  - lxc_conf:
    - lxc.utsname: docker
```
Note: These LXC configuration parameters will only have the desired effect if the container is using the LXC execution driver, which has not been the default for some time.

**publish_all_ports** [False] Allocates a random host port for each port exposed using the `ports` parameter.

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - ports: 8080
    - publish_all_ports: True
```

**links** Link this container to another. Links should be specified in the format `<container_name_or_id>:<link_alias>`. Multiple links can be passed, either as a comma-separated list or a YAML list. The below two examples are equivalent:

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - links: web1:link1,web2:link2

foo:
  dockerng.running:
    - image: bar/baz:latest
    - links:
      - web1:link1
      - web2:link2
```

**dns** List of DNS nameservers. Can be passed as a comma-separated list or a YAML list. The below two examples are equivalent:

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - dns: 8.8.8.8,8.8.4.4

foo:
  dockerng.running:
    - image: bar/baz:latest
    - dns:
      - 8.8.8.8
      - 8.8.4.4
```

Note: To skip IP address validation, use `validate_ip_addrs=False`

**dns_search** List of DNS search domains. Can be passed as a comma-separated list or a YAML list. The below two examples are equivalent:

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - dns_search: foo1.domain.tld,foo2.domain.tld

foo:
  dockerng.running:
    - image: bar/baz:latest
    - dns_search:
```
volumes_from  Container names or IDs from which the container will get volumes. Can be passed as a comma-separated list or a YAML list. The below two examples are equivalent:

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - volumes_from: foo
```

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - volumes_from:
        - foo
```

network_mode  [bridge] One of the following:

- bridge - Creates a new network stack for the container on the docker bridge
- null - No networking (equivalent of the Docker CLI argument --net=none)
- container:<name_or_id> - Reuses another container's network stack
- host - Use the host's network stack inside the container

**Warning:** Using host mode gives the container full access to the host's system's services (such as D-bus), and is therefore considered insecure.

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - network_mode: null
```

restart_policy  Set a restart policy for the container. Must be passed as a string in the format policy[:retry_count] where policy is one of always or on-failure, and retry_count is an optional limit to the number of retries. The retry count is ignored when using the always restart policy.

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - restart_policy: on-failure:5

bar:
  dockerng.running:
    - image: bar/baz:latest
    - restart_policy: always
```

cap_add  List of capabilities to add within the container. Can be passed as a comma-separated list or a Python list. The below two examples are equivalent:

```yaml
foo:
  dockerng.running:
    - image: bar/baz:latest
    - cap_add: SYS_ADMIN,MKNOD
```
foo:
dockerng.running:
- image: bar/baz:latest
- cap_add:
  - SYS_ADMIN
  - MKNOD

**Note:** This option requires Docker 1.2.0 or newer.

**cap_drop** List of capabilities to drop within the container. Can be passed as a comma-separated list or a Python list. The below two examples are equivalent:

```
foo:
dockerng.running:
- image: bar/baz:latest
- cap_drop: SYS_ADMIN,MKNOD
```

```
foo:
dockerng.running:
- image: bar/baz:latest
- cap_drop:
  - SYS_ADMIN
  - MKNOD
```

**Note:** This option requires Docker 1.2.0 or newer.

**extra_hosts** Additional hosts to add to the container’s /etc/hosts file. Can be passed as a comma-separated list or a Python list. The below two examples are equivalent:

```
foo:
dockerng.running:
- image: bar/baz:latest
- extra_hosts: web1:10.9.8.7,web2:10.9.8.8
```

```
foo:
dockerng.running:
- image: bar/baz:latest
- extra_hosts:
  - web1:10.9.8.7
  - web2:10.9.8.8
```

**Note:** To skip IP address validation, use `validate_ip_addrs=False`

**Note:** This option requires Docker 1.3.0 or newer.

**pid_mode** Set to `host` to use the host container’s PID namespace within the container

```
foo:
dockerng.running:
- image: bar/baz:latest
- pid_mode: host
```

**Note:** This option requires Docker 1.5.0 or newer.
**start** [True] Set to False to suppress starting of the container if it exists, matches the desired configuration, but is not running. This is useful for data-only containers, or for non-daemonized container processes, such as the django migrate and collectstatic commands. In instances such as this, the container only needs to be started the first time.

```
salt.states.dockerng.stopped(name=None, containers=None, stop_timeout=10, unpause=False, error_on_absent=True)
```

Ensure that a container (or containers) is stopped

**name** Name or ID of the container

**containers** Run this state on more than one container at a time. The following two examples accomplish the same thing:

```
stopped_containers:
  dockerng.stopped:
    - names:
      - foo
      - bar
      - baz
```

```
stopped_containers:
  dockerng.stopped:
    - containers:
      - foo
      - bar
      - baz
```

However, the second example will be a bit quicker since Salt will stop all specified containers in a single run, rather than executing the state separately on each image (as it would in the first example).

**stop_timeout** [10] Timeout for graceful shutdown of the container. If this timeout is exceeded, the container will be killed.

**unpause** [False] Set to True to unpause any paused containers before stopping. If unset, then an error will be raised for any container that was paused.

**error_on_absent** [True] By default, this state will return an error if any of the specified containers are absent. Set this to False to suppress that error.

### 31.27.44 salt.states.drac

Management of Dell DRAC

The DRAC module is used to create and manage DRAC cards on Dell servers

Ensure the user damian is present

```
damian:
  drac.present:
    - name: damian
    - password: secret
    - permission: login,test_alerts,clear_logs
```

Ensure the user damian does not exist

```
damian:
  drac.absent:
    - name: damian
```

Ensure DRAC network is in a consistent state
my_network:
  drac.network:
    - ip: 10.225.108.29
    - netmask: 255.255.255.224
    - gateway: 10.225.108.1

salt.states.drac.absent(name)
  Ensure a user does not exist on the Dell DRAC
  name: The users username

salt.states.drac.network(ip, netmask, gateway)
  Ensure the DRAC network settings are consistent

salt.states.drac.present(name, password, permission)
  Ensure the user exists on the Dell DRAC
  name: The users username
  password: The password used to authenticate
  permission: The permissions that should be assigned to a user

31.27.45 salt.states.elasticsearch_index

State module to manage Elasticsearch indices
New in version 2015.8.0.

salt.states.elasticsearch_index.absent(name)
  Ensure that the named index is absent

salt.states.elasticsearch_index.present(name, definition)
  Ensure that the named index is present

31.27.46 salt.states.elasticsearch_index_template

State module to manage Elasticsearch index templates
New in version 2015.8.0.

salt.states.elasticsearch_index_template.absent(name)
  Ensure that the named index template is absent

salt.states.elasticsearch_index_template.present(name, definition=None)
  Ensure that the named index template is present

31.27.47 salt.states.environ

Support for getting and setting the environment variables of the current salt process.

salt.states.environ.setenv(name, value, false_unsets=False, clear_all=False, update_minion=False)
  Set the salt process environment variables.
  name: The environment key to set. Must be a string.
  value: Either a string or dict. When string, it will be the value set for the environment key of `name` above.
    When a dict, each key/value pair represents an environment variable to set.
false_unsets If a key's value is False and false_unsets is True, then the key will be removed from the salt processes environment dict entirely. If a key's value is False and false_unsets is not True, then the key's value will be set to an empty string. Default: False

clear_all USE WITH CAUTION! This option can unset environment variables needed for salt to function properly. If clear_all is True, then any environment variables not defined in the environ dict will be deleted. Default: False

update_minion If True, apply these environ changes to the main salt-minion process. If False, the environ changes will only affect the current salt subprocess. Default: False

Example:

```python
a_string_env:
environ.setenv:
  - name: foo
  - value: bar
  - update_minion: True

a_dict_env:
environ.setenv:
  - name: does_not_matter
  - value:
    foo: bar
    baz: quux
```

31.27.48 salt.states.eselect

Management of Gentoo configuration using eeselect

A state module to manage Gentoo configuration via eeselect

```yaml
profile:
  eselect.set:
    target: hardened/linux/amd64

salt.states.eselect.set(name, target, module_parameter=None, action_parameter=None)
  Verify that the given module is set to the given target

name  The name of the module
target The target to be set for this module
module_parameter additional params passed to the defined module
action_parameter additional params passed to the defined action
```

31.27.49 salt.states.etcd_mod

Manage etcd Keys

New in version 2015.8.0.

```yaml
defends
  - python-etcd
```

This state module supports setting and removing keys from etcd.
Salt Master Configuration

To work with an etcd server you must configure an etcd profile in the Salt Master configuration, for example:

You can also configure etcd without a profile however it is recommended that you use profiles:

Available Functions

- **set**
  This will set a value to a key in etcd. Changes will be returned if the key has been created or the value of the key has been updated. This means you can watch these states for changes.

- **wait_set**
  Performs the same functionality as `set` but only if a watch requisite is True.

```
/some/file.txt:
  file.managed:
    - source: salt://file.txt

/foo/bar/baz:
  etcd.wait_set:
    - value: foo
    - profile: my_etcd_config
    - watch:
      - file: /some/file.txt
```

- **rm**
  This will delete a key from etcd. If the key exists then changes will be returned and thus you can watch for changes on the state, if the key does not exist then no changes will occur.

- **wait_rm**
  Performs the same functionality as `rm` but only if a watch requisite is True.

```
/some/file.txt:
  file.managed:
    - source: salt://file.txt

/foo/bar/baz:
  etcd.wait_rm:
    - profile: my_etcd_config
    - watch:
      - file: /some/file.txt
```

**salt.states.etcd_mod.mod_watch(name, **kwargs)**
Execute an etcd function based on a watch call requisite.

**salt.states.etcd_mod.rm(name, recurse=False, profile=None)**
Deletes a key from etcd. This function is also aliased as `rm`.

- **name** The etcd key name to remove, for example `/foo/bar/baz`.
- **requeue** Optional, defaults to `False`. If `True` performs a recursive delete.
- **profile** Optional, defaults to `None`. Sets the etcd profile to use which has been defined in the Salt Master config.
salt.states.etcd_mod.set(name, value, profile=None)
Set a key in etcd and can be called as set.

name The etcd key name, for example: /foo/bar/baz.
value The value the key should contain.
profile Optional, defaults to None. Sets the etcd profile to use which has been defined in the Salt Master config.

salt.states.etcd_mod.wait_rm(name, recurse=False, profile=None)
Deletes a key from etcd only if the watch statement calls it. This function is also aliased as wait_rm.

name The etcd key name to remove, for example /foo/bar/baz.
recurse Optional, defaults to False. If True performs a recursive delete, see: https://python-etcd.readthedocs.org/en/latest/#delete-a-key.
profile Optional, defaults to None. Sets the etcd profile to use which has been defined in the Salt Master config.

salt.states.etcd_mod.wait_set(name, value, profile=None)
Set a key in etcd only if the watch statement calls it. This function is also aliased as wait_set.

name The etcd key name, for example: /foo/bar/baz.
value The value the key should contain.
profile The etcd profile to use that has been configured on the Salt Master, this is optional and defaults to None.

31.27.50 salt.states.event

Send events through Salt’s event system during state runs

salt.states.event.send(name, data=None, preload=None, with_env=False, with_grains=False, with_pillar=False, **kwargs)
Send an event to the Salt Master

New in version 2014.7.0.

Accepts the same arguments as the event.send execution module of the same name.

Example:

```
# ...snip bunch of states above

mycompany/mystaterun/status/update:
  event.send:
    - data:
      status: "Half-way through the state run!"

# ...snip bunch of states below
```

salt.states.event.wait(name, sfun=None)
Fire an event on the Salt master event bus if called from a watch statement

New in version 2014.7.0.

Example:
# Stand up a new web server.
apache:
  pkg:
    - installed
    - name: httpd
  service:
    - running
    - enable: True
    - name: httpd

# Notify the load balancer to update the pool once Apache is running.
refresh_pool:
  event:
    - wait
    - name: mycompany/loadbalancer/pool/update
    - data:
      - new_web_server_ip: {{ grains['ipv4'] | first() }}
  watch:
    - pkg: apache

31.27.51 salt.states.file

Operations on regular files, special files, directories, and symlinks

Salt States can aggressively manipulate files on a system. There are a number of ways in which files can be managed. Regular files can be enforced with the file.managed state. This state downloads files from the salt master and places them on the target system. Managed files can be rendered as a jinja, mako, or wempy template, adding a dynamic component to file management. An example of file.managed which makes use of the jinja templating system would look like this:

/etc/http/conf/http.conf:
    file.managed:
        - source: salt://apache/http.conf
        - user: root
        - group: root
        - mode: 644
        - template: jinja
        - defaults:
            - custom_var: "default value"
            - other_var: 123
{% if grains['os'] == 'Ubuntu' %}
        - context:
            - custom_var: "override"
{% endif %}

It is also possible to use the py renderer as a templating option. The template would be a Python script which would need to contain a function called run(), which returns a string. All arguments to the state will be made available to the Python script as globals. The returned string will be the contents of the managed file. For example:

def run():
    lines = ['foo', 'bar', 'baz']
    lines.extend([source, name, user, context])  # Arguments as globals
    return '

'.join(lines)

Note: The defaults and context arguments require extra indentation (four spaces instead of the normal two)
in order to create a nested dictionary. More information.

If using a template, any user-defined template variables in the file defined in source must be passed in using the defaults and/or context arguments. The general best practice is to place default values in defaults, with conditional overrides going into context, as seen above.

The template will receive a variable custom_var, which would be accessed in the template using {{ custom_var }}. If the operating system is Ubuntu, the value of the variable custom_var would be override, otherwise it is the default default value.

The source parameter can be specified as a list. If this is done, then the first file to be matched will be the one that is used. This allows you to have a default file on which to fall back if the desired file does not exist on the salt fileserver. Here’s an example:

```yaml
/etc/foo.conf:
  file.managed:
    - source:
      - salt://foo.conf{{ grains['fqdn'] }}
      - salt://foo.conf.fallback
      - user: foo
      - group: users
      - mode: 644
      - backup: minion
```

Note: Salt supports backing up managed files via the backup option. For more details on this functionality please review the backup_mode documentation.

The source parameter can also specify a file in another Salt environment. In this example foo.conf in the dev environment will be used instead.

```yaml
/etc/foo.conf:
  file.managed:
    - source:
      - salt://foo.conf?saltenv=dev
      - user: foo
      - group: users
      - mode: 0644
```

Warning: When using a mode that includes a leading zero you must wrap the value in single quotes. If the value is not wrapped in quotes it will be read by YAML as an integer and evaluated as an octal.

Special files can be managed via the mknod function. This function will create and enforce the permissions on a special file. The function supports the creation of character devices, block devices, and fifo pipes. The function will create the directory structure up to the special file if it is needed on the minion. The function will not overwrite or operate on (change major/minor numbers) existing special files with the exception of user, group, and permissions. In most cases the creation of some special files require root permissions on the minion. This would require that the minion to be run as the root user. Here is an example of a character device:

```yaml
/var/named/chroot/dev/random:
  file.mknod:
    - ntype: c
    - major: 1
    - minor: 8
    - user: named
    - group: named
    - mode: 660
```
Here is an example of a block device:

```
/var/named/chroot/dev/loop0:
  file.mknod:
    - ntype: b
    - major: 7
    - minor: 0
    - user: named
    - group: named
    - mode: 660
```

Here is an example of a fifo pipe:

```
/var/named/chroot/var/log/logfifo:
  file.mknod:
    - ntype: p
    - user: named
    - group: named
    - mode: 660
```

Directories can be managed via the `directory` function. This function can create and enforce the permissions on a directory. A directory statement will look like this:

```
/srv/stuff/substuff:
  file.directory:
    - user: fred
    - group: users
    - mode: 755
    - makedirs: True
```

If you need to enforce user and/or group ownership or permissions recursively on the directory's contents, you can do so by adding a `recurse` directive:

```
/srv/stuff/substuff:
  file.directory:
    - user: fred
    - group: users
    - mode: 755
    - makedirs: True
    - recurse:
      - user
      - group
      - mode
```

As a default, `mode` will resolve to `dir_mode` and `file_mode`, to specify both directory and file permissions, use this form:

```
/srv/stuff/substuff:
  file.directory:
    - user: fred
    - group: users
    - file_mode: 744
    - dir_mode: 755
    - makedirs: True
    - recurse:
      - user
      - group
      - mode
```

Symlinks can be easily created; the symlink function is very simple and only takes a few arguments:
Recursive directory management can also be set via the `recurse` function. Recursive directory management allows for a directory on the salt master to be recursively copied down to the minion. This is a great tool for deploying large code and configuration systems. A state using `recurse` would look something like this:

```
/etc/grub.conf:
  file.symlink:
    - target: /boot/grub/grub.conf

A more complex `recurse` example:

```{%
{% set site_user = 'testuser' %}
{% set site_name = 'test_site' %}
{% set project_name = 'test_proj' %}
{% set sites_dir = 'test_dir' %}

django-project:
  file.recurse:
    - name: {{ sites_dir }}/{{ site_name }}/{{ project_name }}
    - user: {{ site_user }}
    - dir_mode: 2775
    - file_mode: '0644'
    - template: jinja
    - source: salt://project/templates_dir
    - include_empty: True
```

salt.states.file.absent(name)

Make sure that the named file or directory is absent. If it exists, it will be deleted. This will work to reverse any of the functions in the file state module.

name The path which should be deleted

salt.states.file.accumulated(name, filename, text, **kwargs)

Prepare accumulator which can be used in template in file.managed state. Accumulator dictionary becomes available in template. It can also be used in file.blockreplace.

name Accumulator name
filename Filename which would receive this accumulator (see file.managed state documentation about name)
text String or list for adding in accumulator
require_in / watch_in One of them required for sure we fill up accumulator before we manage the file. Probably the same as filename

Example:

Given the following:

```animals_doing_things:
  file.accumulated:
    - filename: /tmp/animal_file.txt
    - text: 'jumps over the lazy dog.'
    - require_in:
      - file: animal_file

animal_file:
```
file.managed:
- name: /tmp/animal_file.txt
- source: salt://animal_file.txt
- template: jinja

One might write a template for animal_file.txt like the following:

The quick brown fox{% for animal in accumulator['animals_doing_things'] %}{{ animal }}{% endfor %}

Collectively, the above states and template file will produce:

The quick brown fox jumps over the lazy dog.

Multiple accumulators can be `chained` together.

Note: The `accumulator` data structure is a Python dictionary. Do not expect any loop over the keys in a deterministic order!

salt.states.file.append(name, text=None, makedirs=False, source=None, source_hash=None, template='jinja', sources=None, source_hashes=None, defaults=None, context=None)

Ensure that some text appears at the end of a file.

The text will not be appended if it already exists in the file. A single string of text or a list of strings may be appended.

name The location of the file to append to.

text The text to be appended, which can be a single string or a list of strings.

makedirs If the file is located in a path without a parent directory, then the state will fail. If makedirs is set to True, then the parent directories will be created to facilitate the creation of the named file. Defaults to False.

source A single source file to append. This source file can be hosted on either the salt master server, or on an HTTP or FTP server. Both HTTPS and HTTP are supported as well as downloading directly from Amazon S3 compatible URLs with both pre-configured and automatic IAM credentials (see s3.get state documentation). File retrieval from Openstack Swift object storage is supported via swift://container/object_path URLs (see swift.get documentation).

For files hosted on the salt file server, if the file is located on the master in the directory named spam, and is called eggs, the source string is salt://spam/eggs.

If the file is hosted on an HTTP or FTP server, the source_hash argument is also required.

source_hash

This can be one of the following:

1. a source hash string
2. the URI of a file that contains source hash strings

The function accepts the first encountered long unbroken alphanumeric string of correct length as a valid hash, in order from most secure to least secure:

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>sha512</td>
<td>128</td>
</tr>
<tr>
<td>sha384</td>
<td>96</td>
</tr>
<tr>
<td>sha256</td>
<td>64</td>
</tr>
</tbody>
</table>
The file can contain several checksums for several files. Each line must contain both the file name and the hash. If no file name is matched, the first hash encountered will be used, otherwise the most secure hash with the correct source file name will be used.

Debian file type *.dsc is supported.

Examples:

```
/etc/rc.conf ef6e82e4006dee563d98ada2a2a80a27
sha254c8525aee419eb649f0233be91c151178b30f0dff8ebbdcc8de71b1d5c8bcc06a /etc/resolv.conf
```

**Known issues:** If the remote server URL has the hash file as an apparent sub-directory of the source file, the module will discover that it has already cached a directory where a file should be cached. For example:

```
tomdroid-src-0.7.3.tar.gz:
  file.managed:
    - name: /tmp/tomdroid-src-0.7.3.tar.gz
    - source: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.tar.gz
    - source_hash: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.tar.gz/+md5
```

**template** [jinja] The named templating engine will be used to render the appended-to file. Defaults to jinja.

**sources** A list of source files to append. If the files are hosted on an HTTP or FTP server, the source_hashes argument is also required.

**source_hashes** A list of source_hashes corresponding to the sources list specified in the sources argument.

**defaults** Default context passed to the template.

**context** Overrides default context variables passed to the template.

Multi-line example:

```
/etc/motd:
  file.append:
    - text: |
      Thou hadst better eat salt with the Philosophers of Greece,
      than sugar with the Courtiers of Italy.
      - Benjamin Franklin
```

Multiple lines of text:

```
/etc/motd:
  file.append:
    - text:
      - Trust no one unless you have eaten much salt with him.
      - "Salt is born of the purest of parents: the sun and the sea."
```

Gather text from multiple template files:

```
/etc/motd:
  file:
    - append
    - template: jinja
```
- sources:
  - salt://motd/devops-messages.tmpl
  - salt://motd/hr-messages.tmpl
  - salt://motd/general-messages.tmpl

New in version 0.9.5.

salt.states.file.blockreplace(name, marker_start='#-- start managed zone --', marker_end='##-- end managed zone --', source=None, source_hash=None, template='jinja', sources=None, source_hashes=None, defaults=None, context=None, content='``', append_if_not_found=False, prepend_if_not_found=False, backup='.bak', show_changes=True)

Maintain an edit in a file in a zone delimited by two line markers

New in version 2014.1.0.

A block of content delimited by comments can help you manage several lines entries without worrying about old entries removal. This can help you maintaining an un-managed file containing manual edits. Note: this function will store two copies of the file in-memory (the original version and the edited version) in order to detect changes and only edit the targeted file if necessary.

**name**  Filesystem path to the file to be edited

**marker_start** The line content identifying a line as the start of the content block. Note that the whole line containing this marker will be considered, so whitespace or extra content before or after the marker is included in final output

**marker_end** The line content identifying a line as the end of the content block. Note that the whole line containing this marker will be considered, so whitespace or extra content before or after the marker is included in final output. Note: you can use file.accumulated and target this state. All accumulated data dictionaries content will be added as new lines in the content

**content** The content to be used between the two lines identified by marker_start and marker_end

**source** The source file to download to the minion, this source file can be hosted on either the salt master server, or on an HTTP or FTP server. Both HTTPS and HTTP are supported as well as downloading directly from Amazon S3 compatible URLs with both pre-configured and automatic IAM credentials. (see s3.get state documentation) File retrieval from Openstack Swift object storage is supported via swift://container/object_path URLs, see swift.get documentation. For files hosted on the salt file server, if the file is located on the master in the directory named spam, and is called eggs, the source string is salt://spam/eggs. If source is left blank or None (use ~ in YAML), the file will be created as an empty file and the content will not be managed

If the file is hosted on a HTTP or FTP server then the source_hash argument is also required

A list of sources can also be passed in to provide a default source and a set of fallbacks. The first source in the list that is found to exist will be used and subsequent entries in the list will be ignored.

**source_hash**

This can be one of the following:

1. a source hash string
2. the URI of a file that contains source hash strings
The function accepts the first encountered long unbroken alphanumeric string of correct length as a valid hash, in order from most secure to least secure:

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>sha512</td>
<td>128</td>
</tr>
<tr>
<td>sha384</td>
<td>96</td>
</tr>
<tr>
<td>sha256</td>
<td>64</td>
</tr>
<tr>
<td>sha224</td>
<td>56</td>
</tr>
<tr>
<td>sha1</td>
<td>40</td>
</tr>
<tr>
<td>md5</td>
<td>32</td>
</tr>
</tbody>
</table>

Using a Source Hash File  The file can contain several checksums for several files. Each line must contain both the file name and the hash. If no file name is matched, the first hash encountered will be used, otherwise the most secure hash with the correct source file name will be used.

When using a source hash file the source_hash argument needs to be a url, the standard download urls are supported, ftp, http, salt etc:

Example:

tomdroid-src-0.7.3.tar.gz:

```yaml
file.managed:
  - name: /tmp/tomdroid-src-0.7.3.tar.gz
  - source: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.tar.gz
  - source_hash: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.hash
```

The following is an example of the supported source_hash format:

```
/etc/rc.conf ef6e82e4006dee563d98ada2a2a80a27
sha254c8525aee419eb649f0233be91c151178b30f0dff8ebbdcc8de71b1d5c8bcc06a /etc/resolv.conf
ead48423703509d37c4a90e6a0d53e1e43b6fc268
```

Debian file type *.dsc files are also supported.

Inserting the Source Hash in the sls Data  Examples:

```
tomdroid-src-0.7.3.tar.gz:

file.managed:
  - name: /tmp/tomdroid-src-0.7.3.tar.gz
  - source: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.tar.gz
  - source_hash: md5=79eef25f9b0b2c642c62b7f737d4f53f
```

- **template**  If this setting is applied then the named templating engine will be used to render the downloaded file, currently jinja, mako, and wempy are supported

- **context**  Overrides default context variables passed to the template.

- **defaults**  Default context passed to the template.

- **append_if_not_found**  If markers are not found and set to True then the markers and content will be appended to the file. Default is False

- **prepend_if_not_found**  If markers are not found and set to True then the markers and content will be prepended to the file. Default is False

- **backup**  The file extension to use for a backup of the file if any edit is made. Set this to False to skip making a backup.

- **dry_run**  Don’t make any edits to the file
show_changes  Output a unified diff of the old file and the new file. If False return a boolean if any changes were made.

Example of usage with an accumulator and with a variable:

```python
{% set myvar = 42 %}
hosts-config-block-{{ myvar }}:
    file.blockreplace:
    - name: /etc/hosts
    - marker_start: "# START managed zone {{ myvar }} -DO-NOT-EDIT-
    - marker_end: "# END managed zone {{ myvar }} --"
    - content: 'First line of content'
    - append_if_not_found: True
    - backup: '.bak'
    - show_changes: True

hosts-config-block-{{ myvar }}-accumulated1:
    file.accumulated:
    - filename: /etc/hosts
    - name: my-accumulator-{{ myvar }}
    - text: "text 2"
    - require_in:
        - file: hosts-config-block-{{ myvar }}

hosts-config-block-{{ myvar }}-accumulated2:
    file.accumulated:
    - filename: /etc/hosts
    - name: my-accumulator-{{ myvar }}
    - text: |
        text 3
        text 4
    - require_in:
        - file: hosts-config-block-{{ myvar }}
```

will generate and maintain a block of content in /etc/hosts:

```
# START managed zone 42 -DO-NOT-EDIT-
First line of content
text 2
text 3
text 4
# END managed zone 42 --
```

salt.states.file.comment(name, regex, char='#', backup='.bak')

Comment out specified lines in a file.

name  The full path to the file to be edited
regex A regular expression used to find the lines that are to be commented; this pattern will be wrapped in parenthesis and will move any preceding/trailing ^ or $ characters outside the parenthesis (e.g., the pattern ^foo$ will be rewritten as ^\(foo\)$) Note that you _need_ the leading ^, otherwise each time you run highstate, another comment char will be inserted.
char  [#] The character to be inserted at the beginning of a line in order to comment it out
backup  [.bak] The file will be backed up before edit with this file extension

**Warning:** This backup will be overwritten each time sed / comment / uncomment is called. Meaning the backup will only be useful after the first invocation.
Usage:

```
/etc/fstab:
file.comment:
    - regex: ^bind 127.0.0.1
```

New in version 0.9.5.

```python
salt.states.file.copy(name, source, force=False, makedirs=False, preserve=False, user=None, group=None, mode=None, subdir=False, **kwargs)
```

If the source file exists on the system, copy it to the named file. The named file will not be overwritten if it already exists unless the force option is set to True.

- **name**  The location of the file to copy to
- **source**  The location of the file to copy to the location specified with name
- **force**  If the target location is present then the file will not be moved, specify ``force: True`` to overwrite the target file
- **makedirs**  If the target subdirectories don’t exist create them
- **preserve**  New in version 2015.5.0.
  - Set preserve: True to preserve user/group ownership and mode after copying. Default is False. If preserve is set to True, then user/group/mode attributes will be ignored.
- **user**  New in version 2015.5.0.
  - The user to own the copied file, this defaults to the user salt is running as on the minion. If preserve is set to True, then this will be ignored
- **group**  New in version 2015.5.0.
  - The group to own the copied file, this defaults to the group salt is running as on the minion. If preserve is set to True or on Windows this will be ignored
- **mode**  New in version 2015.5.0.
  - The permissions to set on the copied file, aka 644, `0775`, `'4664`. If preserve is set to True, then this will be ignored. Not supported on Windows
- **subdir**  New in version 2015.5.0.
  - If the name is a directory then place the file inside the named directory

```python
salt.states.file.directory(name, user=None, group=None, recurse=None, dir_mode=None, file_mode=None, makedirs=False, clean=False, require=None, exclude_pat=None, follow_symlinks=False, force=False, backup_name=None, allow_symlink=True, **kwargs)
```

Ensure that a named directory is present and has the right perms

- **name**  The location to create or manage a directory
- **user**  The user to own the directory; this defaults to the user salt is running as on the minion
- **group**  The group ownership set for the directory; this defaults to the group salt is running as on the minion. On Windows, this is ignored
- **recurse**  Enforce user/group ownership and mode of directory recursively. Accepts a list of strings representing what you would like to recurse. If mode is defined, will recurse on both file_mode and dir_mode if they are defined. If ignore_files or ignore_dirs is included, files or directories will be left unchanged respectively. Example:
Leave files or directories unchanged:

```
/var/log/httpd:
  file.directory:
  - user: root
  - group: root
  - dir_mode: 755
  - file_mode: 644
  - recurse:
    - user
    - group
    - mode
```

New in version 2015.5.0.

**dir_mode / mode** The permissions mode to set any directories created. Not supported on Windows

**file_mode** The permissions mode to set any files created if `mode` is run in `recurse`. This defaults to dir_mode. Not supported on Windows

**mkdirs** If the directory is located in a path without a parent directory, then the state will fail. If mkdirs is set to True, then the parent directories will be created to facilitate the creation of the named file.

**clean** Make sure that only files that are set up by salt and required by this function are kept. If this option is set then everything in this directory will be deleted unless it is required.

**require** Require other resources such as packages or files

**exclude_pat** When `clean` is set to True, exclude this pattern from removal list and preserve in the destination.

**follow_symlinks** [False] If the desired path is a symlink (or recurse is defined and a symlink is encountered while recursing), follow it and check the permissions of the directory/file to which the symlink points.

New in version 2014.1.4.

**force** If the name of the directory exists and is not a directory and force is set to False, the state will fail. If force is set to True, the file in the way of the directory will be deleted to make room for the directory,
unless backupname is set, then it will be renamed.

New in version 2014.7.0.

**backupname** If the name of the directory exists and is not a directory, it will be renamed to the backupname.
If the backupname already exists and force is False, the state will fail. Otherwise, the backupname will be removed first.

New in version 2014.7.0.

**allow_symlink** [True] If allow_symlink is True and the specified path is a symlink, it will be allowed to remain if it points to a directory. If allow_symlink is False then the state will fail, unless force is also set to True, in which case it will be removed or renamed, depending on the value of the backupname argument.

New in version 2014.7.0.

**salt.states.file.exists(name)**
Verify that the named file or directory is present or exists. Ensures pre-requisites outside of Salt’s purview (e.g., keytabs, private keys, etc.) have been previously satisfied before deployment.

**name** Absolute path which must exist

**salt.states.file.line(name, content, match=None, mode=None, location=None, before=None, after=None, show_changes=True, backup=False, quiet=False, indent=True)**
Line-based editing of a file.

New in version 2015.8.0.

Params are identical to the remote execution function **file.line**.

**salt.states.file.managed(name, source=None, source_hash='`, user=None, group=None, mode=None, template=None, makedirs=False, dir_mode=None, context=None, replace=True, defaults=None, env=None, backup='`, show_diff=True, create=True, contents=None, contents_pillar=None, contents_grains=None, contents_newline=True, follow_symlinks=True, check_cmd=None, **kwargs)**
Manage a given file, this function allows for a file to be downloaded from the salt master and potentially run through a templating system.

**name** The location of the file to manage

**source** The source file to download to the minion, this source file can be hosted on either the salt master server, or on an HTTP or FTP server. Both HTTPS and HTTP are supported as well as downloading directly from Amazon S3 compatible URLs with both pre-configured and automatic IAM credentials. (see s3.get state documentation) File retrieval from Openstack Swift object storage is supported via swift://container/object_path URLs, see swift.get documentation. For files hosted on the salt file server, if the file is located on the master in the directory named spam, and is called eggs, the source string is salt://spam/eggs. If source is left blank or None (use ~ in YAML), the file will be created as an empty file and the content will not be managed

If the file is hosted on a HTTP or FTP server then the source_hash argument is also required

A list of sources can also be passed in to provide a default source and a set of fallbacks. The first source in the list that is found to exist will be used and subsequent entries in the list will be ignored.

```yaml
file_override_example:
  file.managed:
    - source:
      - salt://file_that_does_not_exist
      - salt://file_that_exists
```

**source_hash**
This can be one of the following:

1. a source hash string
2. the URI of a file that contains source hash strings

The function accepts the first encountered long unbroken alphanumeric string of correct length as a valid hash, in order from most secure to least secure:

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>sha512</td>
<td>128</td>
</tr>
<tr>
<td>sha384</td>
<td>96</td>
</tr>
<tr>
<td>sha256</td>
<td>64</td>
</tr>
<tr>
<td>sha224</td>
<td>56</td>
</tr>
<tr>
<td>sha1</td>
<td>40</td>
</tr>
<tr>
<td>md5</td>
<td>32</td>
</tr>
</tbody>
</table>

Using a Source Hash File  The file can contain several checksums for several files. Each line must contain both the file name and the hash. If no file name is matched, the first hash encountered will be used, otherwise the most secure hash with the correct source file name will be used.

When using a source hash file the source_hash argument needs to be a url, the standard download urls are supported, ftp, http, salt etc:

Example:

```yaml
tomdroid-src-0.7.3.tar.gz:
  file.managed:
    - name: /tmp/tomdroid-src-0.7.3.tar.gz
    - source: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.tar.gz
    - source_hash: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.hash
```

The following is an example of the supported source_hash format:

```
/etc/rc.conf ef6e82e4006dee563d98ada2a2a80a27
sha254c8525aee419eb649f0233be91c151178b30f0dff8e8e6addcc8de71b1d5c8b06a /etc/resolv.conf
ea48423703509d37c4a90e6a0d53e143b6fc268
```

Debian file type *.dsc files are also supported.

Inserting the Source Hash in the sls Data  Examples:

```yaml
tomdroid-src-0.7.3.tar.gz:
  file.managed:
    - name: /tmp/tomdroid-src-0.7.3.tar.gz
    - source: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.tar.gz
    - source_hash: md5=79eef25f9b0b2c642c62b7f737df53f
```

Known issues: If the remote server URL has the hash file as an apparent sub-directory of the source file, the module will discover that it has already cached a directory where a file should be cached. For example:

```yaml
tomdroid-src-0.7.3.tar.gz:
  file.managed:
    - name: /tmp/tomdroid-src-0.7.3.tar.gz
    - source: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.tar.gz
    - source_hash: https://launchpad.net/tomdroid/beta/0.7.3/+download/tomdroid-src-0.7.3.hash
```

1724 Chapter 31. Reference
user  The user to own the file, this defaults to the user salt is running as on the minion

group  The group ownership set for the file, this defaults to the group salt is running as on the minion On Windows, this is ignored

mode  The permissions to set on this file, aka 644, 0775, 4664. Not supported on Windows

template  If this setting is applied then the named templating engine will be used to render the downloaded file, currently jinja, mako, and wempy are supported

makedirs  If the file is located in a path without a parent directory, then the state will fail. If makedirs is set to True, then the parent directories will be created to facilitate the creation of the named file.

dir_mode  If directories are to be created, passing this option specifies the permissions for those directories. If this is not set, directories will be assigned permissions from the `mode' argument.

replace  If this file should be replaced. If false, this command will not overwrite file contents but will enforce permissions if the file exists already. Default is True.

context  Overrides default context variables passed to the template.

defaults  Default context passed to the template.

backup  Overrides the default backup mode for this specific file.

show_diff  If set to False, the diff will not be shown.

create  Default is True, if create is set to False then the file will only be managed if the file already exists on the system.

contents  Default is None. If specified, will use the given string as the contents of the file. Should not be used in conjunction with a source file of any kind. Ignores hashes and does not use a templating engine.

contents_pillar  New in version 0.17.0.

Operates like contents, but draws from a value stored in pillar, using the pillar path syntax used in pillar.get. This is useful when the pillar value contains newlines, as referencing a pillar variable using a jinja/mako template can result in YAML formatting issues due to the newlines causing indentation mismatches.

For example, the following could be used to deploy an SSH private key:

```
/home/deployer/.ssh/id_rsa:
  file.managed:
    - user: deployer
    - group: deployer
    - mode: 600
    - contents_pillar: userdata:deployer:id_rsa
```

This would populate /home/deployer/.ssh/id_rsa with the contents of pillar['userdata']['deployer']['id_rsa']. An example of this pillar setup would be like so:

```
userdata:
  deployer:
    id_rsa: |
      -----BEGIN RSA PRIVATE KEY-----
      MIIEowIBAAKCAQEAoQiwQ3Jn87uP5aAQF9p1LZNXv1YMIswrMe2HcWVBgh+hY
      U7sCwa/dH6+vWnmqmoqMnP=8gTPKGl1vgA0bJAnMT623dMxjVknwEagZPRJ1x
      B/HaAre9EuNiV3L1zBtWRseMfT+rWxIKVbpwlGrgfaz70mQpx+UyFbAGLIn+
      GpxzZAmFp2w4s61lRuissX7j/sHpQb8p9M5e04Z3rjkCPlcxI
      -----END RSA PRIVATE KEY-----
```

31.27. Full list of builtin state modules 1725
**Note:** The private key above is shortened to keep the example brief, but shows how to do multiline string in YAML. The key is followed by a pipe character, and the multiline string is indented two more spaces.

**contents_grains** New in version 2014.7.0.

Same as contents_pillar, but with grains

**contents_newline** New in version 2014.7.0.

When using contents, contents_pillar, or contents_grains, this option ensures the file will have a newline at the end. When loading some data this newline is better left off. Setting contents_newline to False will omit this final newline.

**follow_symlinks** [True] New in version 2014.7.0.

If the desired path is a symlink follow it and make changes to the file to which the symlink points.

**check_cmd** New in version 2014.7.0.

The specified command will be run with the managed file as an argument. If the command exits with a nonzero exit code, the command will not be run.

**salt.states.file.missing(name)**

Verify that the named file or directory is missing, this returns True only if the named file is missing but does not remove the file if it is present.

**name** Absolute path which must NOT exist

**salt.states.file.mknod(name, ntype, major=0, minor=0, user=None, group=None, mode='0600')**

Create a special file similar to the `nix mknod command. The supported device types are p (fifo pipe), c (character device), and b (block device). Provide the major and minor numbers when specifying a character device or block device. A fifo pipe does not require this information. The command will create the necessary dirs if needed. If a file of the same name not of the same type/major/minor exists, it will not be overwritten or unlinked (deleted). This is logically in place as a safety measure because you can really shoot yourself in the foot here and it is the behavior of `nix mknod. It is also important to note that not just anyone can create special devices. Usually this is only done as root. If the state is executed as none other than root on a minion, you may receive a permission error.

**name** name of the file

**ntype** node type `p` (fifo pipe), `c` (character device), or `b` (block device)

**major** major number of the device does not apply to a fifo pipe

**minor** minor number of the device does not apply to a fifo pipe

**user** owning user of the device/pipe

**group** owning group of the device/pipe

**mode** permissions on the device/pipe

Usage:

```
/dev/chr:
  file.mknod:
    - ntype: c
    - major: 180
    - minor: 31
    - user: root
    - group: root
```
New in version 0.17.0.

`salt.states.file.mod_run_check_cmd(cmd, filename, **check_cmd_opts)`

Execute the check_cmd logic.

Return a result dict if check_cmd succeeds (check_cmd == 0) otherwise return True

`salt.states.file.patch(name, source=None, hash=None, options='`, dry_run_first=True, env=None, **kwargs)`

Apply a patch to a file.

**Note:** A suitable patch executable must be available on the minion when using this state function.

- **name** The file to with the patch will be applied.
- **source** The source patch to download to the minion, this source file must be hosted on the salt master server. If the file is located in the directory named spam, and is called eggs, the source string is `salt://spam/eggs`. A source is required.
- **hash** Hash of the patched file. If the hash of the target file matches this value then the patch is assumed to have been applied. The hash string is the hash algorithm followed by the hash of the file: `md5=e138491e9d5b97023cea823fe17bac22`
- **options** Extra options to pass to patch.
- **dry_run_first** `[True]` Run patch with `--dry-run` first to check if it will apply cleanly.
- **env** Specify the environment from which to retrieve the patch file indicated by the `source` parameter. If not provided, this defaults to the environment from which the state is being executed.

**Usage:**

```
# Equivalent to `\patch --forward /opt/file.txt file.patch`

/opt/file.txt:
  file.patch:
    - source: salt://file.patch
    - hash: md5=e138491e9d5b97023cea823fe17bac22
```

`salt.states.file.prepend(name, text=None, makedirs=False, source=None, source_hash=None, template='jinja', sources=None, source_hashes=None, defaults=None, context=None)`

Ensure that some text appears at the beginning of a file
The text will not be prepended again if it already exists in the file. You may specify a single line of text or a list of lines to append.

Multi-line example:

```
/etc/motd:
  file.prepend:
    - text:
        Thou hadst better eat salt with the Philosophers of Greece, 
        than sugar with the Courtiers of Italy.
        - Benjamin Franklin
```

Multiple lines of text:

```
/etc/motd:
  file.prepend:
    - text:
        Trust no one unless you have eaten much salt with him.
        - "Salt is born of the purest of parents: the sun and the sea."
```

Gather text from multiple template files:

```
/etc/motd:
  file:
    - prepend
    - template: jinja
    - sources:
        - salt://motd/devops-messages.tmpl
        - salt://motd/hr-messages.tmpl
        - salt://motd/general-messages.tmpl
```

New in version 2014.7.0.

```
salt.states.file.recurse(name, source, clean=False, require=None, user=None, group=None, dir_mode=None, file_mode=None, sym_mode=None, template=None, context=None, defaults=None, env=None, include_empty=False, **kwargs)
```

Recurse through a subdirectory on the master and copy said subdirectory over to the specified path.

- **name**  The directory to set the recursion in
- **source**  The source directory, this directory is located on the salt master file server and is specified with the salt:// protocol. If the directory is located on the master in the directory named spam, and is called eggs, the source string is salt://spam/eggs
- **clean**  Make sure that only files that are set up by salt and required by this function are kept. If this option is set then everything in this directory will be deleted unless it is required.
- **require**  Require other resources such as packages or files
- **user**  The user to own the directory. This defaults to the user salt is running as on the minion
- **group**  The group ownership set for the directory. This defaults to the group salt is running as on the minion. On Windows, this is ignored
- **dir_mode**  The permissions mode to set on any directories created. Not supported on Windows
- **file_mode**  The permissions mode to set on any files created. Not supported on Windows
- **sym_mode**  The permissions mode to set on any symlink created. Not supported on Windows
**template** If this setting is applied then the named templating engine will be used to render the downloaded file. Supported templates are: *jinja, mako* and *wempy*.

**Note:** The template option is required when recursively applying templates.

**context** Overrides default context variables passed to the template.

**defaults** Default context passed to the template.

**include_empty** Set this to True if empty directories should also be created (default is False)

**include_pat** When copying, include only this pattern from the source. Default is glob match; if prefixed with 'E@', then regexp match. Example:

- include_pat: hello* :: glob matches 'hello01', 'hello02'  
  ... but not 'otherhello'
- include_pat: E@hello :: regexp matches 'otherhello',  
  'hello01' ...

**exclude_pat** Exclude this pattern from the source when copying. If both *include_pat* and *exclude_pat* are supplied, then it will apply conditions cumulatively. i.e. first select based on include_pat, and then within that result apply exclude_pat.

Also, when `clean=True`, exclude this pattern from the removal list and preserve in the destination. Example:

- exclude_pat: APPDATA* :: glob matches APPDATA.01,  
  APPDATA.02,.. for exclusion
- exclude_pat: E@(APPDATA)|(TEMPDATA) :: regexp matches APPDATA  
  or TEMPDATA for exclusion

**maxdepth** When copying, only copy paths which are of depth *maxdepth* from the source path. Example:

- maxdepth: 0 :: Only include files located in the source directory
- maxdepth: 1 :: Only include files located in the source directory  
  or immediate subdirectories

**keep_symlinks** Keep symlinks when copying from the source. This option will cause the copy operation to terminate at the symlink. If desire behavior similar to rsync, then set this to True.

**force_symlinks** Force symlink creation. This option will force the symlink creation. If a file or directory is obstructing symlink creation it will be recursively removed so that symlink creation can proceed. This option is usually not needed except in special circumstances.

**salt.states.file.rename(name, source, force=False, makedirs=False)**

If the source file exists on the system, rename it to the named file. The named file will not be overwritten if it already exists unless the force option is set to True.

**name** The location of the file to rename to

**source** The location of the file to move to the location specified with name

**force** If the target location is present then the file will not be moved, specify `force: True` to overwrite the target file

**makedirs** If the target subdirectories don’t exist create them
salt.states.file.replace(name, pattern, repl, count=0, flags=0, bufsize=1, append_if_not_found=False, prepend_if_not_found=False, not_found_content=None, backup='.bak', show_changes=True)

Maintain an edit in a file.

New in version 0.17.0.

**name**  Filesystem path to the file to be edited.

**pattern**  Python's regular expression search.

**repl**  The replacement text.

**count**  Maximum number of pattern occurrences to be replaced.

**flags**  A list of flags defined in the `re` module documentation. Each list item should be a string that will correlate to the human-friendly flag name. E.g., ['IGNORECASE', 'MULTILINE']. Note: multiline searches must specify `file` as the `bufsize` argument below. Defaults to 0 and can be a list or an int.

**bufsize**  How much of the file to buffer into memory at once. The default value 1 processes one line at a time. The special value `file` may be specified which will read the entire file into memory before processing. Note: multiline searches must specify `file` buffering. Can be an int or a str.

**append_if_not_found**  If pattern is not found and set to `True` then, the content will be appended to the file.

New in version 2014.7.0.

**prepend_if_not_found**  If pattern is not found and set to `True` then, the content will be prepended to the file.

New in version 2014.7.0.

**not_found_content**  Content to use for append/prepend if not found. If `None` (default), uses `repl`. Useful when `repl` uses references to group in pattern.

New in version 2014.7.0.

**backup**  The file extension to use for a backup of the file before editing. Set to `False` to skip making a backup.

**show_changes**  Output a unified diff of the old file and the new file. If `False` return a boolean if any changes were made. Returns a boolean or a string.

For complex regex patterns it can be useful to avoid the need for complex quoting and escape sequences by making use of YAML's multiline string syntax.

```yaml
complex_search_and_replace:
  file.replace:  # <...snip...>
    - pattern: |
        CentOS \(2.6.32[^\n]+\n\s+root[^\n]+\)+
```

**Note:**  When using YAML multiline string syntax in `pattern`, make sure to also use that syntax in the `repl` part, or you might lose line feeds.

salt.states.file.serialize(name, dataset=None, dataset_pillar=None, user=None, group=None, mode=None, env=None, backup='', makedirs=False, show_diff=True, create=True, merge_if_exists=False, **kwargs)

Serializes dataset and store it into managed file. Useful for sharing simple configuration files.

**name**  The location of the file to create

**dataset**  The dataset that will be serialized

**dataset_pillar**  Operates like `dataset`, but draws from a value stored in pillar, using the pillar path syntax used in `pillar.get`. This is useful when the pillar value contains newlines, as referencing a pillar
variable using a jinja/mako template can result in YAML formatting issues due to the newlines causing indentation mismatches.

New in version FIXME.

**formatter** Write the data as this format. Supported output formats:

- JSON
- YAML
- Python (via pprint.pformat)

**user** The user to own the directory, this defaults to the user salt is running as on the minion

**group** The group ownership set for the directory, this defaults to the group salt is running as on the minion

**mode** The permissions to set on this file, aka 644, 0775, 4664

**backup** Overrides the default backup mode for this specific file.

**makedirs** Create parent directories for destination file.

New in version 2014.1.3.

**show_diff** If set to False, the diff will not be shown.

**create** Default is True, if create is set to False then the file will only be managed if the file already exists on the system.

**merge_if_exists** Default is False, if merge_if_exists is True then the existing file will be parsed and the dataset passed in will be merged with the existing content.

New in version 2014.7.0.

For example, this state:

```yaml
/etc/dummy/package.json:
  file.serialize:
    - dataset:
        name: naive
        description: A package using naive versioning
        author: A confused individual <iam@confused.com>
        dependencies:
          express: &gt;= 1.2.0
          optimist: &gt;= 0.1.0
          engine: node 0.4.1
        - formatter: json
```

will manage the file `/etc/dummy/package.json:

```yaml
{
    "author": "A confused individual <iam@confused.com>",
    "dependencies": {
      "express": ">= 1.2.0",
      "optimist": ">= 0.1.0"
    },
    "description": "A package using naive versioning",
    "engine": "node 0.4.1",
    "name": "naive"
}
```

salt.states.file.symlink(name, target, force=False, backupname=None, makedirs=False, user=None, group=None, mode=None, **kwargs)

Create a symlink
If the file already exists and is a symlink pointing to any location other than the specified target, the symlink will be replaced. If the symlink is a regular file or directory then the state will return False. If the regular file or directory is desired to be replaced with a symlink pass force: True, if it is to be renamed, pass a backupname.

**name**  The location of the symlink to create

**target**  The location that the symlink points to

**force**  If the name of the symlink exists and is not a symlink and force is set to False, the state will fail. If force is set to True, the file or directory in the way of the symlink file will be deleted to make room for the symlink, unless backupname is set, when it will be renamed

**backupname**  If the name of the symlink exists and is not a symlink, it will be renamed to the backupname. If the backupname already exists and force is False, the state will fail. Otherwise, the backupname will be removed first.

**makedirs**  If the location of the symlink does not already have a parent directory then the state will fail, setting makedirs to True will allow Salt to create the parent directory

**user**  The user to own the file, this defaults to the user salt is running as on the minion

**group**  The group ownership set for the file, this defaults to the group salt is running as on the minion. On Windows, this is ignored

**mode**  The permissions to set on this file, aka 644, 0775, 4664. Not supported on Windows

```
salt.states.file.touch(name, atime=None, mtime=None, makedirs=False)
```

Replicate the `nix``touch'' command to create a new empty file or update the atime and mtime of an existing file.

Note that if you just want to create a file and don't care about atime or mtime, you should use file.managed instead, as it is more feature-complete. (Just leave out the source/template/contents arguments, and it will just create the file and/or check its permissions, without messing with contents)

**name**  name of the file

**atime**  atime of the file

**mtime**  mtime of the file

**makedirs**  whether we should create the parent directory/directories in order to touch the file

Usage:

```
/var/log/httpd/logrotate.empty:
  file.touch
```

New in version 0.9.5.

```
salt.states.file.uncomment(name, regex, char='#', backup='.bak')
```

Uncomment specified commented lines in a file

**name**  The full path to the file to be edited

**regex**  A regular expression used to find the lines that are to be uncommented. This regex should not include the comment character. A leading ^ character will be stripped for convenience (for easily switching between comment() and uncomment()). The regex will be searched for from the beginning of the line, ignoring leading spaces (we prepend "^[ t]"")

**char**  [#] The character to remove in order to uncomment a line

**backup**  [.bak] The file will be backed up before edit with this file extension;
Warning: This backup will be overwritten each time `sed / comment / uncomment` is called. Meaning the backup will only be useful after the first invocation.

Usage:
```
/etc/adduser.conf:
  file.uncomment:
    - regex: EXTRA_GROUPS
```

New in version 0.9.5.

### 31.27.52 salt.states.firewalld

Management of firewalld

New in version 2015.8.0.

The following example applies changes to the public zone, blocks echo-reply and echo-request packets, does not set the zone to be the default, enables masquerading, and allows ports 22/tcp and 25/tcp.

```
public:
  - name: public
  - block_icmp
    - echo-reply
    - echo-request
  - default: False
  - masquerade: True
  - ports:
    - 22/tcp
    - 25/tcp
```

The following example applies changes to the public zone, enables masquerading and configures port forwarding TCP traffic from port 22 to 2222, and forwards TCP traffic from port 80 to 443 at 192.168.0.1.

```
my_zone:
  firewalld.present:
    - name: public
    - masquerade: True
    - port_fwd:
      - 22:2222:tcp
      - 80:443:tcp:192.168.0.1
```

```
salt.states.firewalld.present(name, block_icmp=None, default=None, masquerade=False, ports=None, port_fwd=None, services=None)
```

Ensure a zone has specific attributes

### 31.27.53 salt.states.gem

Installation of Ruby modules packaged as gems

A state module to manage rubygems. Gems can be set up to be installed or removed. This module will use RVM or rbenv if they are installed. In that case, you can specify what ruby version and gemset to target.

```
addressable:
  gem.installed:
```

31.27. Full list of builtin state modules
salt.states.gem.\texttt{installed}(name, \ruby=None, \gem_bin=None, user=None, version=None, rdoc=False, ri=False, pre_releases=False, proxy=None)

Make sure that a gem is installed.

name The name of the gem to install

ruby: \texttt{None} Only for RVM or rbenv installations: the ruby version and gemset to target.

gem_bin: \texttt{None} Custom \texttt{gem} command to run instead of the default. Use this to install gems to a non-default ruby install. If you are using rvm or rbenv use the ruby argument instead.

user: \texttt{None} The user under which to run the \texttt{gem} command

New in version 0.17.0.

version \texttt{[None]} Specify the version to install for the gem. Doesn't play nice with multiple gems at once

rdoc \texttt{[False]} Generate RDoc documentation for the gem(s).

ri \texttt{[False]} Generate RI documentation for the gem(s).

pre_releases \texttt{[False]} Install pre-release version of gem(s) if available.

proxy \texttt{[None]} Use the specified HTTP proxy server for all outgoing traffic. Format: \url{http://hostname[:port]}

salt.states.gem.\texttt{removed}(name, \ruby=None, user=None, \gem_bin=None)

Make sure that a gem is not installed.

name The name of the gem to uninstall

gem_bin \texttt{[None]} Full path to \texttt{gem} binary to use.

ruby \texttt{[None]} If RVM or rbenv are installed, the ruby version and gemset to use. Ignored if \texttt{gem_bin} is specified.

user: \texttt{None} The user under which to run the \texttt{gem} command

New in version 0.17.0.

salt.states.gem.\texttt{sources_add}(name, \ruby=None, user=None)

Make sure that a gem source is added.

name The URL of the gem source to be added

ruby: \texttt{None} For RVM or rbenv installations: the ruby version and gemset to target.

user: \texttt{None} The user under which to run the \texttt{gem} command

New in version 0.17.0.

salt.states.gem.\texttt{sources_remove}(name, \ruby=None, user=None)

Make sure that a gem source is removed.

name The URL of the gem source to be removed

ruby: \texttt{None} For RVM or rbenv installations: the ruby version and gemset to target.

user: \texttt{None} The user under which to run the \texttt{gem} command

New in version 0.17.0.
31.27.54 salt.states.git

States to manage git repositories and git configuration

**Important:** Before using git over ssh, make sure your remote host fingerprint exists in your ~/.ssh/known_hosts file.

`salt.states.git.config_set(name, cwd=None, value=None, multivar=None, repo=None, user=None,**kwargs)`

New in version 2014.7.0.

Changed in version 2015.8.0: Renamed from `git.config` to `git.config_set`. For earlier versions, use `git.config`.

Ensure that a config value is set to the desired value(s)

**name** Name of the git config value to set

**value** Set a single value for the config item

**multivar** Set multiple values for the config item

**Note:** The order matters here, if the same parameters are set but in a different order, they will be removed and replaced in the order specified.

New in version 2015.8.0.

**repo** [None] An optional location of a git repository for local operations

**user** [None] Optional name of a user as whom `git config` will be run

**global** [False] If True, this will set a global git config option

Changed in version 2015.8.0: Option renamed from `is_global` to `global`. For earlier versions, use `is_global`.

Local Config Example:

```
# Single value
mylocalrepo:
git.config_set:
  - name: user.email
    - value: foo@bar.net
  - repo: /path/to/repo
```

```
# Multiple values
mylocalrepo:
git.config_set:
  - name: mysection.myattribute
  - multivar:
    - foo
    - bar
    - baz
  - repo: /path/to/repo
```

Global Config Example (User ``foo``):

```
mylocalrepo:
git.config_set:
  - name: user.name
  - value: Foo Bar
```
salt.states.git.config_unset(name, value_regex=None, repo=None, user=None, **kwargs)

New in version 2015.8.0.

Ensure that the named config key is not present

name  The name of the configuration key to unset. This value can be a regex, but the regex must match the
entire key name. For example, foo\. would not match all keys in the foo section, it would be necessary
to use foo\..+ to do so.

value_regex  Regex indicating the values to unset for the matching key(s)

Note: This option behaves differently depending on whether or not all is set to True. If it is, then all
values matching the regex will be deleted (this is the only way to delete multiple values from a multivar).
If all is set to False, then this state will fail if the regex matches more than one value in a multivar.

all  [False] If True, unset all matches

repo  [None] An optional location of a git repository for local operations

user  [None] Optional name of a user as whom git config will be run

global  [False] If True, this will set a global git config option

Examples:

# Value matching 'baz'
mylocalrepo:
  git.config_unset:
    - name: foo.bar
    - value_regex: 'baz'
    - repo: /path/to/repo

# Ensure entire multivar is unset
mylocalrepo:
  git.config_unset:
    - name: foo.bar
    - all: True

# Ensure all variables in 'foo' section are unset, including multivars
mylocalrepo:
  git.config_unset:
    - name: 'foo\..+'
    - all: True

# Ensure that global config value is unset
mylocalrepo:
  git.config_unset:
    - name: foo.bar
    - global: True

salt.states.git.latest(name, rev='HEAD', target=None, branch=None, user=None,
force_checkout=False, force_clone=False, force_fetch=False, force_reset=False,
submodules=False, bare=False, mirror=False, remote='origin', fetch_tags=True,
deepth=None, identity=None, https_user=None, https_pass=None, onlyif=False,
unless=False, **kwargs)

Make sure the repository is cloned to the given directory and is up-to-date.
name  Address of the remote repository as passed to `git clone`

rev  [HEAD] The remote branch, tag, or revision ID to checkout after clone / before update. If specified, then Salt will also ensure that the tracking branch is set to `<remote>/<rev>`, unless `rev` refers to a tag or SHA1, in which case Salt will ensure that the tracking branch is unset.

If `rev` is not specified, it will be assumed to be HEAD, and Salt will not manage the tracking branch at all.

target  Name of the target directory where repository is about to be cloned

branch  Name of the branch into which to checkout the specified rev. If not specified, then Salt will not care what branch is being used locally and will just use whatever branch is currently there.

| Note:  | If not specified, this means that the local branch name will not be changed if the repository is reset to another branch/tag/SHA1. |

New in version 2015.8.0.

user  User under which to run git commands. By default, commands are run by the user under which the minion is running.

New in version 0.17.0.

force  [False] Deprecated since version 2015.8.0: Use `force_clone` instead. For earlier Salt versions, `force` must be used.

force_checkout  [False] When checking out the local branch, the state will fail if there are unwritten changes. Set this argument to True to discard unwritten changes when checking out.

force_clone  [False] If the `target` directory exists and is not a git repository, then this state will fail. Set this argument to `True` to remove the contents of the target directory and clone the repo into it.

force_fetch  [False] If a fetch needs to be performed, non-fast-forward fetches will cause this state to fail. Set this argument to `True` to force the fetch even if it is a non-fast-forward update.

New in version 2015.8.0.

force_reset  [False] If the update is not a fast-forward, this state will fail. Set this argument to `True` to force a hard-reset to the remote revision in these cases.

submodules  [False] Update submodules on clone or branch change

bare  [False] Set to `True` if the repository is to be a bare clone of the remote repository.

mirror  Set to `True` if the repository is to be a mirror of the remote repository. This implies that `bare` set to `True`, and thus is incompatible with `rev`.

remote  [origin] Git remote to use. If this state needs to clone the repo, it will clone it using this value as the initial remote name. If the repository already exists, and a remote by this name is not present, one will be added.

remote_name  Deprecated since version 2015.8.0: Use `remote` instead. For earlier Salt versions, `remote_name` must be used.

fetch_tags  [True] If `True`, then when a fetch is performed all tags will be fetched, even those which are not reachable by any branch on the remote.

depth  Defines depth in history when git a clone is needed in order to ensure latest. E.g. `depth: 1` is useful when deploying from a repository with a long history. Use `rev` to specify branch. This is not compatible with tags or revision IDs.

identity  A path on the minion server to a private key to use over SSH
https_user  HTTP Basic Auth username for HTTPS (only) clones
   New in version 2015.5.0.
https_pass  HTTP Basic Auth password for HTTPS (only) clones
   New in version 2015.5.0.
onlyif  A command to run as a check, run the named command only if the command passed to the onlyif option returns true
unless  A command to run as a check, only run the named command if the command passed to the unless option returns false

Note: Clashing ID declarations can be avoided when including different branches from the same git repository in the same sls file by using the name declaration. The example below checks out the gh-pages and gh-pages-prod branches from the same repository into separate directories. The example also sets up the ssh_known_hosts ssh key required to perform the git checkout.

gitlab.example.com:
   ssh_known_hosts:
      - present
      - user: root
      - enc: ecdsa

   git-website-staging:
      git.latest:
         - name: git@gitlab.example.com:user/website.git
         - rev: gh-pages
         - target: /usr/share/nginx/staging
         - identity: /root/.ssh/website_id_rsa
         - require:
            - pkg: git
            - ssh_known_hosts: gitlab.example.com

   git-website-prod:
      git.latest:
         - name: git@gitlab.example.com:user/website.git
         - rev: gh-pages-prod
         - target: /usr/share/nginx/prod
         - identity: /root/.ssh/website_id_rsa
         - require:
            - pkg: git
            - ssh_known_hosts: gitlab.example.com

salt.states.git.mod_run_check(cmd_kwargs, onlyif, unless)
   Execute the onlyif and unless logic. Return a result dict if:
      • onlyif failed (onlyif!= 0)
      • unless succeeded (unless == 0)
   Otherwise, returns True

salt.states.git.present(name, force=False, bare=True, template=None, separate_git_dir=False, shared=None, user=None)
   Ensure that a repository exists in the given directory
Warning: If the minion has Git 2.5 or later installed, name points to a worktree, and force is set to True, then the worktree will be deleted. This has been corrected in Salt 2015.8.0.

name  Path to the directory
       Changed in version 2015.8.0: This path must now be absolute

force  [False] If True, and if name points to an existing directory which does not contain a git repository, then the contents of that directory will be recursively removed and a new repository will be initialized in its place.

bare  [True] If True, and a repository must be initialized, then the repository will be a bare repository.

Note: This differs from the default behavior of git.init, make sure to set this value to False if a bare repo is not desired.

template  If a new repository is initialized, this argument will specify an alternate `template directory`

New in version 2015.8.0.

separate_git_dir  If a new repository is initialized, this argument will specify an alternate $GIT_DIR

New in version 2015.8.0.

shared  Set sharing permissions on git repo. See git-init(1) for more details.

New in version 2015.5.0.

user  User under which to run git commands. By default, commands are run by the user under which the minion is running.

New in version 0.17.0.

31.27.55 salt.states.glusterfs

Manage glusterfs pool.

salt.states.glusterfs.add_volume_bricks(name, bricks)
Add brick(s) to an existing volume

name  Volume name

bricks  List of brick(s) to add to the volume

myvolume:
    glusterfs.add_volume_bricks:
        - bricks:
            - host1:/srv/gluster/drive1
            - host2:/srv/gluster/drive2

Replicated Volume:
    glusterfs.add_volume_bricks:
        - name: volume2
          bricks:
            - host1:/srv/gluster/drive2
            - host2:/srv/gluster/drive3

salt.states.glusterfs.created(name, bricks, stripe=False, replica=False, device_vg=False, transport='tcp', start=False, force=False)
Check if volume already exists
name  name of the volume

myvolume:
  glusterfs.created:
    - bricks:
      - host1:/srv/gluster/drive1
      - host2:/srv/gluster/drive2

Replicated Volume:
  glusterfs.created:
    - name: volume2
    - bricks:
      - host1:/srv/gluster/drive2
      - host2:/srv/gluster/drive3
    - replica: 2
    - start: True

salt.states.glusterfs.peered(name)
Check if node is peered.

  name  The remote host with which to peer.

  peer-cluster:
    glusterfs.peered:
      - name: two

  peer-clusters:
    glusterfs.peered:
      - names:
        - one
        - two
        - three
        - four

salt.states.glusterfs.started(name)
Check if volume has been started

  name  name of the volume

mycluster:
  glusterfs.started: []

31.27.56 salt.states.gnomedesktop

Configuration of the GNOME desktop

Control the GNOME settings

localdesktop_wm_prefs:
  gnomedesktop.wm_preferences:
    - user: username
    - audible_bell: false
    - action_double_click_titlebar: 'toggle-maximize'
    - visual_bell: true
    - num_workspaces: 6
localdesktop_lockdown:
  gnomedesktop.desktop_lockdown:
    - user: username
- disable_user_switching: true

localdesktop_interface:
    gnomedesktop.desktop_interface:
    - user: username
    - clock_show_date: true
    - clock_format: 12h

salt.states.gnomedesktop.desktop_interface
    name, user=None, automatic_mnemonics=None, buttons_have_icons=None, can_change_accels=None, clock_format=None, clock_show_date=None, clock_show_seconds=None, cursor_blink=None, cursor_blink_time=None, cursor_blink_timeout=None, cursor_size=None, cursor_theme=None, document_font_name=None, enable_animations=None, font_name=None, gtk_color_palette=None, gtk_color_scheme=None, gtk_im_module=None, gtk_im_preedit_style=None, gtk_im_status_style=None, gtk_key_theme=None, gtk_theme=None, gtk_timeout_initial=None, gtk_timeout_repeat=None, icon_theme=None, menubar_accel=None, menubar_detachable=None, menus_have_icons=None, menus_have_tearoff=None, monospace_font_name=None, show_input_method_menu=None, show_unicode_menu=None, show_unace_menu=None, text_scaling_factor=None, toolbar_detachable=None, toolbar_icons_size=None, toolbar_style=None, toolkit_accessibility=None, **kwargs)

desktop_interface: sets values in the org.gnome.desktop.interface schema

salt.states.gnomedesktop.desktop_lockdown
    name, user=None, disable_application_handlers=None, disable_command_line=None, disable_lock_screen=None, disable_log_out=None, disable_print_setup=None, disable_printing=None, disable_save_to_disk=None, disable_user_switching=None, user_administration_disabled=None, **kwargs)

desktop_lockdown: sets values in the org.gnome.desktop.lockdown schema
salt.states.gnomedesktop.wm_preferences(name, user=None, action_double_click_titlebar=None, action_middle_click_titlebar=None, action_right_click_titlebar=None, application_based=None, audible_bell=None, auto_raise=None, auto_raise_delay=None, button_layout=None, disable_workarounds=None, focus_mode=None, focus_new_windows=None, mouse_button_modifier=None, num_workspaces=None, raise_on_click=None, resize_with_right_button=None, theme=None, titlebar_font=None, titlebar_uses_system_font=None, visual_bell=None, visual_bell_type=None, workspace_names=None, **kwargs)

wm_preferences: sets values in the org.gnome.desktop.wm.preferences schema

31.27.57 salt.states.grafana

Manage Grafana Dashboards

This module uses elasticsearch, which can be installed via package, or pip.

You can specify elasticsearch hosts directly to the module, or you can use an elasticsearch profile via pillars:

mygrafanaprofile:
  hosts:
    - es1.example.com:9200
    - es2.example.com:9200
  index: grafana-dash

# Basic usage (uses default pillar profile key 'grafana')
Ensure myservice dashboard is managed:
  grafana.dashboard_present:
    - name: myservice
    - dashboard_from_pillar: default
    - rows_from_pillar:
      - systemhealth
      - requests

# Passing hosts in
Ensure myservice dashboard is managed:
  grafana.dashboard_present:
    - name: myservice
    - dashboard_from_pillar: default
    - rows:
      - collapse: false
        editable: true
        height: 150px
        title: System Health
        panels:
          - aliasColors: {}
            id: 200000
            annotate:
              enable: false
              bars: false
              datasource: null
              editable: true
error: false
fill: 7
grid:
  leftMax: 100
  leftMin: null
  rightMax: null
  rightMin: null
  threshold1: 60
  threshold1Color: rgb(216, 27, 27)
  threshold2: null
  threshold2Color: rgba(234, 112, 112, 0.22)
  leftYAxisLabel: ''
legend:
  avg: false
  current: false
  max: false
  min: false
  show: false
  total: false
  values: false
lines: true
linewidth: 1
nullPointMode: connected
percentage: false
pointradius: 5
points: false
renderer: flot
resolution: 100
scale: 1
seriesOverrides: []
span: 4
stack: false
steppedLine: false
targets:
- target: cloudwatch.aws.ec2.mysrv.cpuutilization.average
title: CPU (asg average)
tooltip:
  query_as_alias: true
  shared: false
  value_type: cumulative
type: graph
x-axis: true
y-axis: true
y_formats:
  short
  short
zerofill: true
- rows_from_pillar:
  - systemhealth
  - requests
- profile:
  hosts:
    - es1.example.com:9200
    - es2.example.com:9200
  index: grafana-dash

# Using a profile from pillars
Ensure myservice dashboard is managed:

31.27. Full list of builtin state modules 1743
grafana.dashboard_present:
- name: myservice
- dashboard:
  annotations:
    enable: true
    list: []
  editable: true
  hideAllLegends: false
  hideControls: false
  nav:
    - collapse: false
      enable: true
      notice: false
      now: true
    refresh_intervals:
      - 10s
      - 30s
      - 1m
      - 5m
      - 15m
      - 30m
      - 1h
      - 2h
      - 1d
  status: Stable
  time_options:
    - 5m
    - 15m
    - 1h
    - 2h
    - 3h
    - 4h
    - 6h
    - 12h
    - 1d
    - 2d
    - 4d
    - 7d
    - 16d
    - 30d
  type: timepicker
originalTitle: dockerregistry
refresh: 1m
rows: []
sharedCrosshair: false
style: dark
templating:
  enable: true
  list: []
time:
  from: now-2h
  to: now
timezone: browser
- rows_from_pillars:
  - systemhealth
  - requests
- profile: mygrafanaprofile
The behavior of this module is to create dashboards if they do not exist, to add rows if they do not exist in existing dashboards, and to update rows if they exist in dashboards. The module will not manage rows that are not defined, allowing users to manage their own custom rows.

```python
salt.states.grafana.dashboard_absent(name, hosts=None, profile='grafana')
```

Ensure the named grafana dashboard is deleted.

- **name** Name of the grafana dashboard.
- **profile** A pillar key or dict that contains a list of hosts and an elasticsearch index to use.

```python
salt.states.grafana.dashboard_present(name, dashboard=None, dashboard_from_pillar=None, rows=None, rows_from_pillar=None, profile='grafana')
```

Ensure the grafana dashboard exists and is managed.

- **name** Name of the grafana dashboard.
- **dashboard** A dict that defines a dashboard that should be managed.
- **dashboard_from_pillar** A pillar key that contains a grafana dashboard dict. Mutually exclusive with dashboard.
- **rows** A list of grafana rows.
- **rows_from_pillar** A list of pillar keys that contain lists of grafana dashboard rows. Rows defined in the pillars will be appended to the rows defined in the state.
- **profile** A pillar key or dict that contains a list of hosts and an elasticsearch index to use.

### 31.27.58 salt.states.grains

#### Manage grains on the minion

This state allows for grains to be set. Grains set or altered this way are stored in the `grains` file on the minions, by default at: `/etc/salt/grains`

Note: This does not override any grains set in the minion file.

```python
salt.states.grains.absent(name, destructive=False)
```

New in version 2014.7.0.

Delete a grain from the grains config file

- **name** The grain name

  **Parameters** `destructive` -- If destructive is True, delete the entire grain. If destructive is False, set the grain's value to None. Defaults to False.

```python
grain_name:
grains.absent
```

```python
salt.states.grains.append(name, value, convert=False)
```

New in version 2014.7.0.

Append a value to a list in the grains config file

- **name** The grain name
- **value** The value to append
Parameters **convert** -- If convert is True, convert non-list contents into a list. If convert is False and the grain contains non-list contents, an error is given. Defaults to False.

```python
grain_name:
grains.append:
    - value: to_be_appended
```

```python
salt.states.grains.list_absent(name, value)
Delete a value from a grain formed as a list.
New in version 2014.1.0.
name The grain name.
value The value to delete from the grain list.
The grain should be list type
```

```python
roles:
grains.list_absent:
    - value: db
```

For multiple grains, the syntax looks like:

```python
roles:
grains.list_absent:
    - value:
        - web
        - dev
```

```python
salt.states.grains.list_present(name, value)
Ensure the value is present in the list type grain.
New in version 2014.1.0.
name The grain name.
value The value is present in the list type grain.
The grain should be list type
```

```python
roles:
grains.list_present:
    - value: web
```

For multiple grains, the syntax looks like:

```python
roles:
grains.list_present:
    - value:
        - web
        - dev
```

```python
salt.states.grains.present(name, value)
Ensure that a grain is set
name The grain name
value The value to set on the grain
If the grain with the given name exists, its value is updated to the new value. If the grain does not yet exist, a new grain is set to the given value.
```
31.27.59 salt.states.group

Management of user groups

The group module is used to create and manage unix group settings, groups can be either present or absent:

```
cheese:
    group.present:
        - gid: 7648
        - system: True
        - addusers:
            - user1
            - users2
        - delusers:
            - foo

cheese:
    group.present:
        - gid: 7648
        - system: True
        - members:
            - foo
            - bar
            - user1
            - user2
```

**salt.states.group.absent**(name)

Ensure that the named group is absent

- **name** The name of the group to remove

**salt.states.group.present**(name, gid=None, system=False, addusers=None, delusers=None, members=None)

Ensure that a group is present

- **name** The name of the group to manage
- **gid** The group id to assign to the named group; if left empty, then the next available group id will be assigned
- **system** Whether or not the named group is a system group. This is essentially the `-r` option of `groupadd`.
- **addusers** List of additional users to be added as a group members.
- **delusers** Ensure these user are removed from the group membership.
- **members** Replace existing group members with a list of new members.

**Note:** Options `members` and `addusers/delusers` are mutually exclusive and can not be used together.
31.27.60 salt.states.hg

Interaction with Mercurial repositories

Before using hg over ssh, make sure the remote host fingerprint already exists in ~/.ssh/known_hosts, and the remote host has this host's public key.

```
https://bitbucket.org/example_user/example_repo:
  hg.latest:
    - rev: tip
    - target: /tmp/example_repo
```

salt.states.hg.latest(name, rev=None, target=None, clean=False, user=None, identity=None, force=False, opts=False)

Make sure the repository is cloned to the given directory and is up to date

- **name** Address of the remote repository as passed to ```hg clone```
- **rev** The remote branch, tag, or revision hash to clone/pull
- **target** Target destination directory path on minion to clone into
- **clean** Force a clean update with `-C` (Default: False)
- **user** Name of the user performing repository management operations

New in version 0.17.0.

- **identity** Private SSH key on the minion server for authentication (ssh://)

New in version 2015.5.0.

- **force** Force hg to clone into pre-existing directories (deletes contents)
- **opts** Include additional arguments and options to the hg command line

31.27.61 salt.states.hipchat

Send a message to Hipchat

This state is useful for sending messages to Hipchat during state runs.

New in version 2015.5.0.

```
hipchat-message:
  hipchat.send_message:
    - room_id: 123456
    - from_name: SuperAdmin
    - message: 'This state was executed successfully.'
    - api_key: peWcBiMOS9HrZG15peWcBiMOS9HrZG15
    - api_version: v1
```

The api key can be specified in the master or minion configuration like below: .. code-block:: yaml

```
hipchat: api_key: peWcBiMOS9HrZG15peWcBiMOS9HrZG15 api_version: v1
```

salt.states.hipchat.send_message(name, room_id, from_name, message, api_key=None, api_version=None, message_color='yellow', notify=False)

Send a message to a Hipchat room.
```python
hipchat-message:
    hipchat.send_message:
        - room_id: 123456
        - from_name: SuperAdmin
        - message: 'This state was executed successfully.'
        - api_key: peWcBiMOS9HrZG15peWcBiMOS9HrZG15
        - api_version: v1
        - color: green
        - notify: True
```

The following parameters are required:

- **name** The unique name for this event.
- **room_id** The room to send the message to. Can either be the ID or the name.
- **from_name** The name of that is to be shown in the ``from`` field. If not specified, defaults to.
- **message** The message that is to be sent to the Hipchat room.

The following parameters are optional:

- **api_key** The api key for Hipchat to use for authentication, if not specified in the configuration options of master or minion.
- **api_version** The api version for Hipchat to use, if not specified in the configuration options of master or minion.
- **color** The color the Hipchat message should be displayed in. One of the following, default: yellow, red, green, purple, gray, or random.
- **notify** Should a notification in the room be raised.

### 31.27.62 salt.states.host

Management of addresses and names in hosts file

The `/etc/hosts` file can be managed to contain definitions for specific hosts:

```yaml
salt-master:
    host.present:
        - ip: 192.168.0.42
```

Or using the `names` directive, you can put several names for the same IP. (Do not try one name with space-separated values).

```yaml
server1:
    host.present:
        - ip: 192.168.0.42
        - names:
            - server1
            - florida
```

**Note:** Changing the names in `host.present` does not cause an update to remove the old entry.
salt.states.host.absent(name, ip)
Ensure that the named host is absent

name The host to remove
ip The ip addr(s) of the host to remove

salt.states.host.present(name, ip)
Ensures that the named host is present with the given ip

name The host to assign an ip to
ip The ip addr(s) to apply to the host

31.27.63 salt.states.htpasswd

Support for htpasswd module
New in version 2014.7.0.

salt.states.htpasswd.user_exists(name, password=None, htpasswd_file=None, options='d', force=False, runas=None)
Make sure the user is inside the specified htpasswd file

name User name
password User password
htpasswd_file Path to the htpasswd file
options See salt.modules.htpasswd.useradd
force Touch the file even if user already created
runas The system user to run htpasswd command with

31.27.64 salt.states.http

HTTP monitoring states
Perform an HTTP query and statefully return the result
New in version 2015.2.

salt.states.http.query(name, match=None, match_type='string', status=None, **kwargs)
Perform an HTTP query and statefully return the result
New in version 2015.2.
31.27.65 salt.states.ifttt

Trigger an event in IFTTT

This state is useful for trigging events in IFTTT.

New in version 2015.8.0.

```yaml
ifttt-event:
    ifttt.trigger_event:
        - event: TestEvent
        - value1: 'This state was executed successfully.'
        - value2: 'Another value we can send.'
        - value3: 'A third value we can send.'
```

The api key can be specified in the master or minion configuration like below:

```yaml
ifttt: secret_key: bzMRb-KKIAaNOWKEw792J7Eb-B3z7muhdhYblJn4V6
```

```python
salt.states.ifttt.trigger_event(name, event, value1=None, value2=None, value3=None)
```

Trigger an event in IFTTT

```yaml
ifttt-event:
    ifttt.trigger_event:
        - event: TestEvent
        - value1: 'A value that we want to send.'
        - value2: 'A second value that we want to send.'
        - value3: 'A third value that we wan to send.'
```

The following parameters are required:

- **name** The unique name for this event.
- **event** The name of the event to trigger in IFTTT.

The following parameters are optional:

- **value1** One of the values that we can send to IFTTT.
- **value2** One of the values that we can send to IFTTT.
- **value3** One of the values that we can send to IFTTT.

31.27.66 salt.states.incron

Management of incron, the inotify cron

The incron state module allows for user incrontabs to be cleanly managed.

Incron declarations require a number of parameters. The parameters needed to be declared: `path`, `mask`, and `cmd`. The `user` whose incrontab is to be edited also needs to be defined.

When making changes to an existing incron job, the `path` declaration is the unique factor, so if an existing cron that looks like this:

```bash
Watch for modifications in /home/user:
    incron.present:
        - user: root
        - path: /home/user
        - mask:
```

31.27. Full list of builtin state modules
- IN_MODIFY
- cmd: 'echo $$ $$'

Is changed to this:

Watch for modifications and access in /home/user:

```bash
in cron.present:
  - user: root
  - path: /home/user
  - mask:
    - IN_MODIFY
    - IN_ACCESS
  - cmd: 'echo $$ $$'
```

Then the existing cron will be updated, but if the cron command is changed, then a new cron job will be added to the user's crontab.

New in version 0.17.0.

**salt.states.incron.absent** *(name, path, mask, cmd, user='root')*

Verifies that the specified incron job is absent for the specified user; only the name is matched when removing an incron job.

- **name** Unique comment describing the entry
- **path** The path that should be watched
- **user** The name of the user who's crontab needs to be modified, defaults to the root user
- **mask** The mask of events that should be monitored for
- **cmd** The cmd that should be executed

**salt.states.incron.present** *(name, path, mask, cmd, user='root')*

Verifies that the specified incron job is present for the specified user. For more advanced information about what exactly can be set in the cron timing parameters, check your incron system's documentation. Most Unix-like systems' incron documentation can be found via the incrontab man page: `man 5 incrontab`.

- **name** Unique comment describing the entry
- **path** The path that should be watched
- **user** The name of the user who's crontab needs to be modified, defaults to the root user
- **mask** The mask of events that should be monitored for
- **cmd** The cmd that should be executed

### 31.27.67 salt.states.influxdb_database

Management of InfluxDB databases

(compatible with InfluxDB version 0.5+)

New in version 2014.7.0.

**salt.states.influxdb_database.absent** *(name, user=None, password=None, host=None, port=None)*

Ensure that the named database is absent

- **name** The name of the database to remove
- **user** The user to connect as (must be able to remove the database)
password  The password of the user
host  The host to connect to
port  The port to connect to

salt.states.influxdb_database.present(name, user=None, password=None, host=None, port=None)
Ensure that the named database is present
name  The name of the database to create
user  The user to connect as (must be able to remove the database)
password  The password of the user
host  The host to connect to
port  The port to connect to

31.27.68  salt.states.influxdb_user

Management of InfluxDB users
(compatible with InfluxDB version 0.5+)
New in version 2014.7.0.

salt.states.influxdb_user.absent(name, database=None, user=None, password=None, host=None, port=None)
Ensure that the named cluster admin or database user is absent.
name  The name of the user to remove
database  The database to remove the user from
user  The user to connect as (must be able to remove the user)
password  The password of the user
host  The host to connect to
port  The port to connect to

salt.states.influxdb_user.present(name, passwd, database=None, user=None, password=None, host=None, port=None)
Ensure that the cluster admin or database user is present.
name  The name of the user to manage
passwd  The password of the user
database  The database to create the user in
user  The user to connect as (must be able to create the user)
password  The password of the user
host  The host to connect to
port  The port to connect to
31.27.69  salt.states.ini_manage

Manage ini files

maintainer  <akilesh1597@gmail.com>
maturity  new
depends  re
platform  all

use section as DEFAULT_implicit if your ini file does not have any section for example /etc/sysctl.conf

salt.states.ini_manage.options_absent(name, sections=None)

```ini
/home/saltminion/api-paste.ini:
ini.options_present:
  - sections:
    test:
      - testkey
      - secondoption
    test1:
      - testkey1
```

options present in file and not specified in sections dict will be untouched
changes dict will contain the list of changes made

salt.states.ini_manage.options_present(name, sections=None)

```ini
/home/saltminion/api-paste.ini:
ini.options_present:
  - sections:
    test:
      testkey: 'testval'
      secondoption: 'secondvalue'
    test1:
      testkey1: 'testval121'
```

options present in file and not specified in sections dict will be untouched
changes dict will contain the list of changes made

salt.states.ini_manage.sections_absent(name, sections=None)

```ini
/home/saltminion/api-paste.ini:
ini.sections_absent:
  - sections:
    test
    test1
```

options present in file and not specified in sections will be deleted changes dict will contain the sections that changed

salt.states.ini_manage.sections_present(name, sections=None)
/home/saltminion/api-paste.ini:
ini.sections_present:
  - sections:
    test:
      testkey: testval
      secondoption: secondvalue
    test2:
      testkey2: 'testval121'

options present in file and not specified in sections will be deleted changes dict will contain the sections that changed

### 31.27.70 salt.states.ipmi

**Manage IPMI devices over LAN**

The following configuration defaults can be defined in the minion, master config or pillar:

```
ipmi.config:
  api_host: 127.0.0.1
  api_user: admin
  api_pass: apassword
  api_port: 623
  api_kg: None
```

Every call can override the config defaults:

```
ensure myipmi system is set to network boot:
  ipmi.boot_device:
    - name: network
      - api_host: myipmi.hostname.com
      - api_user: root
      - api_pass: apassword
      - api_kg: None

ensure myipmi system is powered on:
  ipmi.power:
    - name: boot
      - api_host: myipmi.hostname.com
      - api_user: root
      - api_pass: apassword
```

**salt.states.ipmi.boot_device** *(name='default', **kwargs)*

Request power state change

- **name** = *default*
  - network -- Request network boot
  - hd -- Boot from hard drive
  - safe -- Boot from hard drive, requesting `safe mode`
  - optical -- boot from CD/DVD/BD drive
  - setup -- Boot into setup utility
  - default -- remove any IPMI directed boot device request

**kwargs**
• api_host=localhost
• api_user=admin
• api_pass=
• api_port=623
• api_kg=None

salt.states.ipmi.power(name='power_on', wait=300, **kwargs)
Request power state change

name
Ensure power state one of:
• power_on -- system turn on
• power_off -- system turn off (without waiting for OS)
• shutdown -- request OS proper shutdown
• reset -- reset (without waiting for OS)
• boot -- If system is off, then `on', else `reset'

wait  wait X seconds for the job to complete before forcing. (defaults to 300 seconds)

kwargs
• api_host=localhost
• api_user=admin
• api_pass=
• api_port=623
• api_kg=None

salt.states.ipmi.user_absent(name, channel=14, **kwargs)
Remove user Delete all user (uid) records having the matching name.

name  string name of user to delete

channel  channel to remove user access from defaults to 14 for auto.

kwargs
• api_host=localhost
• api_user=admin
• api_pass=
• api_port=623
• api_kg=None

salt.states.ipmi.user_present(name, uid, password, channel=14, callback=False, link_auth=True, ipmi_msg=True, privilege_level='administrator', **kwargs)
Ensure IPMI user and user privileges.

name  name of user (limit 16 bytes)

uid  user id number (1 to 7)

password  user password (limit 16 bytes)

channel  ipmi channel defaults to 14 for auto
callback  User Restricted to Callback

False = User Privilege Limit is determined by the User Privilege Limit parameter privilege_level, for both callback and non-callback connections.

True = User Privilege Limit is determined by the privilege_level parameter for callback connections, but is restricted to Callback level for non-callback connections. Thus, a user can only initiate a Callback when they `call in' to the BMC, but once the callback connection has been made, the user could potentially establish a session as an Operator.

link_auth  User Link authentication True/False user name and password information will be used for link authentication, e.g. PPP CHAP) for the given channel. Link authentication itself is a global setting for the channel and is enabled/disabled via the serial/modem configuration parameters.

ipmi_msg  User IPMI Messaging True/False user name and password information will be used for IPMI Messaging. In this case, 'IPMI Messaging' refers to the ability to execute generic IPMI commands that are not associated with a particular payload type. For example, if IPMI Messaging is disabled for a user, but that user is enabled for activating the SOL payload type, then IPMI commands associated with SOL and session management, such as Get SOL Configuration Parameters and Close Session are available, but generic IPMI commands such as Get SEL Time are unavailable.) ipmi_msg

privilege_level

- callback
- user
- operator
- administrator
- proprietary
- no_access

kwargs

- api_host=localhost
- api_user=admin
- api_pass=
- api_port=623
- api_kg=None

31.27.71 salt.states.ipset

Management of ipsets

This is an ipset-specific module designed to manage IPSets for use in IPTables Firewalls.

setname:
  ipset.set_present:
    - set_type: bitmap:ip
    - range: 192.168.0.0/16
    - comment: True

setname:
  ipset.set_absent:
    - set_type: bitmap:ip
- range: 192.168.0.0/16
- comment: True

setname_entries:
ipset.present:
  - set_name: setname
  - entry: 192.168.0.3
  - comment: Hello
  - require:
    - ipset: baz

setname_entries:
ipset.present:
  - set_name: setname
  - entry:
    - 192.168.0.3
    - 192.168.1.3
  - comment: Hello
  - require:
    - ipset: baz

setname_entries:
ipset.absent:
  - set_name: setname
  - entry:
    - 192.168.0.3
    - 192.168.1.3
  - comment: Hello
  - require:
    - ipset: baz

setname:
ipset.flush:

**salt.states.ipset.absent**(name, entry=None, entries=None, family='ipv4', **kwargs)
New in version 2014.7.0.
Remove a entry or entries from a chain

- **name** A user-defined name to call this entry by in another part of a state or formula. This should not be an actual entry.
- **family** Network family, ipv4 or ipv6.

**salt.states.ipset.flush**(name, family='ipv4', **kwargs)
New in version 2014.7.0.
Flush current ipset set

- **family** Networking family, either ipv4 or ipv6

**salt.states.ipset.present**(name, entry=None, family='ipv4', **kwargs)
New in version 2014.7.0.
Append a entry to a set

- **name** A user-defined name to call this entry by in another part of a state or formula. This should not be an actual entry.
- **entry** A single entry to add to a set or a list of entries to add to a set
- **family** Network family, ipv4 or ipv6.
**salt.states.ipset.set_absent** *(name, family='ipv4'; **kwargs)*

New in version 2014.7.0.

Verify the set is absent.

- **family** Networking family, either ipv4 or ipv6

**salt.states.ipset.set_present** *(name, set_type, family='ipv4'; **kwargs)*

New in version 2014.7.0.

Verify the chain is exist.

- **name** A user-defined set name.
- **set_type** The type for the set
- **family** Networking family, either ipv4 or ipv6

### 31.27.72 salt.states.iptables

**Management of iptables**

This is an iptables-specific module designed to manage Linux firewalls. It is expected that this state module, and other system-specific firewall states, may at some point be deprecated in favor of a more generic firewall state.

```yaml
httpd:
  iptables.append:
  - table: filter
  - chain: INPUT
  - jump: ACCEPT
  - match: state
  - connstate: NEW
  - dport: 80
  - proto: tcp
  - sport: 1025:65535
  - save: True

httpd:
  iptables.append:
  - table: filter
  - chain: INPUT
  - jump: ACCEPT
  - match:
    - state
    - comment
    - comment: "Allow HTTP"
  - connstate: NEW
  - dport: 80
  - proto: tcp
  - sport: 1025:65535
  - save: True

httpd:
  iptables.append:
  - table: filter
  - chain: INPUT
  - jump: ACCEPT
  - match:
    - state
```

**31.27. Full list of builtin state modules**

1759
- comment
- comment: "Allow HTTP"
- connstate: NEW
- source: '127.0.0.1'
- dport: 80
- proto: tcp
- sport: 1025:65535
- save: True

.. Invert Rule

httpd:
  iptables.append:
    - table: filter
    - chain: INPUT
    - jump: ACCEPT
    - match:
      - state
      - comment
      - comment: "Allow HTTP"
      - connstate: NEW
      - source: '! 127.0.0.1'
      - dport: 80
      - proto: tcp
      - sport: 1025:65535
      - save: True

httpd:
  iptables.append:
    - table: filter
    - chain: INPUT
    - jump: ACCEPT
    - match:
      - state
      - comment
      - comment: "Allow HTTP"
      - connstate: NEW
      - source: 'not 127.0.0.1'
      - dport: 80
      - proto: tcp
      - sport: 1025:65535
      - save: True

httpd:
  iptables.append:
    - table: filter
    - family: ipv6
    - chain: INPUT
    - jump: ACCEPT
    - match: state
    - connstate: NEW
    - dport: 80
    - proto: tcp
    - sport: 1025:65535
    - save: True

httpd:
  iptables.append:
    - table: filter
- family: ipv4
  - chain: INPUT
  - jump: ACCEPT
  - match: state
  - connstate: NEW
  - dports:
    - 80
    - 443
  - proto: tcp
  - sport: 1025:65535
  - save: True

httpd:
iptables.insert:
  - position: 1
  - table: filter
  - chain: INPUT
  - jump: ACCEPT
  - match: state
  - connstate: NEW
  - dport: 80
  - proto: tcp
  - sport: 1025:65535
  - save: True

httpd:
iptables.insert:
  - position: 1
  - table: filter
  - family: ipv6
  - chain: INPUT
  - jump: ACCEPT
  - match: state
  - connstate: NEW
  - dport: 80
  - proto: tcp
  - sport: 1025:65535
  - save: True

httpd:
iptables.delete:
  - table: filter
  - chain: INPUT
  - jump: ACCEPT
  - match: state
  - connstate: NEW
  - dport: 80
  - proto: tcp
  - sport: 1025:65535
  - save: True

httpd:
iptables.delete:
  - position: 1
  - table: filter
  - chain: INPUT
  - jump: ACCEPT
  - match: state
- connstate: NEW
- dport: 80
- proto: tcp
- sport: 1025:65535
- save: True

httpd:
- iptables.delete:
  - table: filter
  - family: ipv6
  - chain: INPUT
  - jump: ACCEPT
  - match: state
  - connstate: NEW
  - dport: 80
  - proto: tcp
  - sport: 1025:65535
  - save: True

default to accept:
- iptables.set_policy:
  - chain: INPUT
  - policy: ACCEPT

Note: Various functions of the iptables module use the --check option. If the version of iptables on the target system does not include this option, an alternate version of this check will be performed using the output of iptables-save. This may have unintended consequences on legacy releases of iptables.

salt.states.iptables.append(name, table='filter', family='ipv4', **kwargs)
New in version 0.17.0.

Append a rule to a chain

name A user-defined name to call this rule by in another part of a state or formula. This should not be an actual rule.

table The table that owns the chain which should be modified

family Network family, ipv4 or ipv6.

All other arguments are passed in with the same name as the long option that would normally be used for iptables, with one exception: --state is specified as connstate instead of state (not to be confused with ctstate).

Jump options that doesn’t take arguments should be passed in with an empty string.

salt.states.iptables.chain_absent(name, table='filter', family='ipv4')
New in version 2014.1.0.

Verify the chain is absent.

table The table to remove the chain from

family Networking family, either ipv4 or ipv6

salt.states.iptables.chain_present(name, table='filter', family='ipv4')
New in version 2014.1.0.

Verify the chain is exist.

name A user-defined chain name.
```python
salt.states.iptables.delete(name, table='filter', family='ipv4', **kwargs)
New in version 2014.1.0.
Delete a rule to a chain

name  A user-defined name to call this rule by in another part of a state or formula. This should not be an actual rule.

table  The table that owns the chain that should be modified

family  Networking family, either ipv4 or ipv6

All other arguments are passed in with the same name as the long option that would normally be used for iptables, with one exception: --state is specified as connstate instead of state (not to be confused with ctstate).

Jump options that doesn’t take arguments should be passed in with an empty string.

salt.states.iptables.flush(name, table='filter', family='ipv4', **kwargs)
New in version 2014.1.0.
Flush current iptables state

table  The table that owns the chain that should be modified

family  Networking family, either ipv4 or ipv6

salt.states.iptables.insert(name, table='filter', family='ipv4', **kwargs)
New in version 2014.1.0.
Insert a rule into a chain

name  A user-defined name to call this rule by in another part of a state or formula. This should not be an actual rule.

table  The table that owns the chain that should be modified

family  Networking family, either ipv4 or ipv6

All other arguments are passed in with the same name as the long option that would normally be used for iptables, with one exception: --state is specified as connstate instead of state (not to be confused with ctstate).

Jump options that doesn’t take arguments should be passed in with an empty string.

salt.states.iptables.mod_aggregate(low, chunks, running)
The mod_aggregate function which looks up all rules in the available low chunks and merges them into a single rules ref in the present low data

salt.states.iptables.set_policy(name, table='filter', family='ipv4', **kwargs)
New in version 2014.1.0.
Sets the default policy for iptables firewall tables

table  The table that owns the chain that should be modified

family  Networking family, either ipv4 or ipv6

policy  The requested table policy
```
31.27.73 salt.states.jboss7

Manage JBoss 7 Application Server via CLI interface

New in version 2015.5.0.

This state uses jboss-cli.sh script from JBoss installation and parses its output to determine execution result.

In order to run each state, jboss_config dictionary with the following properties must be passed:

```
jboss:
  cli_path: '/opt/jboss/jboss-7.0/bin/jboss-cli.sh'
  controller: 10.11.12.13:9999
  cli_user: 'jbossadm'
  cli_password: 'jbossadm'
```

If controller doesn’t require password, then passing cli_user and cli_password parameters is not obligatory.

Example of application deployment:

```
application_deployed:
jboss7.deployed:
  - artifact:
      artifact_url: http://artifactory.intranet.company.com/artifactory
      repository: 'ext-release-local'
      artifact_id: 'webcomponent'
      group_id: 'com.company.application'
      packaging: 'war'
      version: '0.1'
      target_dir: '/tmp'
  - jboss_config:
      cli_path: '/opt/jboss/jboss-7.0/bin/jboss-cli.sh'
      controller: 10.11.12.13:9999
      cli_user: 'jbossadm'
      cli_password: 'jbossadm'
```

Since same dictionary with configuration will be used in all the states, it is much more convenient to move jboss configuration and other properties to pillar. For example, configuration of jboss server, artifactory address and application version could be moved to pillars:

```
application_deployed:
jboss7.deployed:
  - artifact:
      artifact_url: {{ pillar['artifactory']['url'] }}
      repository: {{ pillar['artifactory']['repository'] }}
      artifact_id: 'webcomponent'
      group_id: 'com.company.application'
      packaging: 'war'
      version: {{ pillar['webcomponent-artifact']['version'] }}
      latest_snapshot: {{ pillar['webcomponent-artifact']['latest_snapshot'] }}
      repository: {{ pillar['webcomponent-artifact']['repository'] }}
  - jboss_config: {{ pillar['jboss'] }}
```

Configuration in pillars:

```
artifactory:
  url: 'http://artifactory.intranet.company.com/artifactory'
  repository: 'libs-snapshots-local'

webcomponent-artifact:
```
For the sake of brevity, examples for each state assume that jboss_config is moved to pillars.

salt.states.jboss7.bindings_exist(name, jboss_config, bindings)
Ensures that given JNDI binding are present on the server. If a binding doesn’t exist on the server it will be created. If it already exists its value will be changed.

  jboss_config: Dict with connection properties (see state description)
  bindings: Dict with bindings to set.

Example:

jndi_entries_created:
jboss7.bindings_exist:
  - bindings:
      'java:global/sampleapp/environment': 'DEV'
      'java:global/sampleapp/configurationFile': '/var/opt/sampleapp/config.properties'
      jboss_config: {{ pillar['jboss'] }}

salt.states.jboss7.datasource_exists(name, jboss_config, datasource_properties, recreate=False)
Ensures that a datasource with given properties exist on the jboss instance. If datasource doesn’t exist, it is created, otherwise only the properties that are different will be updated.

  name: Datasource property name
  jboss_config: Dict with connection properties (see state description)
  datasource_properties: Dict with datasource properties
  recreate: [False] If set to True and datasource exists it will be removed and created again. However, if there are deployments that depend on the datasource, it will not be possible to remove it.

Example:

sampleDS:
jboss7.datasource_exists:
  - recreate: False
  - datasource_properties:
      driver-name: mysql
      connection-url: 'jdbc:mysql://localhost:3306/sampleDatabase'
      jndi-name: 'java:jboss/datasources/sampleDS'
      user-name: sampleuser
      password: secret
      min-pool-size: 3
      use-java-context: True
  jboss_config: {{ pillar['jboss'] }}

salt.states.jboss7.deployed(name, jboss_config, artifact=None, salt_source=None)
Ensures that the given application is deployed on server.

  jboss_config: Dict with connection properties (see state description)
  artifact:
    If set, the artifact will be fetched from artifactory. This is a Dict object with the following properties:
- artifactory_url: Full url to artifactory instance, for example: http://artifactory.intranet.company.com/artifactory
- repository: One of the repositories, for example: libs-snapshots, ext-release-local, etc..
- artifact_id: Artifact ID of the artifact
- group_id: Group ID of the artifact
- packaging: war/jar/ear, etc...
- version: Artifact version. If latest_snapshot is set to True, the value of this attribute will be ignored, and newest snapshot will be taken instead.
- latest_snapshot: If set to True and repository is a snapshot repository it will automatically select the newest snapshot.
- snapshot_version: Exact version of the snapshot (with timestamp). A snapshot version may have several builds and a way to differentiate is to provide a build timestamp.
- target_dir: Temporary directory on minion where artifacts will be downloaded

salt_source:

If set, the artifact to be deployed will be fetched from salt master. This is a Dict object with the following properties:

- source: File on salt master (eg. salt://application-web-0.39.war)
- target_file: Temporary file on minion to save file to (eg. `/tmp/application-web-0.39.war')
- undeploy: Regular expression to match against existing deployments. If any deployment matches the regular expression then it will be undeployed.

The deployment consists of the following steps:

- Fetch artifact (salt filesystem, artifact or filesystem on minion)
- Check if same artifact is not deployed yet (perhaps with different version)
- Undeploy the artifact if it is already deployed
- Deploy the new artifact

Examples:

Deployment of a file from Salt file system:

```python
application_deployed:
    jboss7_deployed:
        - salt_source:
            source: salt://application-web-0.39.war
            target_file: '/tmp/application-web-0.39.war'
            undeploy: 'application-web-.x'
            - jboss_config: {{ pillar['jboss'] }}
```

Here, application-web-0.39.war file is downloaded from Salt file system to /tmp/application-web-0.39.war file on minion. Existing deployments are checked if any of them matches `application-web-.x` regular expression, and if so then it is undeployed before deploying the application. This is useful to automate deployment of new application versions.

JBoss state is capable of deploying artifacts directly from Artifactory repository. Here are some examples of deployments:

1. Deployment of released version of artifact from Artifactory.
This performs the following operations:

- Download artifact from artifactory. In the example above the artifact will be fetched from: http://artifactory.intranet.company.com/artifactory/ext-release-local/com/company/application/webcomponent/0.1/webcomponent-0.1.war
  
  As a rule, for released versions the artifacts are downloaded from: artifactory_url/repository/group_id_with_slashed_instead_of_dots/artifact_id/version/artifact_id-version.packaging. This follows artifactory convention for artifact resolution. By default the artifact will be downloaded to /tmp directory on minion.

- Connect to JBoss via controller (defined in jboss_config dict) and check if the artifact is not deployed already. In case of artifactory it will check if any deployment's name starts with artifact_id value. If deployment already exists it will be undeployed.

- Deploy the downloaded artifact to JBoss via cli interface.

2. Deployment of last updated version of given SNAPSHOT version of artifact from Artifactory.

Deploying snapshot version involves an additional step of resolving the exact version of the artifact (including the timestamp), which is not necessary when deploying a release. In the example above first a request will be made to retrieve the update timestamp from: http://artifactory.intranet.company.com/artifactory/ext-snapshot-local/com/company/application/webcomponent/0.1-SNAPSHOT/maven-metadata.xml

  Then the artifact will be fetched from: http://artifactory.intranet.company.com/artifactory/ext-snapshot-local/com/company/application/webcomponent/0.1-SNAPSHOT/webcomponent-RESOLVED_SNAPSHOT_VERSION.war

**Note:** In order to perform a snapshot deployment you have to:

- Set repository to a snapshot repository.

- Choose a version that ends with ```SNAPSHOT``` string. Snapshot repositories have a different layout and provide some extra information that is needed for deployment of the last or a specific snapshot.

3. Deployment of SNAPSHOT version (with exact timestamp) of artifact from Artifactory.
If you need to deploy an exact version of the snapshot you may provide snapshot_version parameter.

```yaml
application_deployed:
    jboss7.deployed:
        - artifact:
            artifact_url: http://artifactory.intranet.company.com/artifactory
            repository: 'ext-snapshot-local'
            artifact_id: 'webcomponent'
            group_id: 'com.company.application'
            packaging: 'war'
            version: '0.1-SNAPSHOT'
            snapshot_version: '0.1-20141023.131756-19'
            jboss_config: {{ pillar['jboss'] }}
```

In this example the artifact will be retrieved from: http://artifactory.intranet.company.com/artifactory/ext-snapshot-local/com/company/application/webcomponent/0.1-SNAPSHOT/webcomponent-0.1-20141023.131756-19.war

4. Deployment of latest snapshot of artifact from Artifactory.

```yaml
application_deployed:
    jboss7.deployed:
        - artifact:
            artifact_url: http://artifactory.intranet.company.com/artifactory
            repository: 'ext-snapshot-local'
            artifact_id: 'webcomponent'
            group_id: 'com.company.application'
            packaging: 'war'
            latest_snapshot: True
            jboss_config: {{ pillar['jboss'] }}
```

Instead of providing an exact version of a snapshot it is sometimes more convenient to get the newest version. If artifact.latest_snapshot is set to True, then the newest snapshot will be downloaded from Artifactory. In this case it is not necessary to specify version. This is particularly useful when integrating with CI tools that will deploy the current snapshot to the Artifactory.

```python
salt.states.jboss7.reloaded(name, jboss_config, timeout=60, interval=5)
```

Reloads configuration of jboss server.

**jboss_config**: Dict with connection properties (see state description)

**timeout**: Time to wait until jboss is back in running state. Default timeout is 60s.

**interval**: Interval between state checks. Default interval is 5s. Decreasing the interval may slightly decrease waiting time but be aware that every status check is a call to jboss-cli which is a java process. If interval is smaller than process cleanup time it may easily lead to excessive resource consumption.

This step performs the following operations:

- Ensures that server is in running or reload-required state (by reading server-state attribute)
- Reloads configuration
- Waits for server to reload and be in running state

Example:

```yaml
configuration_reloaded:
    jboss7.reloaded:
        - jboss_config: {{ pillar['jboss'] }}
```
31.27.74 salt.states.keyboard

Management of keyboard layouts

The keyboard layout can be managed for the system:

us:
   keyboard.system

Or it can be managed for XOrg:

us:
   keyboard.xorg

`salt.states.keyboard.system(name)`
Set the keyboard layout for the system

   name  The keyboard layout to use

`salt.states.keyboard.xorg(name)`
Set the keyboard layout for XOrg

   layout  The keyboard layout to use

31.27.75 salt.states.keystone

Management of Keystone users

   depends
      • keystoneclient Python module

   configuration  See `salt.modules.keystone` for setup instructions.

Keystone tenants:
   keystone.tenant_present:
      - names:
         - admin
         - demo
         - service

Keystone roles:
   keystone.role_present:
      - names:
         - admin
         - Member

admin:
   keystone.user_present:
      - password: R00T_4CC3SS
      - email: admin@domain.com
      - roles:
         admin:  # tenants
            - admin  # roles
         service:
            - admin
            - Member
      - require:
         - keystone: Keystone tenants
- keystone: Keystone roles

nova:
  keystone.user_present:
    - password: 'Sup3rn8v4'
    - email: nova@domain.com
    - tenant: service
    - roles:
        service:
          - admin
    - require:
        - keystone: Keystone tenants
        - keystone: Keystone roles

demo:
  keystone.user_present:
    - password: 'd3m0n$trati0n'
    - email: demo@domain.com
    - tenant: demo
    - roles:
        demo:
          - Member
    - require:
        - keystone: Keystone tenants
        - keystone: Keystone roles

nova service:
  keystone.service_present:
    - name: nova
    - service_type: compute
    - description: OpenStack Compute Service

salt.states.keystone.endpoint_absent(name, profile=None, **connection_args)

Ensure that the endpoint for a service doesn't exist in Keystone catalog

name The name of the service whose endpoints should not exist

salt.states.keystone.endpoint_present(name, publicurl=None, internalurl=None, adminurl=None, region='RegionOne', profile=None, **connection_args)

Ensure the specified endpoints exists for service

name The Service name
public url The public url of service endpoint
internal url The internal url of service endpoint
admin url The admin url of the service endpoint
region The region of the endpoint

salt.states.keystone.role_absent(name, profile=None, **connection_args)

Ensure that the keystone role is absent.

name The name of the role that should not exist

salt.states.keystone.role_present(name, profile=None, **connection_args)

Ensure that the keystone role exists

name The name of the role that should be present
salt.states.keystone.**service_absent**(name, profile=None, **connection_args)
Ensure that the service doesn't exist in Keystone catalog

    name  The name of the service that should not exist

salt.states.keystone.**service_present**(name, service_type, description=None, profile=None, **connection_args)
Ensure service present in Keystone catalog

    name  The name of the service
    service_type  The type of Openstack Service
    description (optional)  Description of the service

salt.states.keystone.**tenant_absent**(name, profile=None, **connection_args)
Ensure that the keystone tenant is absent.

    name  The name of the tenant that should not exist

salt.states.keystone.**tenant_present**(name, description=None, enabled=True, profile=None, **connection_args)
Ensures that the keystone tenant exists

    name  The name of the tenant to manage
    description  The description to use for this tenant
    enabled  Availability state for this tenant

salt.states.keystone.**user_absent**(name, profile=None, **connection_args)
Ensure that the keystone user is absent.

    name  The name of the user that should not exist

salt.states.keystone.**user_present**(name, password, email, tenant=None, enabled=True, roles=None, profile=None, **connection_args)
Ensure that the keystone user is present with the specified properties.

    name  The name of the user to manage
    password  The password to use for this user
    email  The email address for this user
    tenant  The tenant for this user
    enabled  Availability state for this user
    roles  The roles the user should have under given tenants. Passed as a dictionary mapping tenant names to a list of roles in this tenant, i.e.:

        roles:
            admin:  # tenant
            - admin  # role
            service:
                - admin
                - Member

---

### 31.27.76 salt.states.kmod

**Loading and unloading of kernel modules**

The Kernel modules on a system can be managed cleanly with the kmod state module:
kvm_amd:
  kmod.present
pcspkr:
  kmod.absent

salt.states.kmod.absent(name, persist=False, comment=True)
  Verify that the named kernel module is not loaded
  name  The name of the kernel module to verify is not loaded
  persist  Delete module from /etc/modules
  comment  Don't remove module from /etc/modules, only comment it

salt.states.kmod.present(name, persist=False)
  Ensure that the specified kernel module is loaded
  name  The name of the kernel module to verify is loaded
  persist  Also add module to /etc/modules

31.27.77 salt.states.layman

Management of Gentoo Overlays using layman

A state module to manage Gentoo package overlays via layman

sunrise:
  layman.present

salt.states.layman.absent(name)
  Verify that the overlay is absent
  name  The name of the overlay to delete

salt.states.layman.present(name)
  Verify that the overlay is present
  name  The name of the overlay to add

31.27.78 salt.states.libvirt

Manage libvirt certificates

This state uses the external pillar in the master to call for the generation and signing of certificates for systems running libvirt:

libvirt_keys:
  libvirt.keys

salt.states.libvirt.keys(name, basepath=/etc/pki)
  Manage libvirt keys.
  name  The name variable used to track the execution
  basepath  Defaults to /etc/pki, this is the root location used for libvirt keys on the hypervisor
31.27.79 salt.states.linux_acl

Linux File Access Control Lists

Ensure a Linux ACL is present

```yaml
class 'root':
    acl.present:
        - name: /root
        - acl_type: users
        - acl_name: damian
        - perms: rwx
```

Ensure a Linux ACL does not exist

```yaml
class 'root':
    acl.absent:
        - name: /root
        - acl_type: user
        - acl_name: damian
        - perms: rwx
```

`salt.states.linux_acl.absent(name, acl_type, acl_name='', perms='', recurse=False)`
Ensure a Linux ACL does not exist

`salt.states.linux_acl.present(name, acl_type, acl_name='', perms='', recurse=False)`
Ensure a Linux ACL is present

31.27.80 salt.states.locale

Management of languages/locales

Manage the available locales and the system default:

```yaml
default_locale:
    locale.system:
        - name: en_US.UTF-8
        - require:
            - locale: us_locale
```

```yaml
us_locale:
    locale.present:
        - name: en_US.UTF-8
```

`salt.states.locale.present(name)`
Generate a locale if it is not present

New in version 2014.7.0.

- `name` The name of the locale to be present. Some distributions require the charmap to be specified as part of the locale at this point.

`salt.states.locale.system(name)`
Set the locale for the system

- `name` The name of the locale to use
31.27.81 salt.states.lvm

Management of Linux logical volumes

A state module to manage LVMs

```
/dev/sda:
    lvm.pv_present

my_vg:
    lvm.vg_present:
        - devices: /dev/sda

lvroot:
    lvm.lv_present:
        - vgname: my_vg
        - size: 10G
        - stripes: 5
        - stripesize: 8K
```

**salt.states.lvm.lv_absent**(name, vgname=None)
Remove a given existing logical volume from a named existing volume group

- `name` The logical volume to remove
- `vgname` The volume group name

**salt.states.lvm.lv_present**(name, vgname=None, size=None, extents=None, snapshot=None, pv=", **kwargs)
Create a new logical volume

- `name` The name of the logical volume
- `vgname` The volume group name for this logical volume
- `size` The initial size of the logical volume
- `extents` The number of logical extents to allocate
- `snapshot` The name of the snapshot
- `pv` The physical volume to use
- `kwargs` Any supported options to lvcreate. See `linux_lvm` for more details.

**salt.states.lvm.pv_absent**(name)
Ensure that a Physical Device is not being used by lvm

- `name` The device name to initialize.

**salt.states.lvm.pv_present**(name, **kwargs)
Set a physical device to be used as an LVM physical volume

- `name` The device name to initialize.
- `kwargs` Any supported options to pvcreate. See `linux_lvm` for more details.

**salt.states.lvm.vg_absent**(name)
Remove an LVM volume group

- `name` The volume group to remove

**salt.states.lvm.vg_present**(name, devices=None, **kwargs)
Create an LVM volume group
name The volume group name to create

devices A list of devices that will be added to the volume group

kwargs Any supported options to vgcreate. See `linux_lvm` for more details.

31.27.82 salt.states.lvs_server

Management of LVS (Linux Virtual Server) Real Server

```
salt.states.lvs_server.absent(name, protocol=None, service_address=None, server_address=None)
```

Ensure the LVS Real Server in specified service is absent.

- **name** The name of the LVS server.
- **protocol** The service protocol (only support `tcp`, `udp` and `fwmark` service).
- **service_address** The LVS service address.
- **server_address** The LVS real server address.

```
salt.states.lvs_server.present(name, protocol=None, service_address=None, server_address=None, packet_forward_method='dr', weight=1)
```

Ensure that the named service is present.

- **name** The LVS server name
- **protocol** The service protocol
- **service_address** The LVS service address
- **server_address** The real server address.
- **packet_forward_method** The LVS packet forwarding method (`dr` for direct routing, `tunnel` for tunneling, `nat` for network access translation).
- **weight** The capacity of a server relative to the others in the pool.

```
.lvrs:
  lvs_server.present:
    - protocol: tcp
    - service_address: 1.1.1.1:80
    - server_address: 192.168.0.11:8080
    - packet_forward_method: dr
    - weight: 10
```

31.27.83 salt.states.lvs_service

Management of LVS (Linux Virtual Server) Service

```
salt.states.lvs_service.absent(name, protocol=None, service_address=None)
```

Ensure the LVS service is absent.

- **name** The name of the LVS service
- **protocol** The service protocol
- **service_address** The LVS service address
salt.states.lvs_service.present(name, protocol=None, service_address=None, scheduler='wlc')

Ensure that the named service is present.

name  The LVS service name
protocol  The service protocol
service_address  The LVS service address
scheduler  Algorithm for allocating TCP connections and UDP datagrams to real servers.

```
lvstest:
  lvs_service.present:
    - service_address: 1.1.1.1:80
    - protocol: tcp
    - scheduler: rr
```

31.27.84 salt.states.lxc

Manage Linux Containers

class lxc_absent:

salt.states.lxc.absent(name, stop=False, path=None)

Ensure a container is not present, destroying it if present

name  Name of the container to destroy
stop  stop before destroying default: false

New in version 2015.5.2.

path  path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

```
web01:
  lxc.absent
```

class lxc_cloned:

salt.states.lxc.cloned(name, orig, snapshot=True, size=None, vgname=None, path=None, profile=None)

Deprecated since version 2015.5.0: Use lxc.present

salt.states.lxc.created(name, **kwargs)

Deprecated since version 2015.5.0: Use lxc.present

salt.states.lxc.edited_conf(name, lxc_conf=None, lxc_conf_unset=None)

Warning: This state is unsuitable for setting parameters that appear more than once in an LXC config file, or parameters which must appear in a certain order (such as when configuring more than one network interface). It is slated to be replaced, and as of version 2015.5.0 it is deprecated.

Edit LXC configuration options

path  path to the container parent default: /var/lib/lxc (system default)

New in version 2015.8.0.

```
setconf:
  lxc.edited_conf:
    - name: ubuntu
      lxc_conf:
        - network.ipv4.ip: 10.0.3.6
```
- lxc_conf_unset:
  - lxc.utsname

salt.states.lxc.frozen(name, start=True, path=None)

New in version 2015.5.0.
Ensure that a container is frozen

**Note:** This state does not enforce the existence of the named container, it just freezes the container if it is running. To ensure that the named container exists, use `lxc.present`.

<table>
<thead>
<tr>
<th>name</th>
<th>The name of the container</th>
</tr>
</thead>
<tbody>
<tr>
<td>path</td>
<td>path to the container parent default: /var/lib/lxc (system default)</td>
</tr>
<tr>
<td>start</td>
<td>[True] Start container first, if necessary. If False, then this state will fail if the container is not running.</td>
</tr>
</tbody>
</table>

```
web01:
  lxc.frozen
web02:
  lxc.frozen:
    - start: False
```

salt.states.lxc.present(name, running=None, clone_from=None, snapshot=False, profile=None, network_profile=None, template=None, config=None, fstype=None, size=None, backing=None, vgname=None, lvname=None, path=None)

Changed in version 2015.8.0: The `lxc.created` state has been renamed to `lxc.present`, and the `lxc.cloned` state has been merged into this state.

Create the named container if it does not exist

<table>
<thead>
<tr>
<th>name</th>
<th>The name of the container to be created</th>
</tr>
</thead>
<tbody>
<tr>
<td>path</td>
<td>path to the container parent default: /var/lib/lxc (system default)</td>
</tr>
<tr>
<td>running</td>
<td>[False]</td>
</tr>
<tr>
<td></td>
<td>• If True, ensure that the container is running</td>
</tr>
<tr>
<td></td>
<td>• If False, ensure that the container is stopped</td>
</tr>
<tr>
<td></td>
<td>• If None, do nothing with regards to the running state of the container</td>
</tr>
</tbody>
</table>

New in version 2015.8.0.

| clone_from | Create named container as a clone of the specified container |
| snapshot   | [False] Use Copy On Write snapshots (LVM). Only supported with clone_from. |
| profile    | Profile to use in container creation (see the LXC Tutorial for more information). Values in a profile will be overridden by the parameters listed below. |
| network_profile | Network Profile to use in container creation (see the LXC Tutorial for more information). Values in a profile will be overridden by the parameters listed below. |

New in version 2015.5.2.
Container Creation Arguments

**template**  The template to use. E.g., `ubuntu` or `fedora`. Conflicts with the `image` argument.

**Note:** The **download** template requires the following three parameters to be defined in `options`:
- `dist` - The name of the distribution
- `release` - Release name/version
- `arch` - Architecture of the container

The available images can be listed using the `lxc.images` function.

**options**

New in version 2015.5.0.

Template-specific options to pass to the lxc-create command. These correspond to the long options (ones beginning with two dashes) that the template script accepts. For example:

```
web01:
  lxc.present:
    - template: download
    - options:
      dist: centos
      release: 6
      arch: amd64
```

Remember to double-indent the options, due to *how PyYAML works*.

**image**  A tar archive to use as the rootfs for the container. Conflicts with the `template` argument.

**backing**  The type of storage to use. Set to `lvm` to use an LVM group. Defaults to filesystem within `/var/lib/lxc`.

**fstype**  Filesystem type to use on LVM logical volume

**size**  Size of the volume to create. Only applicable if `backing` is set to `lvm`.

**vgname**  [lxc] Name of the LVM volume group in which to create the volume for this container. Only applicable if `backing` is set to `lvm`.

**lvname**  Name of the LVM logical volume in which to create the volume for this container. Only applicable if `backing` is set to `lvm`.

**salt.states.lxc.running(name, restart=False, path=None)**

Changed in version 2015.5.0: The `lxc.started` state has been renamed to `lxc.running`.

Ensure that a container is running

**Note:** This state does not enforce the existence of the named container, it just starts the container if it is not running. To ensure that the named container exists, use `lxc.present`.

**name**  The name of the container

**path**  path to the container parent default: `/var/lib/lxc` (system default)

   New in version 2015.8.0.

**restart**  [False] Restart container if it is already running
salt.states.lxc.set_pass(name, **kwargs)
    Deprecated since version 2015.5.0.
    This state function has been disabled, as it did not conform to design guidelines. Specifically, due to the fact that
    lxc.set_password uses chpasswd(8) to set the password, there was no method to make this action
    idempotent (in other words, the password would be changed every time). This makes this state redundant,
    since the following state will do the same thing:

    ```
    setpass:
        module.run:
            - name: set_pass
            - m_name: root
            - password: secret
    ```

salt.states.lxc.started(name, path=None, restart=False)
    Deprecated since version 2015.5.0: Use lxc.running

salt.states.lxc.stopped(name, kill=False, path=None)
    Ensure that a container is stopped

    **Note:** This state does not enforce the existence of the named container, it just stops the container if it running
    or frozen. To ensure that the named container exists, use lxc.present, or use the lxc.absent state to
    ensure that the container does not exist.

    **name**  The name of the container
    **path**  path to the container parent default: /var/lib/lxc (system default)
      New in version 2015.8.0.
    **kill**  [False] Do not wait for the container to stop, kill all tasks in the container. Older LXC versions will stop
    containers like this irrespective of this argument.
      New in version 2015.5.0.

web01:
    lxc.stopped

31.27.85  salt.states.makeconf

Management of Gentoo make.conf

A state module to manage Gentoo’s make.conf file

makeopts:
    makeconf.present:
        - value: '-j3'

salt.states.makeconf.absent(name)
    Verify that the variable is not in the make.conf.
name  The variable name. This will automatically be converted to upper case since variables in make.conf are in upper case

```
salt.states.makeconf.present(name, value=None, contains=None, excludes=None)
```
Verify that the variable is in the make.conf and has the provided settings. If value is set, contains and excludes will be ignored.

- **name**  The variable name. This will automatically be converted to upper case since variables in make.conf are in upper case
- **value**  Enforce that the value of the variable is set to the provided value
- **contains**  Enforce that the value of the variable contains the provided value
- **excludes**  Enforce that the value of the variable does not contain the provided value.

### 31.27.86  salt.states.mdadm

**Managing software RAID with mdadm**

A state module for creating or destroying software RAID devices.

```
/dev/md0:
    raid.present:
      - level: 5
      - devices:
        - /dev/xvdd
        - /dev/xvde
        - /dev/xvdf
      - chunk: 256
      - run: True
```

```
salt.states.mdadm.absent(name)
```
Verify that the raid is absent

- **name**  The name of raid device to be destroyed

```
/dev/md0:
    raid:
      - absent
```

```
salt.states.mdadm.present(name, level, devices, **kwargs)
```
Verify that the raid is present

Changed in version 2014.7.0.

- **name**  The name of raid device to be created
- **level**  The RAID level to use when creating the raid.
- **devices**  A list of devices used to build the array.

Example:

```
/dev/md0:
    raid.present:
      - level: 5
      - devices:
        - /dev/xvdd
        - /dev/xvde
        - /dev/xvdf
```
31.27.87  salt.states.memcached

States for Management of Memcached Keys

New in version 2014.1.0.

salt.states.memcached.absent(name, value=None, host='127.0.0.1', port=11211, time=0)
   Ensure that a memcached key is not present.
   name  The key
   value [None] If specified, only ensure that the key is absent if it matches the specified value.
   host  The memcached server IP address
   port  The memcached server port

foo:
   memcached.absent

bar:
   memcached.absent:
      - host: 10.0.0.1

salt.states.memcached.managed(name, value=None, host='127.0.0.1', port=11211, time=0, min_compress_len=0)
   Manage a memcached key.
   name  The key to manage
   value  The value to set for that key
   host  The memcached server IP address
   port  The memcached server port

   foo:
      memcached.managed:
         - value: bar

31.27.88  salt.states.modjk

State to control Apache modjk

salt.states.modjk.worker_activated(name, workers=None, profile='default')
   Activate all the workers in the modjk load balancer

   Example:

   loadbalancer:
      modjk.worker_activated:
         - workers:
            - app1
            - app2
salt.states.modjk\texttt{.worker\_disabled}(name, workers=None, profile='default')

Disable all the workers in the modjk load balancer

Example:

```
loadbalancer:
  modjk.worker\_disabled:
    - workers:
      - app1
      - app2
```

salt.states.modjk\texttt{.worker\_recover}(name, workers=None, profile='default')

Recover all the workers in the modjk load balancer

Example:

```
loadbalancer:
  modjk.worker\_recover:
    - workers:
      - app1
      - app2
```

salt.states.modjk\texttt{.worker\_stopped}(name, workers=None, profile='default')

Stop all the workers in the modjk load balancer

Example:

```
loadbalancer:
  modjk.worker\_stopped:
    - workers:
      - app1
      - app2
```

31.27.89 salt.states.modjk\_worker

Manage modjk workers

Send commands to a modjk load balancer via the peer system.

This module can be used with the \texttt{prereq} requisite to remove/add the worker from the load balancer before deploying/restarting service.

Mandatory Settings:

- The minion needs to have permission to publish the \texttt{modjk.*} functions (see \texttt{here} for information on configuring peer publishing permissions)
- The modjk load balancer must be configured as stated in the \texttt{modjk} execution module \texttt{documentation}

salt.states.modjk\_worker\texttt{.activate}(name, lbn, target, profile='default', expr\_form='glob')

Activate the named worker from the lbn load balancers at the targeted minions

Example:

```
disable\_before\_deploy:
  modjk\_worker\_activate:
    - name: {{\ grains['id'] }}
    - lbn: application
    - target: 'roles:balancer'
    - expr\_form: grain
```
salt.states.modjk_worker.enable(name, lbn, target, profile='default', expr_form='glob')

Disable the named worker from the lbn load balancers at the targeted minions. The worker will get traffic only for current sessions and won't get new ones.

Example:

```python
disable-before-deploy:
    modjk_worker.enable:
        - name: {{ grains['id'] }}
        - lbn: application
        - target: 'roles:balancer'
        - expr_form: grain
```

salt.states.modjk_worker.stop(name, lbn, target, profile='default', expr_form='glob')

Stop the named worker from the lbn load balancers at the targeted minions. The worker won't get any traffic from the lbn.

Example:

```python
disable-before-deploy:
    modjk_worker.stop:
        - name: {{ grains['id'] }}
        - lbn: application
        - target: 'roles:balancer'
        - expr_form: grain
```

31.27.90 salt.states.module

Execution of Salt modules from within states

These states allow individual execution module calls to be made via states. To call a single module function use a module.run state:

```python
mine.send:
    module.run:
        - name: network.interfaces
```

Note that this example is probably unnecessary to use in practice, since the mine_functions and mine_interval config parameters can be used to schedule updates for the mine (see here for more info).

It is sometimes desirable to trigger a function call after a state is executed, for this the module.wait state can be used:

```python
mine.send:
    module.wait:
        - name: network.interfaces
        - watch:
            - file: /etc/network/interfaces
```

All arguments that the module state does not consume are passed through to the execution module function being executed:

```python
fetch_out_of_band:
    module.run:
        - name: git.fetch
        - cwd: /path/to/my/repo
        - user: myuser
        - opts: '--all'
```
Due to how the state system works, if a module function accepts an argument called, name, then m_name must be used to specify that argument, to avoid a collision with the name argument.

Here is a list of keywords hidden by the state system, which must be prefixed with m_: * fun * name * names * state

For example:

```yaml
disable_nfs:
  module.run:
    - name: service.disable
    - m_name: nfs
```

Note that some modules read all or some of the arguments from a list of keyword arguments. For example:

```yaml
mine.send:
  module.run:
    - func: network.ip_addrs
    - kwargs:
        interface: eth0
```

cloud.create: module.run: - func: cloud.create - provider: test-provider - m_names:

- test-vlad

salt.states.module.mod_watch(name, **kwargs)
  Run a single module function
  name The module function to execute
  returner Specify the returner to send the return of the module execution to
  **kwargs Pass any arguments needed to execute the function

salt.states.module.run(name, **kwargs)
  Run a single module function
  name The module function to execute
  returner Specify the returner to send the return of the module execution to
  **kwargs Pass any arguments needed to execute the function

salt.states.module.wait(name, **kwargs)
  Run a single module function only if the watch statement calls it
  name The module function to execute
  **kwargs Pass any arguments needed to execute the function

Note: Like the cmd.run state, this state will return True but not actually execute, unless one of the following two things happens:

1. The state has a watch requisite, and the state which it is watching changes.
2. Another state has a watch_in requisite which references this state, and the state wth the watch_in changes.
31.27.91 salt.states.mongodb_database

Management of Mongodb databases

Only deletion is supported, creation doesn't make sense and can be done using mongodb_user.present

```python
salt.states.mongodb_database.absent(name, user=None, password=None, host=None, port=None)
```

Ensure that the named database is absent

- **name**: The name of the database to remove
- **user**: The user to connect as (must be able to create the user)
- **password**: The password of the user
- **host**: The host to connect to
- **port**: The port to connect to

31.27.92 salt.states.mongodb_user

Management of Mongodb users

**Note:** This module requires PyMongo to be installed.

```python
salt.states.mongodb_user.absent(name, user=None, password=None, host=None, port=None, database='admin')
```

Ensure that the named user is absent

- **name**: The name of the user to remove
- **user**: MongoDB user with sufficient privilege to create the user
- **password**: Password for the admin user specified by the **user** parameter
- **host**: The hostname/IP address of the MongoDB server
- **port**: The port on which MongoDB is listening
- **database**: The database from which to remove the user specified by the **name** parameter

```python
salt.states.mongodb_user.present(name, passwd, database='admin', user=None, password=None, host='localhost', port=27017)
```

Ensure that the user is present with the specified properties

- **name**: The name of the user to manage
- **passwd**: The password of the user to manage
- **user**: MongoDB user with sufficient privilege to create the user
- **password**: Password for the admin user specified with the **user** parameter
- **host**: The hostname/IP address of the MongoDB server
- **port**: The port on which MongoDB is listening
- **database**: The database in which to create the user

**Note:** If the database doesn't exist, it will be created.

Example:
mongouser-myapp:
    mongodb_user.present:
    - name: myapp
    - passwd: password-of-myapp
    # Connect as admin:sekrit
    - user: admin
    - password: sekrit

31.27.93  salt.states.monit

Monit state

Manage monit states

monit_enable_service_monitoring:
    monit.monitor:
        - name: service

monit_disable_service_monitoring:
    monit.unmonitor:
        - name: service

Note: Use of these states require that the monit execution module is available.

salt.states.monit.monitor(name)
    Get the summary from module monit and try to see if service is being monitored. If not then monitor the service.
	salt.states.monit.unmonitor(name)
    Get the summary from module monit and try to see if service is being monitored. If it is then stop monitoring the service.

31.27.94  salt.states.mount

Mounting of filesystems

Mount any type of mountable filesystem with the mounted function:

/mnt/sdb:
    mount.mounted:
        - device: /dev/sdb1
        - fstype: ext4
        - mkmnt: True
        - opts: 
            - defaults

/srv/bigdata:
    mount.mounted:
        - device: UUID=066e0200-2867-4ebe-b9e6-f30026ca2314
        - fstype: xfs
        - opts: nobootwait,noatime,nodiratime,nobarrier,logbufs=8
salt.states.mount.mod_watch(name, user=None, **kwargs)
    The mounted watcher, called to invoke the watch command.
    name The name of the mount point

salt.states.mount.mounted(name, device, fstype, mkmnt=False, opts='defaults', dump=0, pass_num=0, config='/etc/fstab', persist=True, mount=True, user=None, match_on='auto')
    Verify that a device is mounted
    name The path to the location where the device is to be mounted
    device The device name, typically the device node, such as /dev/sdb1 or UUID=066e0200-2867-4ebe-b9e6-f30026ca2314 or LABEL=DATA
    fstype The filesystem type, this will be xfs, ext2/3/4 in the case of classic filesystems, and fuse in the case of fuse mounts
    mkmnt If the mount point is not present then the state will fail, set mkmnt: True to create the mount point if it is otherwise not present
    opts A list object of options or a comma delimited list
    dump The dump value to be passed into the fstab, Default is 0
    pass_num The pass value to be passed into the fstab, Default is 0
    config Set an alternative location for the fstab, Default is /etc/fstab
    persist Set if the mount should be saved in the fstab, Default is True
    mount Set if the mount should be mounted immediately, Default is True
    user The user to own the mount; this defaults to the user salt is running as on the minion
    match_on A name or list of fstab properties on which this state should be applied. Default is auto, a special value indicating to guess based on fstype. In general, auto matches on name for recognized special devices and device otherwise.

salt.states.mount.swap(name, persist=True, config='''/etc/fstab''')
    Activates a swap device
    /root/swapfile:
    mount.swap

Note: swap does not currently support LABEL

salt.states.mount.unmounted(name, device, config='''/etc/fstab''', persist=False, user=None)
    New in version 0.17.0.
    Verify that a device is not mounted
    name The path to the location where the device is to be unmounted from
    New in version 2015.5.0.
    device The device to be unmounted.
    config Set an alternative location for the fstab, Default is /etc/fstab
persist Set if the mount should be purged from the fstab, Default is False
user The user to own the mount; this defaults to the user salt is running as on the minion

31.27.95 salt.states.mysql_database

Management of MySQL databases (schemas)

depends
  • MySQLdb Python module

configuration See salt.modules.mysql for setup instructions.

The mysql_database module is used to create and manage MySQL databases. Databases can be set as either absent or present.

frank:
  mysql_database.present

salt.states.mysql_database.absent(name, "connection_args")
  Ensure that the named database is absent
  name The name of the database to remove

salt.states.mysql_database.present(name, "connection_args")
  Ensure that the named database is present with the specified properties
  name The name of the database to manage

31.27.96 salt.states.mysql_grants

Management of MySQL grants (user permissions)

depends
  • MySQLdb Python module

configuration See salt.modules.mysql for setup instructions.

The mysql_grants module is used to grant and revoke MySQL permissions.

The name you pass in purely symbolic and does not have anything to do with the grant itself.

The database parameter needs to specify a `priv_level` in the same specification as defined in the MySQL documentation:

  • *
  • **
  • db_name.*
  • db_name.tbl_name
  • etc...

This state is not able to set password for the permission from the specified host. See salt.states.mysql_user for further instructions.
frank_exampledb:
  mysql_grants.present:
  - grant: select, insert, update
  - database: exampledb.*
  - user: frank
  - host: localhost

frank_otherdb:
  mysql_grants.present:
  - grant: all privileges
  - database: otherdb.*
  - user: frank

restricted_singletable:
  mysql_grants.present:
  - grant: select
  - database: somedb.sometable
  - user: joe

salt.states.mysql_grants.absent(name, grant=None, database=None, user=None, host='localhost',
                                   grant_option=False, escape=True, **connection_args)

Ensure that the grant is absent

name  The name (key) of the grant to add
grant  The grant priv_type (i.e. select, insert, update OR all privileges)
database  The database priv_level (i.e. db.tbl OR db.*)
user  The user to apply the grant to
host  The network/host that the grant should apply to

salt.states.mysql_grants.present(name, grant=None, database=None, user=None, host='localhost',
                                   grant_option=False, escape=True, revoke_first=False, ssl_option=False, **connection_args)

Ensure that the grant is present with the specified properties

name  The name (key) of the grant to add
grant  The grant priv_type (i.e. select, insert, update OR all privileges)
database  The database priv_level (i.e. db.tbl OR db.*)
user  The user to apply the grant to
host  The network/host that the grant should apply to

grant_option  Adds the WITH GRANT OPTION to the defined grant. Default is False
escape  Defines if the database value gets escaped or not. Default is True
revoke_first  By default, MySQL will not do anything if you issue a command to grant privileges that are more restrictive than what’s already in place. This effectively means that you cannot downgrade permissions without first revoking permissions applied to a db.table/user pair first.

To have Salt forcibly revoke perms before applying a new grant, enable the `revoke_first` options.

WARNING: This will remove permissions for a database before attempting to apply new permissions. There is no guarantee that new permissions will be applied correctly which can leave your database security in an unknown and potentially dangerous state. Use with caution!

Default is False
ssl_option  Adds the specified ssl options for the connecting user as requirements for this grant. Value is a list
of single-element dicts corresponding to the list of ssl options to use.

Possible key/value pairings for the dicts in the value:

- SSL: True
- X509: True
- SUBJECT: <subject>
- ISSUER: <issuer>
- CIPHER: <cipher>

The non-boolean ssl options take a string as their values, which should be an appropriate value as specified
by the MySQL documentation for these options.

Default is False (no ssl options will be used)

31.27.97  salt.states.mysql_query

Execution of MySQL queries

New in version 2014.7.0.

depends

- MySQLdb Python module

configuration  See salt.modules.mysql for setup instructions.

The mysql_query module is used to execute queries on MySQL databases. Its output may be stored in a file or in a
grain.

query_id:

```python
mysql_query.run
  - database: my_database
  - query: "SELECT * FROM table;"
  - output: "/tmp/query_id.txt"
```

salt.states.mysql_query.run(name, database, query, output=None, grain=None, key=None, overwrite=True, **connection_args)

Execute an arbitrary query on the specified database

name  Used only as an ID

database  The name of the database to execute the query on

query  The query to execute

output  grain: output in a grain other: the file to store results None: output to the result comment (default)

grain:  grain to store the output (need output=grain)

key:  the specified grain will be treated as a dictionary, the result of this state will be stored under the specified

overwrite:  The file or grain will be overwritten if it already exists (default)
31.27.98  salt.states.mysql_user

Management of MySQL users

depends

- MySQLdb Python module

configuration  See salt.modules.mysql for setup instructions.

frank:
  mysql_user.present:
    - host: localhost
    - password: bobcat

New in version 0.16.2: Authentication overrides have been added.

The MySQL authentication information specified in the minion config file can be overridden in states using the following arguments: `connection_host`, `connection_port`, `connection_user`, `connection_pass`, `connection_db`, `connection_unix_socket`, `connection_default_file` and `connection_charset`.

frank:
  mysql_user.present:
    - host: localhost
    - password: "bob@cat"
    - connection_user: someuser
    - connection_pass: somepass
    - connection_charset: utf8
    - saltenv:
      - LC_ALL: "en_US.utf8"

This state is not able to grant permissions for the user. See salt.states.mysql_grants for further instructions.

salt.states.mysql_user.absent(name, host='localhost', **connection_args)

Ensure that the named user is absent

   name  The name of the user to remove

salt.states.mysql_user.present(name, host='localhost', password=None, password_hash=None, allow_passwordless=False, unix_socket=False, **connection_args)

Ensure that the named user is present with the specified properties. A passwordless user can be configured by omitting `password` and `password_hash`, and setting `allow_passwordless` to True.

   name  The name of the user to manage

   host  Host for which this user/password combo applies

   password  The password to use for this user. Will take precedence over the `password_hash` option if both are specified.

   password_hash  The password in hashed form. Be sure to quote the password because YAML doesn't like the `*`. A password hash can be obtained from the mysql command-line client like so:

```
mysql> SELECT PASSWORD('mypass');
+-------------------------------------------+
| PASSWORD('mypass') |
+-------------------------------------------+
| *6C8989366AEF75BB678AD8EAA7A7FC1176A95CEF4 |
+-------------------------------------------+

1 row in set (0.00 sec)
```
allow_passwordless  If True, then password and password_hash can be omitted to permit a passwordless login.

New in version 0.16.2.

unix_socket  If True and allow_passwordless is True, the unix_socket auth plugin will be used.

31.27.99  salt.states.network

Configuration of network interfaces

The network module is used to create and manage network settings, interfaces can be set as either managed or ignored. By default all interfaces are ignored unless specified.

Note: Prior to version 2014.1.0, only RedHat-based systems (RHEL, CentOS, Scientific Linux, etc.) are supported. Support for Debian/Ubuntu is new in 2014.1.0 and should be considered experimental.

Other platforms are not yet supported.

system:
    network.system:
        - enabled: True
        - hostname: server1.example.com
        - gateway: 192.168.0.1
        - gatewaydev: eth0
        - nozeroconf: True
        - nisdomain: example.com
        - require_reboot: True

eth0:
    network.managed:
        - enabled: True
        - type: eth
        - proto: none
        - ipaddr: 10.1.0.1
        - netmask: 255.255.255.0
        - dns:
            - 8.8.8.8
            - 8.8.4.4

eth0-range0:
    network.managed:
        - type: eth
        - ipaddr_start: 192.168.1.1
        - ipaddr_end: 192.168.1.10
        - clonenum_start: 10
        - mtu: 9000

bond0-range0:
    network.managed:
        - type: eth
        - ipaddr_start: 192.168.1.1
        - ipaddr_end: 192.168.1.10
        - clonenum_start: 10
        - mtu: 9000
eth1.0-range0:
  network.managed:
  - type: eth
  - ipaddr_start: 192.168.1.1
  - ipaddr_end: 192.168.1.10
  - clonenum_start: 10
  - vlan: True
  - mtu: 9000

bond0.1-range0:
  network.managed:
  - type: eth
  - ipaddr_start: 192.168.1.1
  - ipaddr_end: 192.168.1.10
  - clonenum_start: 10
  - vlan: True
  - mtu: 9000

.. note::
  add support of ranged interfaces (vlan, bond and eth) for redhat system,
  Important:type must be eth.

routes:
  network.routes:
  - name: eth0
  - routes:
    - name: secure_network
      ipaddr: 10.2.0.0
      netmask: 255.255.255.0
      gateway: 10.1.0.3
    - name: HQ_network
      ipaddr: 10.100.0.0
      netmask: 255.255.0.0
      gateway: 10.1.0.10

eth2:
  network.managed:
  - enabled: True
  - type: slave
  - master: bond0

eth3:
  network.managed:
  - enabled: True
  - type: slave
  - master: bond0

eth4:
  network.managed:
  - enabled: True
  - type: eth
  - proto: dhcp
  - bridge: br0

bond0:
  network.managed:
  - type: bond
  - ipaddr: 10.1.0.1
- netmask: 255.255.255.0
- mode: active-backup
- proto: static
- dns:
  - 8.8.8.8
  - 8.8.4.4
- ipv6:
  - enabled: False
- slaves: eth2 eth3
- require:
  - network: eth2
  - network: eth3
- miimon: 100
- arp_interval: 250
- downdelay: 200
- lacp_rate: fast
- max_bonds: 1
- updelay: 0
- use_carrier: on
- xmit_hash_policy: layer2
- mtu: 9000
- autoneg: on
- speed: 1000
- duplex: full
- rx: on
- tx: off
- sg: on
- tso: off
- ufo: off
- gso: off
- gro: off
- lro: off

bond0.2:
  network.managed:
  - type: vlan
  - ipaddr: 10.1.0.2
  - use:
    - network: bond0
  - require:
    - network: bond0

bond0.3:
  network.managed:
  - type: vlan
  - ipaddr: 10.1.0.3
  - use:
    - network: bond0
  - require:
    - network: bond0

bond0.10:
  network.managed:
  - type: vlan
  - ipaddr: 10.1.0.4
  - use:
    - network: bond0
  - require:
- network: bond0

bond0.12:
  network.managed:
    - type: vlan
    - ipaddr: 10.1.0.5
    - use:
      - network: bond0
    - require:
      - network: bond0

br0:
  network.managed:
    - enabled: True
    - type: bridge
    - proto: dhcp
    - bridge: br0
    - delay: 0
    - ports: eth4
    - bypassfirewall: True
    - use:
      - network: eth4
    - require:
      - network: eth4

system:
  network.system:
    - enabled: True
    - hostname: server1.example.com
    - gateway: 192.168.0.1
    - gatewaydev: eth0
    - nozeroconf: True
    - nisdomain: example.com
    - require_reboot: True
    - apply_hostname: True

.. note::
   Apply changes to hostname immediately.

.. versionadded:: 2015.5.0

Note: When managing bridged interfaces on a Debian or Ubuntu based system, the ports argument is required. Red Hat systems will ignore the argument.

salt.states.network.managed(name, type, enabled=True, **kwargs)
Ensure that the named interface is configured properly.

    name  The name of the interface to manage
    type  Type of interface and configuration.
    enabled  Designates the state of this interface.
    kwargs  The IP parameters for this interface.

salt.states.network.routes(name, **kwargs)
Manage network interface static routes.

    name  Interface name to apply the route to.
    kwargs  Named routes
salt.states.network.system(name, **kwargs)
    Ensure that global network settings are configured properly.
    
    name  Custom name to represent this configuration change.
    
    kwargs  The global parameters for the system.

31.27.100 salt.states.nftables

Management of nftables

This is an nftables-specific module designed to manage Linux firewalls. It is expected that this state module, and other system-specific firewall states, may at some point be deprecated in favor of a more generic firewall state.

httpd:
    nftables.append:
        - table: filter
        - chain: input
        - jump: accept
        - match: state
        - connstate: new
        - dport: 80
        - proto: tcp
        - sport: 1025:65535
        - save: True

httpd:
    nftables.append:
        - table: filter
        - family: ipv6
        - chain: INPUT
        - jump: ACCEPT
        - match: state
        - connstate: NEW
        - dport: 80
        - proto: tcp
        - sport: 1025:65535
        - save: True

httpd:
    nftables.insert:
        - position: 1
        - table: filter
        - chain: INPUT
        - jump: ACCEPT
        - match: state
        - connstate: NEW
        - dport: 80
        - proto: tcp
        - sport: 1025:65535
        - save: True

httpd:
    nftables.insert:
        - position: 1
        - table: filter
        - family: ipv6
        - chain: INPUT
- jump: ACCEPT
  - match: state
  - connstate: NEW
  - dport: 80
  - proto: tcp
  - sport: 1025:65535
  - save: True

httpd:
  nftables.delete:
    - table: filter
    - chain: INPUT
    - jump: ACCEPT
    - match: state
    - connstate: NEW
    - dport: 80
    - proto: tcp
    - sport: 1025:65535
    - save: True

httpd:
  nftables.delete:
    - position: 1
    - table: filter
    - chain: INPUT
    - jump: ACCEPT
    - match: state
    - connstate: NEW
    - dport: 80
    - proto: tcp
    - sport: 1025:65535
    - save: True

httpd:
  nftables.delete:
    - table: filter
    - family: ipv6
    - chain: INPUT
    - jump: ACCEPT
    - match: state
    - connstate: NEW
    - dport: 80
    - proto: tcp
    - sport: 1025:65535
    - save: True

salt.states.nftables.append(name, family='ipv4', **kwargs)

New in version 0.17.0.

Append a rule to a chain

name A user-defined name to call this rule by in another part of a state or formula. This should not be an actual rule.

family Network family, ipv4 or ipv6.

All other arguments are passed in with the same name as the long option that would normally be used for nftables, with one exception: --state is specified as connstate instead of state (not to be confused with ctstate).

salt.states.nftables.chain_absent(name, table='filter', family='ipv4')
New in version 2014.7.0.
Verify the chain is absent.

family Networking family, either ipv4 or ipv6

`salt.states.nftables.chain_present(name, table='filter', table_type=None, hook=None, priority=None, family='ipv4')`

New in version 2014.7.0.
Verify the chain is exist.

name A user-defined chain name.

family Networking family, either ipv4 or ipv6

`salt.states.nftables.delete(name, family='ipv4', **kwargs)`

New in version 2014.7.0.
Delete a rule to a chain

name A user-defined name to call this rule by in another part of a state or formula. This should not be an actual rule.

family Networking family, either ipv4 or ipv6

All other arguments are passed in with the same name as the long option that would normally be used for nftables, with one exception: --state is specified as connstate instead of state (not to be confused with ctstate).

`salt.states.nftables.flush(name, family='ipv4', **kwargs)`

New in version 2014.7.0.
Flush current nftables state

family Networking family, either ipv4 or ipv6

`salt.states.nftables.insert(name, family='ipv4', **kwargs)`

New in version 2014.7.0.
Insert a rule into a chain

name A user-defined name to call this rule by in another part of a state or formula. This should not be an actual rule.

family Networking family, either ipv4 or ipv6

All other arguments are passed in with the same name as the long option that would normally be used for nftables, with one exception: --state is specified as connstate instead of state (not to be confused with ctstate).

31.27.101 salt.states.npm

Installation of NPM Packages

These states manage the installed packages for node.js using the Node Package Manager (npm). Note that npm must be installed for these states to be available, so npm states should include a requisite to a pkg.installed state for the package which provides npm (simply npm in most cases). Example:

```
npm:
  pkg.installed

yaml:
  npm.installed:
```
- require:
  - pkg: npm

salt.states.npm.bootstrap(name, user=None)

  Bootstraps a node.js application.
  
  Will execute `npm install --json` on the specified directory.

  user  The user to run NPM with

    New in version 0.17.0.

salt.states.npm.installed(name, pkgs=None, dir=None, user=None, force_reinstall=False, registry=None, env=None)

  Verify that the given package is installed and is at the correct version (if specified).

  
  coffee-script:
  
    npm.installed:
      - user: someuser

  coffee-script@1.0.1:
    npm.installed: []

  name  The package to install

    Changed in version 2014.7.2: This parameter is no longer lowercased by salt so that case-sensitive NPM package names will work.

  pkgs  A list of packages to install with a single npm invocation; specifying this argument will ignore the name argument

    New in version 2014.7.0.

  dir  The target directory in which to install the package, or None for global installation

  user  The user to run NPM with

    New in version 0.17.0.

  registry  The NPM registry from which to install the package

    New in version 2014.7.0.

  env  A list of environment variables to be set prior to execution. The format is the same as the cmd.run.state function.

    New in version 2014.7.0.

  force_reinstall  Install the package even if it is already installed

salt.states.npm.removed(name, dir=None, user=None)

  Verify that the given package is not installed.

  dir  The target directory in which to install the package, or None for global installation

  user  The user to run NPM with

    New in version 0.17.0.
31.27.102 salt.states.ntp

Management of NTP servers

New in version 2014.1.0.

This state is used to manage NTP servers. Currently only Windows is supported.

```python
win_ntp:
    ntp.managed:
        - servers:
            - pool.ntp.org
            - us.pool.ntp.org
```

```
salt.states.ntp.managed(name, servers=None)

Manage NTP servers

servers  A list of NTP servers
```

31.27.103 salt.states.openstack_config

Manage OpenStack configuration file settings.

```
maintainer  Jeffrey C. Ollie <jeff@ojtech.us>
maturity  new
depsends
platform  linux
```

```
salt.states.openstack_config.absent(name, filename, section, parameter=None)

Ensure a value is not set in an OpenStack configuration file.

filename  The full path to the configuration file
section  The section in which the parameter will be set
parameter (optional)  The parameter to change. If the parameter is not supplied, the name will be used as the parameter.
```

```
salt.states.openstack_config.present(name, filename, section, value, parameter=None)

Ensure a value is set in an OpenStack configuration file.

filename  The full path to the configuration file
section  The section in which the parameter will be set
parameter (optional)  The parameter to change. If the parameter is not supplied, the name will be used as the parameter.
value  The value to set
```

31.27.104 salt.states.pagerduty

Create an Event in PagerDuty

New in version 2014.1.0.

This state is useful for creating events on the PagerDuty service during state runs.
server-warning-message:
pagerduty.create_event:
    - name: 'This is a server warning message'
    - details: 'This is a much more detailed message'
    - service_key: 9abcd123456789efabcde362783cdbus
    - profile: my-pagerduty-account

salt.states.pagerduty.create_event(name, details, service_key, profile)

Create an event on the PagerDuty service

server-warning-message:
pagerduty.create_event:
    - name: 'This is a server warning message'
    - details: 'This is a much more detailed message'
    - service_key: 9abcd123456789efabcde362783cdbus
    - profile: my-pagerduty-account

The following parameters are required:

name  This is a short description of the event.
details  This can be a more detailed description of the event.
service_key  This key can be found by using pagerduty.list_services.
profile  This refers to the configuration profile to use to connect to the PagerDuty service.

31.27.105 salt.states.pagerduty_escalation_policy

Manage PagerDuty escalation policies.

Schedules and users can be referenced by pagerduty ID, or by name, or by email address.

For example:

ensure test escalation policy:
pagerduty_escalation_policy.present:
    - name: bruce test escalation policy
    - escalation_rules:
        - targets:
            - type: schedule
              id: 'bruce test schedule level1'
            - type: user
              id: 'Bruce Sherrod'
              escalation_delay_in_minutes: 15
            - targets:
                - type: schedule
                  id: 'bruce test schedule level2'
                  escalation_delay_in_minutes: 15
                - targets:
                    - type: user
                      id: 'Bruce TestUser1'
                    - type: user
                      id: 'Bruce TestUser2'
                      escalation_delay_in_minutes: 15
                    - type: user
                      id: 'Bruce TestUser3'
                      - type: user
                        id: 'bruce+test4@lyft.com'
                        escalation_delay_in_minutes: 15
salt.states.pagerduty_escalation_policy.absent(profile='pagerduty', subdomain=None, api_key=None, **kwargs)

Ensure that a PagerDuty escalation policy does not exist. Accepts all the arguments that pagerduty_escalation_policy.present accepts; but ignores all arguments except the name.

Name can be the escalation policy id or the escalation policy name.

salt.states.pagerduty_escalation_policy.present(profile='pagerduty', subdomain=None, api_key=None, **kwargs)

Ensure that a pagerduty escalation policy exists. Will create or update as needed.

This method accepts as args everything defined in https://developer.pagerduty.com/documentation/rest/escalation_policies/create. In addition, user and schedule id's will be translated from name (or email address) into PagerDuty unique ids. For example:

```yaml
pagerduty_escalation_policy.present:
  - name: bruce test escalation policy
  - escalation_rules:
    - targets:
      - type: schedule id: `bruce test schedule level1`
      - type: user id: `Bruce Sherrod`

In this example, `Bruce Sherrod` will be looked up and replaced with the PagerDuty id (usually a 7 digit all-caps string, e.g. PX6GQL7)

31.27.106 salt.states.pagerduty_schedule

Manage PagerDuty schedules.

Example:

```yaml
ensure test schedule:
  pagerduty_schedule.present:
    - name: `bruce test schedule level1`
    - schedule: name: `bruce test schedule level1` time_zone: `Pacific Time (US & Canada)`
      schedule_layers:
        - name: `Schedule Layer 1` start: `2015-01-01T00:00:00` users:
          - user: `id`: `Bruce TestUser1`
            member_order: 1
          - user: `id`: `Bruce TestUser2`
            member_order: 2
          - user: `id`: `bruce+test3@lyft.com`
            member_order: 3
```

1802 Chapter 31. Reference
* user: `id': `bruce-test4@lyft.com`

member_order: 4
rotation_virtual_start: `2015-01-01T00:00:00’ priority: 1 rotation_turn_length_seconds: 604800

salt.states.pagerduty_schedule.absent( profile='pagerduty', subdomain=None, api_key=None, **kwargs)

Ensure that a pagerduty schedule does not exist. Name can be pagerduty schedule id or pagerduty schedule name.

salt.states.pagerduty_schedule.present( profile='pagerduty', subdomain=None, api_key=None, **kwargs)

Ensure that a pagerduty schedule exists. This method accepts as args everything defined in https://developer.pagerduty.com/documentation/rest/schedules/create. This means that most arguments are in a dict called `schedule`.

User id's can be pagerduty id, or name, or email address.

31.27.107 salt.states.pagerduty_service

Manage PagerDuty services

Escalation policies can be referenced by pagerduty ID or by namea.

For example:

```

ensure test service

pagerduty_service.present:
  • name: `my service`
  • escalation_policy_id: `my escalation policy'
  • type: nagios

[etc]
```

salt.states.pagerduty_service.absent( profile='pagerduty', subdomain=None, api_key=None, **kwargs)

Ensure a pagerduty service does not exist. Name can be the service name or pagerduty service id.

salt.states.pagerduty_service.present( profile='pagerduty', subdomain=None, api_key=None, **kwargs)

Ensure pagerduty service exists. This method accepts as arguments everything defined in https://developer.pagerduty.com/documentation/rest/services/create

Note that many arguments are mutually exclusive, depending on the `type` argument.

Examples:

```

# create a PagerDuty email service at test-email@DOMAIN.pagerduty.com ensure generic email service exists:

pagerduty_service.present:
  • name: my email service

```

31.27. Full list of builtin state modules 1803
**service**: description: "email service controlled by salt" escalation_policy_id: "my escalation policy" type: "generic_email" service_key: "test-email"

# create a pagerduty service using cloudwatch integration ensure my cloudwatch service exists:

```bash
pagerduty_service.present:
  - name: my cloudwatch service
  - service: escalation_policy_id: "my escalation policy" type: aws_cloudwatch description: "my cloudwatch service controlled by salt"
```

TODO: aws_cloudwatch type should be integrated with boto_sns

### 31.27.108 salt.states.pagerduty_user

Manage PagerDuty users.

Example:

```bash
ensure bruce test user 1:
  pagerduty.user_present:
    - name: 'Bruce TestUser1'
    - email: bruce+test1@lyft.com
    - requester_id: P1GV5NT
```

```bash
salt.states.pagerduty_user.absent(profile='pagerduty', subdomain=None, api_key=None, **kwargs)
```

Ensure pagerduty user does not exist. Name can be pagerduty id, email address, or user name.

```bash
salt.states.pagerduty_user.present(profile='pagerduty', subdomain=None, api_key=None, **kwargs)
```


### 31.27.109 salt.states.pecl

**Installation of PHP Extensions Using pecl**

These states manage the installed pecl extensions. Note that php-pear must be installed for these states to be available, so pecl states should include a requisite to a pkg.installed state for the package which provides pecl (php-pear in most cases). Example:

```bash
php-pear:
  pkg.installed

mongo:
  pecl.installed:
    - require:
      - pkg: php-pear
```

```bash
salt.states.pecl.installed(name, version=None, defaults=False, force=False, preferred_state='stable', **kwargs)
```

New in version 0.17.0.
Make sure that a pecl extension is installed.

**name**  The pecl extension name to install

**version**  The pecl extension version to install. This option may be ignored to install the latest stable version.

**defaults**  Use default answers for extensions such as `pecl_http` which ask questions before installation. Without this option, the `pecl_installed` state will hang indefinitely when trying to install these extensions.

**force**  Whether to force the installed version or not

**preferred_state**  The pecl extension state to install

---

salt.states.pecl.removed(name)

Make sure that a pecl extension is not installed.

**name**  The pecl extension name to uninstall

---

### 31.27.110 salt.states.pip_state

**Installation of Python Packages Using pip**

These states manage system installed python packages. Note that pip must be installed for these states to be available, so pip states should include a requisite to a `pkg.installed` state for the package which provides pip (`python-pip` in most cases). Example:

```
python-pip:
  pkg.installed

virtualenvwrapper:
  pip.installed:
    - require:
      - pkg: python-pip
```

salt.states.pip_state.installed(name, pkgs=None, pip_bin=None, requirements=None, env=None, bin_env=None, use_wheel=False, no_use_wheel=False, log=None, proxy=None, timeout=None, repo=None, editable=None, find_links=None, index_url=None, extra_index_url=None, no_index=False, mirrors=None, build=None, target=None, download=None, download_cache=None, source=None, upgrade=False, force_reinstall=False, ignore_installed=False, exists_action=None, no_deps=False, no_install=False, no_download=False, install_options=None, global_options=None, user=None, no_chown=False, cwd=None, activate=False, pre_releases=False, cert=None, allow_all_external=False, allow_external=None, allow_unverified=False, process_dependency_links=False, env_vars=None, use_vt=False, trusted_host=None)

Make sure the package is installed

---

**Note:** There is a known issue when using pip v1.0 that causes `pip install` to return 1 when executed without arguments. See issue 21845 for details and potential workarounds.

**name**  The name of the python package to install. You can also specify version numbers here using the standard operators `==`, `>`, `<`. If `requirements` is given, this parameter will be ignored.

Example:
django:
  pip.installed:
    - name: django >= 1.6, <= 1.7
    - require:
      - pkg: python-pip

This will install the latest Django version greater than 1.6 but less than 1.7.

requirements Path to a pip requirements file. If the path begins with salt:// the file will be transferred from the master file server.
user The user under which to run pip
use_wheel [False] Prefer wheel archives (requires pip>=1.4)
no_use_wheel [False] Force to not use wheel archives (requires pip>=1.4)
log Log file where a complete (maximum verbosity) record will be kept
proxy Specify a proxy in the form user:passwd@proxy.server:port. Note that the user:password@ is optional and required only if you are behind an authenticated proxy. If you provide user@proxy.server:port then you will be prompted for a password.
timeout Set the socket timeout (default 15 seconds)
editable install something editable (i.e. git+https://github.com/worldcompany/djangoembed.git#egg=djangoembed)
find_links URL to look for packages at
index_url Base URL of Python Package Index
extra_index_url Extra URLs of package indexes to use in addition to index_url
no_index Ignore package index
mirrors Specific mirror URL(s) to query (automatically adds --use-mirrors)
built Unpack packages into build dir
target Install packages into target dir
download Download packages into download instead of installing them
download_cache Cache downloaded packages in download_cache dir
source Check out editable packages into source dir
upgrade Upgrade all packages to the newest available version
force_reinstall When upgrading, reinstall all packages even if they are already up-to-date.
ignore_installed Ignore the installed packages (reinstalling instead)
exists_action Default action when a path already exists: (s)witch, (i)gnore, (w)ipe, (b)ackup
no_deps Ignore package dependencies
no_install Download and unpack all packages, but don't actually install them
no_chOWN When user is given, do not attempt to copy and chown a requirements file
cwd Current working directory to run pip from
activate Activates the virtual environment, if given via bin_env, before running install.

Deprecation since version 2014.7.2: If bin_env is given, pip will already be sourced from that virtualenv, making activate effectively a noop.
pre_releases Include pre-releases in the available versions
cert Provide a path to an alternate CA bundle
allow_all_external Allow the installation of all externally hosted files
allow_external Allow the installation of externally hosted files (comma separated list)
allow_unverified Allow the installation of insecure and unverifiable files (comma separated list)
process_dependency_links Enable the processing of dependency links
bin_env [None] Absolute path to a virtual environment directory or absolute path to a pip executable. The example below assumes a virtual environment has been created at /foo/.virtualenvs/bar.
env_vars Add or modify environment variables. Useful for tweaking build steps, such as specifying INCLUDE or LIBRARY paths in Makefiles, build scripts or compiler calls.
use_vt Use VT terminal emulation (see output while installing)
trusted_host Mark this host as trusted, even though it does not have valid or any HTTPS.
Example:
django:
  pip.installed:
  - name: django >= 1.6, <= 1.7
  - bin_env: /foo/.virtualenvs/bar
  - require:
    - pkg: python-pip

Or
Example:

django:
  pip.installed:
  - name: django >= 1.6, <= 1.7
  - bin_env: /foo/.virtualenvs/bar/bin/pip
  - require:
    - pkg: python-pip

Attention
The following arguments are deprecated, do not use.

pip_bin [None] Deprecated, use bin_env
env [None] Deprecated, use bin_env

Changed in version 0.17.0: use_wheel option added.

install_options
Extra arguments to be supplied to the setup.py install command. If you are using an option with
a directory path, be sure to use absolute path.

Example:

django:
  pip.installed:
  - name: django
  - install_options:
    - --prefix=/blah
  - require:
    - pkg: python-pip

global_options Extra global options to be supplied to the setup.py call before the install command.

    New in version 2014.1.3.

Attention
As of Salt 0.17.0 the pip state needs an importable pip module. This usually means having the system's pip
package installed or running Salt from an active virtualenv.

The reason for this requirement is because pip already does a pretty good job parsing its own requirements.
It makes no sense for Salt to do pip requirements parsing and validation before passing them to the pip
library. It's functionality duplication and it's more error prone.

Attention
Please set reload_modules: True to have the salt minion import this module after installation.
Example:

```python
pyopenssl:
    pip.installed:
        - name: pyOpenSSL
        - reload_modules: True
        - exists_action: i
```

```
salt.states.pip_state.removed(name, requirements=None, bin_env=None, log=None, proxy=None, timeout=None, user=None, cwd=None, use_vt=False)
```

Make sure that a package is not installed.

- **name** The name of the package to uninstall
- **user** The user under which to run pip
- **bin_env** [None] the pip executable or virtualenv to use
- **use_vt** Use VT terminal emulation (see output while installing)

```
salt.states.pip_state.uptodate(name, bin_env=None, user=None, cwd=None, use_vt=False)
```

New in version 2015.5.0.

Verify that the system is completely up to date.

- **name** The name has no functional value and is only used as a tracking reference
- **user** The user under which to run pip
- **bin_env** the pip executable or virtualenv to use
- **use_vt** Use VT terminal emulation (see output while installing)

### 31.27.111 salt.states.pkg

**Installation of packages using OS package managers such as yum or apt-get**

Salt can manage software packages via the pkg state module, packages can be set up to be installed, latest, removed and purged. Package management declarations are typically rather simple:

```
vim:
    pkg.installed
```

A more involved example involves pulling from a custom repository.

```
base:
    pkgrepo.managed:
        - humanname: Logstash PPA
        - name: ppa:wolfnet/logstash
        - dist: precise
        - file: /etc/apt/sources.list.d/logstash.list
        - keyid: 28B04E4A
        - keyserver: keyserver.ubuntu.com

logstash:
    pkg.installed
```

```
    fromrepo: ppa:wolfnet/logstash
```

```
Multiple packages can also be installed with the use of the pkgs state module
```

```
dotdeb.repo:
    pkgrepo.managed:
        - humanname: Dotdeb
```

```
```
- name: deb http://packages.dotdeb.org wheezy-php55 all
- dist: wheezy-php55
- file: /etc/apt/sources.list.d/dotdeb.list
- keyid: 89DF5277
- keyserver: keys.gnupg.net
- refresh_db: true

code

```python
php.packages:
  pkg.installed:
    - fromrepo: wheezy-php55
    - pkgs:
      - php5-fpm
      - php5-cli
      - php5-curl
```

**Warning:** Package names are currently case-sensitive. If the minion is using a package manager which is not case-sensitive (such as `pkng`), then this state will fail if the proper case is not used. This will be addressed in a future release of Salt.

salt.states.pkg.group_installed(name, skip=None, include=None, **kwargs)

New in version 2015.8.0.

Ensure that an entire package group is installed. This state is only supported for the `yum` package manager.

- **skip** Packages that would normally be installed by the package group (``default`` packages), which should not be installed.

  Load Balancer:
  pkg.group_installed:
    - skip:
      - piranha

- **include** Packages which are included in a group, which would not normally be installed by a `yum groupinstall` (``optional`` packages). Note that this will not enforce group membership; if you include packages which are not members of the specified groups, they will still be installed. Can be passed either as a comma-separated list or a python list.

  Load Balancer:
  pkg.group_installed:
    - include:
      - haproxy

**Note:** Because this is essentially a wrapper around `pkg.install`, any argument which can be passed to `pkg.install` may also be included here, and it will be passed along wholesale.

salt.states.pkg.installed(name, version=None, refresh=None, fromrepo=None, skip_verify=False, skip_suggestions=False, pkgs=None, sources=None, allow_updates=False, pkg_verify=False, normalize=True, **kwargs)

Ensure that the package is installed, and that it is the correct version (if specified).

**Parameters**

- **name** *(str)* -- The name of the package to be installed. This parameter is ignored if either `pkgs` or `sources` is used. Additionally, please note that this option can only be used to install packages from a software repository. To install a package file manually, use the `sources` option detailed below.

- **version** *(str)* -- Install a specific version of a package. This option is ignored if either `pkgs` or `sources` is used. Currently, this option is supported for the following pkg providers: `apt`, `ebuild`, `pacman`, `yumpkg`, and `zypper`. The version number
includes the release designation where applicable, to allow Salt to target a specific release of a given version. When in doubt, using the pkg.latest_version function for an uninstalled package will tell you the version available.

```
# salt myminion pkg.latest_version httpd
myminion:
  2.2.15-30.el6.centos
```

Also, while this function is not yet implemented for all pkg frontends, pkg.list_repo_pkgs will show all versions available in the various repositories for a given package, irrespective of whether or not it is installed.

```
# salt myminion pkg.list_repo_pkgs httpd
myminion:
  ----------
  base:
    |_  ----------
    |httpd:
    2.2.15-29.el6.centos
  updates:
    |_  ----------
    |httpd:
    2.2.15-30.el6.centos
```

The version strings returned by either of these functions can be used as version specifiers in pkg states.

- **refresh (bool)** -- Update the repo database of available packages prior to installing the requested package.

- **fromrepo (str)** -- Specify a repository from which to install

**Note:** Distros which use APT (Debian, Ubuntu, etc.) do not have a concept of repositories, in the same way as YUM-based distros do. When a source is added, it is assigned to a given release. Consider the following source configuration:

```
deb http://ppa.launchpad.net/saltstack/salt/ubuntu precise main
```

The packages provided by this source would be made available via the precise release, therefore fromrepo would need to be set to precise for Salt to install the package from this source.

Having multiple sources in the same release may result in the default install candidate being newer than what is desired. If this is the case, the desired version must be specified using the version parameter.

If the pkgs parameter is being used to install multiple packages in the same state, then instead of using version, use the method of version specification described in the Multiple Package Installation Options section below.

Running the shell command `apt-cache policy pkgname` on a minion can help elucidate the APT configuration and aid in properly configuring states:

```
root@saltmaster:~# salt ubuntu01 cmd.run 'apt-cache policy ffmpeg'
ubuntu01:
  ffmpeg:
    Installed: (none)
    Candidate: 7:0.10.11-1~precise1
```
Version table:

- 7:0.10.11-1-precise1 0
  http://ppa.launchpad.net/jon-severinsson/ffmpeg/ubuntu/ precise/main amd64 Packages
- 4:0.8.10-0ubuntu0.12.04.1 0
  http://us.archive.ubuntu.com/ubuntu/ precise-updates/main amd64 Packages
- 4:0.8.1-0ubuntu1 0
  http://us.archive.ubuntu.com/ubuntu/ precise/main amd64 Packages
- 4:0.8.10-0ubuntu0.12.04.1 0
  http://security.ubuntu.com/ubuntu/ precise-security/main amd64 Packages

The release is located directly after the source's URL. The actual release name is the part before the slash, so to install version `4:0.8.10-0ubuntu0.12.04.1` either `precise-updates` or `precise-security` could be used for the `fromrepo` value.

- **skip_verify** *(bool)* -- Skip the GPG verification check for the package to be installed

- **skip_suggestions** *(bool)* -- Force strict package naming. Disables lookup of package alternatives.

  New in version 2014.1.1.

- **pkgs** *(list)* -- A list of packages to install from a software repository. All packages listed under `pkgs` will be installed via a single command.

  Example:

  ```
  mypkgs:
  pkg.installed:
  - pkgs:
    - foo
    - bar
    - baz
    - hold: True
  ```

  **NOTE:** For `apt`, `ebuild`, `pacman`, `yumpkg`, and `zypper`, version numbers can be specified in the `pkgs` argument. For example:

  ```
  mypkgs:
  pkg.installed:
  - pkgs:
    - foo
    - bar: 1.2.3-4
    - baz
  ```

  Additionally, `ebuild`, `pacman` and `zypper` support the `<`, `<=`, `>=`, and `>` operators for more control over what versions will be installed. For example:

  ```
  mypkgs:
  pkg.installed:
  - pkgs:
    - foo
    - bar: '>=1.2.3-4'
    - baz
  ```

  **NOTE:** When using comparison operators, the expression must be enclosed in quotes to avoid a YAML render error.
With `ebuild` is also possible to specify a use flag list and/or if the given packages should be in package.accept_keywords file and/or the overlay from which you want the package to be installed.

For example:

```bash
mypkgs:
pkg.installed:
  - pkgs:
    - foo: '~= '
    - bar: '>=1.2:slot::overlay[use,-otheruse]' 
    - baz
```

Multiple Package Installation Options: (not supported in Windows or pkgng)

- **sources** *(list)* -- A list of packages to install, along with the source URI or local path from which to install each package. In the example below, foo, bar, baz, etc. refer to the name of the package, as it would appear in the output of the `pkg.version` or `pkg.list_pkgs` salt CLI commands.

```bash
mypkgs:
pkg.installed:
  - sources:
    - foo: salt://rpms/foo.rpm
    - bar: http://somesite.org/bar.rpm
    - baz: ftp://someothersite.org/baz.rpm
    - qux: /minion/path/to/qux.rpm
```

- **allow_updates** *(bool)* -- Allow the package to be updated outside Salt's control (e.g. auto updates on Windows). This means a package on the Minion can have a newer version than the latest available in the repository without enforcing a re-installation of the package.

  New in version 2014.7.0.

  Example:

```
httpd:
pkg.installed:
  - fromrepo: mycustomrepo
  - skip_verify: True
  - skip_suggestions: True
  - version: 2.0.6~ubuntu3
  - refresh: True
  - allow_updates: True
  - hold: False
```

- **pkg_verify** *(bool)* -- New in version 2014.7.0.

  For requested packages that are already installed and would not be targeted for upgrade or downgrade, use `pkg.verify` to determine if any of the files installed by the package have been altered. If files have been altered, the reinstall option of `pkg.install` is used to force a reinstall. Types to ignore can be passed to `pkg.verify` (see example below). Currently, this option is supported for the following pkg providers: `yumpkg`.

  Examples:

```
httpd:
pkg.installed:
  - version: 2.2.15-30.el6.centos
  - pkg_verify: True
```
mypkgs:
  pkg.installed:
    - pkgs:
      - foo
      - bar: 1.2.3-4
      - baz
    - pkg_verify:
      - ignore_types: [config, doc]

- **normalize**(bool) -- Normalize the package name by removing the architecture, if the architecture of the package is different from the architecture of the operating system. The ability to disable this behavior is useful for poorly-created packages which include the architecture as an actual part of the name, such as kernel modules which match a specific kernel version.

  New in version 2014.7.0.

  Example:

  gpf.s.gplbin-2.6.32-279.31.1.el6.x86_64:
  pkg.installed:
    - normalize: False

- **kwargs** -- These are specific to each OS. If it does not apply to the execution module for your OS, it is ignored.

  **param bool hold** Force the package to be held at the current installed version. Currently works with YUM & APT based systems.

  New in version 2014.7.0.

  **param list names** A list of packages to install from a software repository. Each package will be installed individually by the package manager.

  **Warning:** Unlike `pkgs`, the `names` parameter cannot specify a version. In addition, it makes a separate call to the package management frontend to install each package, whereas `pkgs` makes just a single call. It is therefore recommended to use `pkgs` instead of `names` to install multiple packages, both for the additional features and the performance improvement that it brings.

  **param bool install_recommends** Whether to install the packages marked as recommended. Default is True. Currently only works with APT-based systems.

  New in version 2015.5.0.

  httpd:
  pkg.installed:
    - install_recommends: False

  **param bool only_upgrade** Only upgrade the packages, if they are already installed. Default is False. Currently only works with APT-based systems.

  New in version 2015.5.0.
Returns A dictionary containing the state of the software installation

Rtype dict

salt.states.pkg.latest(name, refresh=None, fromrepo=None, skip_verify=False, pkgs=None, watch_flags=True, **kwargs)

Ensure that the named package is installed and the latest available package. If the package can be updated, this state function will update the package. Generally it is better for the installed function to be used, as latest will update the package whenever a new package is available.

name The name of the package to maintain at the latest available version. This parameter is ignored if `'pkgs` is used.

fromrepo Specify a repository from which to install

skip_verify Skip the GPG verification check for the package to be installed

refresh Update the repo database of available packages prior to installing the requested package.

Multiple Package Installation Options:

(Not yet supported for: Windows, FreeBSD, OpenBSD, MacOS, and Solaris pkgutil)

pkgs A list of packages to maintain at the latest available version.

mypkgs:
  pkg.latest:
    - pkgs:
      - foo
      - bar
      - baz

install_recommends Whether to install the packages marked as recommended. Default is True. Currently only works with APT-based systems.

New in version 2015.5.0.

httpd:
  pkg.latest:
    - install_recommends: False

only_upgrade Only upgrade the packages, if they are already installed. Default is False. Currently only works with APT-based systems.

New in version 2015.5.0.

httpd:
  pkg.latest:
    - only_upgrade: True

salt.states.pkg.mod_aggregate(low, chunks, running)

The mod_aggregate function which looks up all packages in the available low chunks and merges them into a single pkgs ref in the present low data

salt.states.pkg.purged(name, version=None, pkgs=None, normalize=True, **kwargs)

Verify that a package is not installed, calling pkg.purge if necessary to purge the package. All configuration files are also removed.

name The name of the package to be purged.
version  The version of the package that should be removed. Don't do anything if the package is installed with an unmatching version.

normalize  [True] Normalize the package name by removing the architecture, if the architecture of the package is different from the architecture of the operating system. The ability to disable this behavior is useful for poorly-created packages which include the architecture as an actual part of the name, such as kernel modules which match a specific kernel version.

New in version 2015.8.0.

Multiple Package Options:

pkgs  A list of packages to purge. Must be passed as a python list. The name parameter will be ignored if this option is passed. It accepts version numbers as well.

New in version 0.16.0.

salt.states.pkg.removed(name, version=None, pkgs=None, normalize=True, **kwargs)

Verify that a package is not installed, calling pkg.remove if necessary to remove the package.

name  The name of the package to be removed.

version  The version of the package that should be removed. Don't do anything if the package is installed with an unmatching version.

normalize  [True] Normalize the package name by removing the architecture, if the architecture of the package is different from the architecture of the operating system. The ability to disable this behavior is useful for poorly-created packages which include the architecture as an actual part of the name, such as kernel modules which match a specific kernel version.

New in version 2015.8.0.

Multiple Package Options:

pkgs  A list of packages to remove. Must be passed as a python list. The name parameter will be ignored if this option is passed. It accepts version numbers as well.

New in version 0.16.0.

salt.states.pkg.upodate(name, refresh=False, **kwargs)

Verify that the system is completely up to date.

name  The name has no functional value and is only used as a tracking reference

refresh  refresh the package database before checking for new upgrades

kwargs  Any keyword arguments to pass through to pkg.upgrade.

New in version 2015.5.0.

31.27.112  salt.states.pkgbuild

The pkgbuild state is the front of Salt package building backend. It automatically

New in version 2015.8.0.

salt_2015.5.2:

pkgbuild.built:
  - runas: thatch
  - results:
    - salt-2015.5.2-2.el7.centos.noarch.rpm
    - salt-api-2015.5.2-2.el7.centos.noarch.rpm
    - salt-cloud-2015.5.2-2.el7.centos.noarch.rpm
    - salt-master-2015.5.2-2.el7.centos.noarch.rpm
    - salt-minion-2015.5.2-2.el7.centos.noarch.rpm
    - salt-ssh-2015.5.2-2.el7.centos.noarch.rpm
    - salt-syndic-2015.5.2-2.el7.centos.noarch.rpm
    - dest_dir: /tmp/pkg
- spec: salt://pkg/salt/spec/salt.spec
- template: jinja
- deps:
  - salt://pkg/salt/sources/required_dependency.rpm
- tgt: epel-7-x86_64
- sources:
  - salt://pkg/salt/sources/logrotate.salt
  - salt://pkg/salt/sources/README.fedora
  - salt://pkg/salt/sources/salt-2015.5.2.tar.gz
  - salt://pkg/salt/sources/salt-2015.5.2-tests.patch
  - salt://pkg/salt/sources/salt-api
  - salt://pkg/salt/sources/salt-api.service
  - salt://pkg/salt/sources/salt-master
  - salt://pkg/salt/sources/salt-master.service
  - salt://pkg/salt/sources/salt-minion
  - salt://pkg/salt/sources/salt-minion.service
  - salt://pkg/salt/sources/salt/pkgpkg.sls
  - salt://pkg/salt/sources/salt-syndic
  - salt://pkg/salt/sources/salt-syndic.service
  - salt://pkg/salt/sources/SaltTesting-2015.5.8.tar.gz

/tmp/pkg:
  pkgbuild.repo

salt.states.pkgbuild.build(name, runas, dest_dir, spec, sources, template, tgt, deps=None, env=None, results=None, always=False, saltenv='base')

Ensure that the named package is built and exists in the named directory

name The name to track the build, the name value is otherwise unused
runas The user to run the build process as
dest_dir The directory on the minion to place the built package(s)
spec The location of the spec file (used for rpms)
sources The list of package sources
template Set to run the spec file through a templating engine
tgt The target platform to run the build on
deps Packages required to ensure that the named package is built can be hosted on either the salt master server or on an HTTP or FTP server. Both HTTPS and HTTP are supported as well as downloading directly from Amazon S3 compatible URLs with both pre-configured and automatic IAM credentials
env A dictionary of environment variables to be set prior to execution. Example:

  - env:
    DEB_BUILD_OPTIONS: 'nocheck'

Warning: The above illustrates a common PyYAML pitfall, that yes, no, on, off, true, and false are all loaded as boolean True and False values, and must be enclosed in quotes to be used as strings. More info on this (and other) PyYAML idiosyncrasies can be found here.

results The names of the expected rpms that will be built
always Build with every run (good if the package is for continuous or nightly package builds)
saltenv The saltenv to use for files downloaded from the salt fileserver

salt.states.pkgbuild.repo(name, keyid=None, env=None)

Make a package repository, the name is directory to turn into a repo. This state is best used with onchanges linked to your package building states
name The directory to find packages that will be in the repository
keyid Optional Key ID to use in signing repository
env A dictionary of environment variables to be utilized in creating the repository. Example:
31.27.113 salt.states.pkgng

Manage package remote repo using FreeBSD pkgng

Salt can manage the URL pkgng pulls packages from. ATM the state and module are small so use cases are typically rather simple:

```
pkgng_clients:
    pkgng.update_packaging_site:
    - name: "http://192.168.0.2"
```

salt.states.pkgng.update_packaging_site(name)

31.27.114 salt.states.pkgrepo

Management of APT/YUM package repos

Package repositories for APT-based and YUM-based distros can be managed with these states. Here is some example SLS:

```
base:
    pkgrepo.managed:
    - humanname: CentOS-$releasever - Base
    - mirrorlist: http://mirrorlist.centos.org/?release=$releasever&arch=$basearch&repo=os
      comments:
      - '#http://mirror.centos.org/centos/$releasever/os/$basearch/'
    - gpgcheck: 1
    - gpgkey: file:///etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-6

base:
    pkgrepo.managed:
    - humanname: Logstash PPA
    - name: deb http://ppa.launchpad.net/wolfnet/logstash/ubuntu precise main
tfrequency: precise
    - file: /etc/apt/sources.list.d/logstash.list
    - keyid: 28B04E4A
    - keyserver: keyserver.ubuntu.com
    - require_in:
      - pkg: logstash

pkg.latest:
    - name: logstash
    - refresh: True
```

31.27. Full list of builtin state modules
base:
pkgrepo.managed:
  - humanname: deb-multimedia
  - name: deb http://www.deb-multimedia.org stable main
  - file: /etc/apt/sources.list.d/deb-multimedia.list
  - key_url: salt://deb-multimedia/files/marillat.pub

base:
pkgrepo.managed:
  - humanname: Google Chrome
  - name: deb http://dl.google.com/linux/chrome/deb/ stable main
  - dist: stable
  - file: /etc/apt/sources.list.d/chrome-browser.list
  - require_in:
    - pkg: google-chrome-stable
    - gpgcheck: 1
  - key_url: https://dl-ssl.google.com/linux/linux_signing_key.pub

base:
pkgrepo.managed:
  - ppa: wolfnet/logstash

pkg.latest:
  - name: logstash
  - refresh: True

Note: On Ubuntu systems, the python-software-properties package should be installed for better support of PPA repositories. To check if this package is installed, run `dpkg -l python-software-properties`.

Also, some Ubuntu releases have a bug in their python-software-properties package, a missing dependency on pycurl, so python-pycurl will need to be manually installed if it is not present once python-software-properties is installed.

On Ubuntu & Debian systems, the `python-apt` package is required to be installed. To check if this package is installed, run `dpkg -l python-software-properties`. python-apt will need to be manually installed if it is not present.

salt.states.pkgrepo.absent(name, **kwargs)

This function deletes the specified repo on the system, if it exists. It is essentially a wrapper around `pkg.del_repo`.

name The name of the package repo, as it would be referred to when running the regular package manager commands.

UBUNTU-SPECIFIC OPTIONS

ppa On Ubuntu, you can take advantage of Personal Package Archives on Launchpad simply by specifying the user and archive name.

    logstash-ppa:
    pkgrepo.absent:
      - ppa: wolfnet/logstash

ppa_auth For Ubuntu PPAs there can be private PPAs that require authentication to access. For these PPAs the username/password can be specified. This is required for matching if the name format uses the ppa: specifier and is private (requires username/password to access, which is encoded in the URI).

    logstash-ppa:
    pkgrepo.absent:
- ppa: wolfnet/logstash
- ppa_auth: username:password

```yaml
keyid
If passed, then the GPG key corresponding to the passed KeyID will also be removed.

keyid_ppa [False] If set to True, the GPG key's ID will be looked up from ppa.launchpad.net and removed, and the keyid argument will be ignored.
```

---

**Note:** This option will be disregarded unless the ppa argument is present.

salt.states.pkgrepo.managed(name, **kwargs)
This function manages the configuration on a system that points to the repositories for the system's package manager.

- **name** The name of the package repo, as it would be referred to when running the regular package manager commands.
- **ppa** On Ubuntu, you can take advantage of Personal Package Archives on Launchpad simply by specifying the user and archive name. The keyid will be queried from launchpad and everything else is set automatically. You can override any of the below settings by simply setting them as you would normally. For example:

```yaml
logstash-ppa:
  pkgrepo.managed:
    - ppa: wolfnet/logstash
```

- **ppa_auth** For Ubuntu PPAs there can be private PPAs that require authentication to access. For these PPAs the username/password can be passed as an HTTP Basic style username/password combination.

```yaml
logstash-ppa:
  pkgrepo.managed:
    - ppa: wolfnet/logstash
    - ppa_auth: username:password
```

- **name** On apt-based systems this must be the complete entry as it would be seen in the sources.list file. This can have a limited subset of components (i.e. `main`) which can be added/modified with the ``comps`` option.

```yaml
precise-repo:
  pkgrepo.managed:
    - name: deb http://us.archive.ubuntu.com/ubuntu precise main
```

- **disabled** Toggles whether or not the repo is used for resolving dependencies and/or installing packages.
- **comps** On apt-based systems, comps dictate the types of packages to be installed from the repository (e.g. main, nonfree, ...). For purposes of this, comps should be a comma-separated list.
- **file** The filename for the .list that the repository is configured in. It is important to include the full-path AND make sure it is in a directory that APT will look in when handling packages.
- **dist** This dictates the release of the distro the packages should be built for. (e.g. unstable). This option is rarely
needed.

**keyid**  The KeyID of the GPG key to install. This option also requires the **keyserver** option to be set.

**keyserver**  This is the name of the keys server to retrieve gpg keys from. The **keyid** option must also be set for this option to work.

**key_url**  URL to retrieve a GPG key from. Allows the usage of http://, https:// as well as salt://.

**Note:** Use either **keyid/**keyserver or **key_url**, but not both.

**consolidate**  If set to true, this will consolidate all sources definitions to the sources.list file, cleanup the now unused files, consolidate components (e.g. main) for the same URI, type, and architecture to a single line, and finally remove comments from the sources.list file. The consolidate will run every time the state is processed. The option only needs to be set on one repo managed by salt to take effect.

**clean_file**  If set to true, empty file before config repo, dangerous if use multiple sources in one file.

**refresh_db**  If set to false this will skip refreshing the apt package database on debian based systems.

**require_in**  Set this to a list of pkg.installed or pkg.latest to trigger the running of apt-get update prior to attempting to install these packages. Setting a require in the pkg will not work for this.

### 31.27.115 salt.states.portage_config

**Management of Portage package configuration on Gentoo**

A state module to manage Portage configuration on Gentoo

```Python
salt:
    portage_config.flags:
        - use:
            openssl
```

**salt.states.portage_config.flags**(*name*, *use=None*, *accept_keywords=None*, *env=None*, *license=None*, *properties=None*, *unmask=False*, *mask=False*)

Enforce the given flags on the given package or DEPEND atom.

**Warning:** In most cases, the affected package(s) need to be rebuilt in order to apply the changes.

**name**  The name of the package or its DEPEND atom

**use**  A list of USE flags

**accept_keywords**  A list of keywords to accept. ~ARCH means current host arch, and will be translated into a line without keywords

**env**  A list of environment files

**license**  A list of accepted licenses

**properties**  A list of additional properties

**unmask**  A boolean to unmask the package

**mask**  A boolean to mask the package

### 31.27.116 salt.states.ports

**Manage software from FreeBSD ports**

New in version 2014.1.0.

**Note:** It may be helpful to use a higher timeout when running a **ports.installed** state, since compiling the port may exceed Salt’s timeout.
salt -t 1200 '*' state.highstate

salt.states.ports.installed(name, options=None)
Verify that the desired port is installed, and that it was compiled with the desired options.

options Make sure that the desired non-default options are set

| Warning: Any build options not passed here assume the default values for the port, and are not just differences from the existing cached options from a previous make config. |

Example usage:

```python
security/nmap:
    ports.installed:
        - options:
            - IPV6: off
```

31.27.117 salt.states.postgres_database

Management of PostgreSQL databases

The postgres_database module is used to create and manage Postgres databases. Databases can be set as either absent or present

frank:
    postgres_database.present

salt.states.postgres_database.absent(name, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named database is absent
name The name of the database to remove
db_user database username if different from config or default
db_password user password if any password for a specified user
db_host Database host if different from config or default
db_port Database port if different from config or default
user System user all operations should be performed on behalf of

New in version 0.17.0.

salt.states.postgres_database.present(name, tablespace=None, encoding=None, lc_collate=None, lc_ctype=None, owner=None, owner_recurse=False, template=None, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named database is present with the specified properties. For more information about all of these options see man createdb(1)
name The name of the database to manage
tablespace Default tablespace for the database
encoding The character encoding scheme to be used in this database
lc_collate The LC_COLLATE setting to be used in this database
lc_ctype The LC_CTYPE setting to be used in this database
owner The username of the database owner

31.27. Full list of builtin state modules
owner_recurse  Recurse owner change to all relations in the database

**template**  The template database from which to build this database

**user**  System user all operations should be performed on behalf of

**db_user**  database username if different from config or default

**db_password**  user password if any password for a specified user

**db_host**  Database host if different from config or default

**db_port**  Database port if different from config or default

New in version 0.17.0.

### 31.27.118 salt.states.postgres_extension

**Management of PostgreSQL extensions (e.g.: postgis)**

The postgres_extensions module is used to create and manage Postgres extensions.

```
adminpack:
  postgres_extension.present
```

New in version 2014.7.0.

**salt.states.postgres_extension.absent**(name, if_exists=None, restrict=None, cascade=None, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named extension is absent

**name**  Extension name of the extension to remove

**cascade**  Drop on cascade

**if_exists**  Add if exist slug

**restrict**  Add restrict slug

**maintenance_db**  Database to act on

**user**  System user all operations should be performed on behalf of

**db_user**  database username if different from config or default

**db_password**  user password if any password for a specified user

**db_host**  Database host if different from config or default

**db_port**  Database port if different from config or default

**salt.states.postgres_extension.present**(name, if_not_exists=None, schema=None, ext_version=None, from_version=None, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named extension is present with the specified privileges

**name**  The name of the extension to manage

**if_not_exists**  Add a if_not_exists switch to the ddl statement

**schema**  Schema to install the extension into

**from_version**  Old extension version if already installed

**ext_version**  version to install

**user**  System user all operations should be performed on behalf of

**maintenance_db**  Database to act on

**db_user**  database username if different from config or default

**db_password**  user password if any password for a specified user

**db_host**  Database host if different from config or default

**db_port**  Database port if different from config or default
31.27.119 salt.states.postgres_group

Management of PostgreSQL groups (roles)

The postgres_group module is used to create and manage Postgres groups.

```
frank:
  postgres_group.present
```

salt.states.postgres_group.absent(name, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named group is absent

- name: The groupname of the group to remove
- user: System user all operations should be performed on behalf of

New in version 0.17.0.

- `db_user`: database username if different from config or default
- `db_password`: user password if any password for a specified user
- `db_host`: Database host if different from config or default
- `db_port`: Database port if different from config or default

salt.states.postgres_group.present(name, createdb=None, createroles=None, createuser=None, encrypted=None, login=None, superuser=None, inherit=None, replication=None, password=None, refresh_password=None, groups=None, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named group is present with the specified privileges

Please note that the user/group notion in postgresql is just abstract, we have roles, where users can be seen as roles with the LOGIN privilege and groups the others.

- name: The name of the group to manage
- createdb: Is the group allowed to create databases?
- createroles: Is the group allowed to create other roles/users
- createuser: Alias to create roles, and history problem, in psql normally createuser == superuser
- encrypted: Should the password be encrypted in the system catalog?
- login: Should the group have login perm
- inherit: Should the group inherit permissions
- superuser: Should the new group be a `superuser`
- replication: Should the new group be allowed to initiate streaming replication
- password: The Group's password It can be either a plain string or a md5 postgresql hashed password:

  `'md5(MD5OF({password}{role})`'

If encrypted is None or True, the password will be automatically encrypted to the previous format if it is not already done.

- refresh_password: Password refresh flag

  Boolean attribute to specify whether to password comparison check should be performed.

  If refresh_password is None or False, the password will be automatically updated without extra password change check.

  This behaviour makes it possible to execute in environments without superuser access available, e.g. Amazon RDS for PostgreSQL.

- groups: A string of comma separated groups the group should be in
31.27.120 salt.states.postgres_schema

Management of PostgreSQL schemas

The postgres_schemas module is used to create and manage Postgres schemas.

```python
public:
    postgres_schema.present 'dbname' 'name'
```

salt.states.postgres_schema.absent(dbname, name, db_user=None, db_password=None, db_host=None, db_port=None)

Ensure that the named schema is absent.
dbname The database's name will work on
name The name of the schema to remove
db_user database username if different from config or default
db_password user password if any password for a specified user
db_host Database host if different from config or default
db_port Database port if different from config or default

salt.states.postgres_schema.present(dbname, name, owner=None, db_user=None, db_password=None, db_host=None, db_port=None)

Ensure that the named schema is present in the database.
dbname The database's name will work on
name The name of the schema to manage
db_user database username if different from config or default
db_password user password if any password for a specified user
db_host Database host if different from config or default
db_port Database port if different from config or default

31.27.121 salt.states.postgres_tablespace

Management of PostgreSQL tablespace

The postgres_tablespace module is used to create and manage Postgres tablespaces.

Tablespaces can be set as either absent or present.

New in version 2015.8.0.

salt.states.postgres_tablespace.absent(name, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named database is absent.
name The name of the database to remove
db_user database username if different from config or default
db_password user password if any password for a specified user
db_host Database host if different from config or default
db_port  Database port if different from config or default
user  System user all operations should be performed on behalf of

salt.states.postgres_tablespace.present(name, directory, options=None, owner=None, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named tablespace is present with the specified properties. For more information about all of these options see man create_tablespace(1).

name  The name of the tablespace to create/manage.
directory  The directory where the tablespace will be located, must already exist.
options  A dictionary of options to specify for the table. Currently, the only tablespace options supported are
    seq_page_cost - float; default=1.0
    random_page_cost - float; default=4.0
owner  The database user that will be the owner of the tablespace Defaults to the user executing the command
    (i.e. the user option)
db_user  database username if different from config or default
db_password  user password if any password for a specified user
db_host  Database host if different from config or default
db_port  Database port if different from config or default
user  System user all operations should be performed on behalf of

31.27.122 salt.states.postgres_user

Management of PostgreSQL users (roles)

The postgres_user module is used to create and manage Postgres users.

frank:
    postgres_user.present

salt.states.postgres_user.absent(name, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named user is absent

name  The username of the user to remove
user  System user all operations should be performed on behalf of

    New in version 0.17.0.
db_user  database username if different from config or default
db_password  user password if any password for a specified user
db_host  Database host if different from config or default
db_port  Database port if different from config or default

salt.states.postgres_user.present(name, createdb=None, createroles=None, createuser=None, encrypted=None, superuser=None, replication=None, inherit=None, login=None, password=None, refresh_password=None, groups=None, user=None, maintenance_db=None, db_password=None, db_host=None, db_port=None, db_user=None)

Ensure that the named user is present with the specified privileges Please note that the user/group notion in postgresql is just abstract, we have roles, where users can be seen as roles with the LOGIN privilege and groups the others.

name  The name of the user to manage
createdb  Is the user allowed to create databases?
createroles  Is the user allowed to create other users?
createuser  Alias to create roles

31.27.  Full list of builtin state modules  1825
encrypted Should the password be encrypted in the system catalog?
login Should the group have login perm
inherit Should the group inherit permissions
superuser Should the new user be a "superuser"
replication Should the new user be allowed to initiate streaming replication
password The user’s password It can be either a plain string or a md5 postgresql hashed password:

(md5{MD5OF{{password}{role}}})

If encrypted is None or True, the password will be automatically encrypted to the previous format if it is not already done.

refresh_password Password refresh flag

Boolean attribute to specify whether to password comparison check should be performed.

If refresh_password is None or False, the password will be automatically updated without extra password change check.

This behaviour makes it possible to execute in environments without superuser access available, e.g. Amazon RDS for PostgreSQL.
groups A string of comma separated groups the user should be in
user System user alloperationsshould be performed on behalf of

New in version 0.17.0.
db_user database username if different from config or default
db_password user password if any password for a specified user
db_host Database host if different from config or default
db_port Database port if different from config or default

31.27.123 salt.states.powerpath

Powerpath configuration support

Allows configuration of EMC Powerpath. Currently only addition/deletion of licenses is supported.

key:
  powerpath.license_present: []

salt.states.powerpath.license_absent(name)

Ensures that the specified PowerPath license key is absent on the host.

name The license key to ensure is absent

salt.states.powerpath.license_present(name)

Ensures that the specified PowerPath license key is present on the host.

name The license key to ensure is present

31.27.124 salt.states.process

Process Management

Ensure a process matching a given pattern is absent.
**31.27.125 salt.states.pushover**

Send a message to PushOver

This state is useful for sending messages to PushOver during state runs.

New in version Lithium.

```yaml
pushover-message:
  pushover.post_message:
    - user: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    - token: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    - title: Salt Returner
    - device: phone
    - priority: -1
    - expire: 3600
    - retry: 5
    - message: 'This state was executed successfully.'
```

The api key can be specified in the master or minion configuration like below:

```yaml
pushover: token: peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

**salt.states.pushover.post_message**

```
pushover-message:
  pushover.post_message:
    - user: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    - token: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
    - title: Salt Returner
    - device: phone
    - priority: -1
    - expire: 3600
    - retry: 5
```

Send a message to a PushOver channel.

The following parameters are required:
- **name** The unique name for this event.
- **user** The user or group of users to send the message to. Must be ID of user, not name or email address.
- **message** The message that is to be sent to the PushOver channel.

The following parameters are optional:
- **title** The title to use for the message.
- **device** The device for the user to send the message to.
- **priority** The priority for the message.
- **expire** The message should expire after specified amount of seconds.
- **retry** The message should be resent this many times.
- **token** The token for PushOver to use for authentication, if not specified in the configuration options of master or minion.
31.27.126 salt.states.pyenv

Managing python installations with pyenv

This module is used to install and manage python installations with pyenv. Different versions of python can be installed, and uninstalled. pyenv will be installed automatically the first time it is needed and can be updated later. This module will not automatically install packages which pyenv will need to compile the versions of python.

If pyenv is run as the root user then it will be installed to /usr/local/pyenv, otherwise it will be installed to the users ~/.pyenv directory. To make pyenv available in the shell you may need to add the pyenv/shims and pyenv/bin directories to the users PATH. If you are installing as root and want other users to be able to access pyenv then you will need to add pyenv_ROOT to their environment.

This is how a state configuration could look like:

```yaml
pyenv-deps:
  pkg.installed:
    - pkgs:
      - make
      - build-essential
      - libssl-dev
      - zlib1g-dev
      - libb2z-dev
      - libreadline-dev
      - libsqlite3-dev
      - wget
      - curl
      - llvm

python-2.6:
  pyenv.absent:
    - require:
      - pkg: pyenv-deps

python-2.7.6:
  pyenv.installed:
    - default: True
    - require:
      - pkg: pyenv-deps
```

**salt.states.pyenv.absent**(name, user=None)

Verify that the specified python is not installed with pyenv. pyenv is installed if necessary.

- **name** The version of python to uninstall
- **user** The user to run pyenv as.

New in version 0.17.0.
New in version 0.16.0.

**salt.states.pyenv.install_pyenv**(name, user=None)

Install pyenv if not installed. Allows you to require pyenv be installed prior to installing the plugins. Useful if you want to install pyenv plugins via the git or file modules and need them installed before installing any rubies.

Use the pyenv.root configuration option to set the path for pyenv if you want a system wide install that is not in a user home dir.

- **user** The user to run pyenv as.

**salt.states.pyenv.installed**(name, default=False, user=None)

Verify that the specified python is installed with pyenv. pyenv is installed if necessary.

- **name** The version of python to install
default  [False] Whether to make this python the default.
user: None  The user to run pyenv as.

New in version 0.17.0.
New in version 0.16.0.

31.27.127 salt.states.pyrax_queues

Manage Rackspace Queues

New in version 2015.5.0.
Create and destroy Rackspace queues. Be aware that this interacts with Rackspace's services, and so may incur charges.
This module uses pyrax, which can be installed via package, or pip. This module is greatly inspired by boto_* modules from SaltStack code source.

myqueue:
    pyrax_queues.present:
        - provider: my-pyrax

myqueue:
    pyrax_queues.absent:
        - provider: my-pyrax

salt.states.pyrax_queues.absent(name, provider)
Ensure the named Rackspace queue is deleted.
name  Name of the Rackspace queue.
provider  Salt Cloud provider

salt.states.pyrax_queues.present(name, provider)
Ensure the RackSpace queue exists.
name  Name of the Rackspace queue.
provider  Salt Cloud Provider

31.27.128 salt.states.quota

Management of POSIX Quotas

The quota can be managed for the system:

/:
    quota.mode:
        mode: off
        quotatypename: user

salt.states.quota.mode(name, mode, quotatypename)
Set the quota for the system
name  The filesystem to set the quota mode on
mode  Whether the quota system is on or off
quotatypename  Must be user or group

31.27. Full list of builtin state modules
31.27.129 salt.states.rabbitmq_cluster

Manage RabbitMQ Clusters

Example:

```text
rabbit@rabbit.example.com:
rabbitmq_cluster.join:
  - user: rabbit
  - host: rabbit.example.com
```

salt.states.rabbitmq_cluster.join(name, host, user='rabbit', ram_node=None, runas='root')

Ensure the current node joined to a cluster with node user@host

- name Irrelevant, not used (recommended: user@host)
- user The user of node to join to (default: rabbit)
- host The host of node to join to
- ram_node Join node as a RAM node
- runas The user to run the rabbitmq command as

salt.states.rabbitmq_cluster.joined(name, host, user='rabbit', ram_node=None, runas='root')

Ensure the current node joined to a cluster with node user@host

- name Irrelevant, not used (recommended: user@host)
- user The user of node to join to (default: rabbit)
- host The host of node to join to
- ram_node Join node as a RAM node
- runas The user to run the rabbitmq command as

31.27.130 salt.states.rabbitmq_plugin

Manage RabbitMQ Plugins

New in version 2014.1.0.

Example:

```text
some_plugin:
rabbitmq_plugin.enabled: []
```

salt.states.rabbitmq_plugin.disabled(name, runas=None)

Ensure the RabbitMQ plugin is disabled.

- name The name of the plugin
- runas The user to run the rabbitmq-plugin command as

salt.states.rabbitmq_plugin.enabled(name, runas=None)

Ensure the RabbitMQ plugin is enabled.

- name The name of the plugin
- runas The user to run the rabbitmq-plugin command as

31.27.131 salt.states.rabbitmq_policy

Manage RabbitMQ Policies

- maintainer Benn Eichhorn <benn@getlocalmeasure.com>
Example:

```yaml
rabbit_policy:
    rabbitmq_policy.present:
    - name: HA
    - pattern: '.*'
    - definition: '{"ha-mode":"all"}'
```

salt.states.rabbitmq_policy.absent(name, vhost='/', runas=None)
Ensure the named policy is absent

- **name** The name of the policy to remove
- **runas** Name of the user to run the command as

salt.states.rabbitmq_policy.present(name, pattern, definition, priority=0, vhost='/', runas=None)
Ensure the RabbitMQ policy exists.

- **name** Policy name
- **pattern** A regex of queues to apply the policy to
- **definition** A json dict describing the policy
- **priority** Priority (defaults to 0)
- **vhost** Virtual host to apply to (defaults to '/')
- **runas** Name of the user to run the command as

31.27.132 salt.states.rabbitmq_user
Manage RabbitMQ Users

Example:

```yaml
rabbit_user:
    rabbitmq_user.present:
    - password: password
    - force: True
    - tags:
        - monitoring
        - user
    - perms:
        - '/':
          - '.*'
          - '.*'  # Add more entries as needed
        - runas: rabbitmq
```

salt.states.rabbitmq_user.absent(name, runas=None)
Ensure the named user is absent

- **name** The name of the user to remove
- **runas** User to run the command as
salt.states.rabbitmq_user.present(name, password=None, force=False, tags=None, perms=(), runas=None)

Ensure the RabbitMQ user exists.

- **name**: User name
- **password**: User's password, if one needs to be set
- **force**: If user exists, forcibly change the password
- **tags**: Optional list of tags for the user
- **perms**: A list of dicts with vhost keys and 3-tuple values
- **runas**: Name of the user to run the command

### 31.27.133 salt.states.rabbitmq_vhost

Manage RabbitMQ Virtual Hosts

Example:

```
virtual_host:
    rabbitmq_vhost.present:
        - user: rabbit_user
        - conf: .*
        - write: .*
        - read: .*
```

salt.states.rabbitmq_vhost.absent(name)

Ensure the RabbitMQ Virtual Host is absent

- **name**: Name of the Virtual Host to remove
- **runas**: User to run the command

Deprecated since version 2015.8.0.

salt.states.rabbitmq_vhost.present(name)

Ensure the RabbitMQ VHost exists.

- **name**: VHost name
- **user**: Initial user permission to set on the VHost, if present

Deprecated since version 2015.8.0.

- **owner**: Initial owner permission to set on the VHost, if present

Deprecated since version 2015.8.0.

- **conf**: Initial conf string to apply to the VHost and user. Defaults to "."

Deprecated since version 2015.8.0.

- **write**: Initial write permissions to apply to the VHost and user. Defaults to "."

Deprecated since version 2015.8.0.

- **read**: Initial read permissions to apply to the VHost and user. Defaults to "."

Deprecated since version 2015.8.0.

- **runas**: Name of the user to run the command

Deprecated since version 2015.8.0.
31.27.134 salt.states.rbenv

Managing Ruby installations with rbenv

This module is used to install and manage ruby installations with rbenv and the ruby-build plugin. Different versions of ruby can be installed, and uninstalled. Rbenv will be installed automatically the first time it is needed and can be updated later. This module will not automatically install packages which rbenv will need to compile the versions of ruby. If your version of ruby fails to install, refer to the ruby-build documentation to verify you are not missing any dependencies: https://github.com/sstephenson/ruby-build/wiki

If rbenv is run as the root user then it will be installed to /usr/local/rbenv, otherwise it will be installed to the users ~/.rbenv directory. To make rbenv available in the shell you may need to add the rbenv/shims and rbenv/bin directories to the users PATH. If you are installing as root and want other users to be able to access rbenv then you will need to add RBENV_ROOT to their environment.

The following state configuration demonstrates how to install Ruby 1.9.x and 2.x using rbenv on Ubuntu/Debian:

```yaml
rbenv-deps:
  pkg.installed:
    - names:
      - bash
      - git
      - openssl
      - libssl-dev
      - make
      - curl
      - autoconf
      - bison
      - build-essential
      - libffi-dev
      - libyaml-dev
      - libreadline6-dev
      - zlib1g-dev
      - libncurses5-dev

ruby-1.9.3-p429:
  rbenv.absent:
    - require:
      - pkg: rbenv-deps

ruby-2.0.0-p598:
  rbenv.installed:
    - default: True
    - require:
      - pkg: rbenv-deps
```

salt.states.rbenv.absent(name, user=None)

Verify that the specified ruby is not installed with rbenv. Rbenv is installed if necessary.

name The version of ruby to uninstall
user: None The user to run rbenv as.

New in version 0.17.0.
New in version 0.16.0.

salt.states.rbenv.install_rbenv(name, user=None)

Install rbenv if not installed. Allows you to require rbenv be installed prior to installing the plugins. Useful if you want to install rbenv plugins via the git or file modules and need them installed before installing any rubies.
Use the `rbenv.root` configuration option to set the path for rbenv if you want a system wide install that is not in a user home dir.

user: None  The user to run rbenv as.

**salt.states.rbenv.installed**(name, default=False, user=None)
Verify that the specified ruby is installed with rbenv. Rbenv is installed if necessary.

name  The version of ruby to install

default [False] Whether to make this ruby the default.

user: None  The user to run rbenv as.

New in version 0.17.0.
New in version 0.16.0.

### 31.27.135 salt.states.rdp

Manage RDP Service on Windows servers

**salt.states.rdp.disabled**(name)
Disable the RDP service

**salt.states.rdp.enabled**(name)
Enable the RDP service and make sure access to the RDP port is allowed in the firewall configuration

### 31.27.136 salt.states.redismod

Management of Redis server

New in version 2014.7.0.

```
    depends
    • redis Python module
```

**configuration** See `salt.modules.redis` for setup instructions.

```plaintext
key_in_redis:
  redis.string:
    - value: string data
```

The redis server information specified in the minion config file can be overridden in states using the following arguments: `host, port, db, password`.

```plaintext
key_in_redis:
  redis.string:
    - value: string data
    - host: localhost
    - port: 6379
    - db: 0
    - password: somuchkittycat
```

**salt.states.redismod.absent**(name, keys=None, **connection_args)**
Ensure key absent from redis

name  Key to ensure absent from redis

keys list of keys to ensure absent, name will be ignored if this is used

**salt.states.redismod.string**(name, value, expire=None, expireat=None, **connection_args)**
Ensure that the key exists in redis with the value specified
name  Redis key to manage  
value  Data to persist in key  
expire  Sets time to live for key in seconds  
expireat  Sets expiration time for key via UNIX timestamp, overrides expire

31.27.137  salt.states.reg

Manage the Windows registry

Many Python developers think of registry keys as if they were Python keys in a dictionary which is not the case. The Windows registry is broken down into the following components:

Hives

This is the top level of the registry. They all begin with HKEY. - HKEY_CLASSES_ROOT (HKCR) - HKEY_CURRENT_USER (HKCU) - HKEY_LOCAL_MACHINE (HKLM) - HKEY_USER (HKU) - HKEY_CURRENT_CONFIG

Keys

Hives contain keys. These are basically the folders beneath the hives. They can contain any number of subkeys.

Values or Entries

Values or Entries are the name/data pairs beneath the keys and subkeys. All keys have a default name/data pair. It is usually ``(Default)''=''(value not set)''. The actual value for the name and the data is Null. The registry editor will display ``(Default)'' and ``(value not set)''.

Example

The following example is taken from the Windows startup portion of the registry:

``
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Run] "RTHDVCPPL" ="C:\Program Files\Realtek\Audio\HDA\RtkNGUI64.exe" -s
"NvBackend" ="C:\Program Files (x86)\NVIDIA Corporation\Update Core\NvBackend.exe"
"BTMTrayAgent" ="rundll32.exe \"C:\Program Files (x86)\Intel\Bluetooth\btmshellex.dll\",TrayApp"
``

In this example these are the values for each:

Hive: HKEY_LOCAL_MACHINE

Key and subkeys: SOFTWARE\Microsoft\Windows\CurrentVersion\Run

Value:

- There are 3 value names: RTHDVCPPL, NvBackend, and BTMTrayAgent
- Each value name has a corresponding value

salt.states.reg.absent(name, vname=None)

Ensure a registry value is removed. To remove a key use key_absent.

Example:
In the above example the path is interpreted as follows: - HKEY_CURRENT_USER is the hive - SOFTWARE\Salt is the key - version is the value name So the value version will be deleted from the SOFTWARE\Salt key in the HKEY_CURRENT_USER hive.

salt.states.reg.key_absent(name, force=False)

New in version 2015.5.4.

Ensure a registry key is removed. This will remove a key and all value entries it contains. It will fail if the key contains subkeys.

Parameters

- **name (str)** -- A string representing the full path to the key to be removed to include the hive and the keypath. The hive can be any of the following: - HKEY_LOCAL_MACHINE or HKLM - HKEY_CURRENT_USER or HKCU - HKEY_USERS or HKU

- **force (bool)** -- A boolean value indicating that all subkeys should be deleted with the key. If force=False and subkeys exists beneath the key you want to delete, key_absent will fail. Use with caution. The default is False.

Returns

Returns a dictionary showing the results of the registry operation.

Return type dict

The following example will delete the SOFTWARE\Salt key and all subkeys under the HKEY_CURRENT_USER hive.

Example:

```
'HKEY_CURRENT_USER\SOFTWARE\Salt':
  reg.key_absent:
    - force: True
```

In the above example the path is interpreted as follows: - HKEY_CURRENT_USER is the hive - SOFTWARE\Salt is the key

salt.states.reg.present(name, value=None, vname=None, vdata=None, vtype='REG_SZ', reflection=True)

Ensure a registry key or value is present.

Parameters

- **name (str)** -- A string value representing the full path of the key to include the HIVE, Key, and all Subkeys. For example:
  
  HKEY_LOCAL_MACHINE\SOFTWARE\Salt

  Valid hive values include:
  
  - HKEY_CURRENT_USER or HKCU
  
  - HKEY_LOCAL_MACHINE or HKLM
  
  - HKEY_USERS or HKU

- **value (str)** -- Deprecated. Use vname and vdata instead. Included here for backwards compatability.

- **vname (str)** -- The name of the value you'd like to create beneath the Key. If this parameter is not passed it will assume you want to set the (Default) value
• **vdata** (*str*) -- The value you’d like to set for the Key. If a value name (vname) is passed, this will be the data for that value name. If not, this will be the (Default) value for the key.

The type for the (Default) value is always REG_SZ and cannot be changed. This parameter is optional. If not passed, the Key will be created with.

• **vtype** (*str*) -- The value type for the data you wish to store in the registry. Valid values are:
  - REG_BINARY
  - REG_DWORD
  - REG_EXPAND_SZ
  - REG_MULTI_SZ
  - REG_SZ (Default)

• **reflection** (*bool*) -- On 64 bit machines a duplicate value will be created in the Wow6432Node for 32bit programs. This only applies to the SOFTWARE key. This option is ignored on 32bit operating systems. This value defaults to True. Set it to False to disable reflection.

**Returns**  Returns a dictionary showing the results of the registry operation.

**Return type**  dict

The following example will set the (Default) value for the SOFTWARE\Salt key in the HKEY_CURRENT_USER hive to 0.15.3. The value will not be reflected in Wow6432Node:

Example:

```python
HKEY_CURRENT_USER\SOFTWARE\Salt:
  reg.present:
    - vdata: 0.15.3
    - reflection: False
```

The following example will set the value for the version entry under the SOFTWARE\Salt key in the HKEY_CURRENT_USER hive to 0.15.3. The value will be reflected in Wow6432Node:

Example:

```python
HKEY_CURRENT_USER\SOFTWARE\Salt:
  reg.present:
    - vname: version
    - vdata: 0.15.3
```

In the above example the path is interpreted as follows: - HKEY_CURRENT_USER is the hive - SOFTWARE\Salt is the key - vname is the value name (`version`) that will be created under the key - vdata is the data that will be assigned to `version`

### 31.27.138 salt.states.rvm

**Managing Ruby installations and gemsets with Ruby Version Manager (RVM)**

This module is used to install and manage ruby installations and gemsets with RVM, the Ruby Version Manager. Different versions of ruby can be installed and gemsets created. RVM itself will be installed automatically if it’s not present. This module will not automatically install packages that RVM depends on or ones that are needed to build
ruby. If you want to run RVM as an unprivileged user (recommended) you will have to create this user yourself. This is how a state configuration could look like:

```yaml
rvm:
  group.present: []
  user.present:
    - gid: rvm
    - home: /home/rvm
    - require:
      - group: rvm

rvm-deps:
  pkg.installed:
    - pkgs:
      - bash
      - coreutils
      - gzip
      - bzip2
      - gawk
      - sed
      - curl
      - git-core
      - subversion

mri-deps:
  pkg.installed:
    - pkgs:
      - build-essential
      - openssl
      - libreadline6
      - libreadline6-dev
      - curl
      - git-core
      - zlib1g
      - zlib1g-dev
      - libssl-dev
      - libyaml-dev
      - libsqlite3-0
      - libsqlite3-dev
      - sqlite3
      - libxml2-dev
      - libxslt1-dev
      - autoconf
      - libc6-dev
      - libncurses5-dev
      - automake
      - libtool
      - bison
      - subversion
      - ruby

jruby-deps:
  pkg.installed:
    - pkgs:
      - curl
      - g++
      - openjdk-6-jre-headless
```
Ruby

- **salt.states.rvm.gemset_present** *(name, ruby='default', user=None)*
  - Verify that the gemset is present.
  - **name** The name of the gemset.
  - **ruby** default The ruby version this gemset belongs to.
  - **user** None The user to run rvm as.
  - New in version 0.17.0.

- **salt.states.rvm.installed** *(name, default=False, user=None)*
  - Verify that the specified ruby is installed with RVM. RVM is installed when necessary.
  - **name** The version of ruby to install
  - **default** [False] Whether to make this ruby the default.
  - **user** None The user to run rvm as.
  - New in version 0.17.0.

Salt States

31.27.139 salt.states.saltmod

Control the Salt command interface

This state is intended for use from the Salt Master. It provides access to sending commands down to minions as well as access to executing master-side modules. These state functions wrap Salt’s *Python API*.

See also:

More Orchestrate documentation
- **Full Orchestrate Tutorial**
- **The Orchestrate runner**

```python
salt.states.saltmod.function(name, tgt, ssh=False, tgt_type=None, expr_form=None, ret='`,
                              expect_minions=False, fail_minions=None, fail_function=None,
                              arg=None, kwarg=None, timeout=None)
```

Execute a single module function on a remote minion via salt or salt-ssh

**name**  The name of the function to run, aka cmd.run or pkg.install

**tgt**  The target specification, aka `'*' for all minions

**tgt_type | expr_form**  The target type, defaults to glob

**arg**  The list of arguments to pass into the function

**kwarg**  The list of keyword arguments to pass into the function

**ret**  Optionally set as a single or a list of returners to use

**expect_minions**  An optional boolean for failing if some minions do not respond

**fail_minions**  An optional list of targeted minions where failure is an option

**fail_function**  An optional string that points to a salt module that returns True or False based on the returned data dict for individual minions

**ssh**  Set to `True` to use the ssh client instead of the standard salt client

```python
salt.states.saltmod.runner(name, **kwargs)
```

Execute a runner module on the master

New in version 2014.7.

**name**  The name of the function to run

**kwarg**  Any keyword arguments to pass to the runner function

```python
run-manage-up:
salt.runner:
    - name: manage.up
```

```python
salt.states.saltmod.state(name, tgt, ssh=False, tgt_type=None, expr_form=None, ret='`,
                          highstate=None, sls=None, top=None, env=None, test=False, pillar=None,
                          expect_minions=False, fail_minions=None, allow_fail=0, concurrent=False,
                          timeout=None)
```

Invoke a state run on a given target

**name**  An arbitrary name used to track the state execution

**tgt**  The target specification for the state run.

**tgt_type | expr_form**  The target type to resolve, defaults to glob

**ret**  Optionally set a single or a list of returners to use

**highstate**  Defaults to None, if set to True the target systems will ignore any sls references specified in the sls option and call state.highstate on the targeted minions

**top**  Should be the name of a top file. If set state.top is called with this top file instead of state.sls.

**sls**  A group of sls files to execute. This can be defined as a single string containing a single sls file, or a list of sls files

**test**  Pass `test=true` through to the state function

**pillar**  Pass the pillar kwarg through to the state function

**saltenv**  The default salt environment to pull sls files from

**ssh**  Set to `True` to use the ssh client instead of the standard salt client

**roster**  In the event of using salt-ssh, a roster system can be set

**expect_minions**  An optional boolean for failing if some minions do not respond

**fail_minions**  An optional list of targeted minions where failure is an option

**allow_fail**  Pass in the number of minions to allow for failure before setting the result of the execution to False

**concurrent**  Allow multiple state runs to occur at once.

WARNING: This flag is potentially dangerous. It is designed for use when multiple state runs can safely be run at the same Do not use this flag for performance optimization.
Examples:

Run a list of sls files via state.sls on target minions:

webservers:
  salt.state:
    - tgt: 'web*'  
    - sls: 
      - apache 
      - django 
      - core 
      - saltenv: prod

Run a full state.highstate on target minions.

databases:
  salt.state:
    - tgt: role:database
    - tgt_type: grain
    - highstate: True

salt.states.saltmod.wait_for_event(name, id_list, event_id='id', timeout=300)
  Watch Salt’s event bus and block until a condition is met

New in version 2014.7.

name  An event tag to watch for; supports Reactor-style globbing.

id_list A list of event identifiers to watch for -- usually the minion ID. Each time an event tag is matched
  the event data is inspected for event_id, if found it is removed from id_list. When id_list is
  empty this function returns success.

event_id [id] The name of a key in the event data. Default is 'id' for the minion ID, another common value is
  name for use with orchestrating salt-cloud events.

timeout [300] The maximum time in seconds to wait before failing.

The following example blocks until all the listed minions complete a restart and reconnect to the Salt master:

reboot_all_minions:
  salt.function:
    - name: system.reboot
    - tgt: '*'

wait_for_reboots:
  salt.wait_for_event:
    - name: salt/minion/*/start
    - id_list:
      - jerry
      - stuart
      - dave
      - phil
      - kevin
      - mike
    - require:
      - salt: reboot_all_minions

salt.states.saltmod.wheel(name, **kwargs)
  Execute a wheel module on the master

New in version 2014.7.

name  The name of the function to run
kwarg

Any keyword arguments to pass to the wheel function

accept_minion_key:
salt.wheel:
  - name: key.accept
  - match: frank

31.27.140 salt.states.schedule

Management of the Salt scheduler

job3:
schedule.present:
  - function: test.ping
  - seconds: 3600
  - splay: 10

This will schedule the command: test.ping every 3600 seconds
(every hour) splaying the time between 0 and 10 seconds

job2:
schedule.present:
  - function: test.ping
  - seconds: 15
  - splay:
    - start: 10
    - end: 20

This will schedule the command: test.ping every 3600 seconds
(every hour) splaying the time between 10 and 20 seconds

job1:
schedule.present:
  - function: state.sls
  - job_args:
    - httpd
  - job_kwargs:
    test: True
  - when:
    - Monday 5:00pm
    - Tuesday 3:00pm
    - Wednesday 5:00pm
    - Thursday 3:00pm
    - Friday 5:00pm

This will schedule the command: state.sls httpd test=True at 5pm on Monday,
Wednesday and Friday, and 3pm on Tuesday and Thursday. Requires that
python-dateutil is installed on the minion.

job1:
schedule.present:
  - function: state.sls
  - job_args:
    - httpd
  - job_kwargs:
    test: True
- cron: '*/5 * * * *'

Scheduled jobs can also be specified using the format used by cron. This will schedule the command: state.sls httpd test=True to run every 5 minutes. Requires that python-croniter is installed on the minion.

```yaml
job1:
  schedule.present:
    - function: state.sls
      - args:
        - httpd
      - kwargs:
        test: True
      - when:
        - Monday 5:00pm
        - Tuesday 3:00pm
        - Wednesday 5:00pm
        - Thursday 3:00pm
        - Friday 5:00pm
      - returner: xmpp
      - return_config: xmpp_state_run
```

This will schedule the command: state.sls httpd test=True at 5pm on Monday, Wednesday and Friday, and 3pm on Tuesday and Thursday. Using the xmpp returner to return the results of the scheduled job, with the alternative configuration options found in the xmpp_state_run section.

```python
salt.states.schedule.absent(name, **kwargs)
Ensure a job is absent from the schedule
name The unique name that is given to the scheduled job.
persist Whether the job should persist between minion restarts, defaults to True.

salt.states.schedule.disabled(name, **kwargs)
Ensure a job is disabled in the schedule
name The unique name that is given to the scheduled job.
persist Whether the job should persist between minion restarts, defaults to True.

salt.states.schedule.enabled(name, **kwargs)
Ensure a job is enabled in the schedule
name The unique name that is given to the scheduled job.
persist Whether the job should persist between minion restarts, defaults to True.

salt.states.schedule.present(name, **kwargs)
Ensure a job is present in the schedule
name The unique name that is given to the scheduled job.
seconds The scheduled job will be executed after the specified number of seconds have passed.
minutes The scheduled job will be executed after the specified number of minutes have passed.
hours The scheduled job will be executed after the specified number of hours have passed.
days The scheduled job will be executed after the specified number of days have passed.
when This will schedule the job at the specified time(s). The when parameter must be a single value or a dictionary with the date string(s) using the dateutil format. Requires python-dateutil.
cron This will schedule the job at the specified time(s) using the crontab format. Requires python-croniter.
function The function that should be executed by the scheduled job.
job_args The arguments that will be used by the scheduled job.
job_kwargs The keyword arguments that will be used by the scheduled job.
maxrunning Ensure that there are no more than N copies of a particular job running.
jid_include Include the job into the job cache.
```
splay  The amount of time in seconds to splay a scheduled job. Can be specified as a single value in seconds or as a dictionary range with 'start' and 'end' values.
range  This will schedule the command within the range specified. The range parameter must be a dictionary with the date strings using the dateutil format. Requires python-dateutil.
once  This will schedule a job to run once on the specified date.
once_fmt  The default date format is ISO 8601 but can be overridden by also specifying the once_fmt option.
enabled  Whether the job should be enabled or disabled. Value should be a boolean.
return_job  Whether to return information to the Salt master upon job completion.
metadata  Using the metadata parameter special values can be associated with a scheduled job. These values are not used in the execution of the job, but can be used to search for specific jobs later if combined with the return_job parameter. The metadata parameter must be specified as a dictionary, otherwise it will be ignored.
returner  The returner to use to return the results of the scheduled job.
return_config  The alternative configuration to use for returner configuration options.
persist  Whether the job should persist between minion restarts, defaults to True.

31.27.141  salt.states.selinux

Management of SELinux rules

If SELinux is available for the running system, the mode can be managed and booleans can be set.

enforcing:
  selinux.mode

samba_create_home_dirs:
  selinux.boolean:
    - value: True
    - persist: True

Note:  Use of these states require that the selinux execution module is available.

salt.states.selinux.boolean(name, value, persist=False)
  Set up an SELinux boolean
    name  The name of the boolean to set
    value  The value to set on the boolean
    persist  Defaults to False, set persist to true to make the boolean apply on a reboot

salt.states.selinux.mode(name)
  Verifies the mode SELinux is running in, can be set to enforcing or permissive
    name  The mode to run SELinux in, permissive or enforcing

31.27.142  salt.states.serverdensity_device

Monitor Server with Server Density

New in version 2014.7.0.

Server Density  Is a hosted monitoring service.

Warning:  This state module is beta. It might be changed later to include more or less automation.
Note: This state module requires a pillar for authentication with Server Density:

```
serverdensity:
  api_token: "b97da80a41c4f61bff05975ee51eb1aa"
  account_url: "https://your-account.serverdensity.io"
```

Note: Although Server Density allows duplicate device names in its database, this module will raise an exception if you try monitoring devices with the same name.

Example:

```
'server_name':
  serverdensity_device.monitored

salt.states.serverdensity_device.monitored(name, group=None, salt_name=True,
  salt_params=True, **params)
```

Device is monitored with Server Density.

- `name` Device name in Server Density.
- `salt_name` If `True` (default), takes the name from the id grain. If `False`, the provided name is used.
- `group` Group name under with device will appear in Server Density dashboard. Default - `None`.
- `salt_params` If `True` (default), needed config parameters will be sourced from grains and from `sta-
tus.all_status`.
- `params` Add parameters that you want to appear in the Server Density dashboard. Will overwrite the `salt_params` parameters. For more info, see the API docs.

Usage example:

```
'server_name':
  serverdensity_device.monitored

'server_name':
  serverdensity_device.monitored:
    - group: web-servers

'my_special_server':
  serverdensity_device.monitored:
    - salt_name: False
    - group: web-servers
    - cpuCores: 2
    - os: CentOS
```

### 31.27.143 salt.states.service

**Starting or restarting of services and daemons**

Services are defined as system daemons typically started with system init or rc scripts. Services can be defined as running or dead.

Note: The current status of a service is determined by the return code of the init/rc script status command. A status return code of 0 it is considered running. Any other return code is considered dead.
httpd:
  service.running: []

The service can also be set to be started at runtime via the enable option:

openvpn:
  service.running:
    - enable: True

By default if a service is triggered to refresh due to a watch statement the service is by default restarted. If the desired behavior is to reload the service, then set the reload value to True:

redis:
  service.running:
    - enable: True
    - reload: True
    - watch:
      pkg: redis

Note: More details regarding watch can be found in the Requisites documentation.

salt.states.service.dead(name, enable=None, sig=None, **kwargs)
   Ensure that the named service is dead by stopping the service if it is running
   name  The name of the init or rc script used to manage the service
   enable Set the service to be enabled at boot time, True sets the service to be enabled, False sets the named service to be disabled. The default is None, which does not enable or disable anything.
   sig    The string to search for when looking for the service process with ps

salt.states.service.disabled(name, **kwargs)
   Verify that the service is disabled on boot, only use this state if you don't want to manage the running process, remember that if you want to disable a service to use the enable: False option for the running or dead function.
   name  The name of the init or rc script used to manage the service

salt.states.service.enabled(name, **kwargs)
   Verify that the service is enabled on boot, only use this state if you don't want to manage the running process, remember that if you want to enable a running service to use the enable: True option for the running or dead function.
   name  The name of the init or rc script used to manage the service

salt.states.service.mod_watch(name, sfun=None, sig=None, reload=False, full_restart=False, init_delay=None, force=False, **kwargs)
   The service watcher, called to invoke the watch command.
   name  The name of the init or rc script used to manage the service
   sfun   The original function which triggered the mod_watch call (service.running, for example).
   sig    The string to search for when looking for the service process with ps

salt.states.service.running(name, enable=None, sig=None, init_delay=None, **kwargs)
   Verify that the service is running
   name  The name of the init or rc script used to manage the service
   enable Set the service to be enabled at boot time, True sets the service to be enabled, False sets the named service to be disabled. The default is None, which does not enable or disable anything.
   sig    The string to search for when looking for the service process with ps
   init_delay Some services may not be truly available for a short period after their startup script indicates to the system that they are. Provide an `init_delay' to specify that this state should wait an additional given number of seconds after a service has started before returning. Useful for requisite states wherein a dependent state might assume a service has started but is not yet fully initialized.
31.27.144 salt.states.slack

Send a message to Slack

This state is useful for sending messages to Slack during state runs.

New in version 2015.5.0.

```
salt-message:
  slack.post_message:
    - channel: '#general'
    - from_name: SuperAdmin
    - message: 'This state was executed successfully.'
    - api_key: peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

The api key can be specified in the master or minion configuration like below:

```
salt:
  api_key: peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

**salt.states.slack.post_message** *(name, channel, from_name, message, api_key= None)*

Send a message to a Slack channel.

```
salt-message:
  slack.post_message:
    - channel: '#general'
    - from_name: SuperAdmin
    - message: 'This state was executed successfully.'
    - api_key: peWcBiMOS9HrZG15peWcBiMOS9HrZG15
```

The following parameters are required:

- **name** The unique name for this event.
- **channel** The channel to send the message to. Can either be the ID or the name.
- **from_name** The name of that is to be shown in the `from` field.
- **message** The message that is to be sent to the Slack channel.

The following parameters are optional:

- **api_key** The api key for Slack to use for authentication, if not specified in the configuration options of master or minion.

31.27.145 salt.states.smtp

Sending Messages via SMTP

New in version 2014.7.0.

This state is useful for firing messages during state runs, using the SMTP protocol.

```
server-warning-message:
  smtp.send_msg:
    - name: 'This is a server warning message'
    - profile: my-smtp-account
    - recipient: admins@example.com
```

31.27. Full list of builtin state modules
salt.states.smtp.send_msg(name, recipient, subject, sender, profile, use_ssl='True')
Send a message via SMTP

```
server-warning-message:
smt...'
- profile: my-smtp-account
- subject: 'Message from Salt'
- recipient: admin@example.com
- sender: admin@example.com
- use_ssl: True
```

name The message to send via SMTP

### 31.27.146 salt.states.splunk_search

Splunk Search State Module

New in version 2015.5.0.

This state is used to ensure presence of splunk searches.

```
salt.states.splunk_search.absent(name, profile='splunk')
Ensure a search is absent
```

API Error Search:
splunk_search.absent

The following parameters are required:
- name This is the name of the search in splunk

```
salt.states.splunk_search.present(name, profile='splunk', **kwargs)
Ensure a search is present
```

API Error Search:
splunk_search.present:
splunk_search.present:
- search: index=main sourcetype=blah
- template: alert_5min

The following parameters are required:
- name This is the name of the search in splunk

### 31.27.147 salt.states.ssh_auth

Control of entries in SSH authorized_key files

The information stored in a user's SSH authorized key file can be easily controlled via the ssh_auth state. Defaults can be set by the enc, options, and comment keys. These defaults can be overridden by including them in the name.
Since the YAML specification limits the length of simple keys to 1024 characters, and since SSH keys are often longer than that, you may have to use a YAML `explicit key', as demonstrated in the second example below.

AAAAB3NzaC1kc3MAACBAL0sQ9fJ5bYTEyY==:
  ssh_auth.present:
    - user: root
    - enc: ssh-dss

? AAAAB3NzaC1kc3MAACBAL0sQ9fJ5bYTEyY==...
: ssh_auth.present:
  - user: root
  - enc: ssh-dss

thatch:
  ssh_auth.present:
    - user: root
    - source: salt://ssh_keys/thatch.id_rsa.pub
    - config: %h/.ssh/authorized_keys

sshkeys:
  ssh_auth.present:
    - user: root
    - enc: ssh-rsa
    - options:
      - option1="value1"
      - option2="value2 flag2"
    - comment: myuser
    - names:
      - AAAAB3NzaC1kc3MAACBAL0sQ9fJ5bYTEyY==
      - ssh-dss AAAAB3NzaCL0sQ9fJ5bYTEyY== user@domain
      - option3="value3" ssh-dss AAAAB3NzaC1kcQ9fJFF435bYTEyY== other@testdomain
      - AAAAB3NzaC1kcQ9fJFF435bYTEyY== newcomment

salt.states.ssh_auth.absent(name, user, enc='ssh-rsa', comment='`, source='`, options=None, config='.`ssh/authorized_keys')

Verifies that the specified SSH key is absent

name  The SSH key to manage
user  The user who owns the SSH authorized keys file to modify
enc  Defines what type of key is being used; can be ed25519, ecdsa, ssh-rsa or ssh-dss
comment  The comment to be placed with the SSH public key
options  The options passed to the key, pass a list object
source  The source file for the key(s). Can contain any number of public keys, in standard ``authorized_keys' format. If this is set, comment, enc and options will be ignored.

New in version 2015.8.0.

config  The location of the authorized keys file relative to the user's home directory, defaults to `.`ssh/authorized_keys`. Token expansion %u and %h for username and home path supported.

salt.states.ssh_auth.present(name, user, enc='ssh-rsa', comment='`, source='`, options=None, config='.`ssh/authorized_keys', **kwargs)

Verifies that the specified SSH key is present for the specified user

name  The SSH key to manage
user  The user who owns the SSH authorized keys file to modify
enc  Defines what type of key is being used; can be ed25519, ecdsa, ssh-rsa or ssh-dss
comment  The comment to be placed with the SSH public key
source  The source file for the key(s). Can contain any number of public keys, in standard ``authorized_keys' format. If this is set, comment and enc will be ignored.
Note: The source file must contain keys in the format `<enc> <key> <comment>`. If you have generated a keypair using PuTTYgen, then you will need to do the following to retrieve an OpenSSH-compatible public key.

1. In PuTTYgen, click Load, and select the private key file (not the public key), and click Open.
2. Copy the public key from the box labeled Public key for pasting into OpenSSH authorized_keys file.
3. Paste it into a new file.

options  The options passed to the key, pass a list object.

config  The location of the authorized keys file relative to the user's home directory, defaults to ".ssh/authorized_keys". Token expansion %u and %h for username and home path supported.

31.27.148 salt.states.ssh_known_hosts

Control of SSH known_hosts entries

Manage the information stored in the known_hosts files.

github.com:
 ssh_known_hosts:
 - present
 - user: root

e.example.com:
 ssh_known_hosts:
 - absent
 - user: root

salt.states.ssh_known_hosts.absent(name, user=None, config=None)
 Verifies that the specified host is not known by the given user.

name  The host name.
user  The user who owns the ssh authorized keys file to modify.
config  The location of the authorized keys file relative to the user's home directory, defaults to ".ssh/known_hosts". If no user is specified, defaults to "/etc/ssh/ssh_known_hosts". If present, must be an absolute path when a user is not specified.

salt.states.ssh_known_hosts.present(name, user=None, fingerprint=None, key=None, port=None, enc=None, config=None, hash_hostname=True)
 Verifies that the specified host is known by the specified user.

On many systems, specifically those running with openssh 4 or older, the enc option must be set, only openssh 5 and above can detect the key type.

name  The name of the remote host (e.g. `github.com`)
user  The user who owns the ssh authorized keys file to modify.
fingerprint  The fingerprint of the key which must be presented in the known_hosts file (optional if key specified).
key  The public key which must be presented in the known_hosts file (optional if fingerprint specified).
port  optional parameter, denoting the port of the remote host, which will be used in case, if the public key will be requested from it. By default the port 22 is used.
enc  Defines what type of key is being used, can be ed25519, ecdsa ssh-rsa or ssh-dss.
config  The location of the authorized keys file relative to the user's home directory, defaults to ".ssh/known_hosts". If no user is specified, defaults to "/etc/ssh/ssh_known_hosts". If present, must...
be an absolute path when a user is not specified.

hash_hostname  [True] Hash all hostnames and addresses in the output.

31.27.149 salt.states.stateconf

Stateconf System

The stateconf system is intended for use only with the stateconf renderer. This State module presents the set function. This function does not execute any functionality, but is used to interact with the stateconf renderer.

salt.states.stateconf.context(name, **kwargs)
   No-op state to support state config via the stateconf renderer.

tsalt.states.stateconf.set(name, **kwargs)
   No-op state to support state config via the stateconf renderer.

31.27.150 salt.states.status

Minion status monitoring

Maps to the status execution module.

salt.states.status.loadavg(name, maximum=None, minimum=None)
   Return the current load average for the specified minion. Available values for name are 1-min, 5-min and
   15-min. minimum and maximum values should be passed in as strings.

tsalt.states.status.process(name)
   Return whether the specified signature is found in the process tree. This differs slightly from the services
   states, in that it may refer to a process that is not managed via the init system.

31.27.151 salt.states.stormpath_account

Support for Stormpath.

New in version 2015.8.0.

salt.states.stormpath_account.absent(name, directory_id=None)
   Ensure that an account associated with the given email address is absent. Will search all directories for the
   account, unless a directory_id is specified.
   name The email address of the account to delete.
   directory_id Optional. The ID of the directory that the account is expected to belong to. If not specified, then a
   list of directories will be retrieved, and each will be scanned for the account. Specifying a directory_id will
   therefore cut down on the number of requests to Stormpath, and increase performance of this state.

tsalt.states.stormpath_account.present(name, **kwargs)
   Ensure that an account is present and properly configured
   name The email address associated with the Stormpath account
   directory_id The ID of a directory which the account belongs to. Required.
   password Required when creating a new account. If specified, it is advisable to reference the password in another
   database using an sdb:// URL. Will NOT update the password if an account already exists.
   givenName Required when creating a new account.
   surname Required when creating a new account.
   username Optional. Must be unique across the owning directory. If not specified, the username will default
to the email field.
   middleName Optional.
status enabled accounts are able to login to their assigned applications, disabled accounts may not login to applications, unverified accounts are disabled and have not verified their email address.
customData. Optional. Must be specified as a dict.

31.27.152 salt.states.supervisord

Interaction with the Supervisor daemon

```python
wsgi_server:
    supervisord.running:
        - require:
        - pkg: supervisor
        - watch:
        - file: /etc/nginx/sites-enabled/wsgi_server.conf

salt.states.supervisord.dead(name, user=None, conf_file=None, bin_env=None)
Ensure the named service is dead (not running).
name Service name as defined in the supervisor configuration file
user Name of the user to run the supervisorctl command

New in version 0.17.0.
conf_file path to supervisorctl config file
bin_env path to supervisorctl bin or path to virtualenv with supervisor installed

salt.states.supervisord.mod_watch(name, restart=True, update=False, user=None, conf_file=None, bin_env=None, **kwargs)
salt.states.supervisord.running(name, restart=False, update=False, user=None, conf_file=None, bin_env=None)
Ensure the named service is running.
name Service name as defined in the supervisor configuration file
restart Whether to force a restart
update Whether to update the supervisor configuration.
user Name of the user to run the supervisorctl command

New in version 0.17.0.
conf_file path to supervisorctl config file
bin_env path to supervisorctl bin or path to virtualenv with supervisor installed

31.27.153 salt.states.svn

Manage SVN repositories

Manage repository checkouts via the svn vcs system:

http://unladen-swallow.googlecode.com/svn/trunk/:
svn.latest:
    - target: /tmp/swallow

salt.states.svn.dirty(name, target, user=None, username=None, password=None, ignore_unversioned=False)
Determine if the working directory has been changed.
salt.states.svn.export

Export a file or directory from an SVN repository

- `name`: Address and path to the file or directory to be exported.
- `target`: Name of the target directory where the checkout will put the working directory
- `rev`: The name revision number to checkout. Enable `force` if the directory already exists.
- `user`: Name of the user performing repository management operations
- `username`: The user to access the name repository with. The svn default is the current user
- `password`: Connect to the Subversion server with this password
- `force`: Continue if conflicts are encountered
- `overwrite`: Overwrite existing target
- `externals`: Change to False to not checkout or update externals
- `trust`: Automatically trust the remote server.

salt.states.svn.latest

Checkout or update the working directory to the latest revision from the remote repository.

- `name`: Address of the name repository as passed to `svn checkout`
- `target`: Name of the target directory where the checkout will put the working directory
- `rev`: The name revision number to checkout. Enable `force` if the directory already exists.
- `user`: Name of the user performing repository management operations
- `username`: The user to access the name repository with. The svn default is the current user
- `password`: Connect to the Subversion server with this password
- `force`: Continue if conflicts are encountered
- `externals`: Change to False to not checkout or update externals
- `trust`: Automatically trust the remote server.

31.27.154 salt.states.sysctl

Configuration of the Linux kernel using sysctl

Control the kernel sysctl system.

```
vm.swappiness:
    sysctl.present:
      - value: 20
```

salt.states.sysctl.present

Ensure that the named sysctl value is set in memory and persisted to the named configuration file. The default sysctl configuration file is `/etc/sysctl.conf`

- `name`: The name of the sysctl value to edit
- `value`: The sysctl value to apply
- `config`: The location of the sysctl configuration file. If not specified, the proper location will be detected based on platform.

31.27.155 salt.states.syslog_ng

State module for syslog_ng

- `maintainer`: Tibor Benke <btibi@sch.bme.hu>
maturity  new
depends  cmd, ps, syslog_ng
platform  all

Users can generate syslog-ng configuration files from YAML format or use plain ones and reload, start, or stop their syslog-ng by using this module.

Details

The service module is not available on all system, so this module includes syslog_ng.reloadd, syslog_ng.stopped, and syslog_ng.started functions. If the service module is available on the computers, users should use that.

Users can generate syslog-ng configuration with syslog_ng.config function. For more information see syslog-ng state usage.

Syslog-ng configuration file format

The syntax of a configuration snippet in syslog-ng.conf:

```
object_type object_id {<options>};
```

These constructions are also called statements. There are options inside of them:

```
option(parameter1, parameter2); option2(parameter1, parameter2);
```


**salt.states.syslog_ng.config**(name, config, write=True)

Builds syslog-ng configuration.

```
name : the id of the Salt document config : the parsed YAML code write : if True, it writes the config into the configuration file, otherwise just returns it
```

**salt.states.syslog_ng.reloaded**(name)

Reloads syslog-ng.

**salt.states.syslog_ng.started**(name=None, user=None, group=None, chroot=None, caps=None, no_caps=False, pidfile=None, enable_core=False, fd_limit=None, verbose=False, debug=False, trace=False, yydebug=False, persist_file=None, control=None, worker_threads=None, *args, **kwargs)

Ensures, that syslog-ng is started via the given parameters.

Users shouldn’t use this function, if the service module is available on their system.

**salt.states.syslog_ng.stopped**(name=None)

Kills syslog-ng.

### 31.27.156 salt.states.sysrc

**salt.states.sysrc.absent**(name, **kwargs)

Ensure a sysrc variable is absent.

```
name  The variable name to set
```
file  (optional) The rc file to add the variable to.
  jail  (option) the name or JID of the jail to set the value in.

salt.states.sysrc.managed(name, value, **kwargs)
  Ensure a sysrc variable is set to a specific value.
  name  The variable name to set
  value  Value to set the variable to
  file  (optional) The rc file to add the variable to.
  jail  (option) the name or JID of the jail to set the value in.

31.27.157  salt.states.test

Test States

Provide test case states that enable easy testing of things to do with state calls, e.g. running, calling, logging, output filtering etc.

always-passes:
  test.succeed_without_changes:
    - name: foo

always-fails:
  test.fail_without_changes:
    - name: foo

always-changes-and-succeeds:
  test.succeed_with_changes:
    - name: foo

always-changes-and-fails:
  test.fail_with_changes:
    - name: foo

my-custom-combo:
  test.configurable_test_state:
    - name: foo
    - changes: True
    - result: False
    - comment: bar.baz

is-pillar-foo-present-and-bar-is-int:
  test.check_pillar:
    - present:
      - foo
    - integer:
      - bar

salt.states.test.check_pillar(name, present=None, boolean=None, integer=None, string=None, listing=None, dictionary=None, verbose=False)
  Checks the presence and, optionally, the type of given keys in Pillar. Supported kwargs for types are: - boolean (bool) - integer (int) - string (str) - listing (list) - dictionary (dict)
  Checking for None type pillars is not implemented yet.

is-pillar-foo-present-and-bar-is-int:
  test.check_pillar:
- present:
  - foo
- integer:
  - bar

```
salt.states.test.configurable_test_state(name, changes=True, result=True, comment='')
```
A configurable test state which determines its output based on the inputs.

- name: A unique string.
- changes: Do we return anything in the changes field? Accepts True, False, and 'Random' Default is True
- result: Do we return successfully or not? Accepts True, False, and 'Random' Default is True
- comment: String to fill the comment field with. Default is ''

```
salt.states.test.fail_with_changes(name)
```
Returns failure and changes is not empty.

- name: A unique string.

```
salt.states.test.fail_without_changes(name)
```
Returns failure.

- name: A unique string.

```
salt.states.test.mod_watch(name, sfun=None, **kwargs)
```
'Call this function via a watch statement

- name: A unique string.
- sfun: None
- **kwargs: Any parameters in the state return dictionary can be customized by adding the keywords result, comment, and changes.

```
this_state_will_return_changes:
  test.succeed_with_changes

this_state_will_NOT_return_changes:
  test.succeed_without_changes

this_state_is_watching_another_state:
  test.succeed_without_changes:
    - comment: 'This is a custom comment'
    - watch:
      - test: this_state_will_return_changes
      - test: this_state_will_NOT_return_changes

this_state_is_also_watching_another_state:
  test.succeed_without_changes:
    - watch:
      - test: this_state_will_NOT_return_changes

salt.states.test.show_notification(name, text=None, **kwargs)
```
Simple notification using text argument.

- name: A unique string.
- text: Text to return in the comment.
salt.states.test.succeed_with_changes(name)
   Returns successful and changes is not empty
   New in version 2014.7.0.
   name: A unique string.

salt.states.test.succeed_without_changes(name)
   Returns successful.
   New in version 2014.7.0.
   name A unique string.

31.27.158 salt.states.timezone

Management of timezones

The timezone can be managed for the system:

America/Denver:
   timezone.system

   The system and the hardware clock are not necessarily set to the same time. By default, the hardware clock is set to localtime, meaning it is set to the same time as the system clock. If utc is set to True, then the hardware clock will be set to UTC, and the system clock will be an offset of that.

America/Denver:
   timezone.system:
   - utc: True

   The Ubuntu community documentation contains an explanation of this setting, as it applies to systems that dual-boot with Windows. This is explained in greater detail here.

salt.states.timezone.system(name, utc=True)
   Set the timezone for the system.
   name The name of the timezone to use (e.g.: America/Denver)
   utc Whether or not to set the hardware clock to UTC (default is True)

31.27.159 salt.states.tls

Enforce state for SSL/TLS

salt.states.tls.valid_certificate(name, weeks=0, days=0, hours=0, minutes=0, seconds=0)
   Verify that a TLS certificate is valid now and (optionally) will be valid for the time specified through weeks, days, hours, minutes, and seconds.

31.27.160 salt.states.tomcat

This state uses the manager webapp to manage Apache tomcat webapps This state requires the manager webapp to be enabled

The following grains/pillar should be set:

   tocat-manager:user: admin user name
   tocat-manager:passwd: password

31.27. Full list of built-in state modules
and also configure a user in the conf/tomcat-users.xml file:

```xml
<?xml version='1.0' encoding='utf-8'?>
<tomcat-users>
    <role rolename="manager-script"/>
    <user username="tomcat" password="tomcat" roles="manager-script"/>
</tomcat-users>
```

Notes:

- Not supported multiple version on the same context path
- if you use only this module for deployments you might want to restrict access to the manager so its only accessible via localhost for more info: [http://tomcat.apache.org/tomcat-7.0-doc/manager-howto.html#Configuring_Manager_Application_Access](http://tomcat.apache.org/tomcat-7.0-doc/manager-howto.html#Configuring_Manager_Application_Access)

- Tested on:
  - JVM Vendor: Sun Microsystems Inc.
  - JVM Version: 1.6.0_43-b01
  - OS Architecture: amd64
  - OS Name: Linux
  - OS Version: 2.6.32-358.el6.x86_64
  - Tomcat Version: Apache Tomcat/7.0.37

salt.states.tomcat.mod_watch(name, url='http://localhost:8080/manager', timeout=180)

The tomcat watcher function. When called it will reload the webapp in question

salt.states.tomcat.undeployed(name, url='http://localhost:8080/manager', timeout=180)

Enforce that the WAR will be un-deployed from the server

name the context path to deploy

url [http://localhost:8080/manager] the URL of the server manager webapp

timeout [180] timeout for HTTP request to the tomcat manager

Example:

```yaml
jenkins:
  tomcat.undeployed:
    - name: /ran
    - require:
      - service: application-service
```

salt.states.tomcat.wait(name, url='http://localhost:8080/manager', timeout=180)

Wait for the tomcat manager to load

Notice that if tomcat is not running we won’t wait for it start and the state will fail. This state can be required in the tomcat.war_deployed state to make sure tomcat is running and that the manager is running as well and ready for deployment

url [http://localhost:8080/manager] the URL of the server manager webapp

timeout [180] timeout for HTTP request to the tomcat manager

Example:

```yaml
tomcat-service:
  service.running:
    - name: tomcat
```
- enable: True

wait-for-tomcatmanager:
  tomcat.wait:
    - timeout: 300
    - require:
      - service: tomcat-service

jenkins:
  tomcat.war_deployed:
    - name: /ran
    - war: salt://jenkins-1.2.4.war
    - require:
      - tomcat: wait-for-tomcatmanager

salt.states.tomcat.
war_deployed( name, war, force=False, url='http://localhost:8080/manager',
  timeout=180, temp_war_location=None )

Enforce that the WAR will be deployed and started in the context path it will make use of WAR versions
for more info: http://tomcat.apache.org/tomcat-7.0-doc/config/context.html#Naming

name the context path to deploy
war absolute path to WAR file (should be accessible by the user running tomcat) or a path supported by the
salt.modules.cp.get_url function
force force deploy even if version strings are the same, False by default.
url [http://localhost:8080/manager] the URL of the server manager webapp
timeout [180] timeout for HTTP request to the tomcat manager
temp_war_location [None] use another location to temporarily copy to war file by default the system's temp
directory is used

Example:

jenkins:
  tomcat.war_deployed:
    - name: /ran
    - war: salt://jenkins-1.2.4.war
    - require:
      - tomcat: wait-for-tomcatmanager

31.27.161 salt.states.trafficserver

Control Apache Traffic Server

New in version 2015.8.0.

salt.states.trafficserver.

bounce_cluster(name)
  Bounce all Traffic Server nodes in the cluster. Bouncing Traffic Server shuts down and immediately restarts
  Traffic Server, node-by-node.

  bounce_ats_cluster:
    trafficserver.bounce_cluster

salt.states.trafficserver.

bounce_local(name, drain=False)
  Bounce Traffic Server on the local node. Bouncing Traffic Server shuts down and immediately restarts the
  Traffic Server node.
This option modifies the behavior of traffic_line -b and traffic_line -L such that traffic_server is not shut down until the number of active client connections drops to the number given by the proxy.config.restart.active_client_threshold configuration variable.

```
bounce_ats_local:
  trafficserver.bounce_local

bounce_ats_local:
  trafficserver.bounce_local
    - drain: True
```

**salt.states.trafficserver.clear_cluster(name)**
Clears accumulated statistics on all nodes in the cluster.

```
clear_ats_cluster:
  trafficserver.clear_cluster
```

**salt.states.trafficserver.clear_node(name)**
Clears accumulated statistics on the local node.

```
clear_ats_node:
  trafficserver.clear_node
```

**salt.states.trafficserver.offline(name, path)**
Mark a cache storage device as offline. The storage is identified by a path which must match exactly a path specified in storage.config. This removes the storage from the cache and redirects requests that would have used this storage to other storage. This has exactly the same effect as a disk failure for that storage. This does not persist across restarts of the traffic_server process.

```
offline_ats_path:
  trafficserver.offline:
    - path: /path/to/cache
```

**salt.states.trafficserver.refresh(name)**
Initiate a Traffic Server configuration file reread. Use this command to update the running configuration after any configuration file modification.

The timestamp of the last reconfiguration event (in seconds since epoch) is published in the proxy.node.config.reconfigure_time metric.

```
refresh_ats:
  trafficserver.refresh
```

**salt.states.trafficserver.restart_cluster(name)**
Restart the traffic_manager process and the traffic_server process on all the nodes in a cluster.

```
restart_ats_cluster:
  trafficserver.restart_cluster
```

**salt.states.trafficserver.restart_local(name, drain=False)**
Restart the traffic_manager and traffic_server processes on the local node.

This option modifies the behavior of traffic_line -b and traffic_line -L such that traffic_server is not shut down until the number of active client connections drops to the number given by the proxy.config.restart.active_client_threshold configuration variable.
restart_ats_local:
    trafficserver.restart_local

restart_ats_local_drain:
    trafficserver.restart_local
    - drain: True

salt.states.trafficserver.set_var(name, value)
Set Traffic Server variable values

proxy.config.proxy_name:
    trafficserver.set_var:
        - value: cdn.site.domain.tld

OR

traffic_server_setting:
    trafficserver.set_var:
        - name: proxy.config.proxy_name
        - value: cdn.site.domain.tld

salt.states.trafficserver.shutdown(name)
Shut down Traffic Server on the local node.

shutdown_ats:
    trafficserver.shutdown

salt.states.trafficserver.startup(name)
Start Traffic Server on the local node.

startup_ats:
    trafficserver.startup

salt.states.trafficserver.zero_cluster(name)
Reset performance statistics to zero across the cluster.

zero_ats_cluster:
    trafficserver.zero_cluster

salt.states.trafficserver.zero_node(name)
Reset performance statistics to zero on the local node.

zero_ats_node:
    trafficserver.zero_node

31.27.162 salt.states.tuned

Interface to Red Hat tuned-adm module

maintainer Syed Ali <alicsyed@gmail.com>
maturity new
depends  cmd.run
platform  Linux

salt.states.tuned.off(name=None)
   Turns 'tuned' off. Example tuned.sls file for turning tuned off:
   tuned: tuned.off: []
   To see a valid list of states call execution module: tuned.list

salt.states.tuned.profile(name)
   This state module allows you to modify system tuned parameters
   Example tuned.sls file to set profile to virtual-guest
   tuned:
       tuned:
           • profile
           • name: virtual-guest
   name  tuned profile name to set the system to
   To see a valid list of states call execution module: tuned.list

31.27.163  salt.states.uptime

Monitor Web Server with Uptime

Uptime is an open source remote monitoring application using Node.js, MongoDB, and Twitter Bootstrap.

Warning:  This state module is beta. It might be changed later to include more or less automation.

Note:  This state module requires a pillar to specify the location of your uptime install

uptime:
    application_url: "http://uptime-url.example.org"

Example:

url:
    uptime.monitored
url/sitemap.xml:
    uptime.monitored:
        - polling: 600  # every hour

salt.states.uptime.monitored(name, **params)
   Makes sure an URL is monitored by uptime. Checks if URL is already monitored, and if not, adds it.

31.27.164  salt.states.user

Management of user accounts

The user module is used to create and manage user settings, users can be set as either absent or present
fred:
user.present:
  - fullname: Fred Jones
  - shell: /bin/zsh
  - home: /home/fred
  - uid: 4000
  - gid: 4000
  - groups:
    - wheel
    - storage
    - games

testuser:
user.absent

salt.states.user.absent(name, purge=False, force=False)
Ensure that the named user is absent
  name The name of the user to remove
  purge Set purge to True to delete all of the user's files as well as the user, Default is False.
  force If the user is logged in, the absent state will fail. Set the force option to True to remove the user even if they are logged in. Not supported in FreeBSD and Solaris, Default is False.

salt.states.user.present(name, uid=None, gid=None, gid_from_name=False, groups=None, optional_groups=None, remove_groups=True, home=None, createhome=True, password=None, enforce_password=True, empty_password=False, shell=None, unique=True, system=False, fullname=None, roomnumber=None, workphone=None, homephone=None, loginclass=None, date=None, mindays=None, maxdays=None, inactdays=None, warndays=None, expire=None, win_homedrive=None, win_profile=None, win_logonscript=None, win_description=None)
Ensure that the named user is present with the specified properties
  name The name of the user to manage
  uid The user id to assign, if left empty then the next available user id will be assigned
  gid The default group id. Also accepts group name.
  gid_from_name If True, the default group id will be set to the id of the group with the same name as the user, Default is False.
  groups A list of groups to assign the user to, pass a list object. If a group specified here does not exist on the minion, the state will fail. If set to the empty list, the user will be removed from all groups except the default group.
  optional_groups A list of groups to assign the user to, pass a list object. If a group specified here does not exist on the minion, the state will silently ignore it.
  NOTE: If the same group is specified in both "groups" and "optional_groups", then it will be assumed to be required and not optional.
  remove_groups Remove groups that the user is a member of that weren't specified in the state, Default is True.
  home The custom login directory of user. Uses default value of underlying system if not set. Notice that this directory does not have to exist. This also the location of the home directory to create if createhome is set to True.
  createhome If False, the home directory will not be created if it doesn’t exist. Please note that directories leading up to the home directory will NOT be created, Default is True.
  password A password hash to set for the user. This field is only supported on Linux, FreeBSD, NetBSD, OpenBSD, and Solaris. For Windows this is the plain text password.
  Changed in version 0.16.0: BSD support added.
  enforce_password Set to False to keep the password from being changed if it has already been set and the password hash differs from what is specified in the "password" field. This option will be ignored if
`password` is not specified, Default is True.

**empty_password** Set to True to enable password-less login for user, Default is False.

**shell** The login shell, defaults to the system default shell

**unique** Require a unique UID, Default is True.

**system** Choose UID in the range of FIRST_SYSTEM_UID and LAST_SYSTEM_UID, Default is False.

**loginclass** The login class, defaults to empty (BSD only)

User comment field (GECOS) support (currently Linux, BSD, and MacOS only):

The below values should be specified as strings to avoid ambiguities when the values are loaded. (Especially the phone and room number fields which are likely to contain numeric data)

**fullname** The user's full name

**roomnumber** The user's room number (not supported in MacOS)

**workphone** The user's work phone number (not supported in MacOS)

**homephone** The user's home phone number (not supported in MacOS)

Changed in version 2014.7.0: Shadow attribute support added.

Shadow attributes support (currently Linux only):

The below values should be specified as integers.

**date** Date of last change of password, represented in days since epoch (January 1, 1970).

**mindays** The minimum number of days between password changes.

**maxdays** The maximum number of days between password changes.

**inactdays** The number of days after a password expires before an account is locked.

**warndays** Number of days prior to maxdays to warn users.

**expire** Date that account expires, represented in days since epoch (January 1, 1970).

The below parameters apply to windows only:

**win_homedrive** (Windows Only) The drive letter to use for the home directory. If not specified the home directory will be a unc path. Otherwise the home directory will be mapped to the specified drive. Must be a letter followed by a colon. Because of the colon, the value must be surrounded by single quotes. ie:

- win_homedrive: `U:

Changed in version 2015.8.0.

**win_profile** (Windows Only) The custom profile directory of the user. Uses default value of underlying system if not set.

Changed in version 2015.8.0.

**win_logonscript** (Windows Only) The full path to the logon script to run when the user logs in.

Changed in version 2015.8.0.

**win_description** (Windows Only) A brief description of the purpose of the users account.

Changed in version 2015.8.0.

### 31.27.165 salt.states.vbox_guest

VirtualBox Guest Additions installer state

salt.states.vbox_guest.additions_installed(name, reboot=False, upgrade_os=False)

Ensure that the VirtualBox Guest Additions are installed. Uses the CD, connected by VirtualBox.

name The name has no functional value and is only used as a tracking reference.

reboot [False] Restart OSto complete installation.

upgrade_os [False] Upgrade OS (to ensure the latests version of kernel and developer tools installed).

salt.states.vbox_guest.additions_removed(name, force=False)

Ensure that the VirtualBox Guest Additions are removed. Uses the CD, connected by VirtualBox.

To connect VirtualBox Guest Additions via VirtualBox graphical interface press `Host+D` (`Host` is usually `Right Ctrl`).

name The name has no functional value and is only used as a tracking reference.

force Force VirtualBox Guest Additions removing.
salt.states.vbox_guest.grant_access_to_shared_folders_to(name, users=None)
Grant access to auto-mounted shared folders to the users.

User is specified by its name. To grant access for several users use argument users.
name Name of the user to grant access to auto-mounted shared folders to.
users List of names of users to grant access to auto-mounted shared folders to. If specified, name will not be taken into account.

31.27.166 salt.states.victorops

Create an Event in VictorOps

New in version 2015.8.0.
This state is useful for creating events on the VictorOps service during state runs.

webserver-warning-message:
    victorops.create_event:
        - message_type: 'CRITICAL'
        - entity_id: 'webserver/diskspace'
        - state_message: 'Webserver diskspace is low.'

salt.states.victorops.create_event(name, message_type, routing_key='everyone', **kwargs)
Create an event on the VictorOps service

webserver-warning-message:
    victorops.create_event:
        - message_type: 'CRITICAL'
        - entity_id: 'webserver/diskspace'
        - state_message: 'Webserver diskspace is low.'

database-server-warning-message:
    victorops.create_event:
        - message_type: 'WARNING'
        - entity_id: 'db_server/load'
        - state_message: 'Database Server load is high.'
        - entity_is_host: True
        - entity_display_name: 'dbdserver.example.com'

The following parameters are required:
name This is a short description of the event.
message_type One of the following values: INFO, WARNING, ACKNOWLEDGEMENT, CRITICAL, RECOVERY.
The following parameters are optional:
routing_key The key for where messages should be routed. By default, sent to `everyone` route.
entity_id The name of alerting entity. If not provided, a random name will be assigned.
timestamp Timestamp of the alert in seconds since epoch. Defaults to the time the alert is received at VictorOps.
timestamp_fmt The date format for the timestamp parameter. Defaults to `\%Y-%m-%dT%H:%M:%S`.
state_start_time The time this entity entered its current state (seconds since epoch). Defaults to the time alert is received.
state_start_time_fmt The date format for the timestamp parameter. Defaults to `%Y-%m-%dT%H:%M:%S'.

state_message Any additional status information from the alert item.

entity_is_host Used within VictorOps to select the appropriate display format for the incident.

entity_display_name Used within VictorOps to display a human-readable name for the entity.

ack_message A user entered comment for the acknowledgment.

ack_author The user that acknowledged the incident.

### 31.27.167 salt.states.virtualenv

**Setup of Python virtualenv sandboxes**

```python
salt.states.virtualenv_mod.managed(name, venv_bin=None, requirements=None, system_site_packages=False, distribute=False, use_wheel=False, clear=False, python=None, extra_search_dir=None, prompt=None, user=None, no_chown=False, cwd=None, index_url=None, extra_index_url=None, pre_releases=False, no_deps=False, pip_download=None, pip_download_cache=None, pip_exists_action=None, proxy=None, use_vt=False, env_vars=None)
```

Create a virtualenv and optionally manage it with pip

- **name** Path to the virtualenv
- **requirements** Path to a pip requirements file. If the path begins with `salt://` the file will be transferred from the master file server.
- **cwd** Path to the working directory where `''pip install''` is executed.
- **user** The user under which to run virtualenv and pip
- **no_chown**: False When user is given, do not attempt to copy and chown a requirements file (needed if the requirements file refers to other files via relative paths, as the copy-and-chown procedure does not account for such files)
- **use_wheel** [False] Prefer wheel archives (requires pip>=1.4)
- **no_deps**: False Pass `--no-deps` to pip.
- **pip_exists_action**: None Default action of pip when a path already exists: (s)witch, (i)gnore, (w)ipe, (b)ackup
- **proxy**: None Proxy address which is passed to `''pip install''`
- **env_vars** Set environment variables that some builds will depend on. For example, a Python C-module may have a Makefile that needs `INCLUDE_PATH` set to pick up a header file while compiling. Also accepts any kwargs that the virtualenv module will.

```
/var/www/myvirtualenv.com:
virtualenv.managed:
    - system_site_packages: False
    - requirements: salt://REQUIREMENTS.txt
```

### 31.27.168 salt.states.win_dacl

**Windows Object Access Control Lists**

Ensure an ACL is present
parameters: name - the path of the object objectType - Registry/File/Directory user - user account for the ace permission - permission for the ace (see module win_acl for available permissions for each objectType) acetype - Allow/Deny propagation - how the ACL should apply to child objects (see module win_acl for available propagation types)

addAcl:
  win_dacl.present:
    - name: HKEY_LOCAL_MACHINE\SOFTWARE\mykey
    - objectType: Registry
    - user: FakeUser
    - permission: FullControl
    - acetype: ALLOW
    - propagation: KEY&SUBKEYS

Ensure an ACL does not exist

parameters: name - the path of the object objectType - Registry/File/Directory user - user account for the ace permission - permission for the ace (see module win_acl for available permissions for each objectType) acetype - Allow/Deny propagation - how the ACL should apply to child objects (see module win_acl for available propagation types)

removeAcl:
  win_dacl.absent:
    - name: HKEY_LOCAL_MACHINE\SOFTWARE\mykey
    - objectType: Registry
    - user: FakeUser
    - permission: FullControl
    - acetype: ALLOW
    - propagation: KEY&SUBKEYS

Ensure an object is inheriting permissions

parameters: name - the path of the object objectType - Registry/File/Directory clear_existing_acl - True/False - when inheritance is enabled, should the existing ACL be kept or cleared out

elInherit:
  win_dacl.enableinheritance:
    - name: HKEY_LOCAL_MACHINE\SOFTWARE\mykey
    - objectType: Registry
    - clear_existing_acl: True

Ensure an object is not inheriting permissions

parameters: name - the path of the object objectType - Registry/File/Directory copy_inherited_acl - True/False - if inheritance is enabled, should the inherited permissions be copied to the ACL when inheritance is disabled
31.27.169 salt.states.win_dns_client

Module for configuring DNS Client on Windows systems

salt.states.win_dns_client.dns_dhcp(name, interface='Local Area Connection')
Configure the DNS server list from DHCP Server

salt.states.win_dns_client.dns_exists(name, servers=None, interface='Local Area Connection', replace=False)
Configure the DNS server list in the specified interface

Example:

```
config_dns_servers:
  win_dns_client.dns_exists:
    - replace: True  # remove any servers not in the "servers" list, default is False
    - servers:
      - 8.8.8.8
      - 8.8.8.9
```

salt.states.win_dns_client.primary_suffix(name, suffix=None, updates=False)
New in version 2014.7.0.
Configure the global primary DNS suffix of a DHCP client.
suffix [None] The suffix which is advertised for this client when acquiring a DHCP lease When none is set, the explicitly configured DNS suffix will be removed.
updates [False] Allow syncing the DNS suffix with the AD domain when the client's AD domain membership changes

```
primary_dns_suffix:
  win_dns_client.primary_suffix:
    - suffix: sub.domain.tld
    - updates: True
```
31.27.170 salt.states.win_firewall

State for configuring Windows Firewall

```python
salt.states.win_firewall.add_rule(name, localport, protocol='tcp', action='allow', dir='in')
```

Add a new firewall rule (Windows only)

```python
salt.states.win_firewall.disabled(name)
```

Disable all the firewall profiles (Windows only)

31.27.171 salt.states.win_network

Configuration of network interfaces on Windows hosts

New in version 2014.1.0.

This module provides the network state(s) on Windows hosts. DNS servers, IP addresses and default gateways can currently be managed.

Below is an example of the configuration for an interface that uses DHCP for both DNS servers and IP addresses:

```
Local Area Connection #2:
    network.managed:
        - dns_proto: dhcp
        - ip_proto: dhcp
```

**Note:** Both the `dns_proto` and `ip_proto` arguments are required.

Static DNS and IP addresses can be configured like so:

```
Local Area Connection #2:
    network.managed:
        - dns_proto: static
        - dns_servers:
            - 8.8.8.8
            - 8.8.4.4
        - ip_proto: static
        - ip_addrs:
            - 10.2.3.4/24
```

**Note:** IP addresses are specified using the format `<ip-address>/<subnet-length>`. Salt provides a convenience function called `ip.get_subnet_length` to calculate the subnet length from a netmask.

Optionally, if you are setting a static IP address, you can also specify the default gateway using the `gateway` parameter:

```
Local Area Connection #2:
    network.managed:
        - dns_proto: static
        - dns_servers:
            - 8.8.8.8
            - 8.8.4.4
        - ip_proto: static
        - ip_addrs:
```
salt.states.win_network.managed

Ensure that the named interface is configured properly.

- **name**: The name of the interface to manage
- **dns_proto**: [None] Set to **static** and use the **dns_servers** parameter to provide a list of DNS nameservers.
  - set to **dhcp** to use DHCP to get the DNS servers.
- **dns_servers**: [None] A list of static DNS servers.
- **ip_proto**: [None] Set to **static** and use the **ip_addrs** and (optionally) **gateway** parameters to provide a list of static IP addresses and the default gateway. Set to **dhcp** to use DHCP.
- **ip_addrs**: [None] A list of static IP addresses.
- **gateway**: [None] A list of static IP addresses.
- **enabled**: [True] Set to **False** to ensure that this interface is disabled.

31.27.172 salt.states.win_path

Manage the Windows System PATH

salt.states.win_path.absent(name)

Remove the directory from the SYSTEM path

- **index**: where the directory should be placed in the PATH (default: 0)

Example:

'C:\sysinternals':
  win_path.absent

salt.states.win_path.exists(name, index=None)

Add the directory to the system PATH at index location

- **index**: where the directory should be placed in the PATH (default: None) [Note: Providing no index will append directory to PATH and will not enforce its location within the PATH.]

Example:

'C:\python27':
  win_path.exists

'C:\sysinternals':
  win_path.exists:
    index: 0

31.27.173 salt.states.win_powercfg

This module allows you to control the power settings of a windows minion via powercfg.

New in version 2015.8.0.

- **monitor**: 10.2.3.4/24
- gateway: 10.2.3.1

monitor:
  powercfg.set_timeout:
    - value: 30
    - power: dc
**salt.states.win_powercfg.set_timeout**(*name*, *value*, *power='ac'*)

Set the sleep timeouts of specific items such as disk, monitor.

CLI Example:

```yaml
monitor:
    powercfg.set_timeout:
      - value: 30
      - power: dc

disk:
    powercfg.set_timeout:
      - value: 12
      - power: ac
```

- **name**: The setting to change, can be one of the following: monitor, disk, standby, hibernate
- **timeout**: The amount of time in minutes before the item will timeout i.e the monitor
- **power**: Should we set the value for AC or DC (battery)? Valid options ac,dc.

### 31.27.174 salt.states.win_servermanager

Manage Windows features via the ServerManager powershell module

**salt.states.win_servermanager.installed**(*name*, *recurse=False*, *force=False*)

Install the windows feature

- **name**: short name of the feature (the right column in win_servermanager.list_available)
- **recurse**: install all sub-features as well
- **force**: if the feature is installed but on of its sub-features are not installed set this to True to force the installation of the sub-features

Note: Some features require reboot after un/installation. If so, until the server is restarted other features cannot be installed!

Example:

Run `salt MinionName win_servermanager.list_available` to get a list of available roles and features. Use the name in the right column. Do not use the role or feature names mentioned in the PKGMGR documentation. In this example for IIS-WebServerRole the name to be used is Web-Server.

```yaml
ISWebserverRole:
    win_servermanager.installed:
      - force: True
      - recurse: True
      - name: Web-Server
```

**salt.states.win_servermanager.removed**(*name*)

Remove the windows feature

- **name**: short name of the feature (the right column in win_servermanager.list_available)

Note: Some features require a reboot after un/installation. If so the feature will not be completely uninstalled until the server is restarted.

Example:

Run `salt MinionName win_servermanager.list_installed` to get a list of all features installed. Use the top name listed for each feature, not the indented one. Do not use the role or feature names mentioned in the PKGMGR documentation.
ISWebserverRole:
    win_servermanager.removed:
        - name: Web-Server

31.27.175 salt.states.win_system

Management of Windows system information

New in version 2014.1.0.
This state is used to manage system information such as the computer name and description.

ERIK-WORKSTATION:
    system.computer_name: []

This is Erik's computer, don't touch!:
    system.computer_desc: []

salt.states.win_system.computer_desc(name)
    Manage the computer's description field
    name  The desired computer description

salt.states.win_system.computer_name(name)
    Manage the computer's name
    name  The desired computer name

31.27.176 salt.states.win_update

Management of the windows update agent

New in version 2014.7.0.
Set windows updates to run by category. Default behavior is to install all updates that do not require user interaction to complete.
Optionally set category to a category of your choice to only install certain updates. Default is to set to install all available updates.
The following example will install all Security and Critical Updates, and download but not install standard updates.

updates:
    win_update.installed:
        - categories:
            - 'Critical Updates'
            - 'Security Updates'
    win_update.downloaded:
        - categories:
            - 'Updates'

You can also specify a number of features about the update to have a fine grain approach to specific types of updates.
These are the following features/states of updates available for configuring:
'UI' - User interaction required, skipped by default
'downloaded' - Already downloaded, skipped by default (downloading)
'present' - Present on computer, included by default (installing)
'installed' - Already installed, skipped by default
'reboot' - Reboot required, included by default
'hidden' - skip those updates that have been hidden.
'software' - Software updates, included by default
'driver' - driver updates, skipped by default

The following example installs all driver updates that don't require a reboot:

gryffindor:
  win_update.installed:
    - includes:
      - driver: True
      - software: False
      - reboot: False

To just update your windows machine, add this your sls:

updates:
  win_update.installed

class salt.states.win_update.PyWinUpdater(categories=None, skipUI=True, skipDownloaded=True, skipInstalled=True, skipReboot=False, skipPresent=True, softwareUpdates=True, driverUpdates=False, skipHidden=True)

salt.states.win_update.downloaded(name, categories=None, includes=None, retries=10)
Cache updates for later install.
  name: if categories is left empty, it will be assumed that you are passing the category option through the name. These are separate because you can only have one name, but can have multiple categories.
categories: the list of categories to be downloaded. These are simply strings in the update's information, so there is no enumeration of the categories available. Some known categories:

  Updates
  Windows 7
  Critical Updates

31.27. Full list of builtin state modules
Security Updates
Update Rollups

**includes**: a list of features of the updates to cull by. Available features:

- 'UI' - User interaction required, skipped by default
- 'downloaded' - Already downloaded, skipped by default (downloading)
- 'present' - Present on computer, included by default (installing)
- 'installed' - Already installed, skipped by default
- 'reboot' - Reboot required, included by default
- 'hidden' - skip those updates that have been hidden.
- 'software' - Software updates, included by default
- 'driver' - driver updates, skipped by default

**retries** Number of retries to make before giving up. This is total, not per step.

salt.states.win_update.**installed**(name, categories=None, includes=None, retries=10)
Install specified windows updates.

- **name**: if categories is left empty, it will be assumed that you are passing the category option through the name. These are separate because you can only have one name, but can have multiple categories.
- **categories**: the list of categories to be downloaded. These are simply strings in the update's information, so there is no enumeration of the categories available. Some known categories:

  - Updates
  - Windows 7
  - Critical Updates
  - Security Updates
  - Update Rollups

**includes**: a list of features of the updates to cull by. Available features:

- 'UI' - User interaction required, skipped by default
- 'downloaded' - Already downloaded, skipped by default (downloading)
- 'present' - Present on computer, included by default (installing)
- 'installed' - Already installed, skipped by default
- 'reboot' - Reboot required, included by default
- 'hidden' - skip those updates that have been hidden.
- 'software' - Software updates, included by default
- 'driver' - driver updates, skipped by default

**retries** Number of retries to make before giving up. This is total, not per step.

### 31.27.177 salt.states.winrepo

Manage Windows Package Repository

salt.states.winrepo.**genrepo**(name, force=False, allow_empty=False)

Refresh the winrepo.p file of the repository (salt-run winrepo.genrepo)

If force is True no checks will be made and the repository will be generated if allow_empty is True then the state will not return an error if there are 0 packages,

**Note**: This state only loads on minions that have the roles: salt-master grain set.

Example:

```
winrepo:
    winrepo.genrepo
```
31.27.178 salt.states.x509

Manage X509 Certificates

New in version 2015.8.0.

This module can enable managing a complete PKI infrastructure including creating private keys, CA’s, certificates and CRLs. It includes the ability to generate a private key on a server, and have the corresponding public key sent to a remote CA to create a CA signed certificate. This can be done in a secure manner, where private keys are always generated locally and never moved across the network.

Here is a simple example scenario. In this example ca is the ca server, and www is a web server that needs a certificate signed by ca.

For remote signing, peers must be permitted to remotely call the sign_remote_certificate function.

/etc/salt/master.d/peer.sls

```
peer:
  .*:
    - x509.sign_remote_certificate
```

/srv/salt/top.sls

```
base:
  '.*':
    - cert
  'ca':
    - ca
  'www':
    - www
```

This state creates the CA key, certificate and signing policy. It also publishes the certificate to the mine where it can be easily retrieved by other minions.

/srv/salt/ca.sls

```
salt-minion:
  service.running:
    - enabled
    - listen:
      - file: /etc/salt/minion.d/signing_policies.conf

/etc/salt/minion.d/signing_policies.conf:
  file.managed:
    - source: salt://signing_policies.conf

/etc/pki:
  file.directory: []

/etc/pki/ca.key:
  x509.private_key_managed:
    - bits: 4096
    - backup: True
    - require:
      - file: /etc/pki

/etc/pki/ca.crt:
  x509.certificate_managed:
```
The signing policy defines properties that override any property requested or included in a CRL. It also can define a restricted list of minions which are allowed to remotely invoke this signing policy.

```
/signing_policies.conf
```

```
x509_signing_policies:
  www:
    - minions: 'www'
    - signing_private_key: /etc/pki/ca.key
    - signing_cert: /etc/pki/ca.crt
    - C: US
    - ST: Utah
    - L: Salt Lake City
    - basicConstraints: "critical CA:false"
    - keyUsage: "critical cRLSign, keyCertSign"
    - subjectKeyIdentifier: hash
    - authorityKeyIdentifier: keyid,issuer:always
    - days_valid: 90
    - copypath: /etc/pki/issued_certs/
```

This state will instruct all minions to trust certificates signed by our new CA. Using jinja to strip newlines from the text avoids dealing with newlines in the rendered yaml, and the `sign_remote_certificate` state will handle properly formatting the text before writing the output.

```
/srv/salt/cert.sls
```

```
/usr/local/share/ca-certificates/intca.crt
```

```
x509.pem_managed:
  - text: "{{ salt['mine.get']('pki', 'x509.get_pem_entries')['pki']["/etc/pki/ca.crt"]|replace('\n', '') }}"
```

This state creates a private key then requests a certificate signed by ca according to the www policy.
salt.states.x509.certificate_managed\(name, days\_remaining=90, backup=False, \*\*kwargs\)

Manage a Certificate

- **name**: Path to the certificate
- **days\_remaining**: The minimum number of days remaining when the certificate should be renewed. Default is 90. A value of 0 disables automatic renewal.
- **backup**: When replacing an existing file, backup the old file on the minion. Default is False.
- **kwargs**: Any arguments supported by x509.create_certificate are supported.

Examples:

```bash
/etc/pki/ca.crt:
    x509.certificate\_managed:
    - signing\_private\_key: /etc/pki/ca.key
    - CN: ca.example.com
    - C: US
    - ST: Utah
    - L: Salt Lake City
    - basic\_Constraints: "critical CA:true"
    - key\_Usage: "critical cRLSign, keyCertSign"
    - subject\_Key\_Identifier: hash
    - authority\_Key\_Identifier: keyid,issuer:always
    - days\_valid: 3650
    - days\_remaining: 0
    - backup: True
```

```bash
/etc/ssl/www.crt:
    x509.certificate\_managed:
    - ca\_server: pki
    - signing\_policy: www
    - public\_key: /etc/ssl/www.key
    - CN: www.example.com
    - days\_valid: 90
    - days\_remaining: 30
    - backup: True
```

salt.states.x509.crl\_managed\(name, signing\_private\_key, signing\_cert=None, revoked=None, days\_valid=100, days\_remaining=30, include\_expired=False, backup=False\)

Manage a Certificate Revocation List

- **name**: Path to the certificate
- **signing\_private\_key**: The private key that will be used to sign this crl. This is usually your CA's private key.
- **signing\_cert**: The certificate of the authority that will be used to sign this crl. This is usually your CA's certificate.
revoked: A list of certificates to revoke. Must include either a serial number or a the certificate itself. Can optionally include the revocation date and notAfter date from the certificate. See example below for details.
days_valid: The number of days the certificate should be valid for. Default is 100.
days_remaining: The crl should be automatically recreated if there are less than days_remaining days until the crl expires. Set to 0 to disable automatic renewal. Default is 30.
include_expired: Include expired certificates in the CRL. Default is False.
backup: When replacing an existing file, backup the old file on the minion. Default is False.

Example:

/etc/pki/ca.crl:
x509.crl_managed:
  - signing_private_key: /etc/pki/myca.key
  - signing_cert: /etc/pki/myca.crt
  - revoked:
    - compromised_Web_key:
      - certificate: /etc/pki/certs/badweb.crt
      - revocation_date: 2015-03-01 00:00:00
      - reason: keyCompromise
    - terminated_vpn_user:
      - serial_number: D6:D2:DC:D8:4D:5C:C0:F4
      - not_after: 2016-01-01 00:00:00
      - revocation_date: 2015-02-25 00:00:00
      - reason: cessationOfOperation

salt.states.x509.csr_managed(name, backup=False, **kwargs)
Manage a Certificate Signing Request
name: Path to the CSR
properties: The properties to be added to the certificate request, including items like subject, extensions and public key. See above for valid properties.

Example:

/etc/pki/mycert.csr:
x509.csr_managed:
  - public_key: /etc/pki/mycert.key
  - CN: www.example.com
  - C: US
  - ST: Utah
  - L: Salt Lake City
  - keyUsage: 'critical dataEncipherment'

salt.states.x509.pem_managed(name, text, backup=False)
Manage the contents of a PEM file directly with the content in text, ensuring correct formatting.
name: The path to the file to manage
text: The PEM formatted text to write.
backup: When replacing an existing file, backup the old file on the minion. Default is False.

salt.states.x509.private_key_managed(name, bits=2048, new=False, backup=False)
Manage a private key’s existence.
name: Path to the private key
bits: Key length in bits. Default 2048.
new: Always create a new key. Defaults to False. Combining new with prereq can allow key rotation whenever a new certificate is generated.
backup: When replacing an existing file, backup the old file on the minion. Default is False.
Example:
The jinja templating in this example ensures a private key is generated if the file doesn’t exist and that a new private key is generated whenever the certificate that uses it is to be renewed.

```yaml
/etc/pki/www.key:
  x509.private_key_managed:
    - bits: 4096
    - new: True
  {% if salt['file.file_exists']('/etc/pki/ca.key') -%}
  - prereq:
    - x509: /etc/pki/www.crt
  {%- endif %}
```

### 31.27.179 salt.states.xmpp

#### Sending Messages over XMPP

New in version 2014.1.0.

This state is useful for firing messages during state runs, using the XMPP protocol

```yaml
server-warning-message:
  xmpp.send_msg:
    - name: 'This is a server warning message'
    - profile: my-xmpp-account
    - recipient: admins@xmpp.example.com/salt
```

**salt.states.xmpp.send_msg**(*name, recipient, profile*)

Send a message to an XMPP user

```yaml
server-warning-message:
  xmpp.send_msg:
    - name: 'This is a server warning message'
    - profile: my-xmpp-account
    - recipient: admins@xmpp.example.com/salt
```

**name** The message to send to the XMPP user

**salt.states.xmpp.send_msg_multi**(*name, profile, recipients=None, rooms=None*)

Send a message to a list of recipients or rooms

```yaml
server-warning-message:
  xmpp.send_msg:
    - name: 'This is a server warning message'
    - profile: my-xmpp-account
    - recipients:
      - admins@xmpp.example.com/salt
    - rooms:
      - qa@conference.xmpp.example.com
```

**name** The message to send to the XMPP user
31.27.180 salt.states.zcbuildout

Management of zc.buildout

This module is inspired from minitage's buildout maker [https://github.com/minitage/minitage/blob/master/src/minitage/core/makers/buildout.py](https://github.com/minitage/minitage/blob/master/src/minitage/core/makers/buildout.py)

New in version Boron.

Note: This state module is beta; the API is subject to change and no promise as to performance or functionality is yet present.

Available Functions

- built

```python
installed1
    buildout.installed:
    - name: /path/to/buildout

installed2
    buildout.installed:
    - name: /path/to/buildout
    - parts:
      - a
      - b
    - python: /path/to/pythonpath/bin/python
    - unless: /bin/test_something_installed
    - onlyif: /bin/test_else_installed
```

```python
salt.states.zcbuildout.installed(name, config='buildout.cfg', quiet=False, parts=None, user=None, env=(), buildout_ver=None, test_release=False, distribute=None, new_st=None, offline=False, newest=False, python='/usr/bin/python2.7', debug=False, verbose=False, unless=None, onlyif=None, use_vt=False, loglevel='debug', **kwargs)
```

Install buildout in a specific directory

It is a thin wrapper to modules.buildout.buildout

- **name** directory to execute in
- **quiet** do not output console & logs
- **config** buildout config to use (default: buildout.cfg)
- **parts** specific buildout parts to run
- **user** user used to run buildout as

New in version 2014.1.4.

- **env** environment variables to set when running
- **buildout_ver** force a specific buildout version (1 | 2)
- **test_release** buildout accept test release
- **new_st** Forcing use of setuptools >= 0.7
- **distribute** use distribute over setuptools if possible
- **offline** does buildout run offline
- **python** python to use
- **debug** run buildout with -D debug flag
onlyif Only execute cmd if statement on the host return 0
unless Do not execute cmd if statement on the host return 0
newest run buildout in newest mode
verbose run buildout in verbose mode (-vvvvv)
use_vt Use the new salt VT to stream output [experimental]
loglevel loglevel for buildout commands

31.27.181 salt.states.zk_concurrency

Control concurrency of steps within state execution using zookeeper

This module allows you to "wrap" a state's execution with concurrency control. This is useful to protect against all hosts executing highstate simultaneously if your services don't all HUP restart. The common way of protecting against this is to run in batch mode, but that doesn't protect from another person running the same batch command (and thereby having 2x the number of nodes deploying at once).

This module will block while acquiring a slot, meaning that however the command gets called it will coordinate with zookeeper to ensure that no more than max_concurrency steps are executing with a single path.

```python
acquire_lock:
  zk_concurrency.lock:
    - name: /trafficeserver
    - zk_hosts: 'zookeeper:2181'
    - max_concurrency: 4
    - prereq:
      - service: trafficserver

trafficserver:
  service.running:
    - watch:
      - file: /etc/trafficserver/records.config

/etc/trafficserver/records.config:
  file.managed:
    - source: salt://records.config

release_lock:
  zk_concurrency.unlock:
    - name: /trafficserver
    - require:
      - service: trafficserver
```

This example would allow the file state to change, but would limit the concurrency of the trafficserver service restart to 4.

```python
salt.states.zk_concurrency.lock(name, zk_hosts=None, identifier=None, max_concurrency=1, timeout=None, ephemeral_lease=False)

Block state execution until you are able to get the lock (or hit the timeout)
```

```python
salt.states.zk_concurrency.min_party(name, zk_hosts, min_nodes)

Ensure that there are min_nodes in the party at name.
```

```python
salt.states.zk_concurrency.unlock(name, zk_hosts=None, identifier=None, max_concurrency=1, ephemeral_lease=False)

Remove lease from semaphore.
```
31.28 Execution Modules

Salt execution modules are the functions called by the `salt` command.

**Note:** Salt execution modules are different from state modules and cannot be called directly within state files. You must use the `module` state module to call execution modules within state runs.

See also:

*Full list of builtin modules*

Salt ships with many modules that cover a wide variety of tasks.

31.28.1 Modules Are Easy to Write!

Writing Salt execution modules is straightforward.

A Salt execution modules is a Python or Cython module placed in a directory called `_modules/` within the `file_roots` as specified by the master config file. By default this is `/srv/salt/_modules` on Linux systems.

Modules placed in `_modules/` will be synced to the minions when any of the following Salt functions are called:

- `state.highstate`
- `saltutil.sync_modules`
- `saltutil.sync_all`

Note that a module's default name is its filename (i.e. `foo.py` becomes module `foo`), but that its name can be overridden by using a `__virtual__` function.

If a Salt module has errors and cannot be imported, the Salt minion will continue to load without issue and the module with errors will simply be omitted.

If adding a Cython module the file must be named `<modulename>.pyx` so that the loader knows that the module needs to be imported as a Cython module. The compilation of the Cython module is automatic and happens when the minion starts, so only the `.pyx` file is required.

31.28.2 Zip Archives as Modules

Python 2.3 and higher allows developers to directly import zip archives containing Python code. By setting `enable_zip_modules` to True in the minion config, the Salt loader will be able to import `.zip` files in this fashion. This allows Salt module developers to package dependencies with their modules for ease of deployment, isolation, etc.

For a user, Zip Archive modules behave just like other modules. When executing a function from a module provided as the file `my_module.zip`, a user would call a function within that module as `my_module.<function>.

Creating a Zip Archive Module

A Zip Archive module is structured similarly to a simple Python package. The `.zip` file contains a single directory with the same name as the module. The module code traditionally in `<module_name>.py` goes in `<module_name>/__init__.py`. The dependency packages are subdirectories of `<module_name>/`.

Here is an example directory structure for the `lumberjack` module, which has two library dependencies (sleep and work) to be included.
The contents of lumberjack/__init__.py show how to import and use these included libraries.

```python
# Libraries included in lumberjack.zip
from lumberjack import sleep, work

def is_ok(person):
    ''' Checks whether a person is really a lumberjack '''
    return sleep.all_night(person) and work.all_day(person)
```

Then, create the zip:

```bash
modules $ ls -R lumberjack
__init__.py    sleep       work
lumberjack/sleep:
    __init__.py
lumberjack/work:
    __init__.py

modules $ zip -r lumberjack lumberjack
  adding: lumberjack/ (stored 0%)
  adding: lumberjack/__init__.py (deflated 39%)
  adding: lumberjack/sleep/ (stored 0%)
  adding: lumberjack/sleep/__init__.py (deflated 7%)
  adding: lumberjack/work/ (stored 0%)
  adding: lumberjack/work/__init__.py (deflated 7%)

modules $ unzip -l lumberjack.zip
Archive: lumberjack.zip

   Length Date Time Name
  -------- ---- ---- ----
0 08-21-15 20:08 lumberjack/
348 08-21-15 20:08 lumberjack/__init__.py
0 08-21-15 19:53 lumberjack/sleep/
83 08-21-15 19:53 lumberjack/sleep/__init__.py
0 08-21-15 19:53 lumberjack/work/
81 08-21-15 19:21 lumberjack/work/__init__.py

512 6 files
```

Once placed in file_roots, Salt users can distribute and use lumberjack.zip like any other module.

```bash
$ sudo salt minion1 saltutil.sync_modules
minion1:
  - modules.lumberjack
$ sudo salt minion1 lumberjack.is_ok 'Michael Palin'
minion1:
  True
```

### 31.28.3 Cross Calling Execution Modules

All of the Salt execution modules are available to each other and modules can call functions available in other execution modules.

The variable __salt__ is packed into the modules after they are loaded into the Salt minion.
The __salt__ variable is a *Python dictionary* containing all of the Salt functions. Dictionary keys are strings representing the names of the modules and the values are the functions themselves.

Salt modules can be cross-called by accessing the value in the __salt__ dict:

```python
def foo(bar):
    return __salt__['cmd.run'](bar)
```

This code will call the *run* function in the *cmd* module and pass the argument `bar` to it.

### 31.28.4 Preloaded Execution Module Data

When interacting with execution modules often it is nice to be able to read information dynamically about the minion or to load in configuration parameters for a module.

Salt allows for different types of data to be loaded into the modules by the minion.

#### Grains Data

The values detected by the Salt Grains on the minion are available in a *dict* named __grains__ and can be accessed from within callable objects in the Python modules.

To see the contents of the grains dictionary for a given system in your deployment run the `grains.items()` function:

```bash
salt 'hostname' grains.items --output=pprint
```

Any value in a grains dictionary can be accessed as any other Python dictionary. For example, the grain representing the minion ID is stored in the `id` key and from an execution module, the value would be stored in __grains__['id'].

#### Module Configuration

Since parameters for configuring a module may be desired, Salt allows for configuration information from the minion configuration file to be passed to execution modules.

Since the minion configuration file is a YAML document, arbitrary configuration data can be passed in the minion config that is read by the modules. It is therefore *strongly* recommended that the values passed in the configuration file match the module name. A value intended for the *test* execution module should be named `test.<value>`.

The test execution module contains usage of the module configuration and the default configuration file for the minion contains the information and format used to pass data to the modules. `salt.modules.test`, `conf/minion`.

### 31.28.5 Printout Configuration

Since execution module functions can return different data, and the way the data is printed can greatly change the presentation, Salt has a printout configuration.

When writing a module the __outputter__ dictionary can be declared in the module. The __outputter__ dictionary contains a mapping of function name to Salt Outputter.

```python
__outputter__ = {
    'run': 'txt'
}
```
This will ensure that the text outputter is used.

### 31.28.6 Virtual Modules

Sometimes an execution module should be presented in a generic way. A good example of this can be found in the package manager modules. The package manager changes from one operating system to another, but the Salt execution module that interfaces with the package manager can be presented in a generic way.

The Salt modules for package managers all contain a `__virtual__` function which is called to define what systems the module should be loaded on.

The `__virtual__` function is used to return either a `string` or `False`. If `False` is returned then the module is not loaded, if a string is returned then the module is loaded with the name of the string.

**Note:** Optionally, modules may additionally return a list of reasons that a module could not be loaded. For example, if a dependency for `my_mod` was not met, a `__virtual__` function could do as follows:

```python
return False, ['My Module must be installed before this module can be used.]
```

This means that the package manager modules can be presented as the `pkg` module regardless of what the actual module is named.

Since `__virtual__` is called before the module is loaded, `__salt__` will be unavailable as it will not have been packed into the module at this point in time.

The package manager modules are among the best example of using the `__virtual__` function. Some examples:

- `pacman.py`
- `yumpkg.py`
- `aptpkg.py`
- `at.py`

**Note:** Modules which return a string from `__virtual__` that is already used by a module that ships with Salt will override the stock module.

### 31.28.7 Documentation

Salt execution modules are documented. The `sys.doc()` function will return the documentation for all available modules:

```bash
salt '*' sys.doc
```

The `sys.doc` function simply prints out the docstrings found in the modules; when writing Salt execution modules, please follow the formatting conventions for docstrings as they appear in the other modules.

**Adding Documentation to Salt Modules**

It is strongly suggested that all Salt modules have documentation added.

To add documentation add a Python docstring to the function.
def spam(eggs):
    '''
    A function to make some spam with eggs!
    CLI Example:::
        salt '*' test.spam eggs
    '''
    return eggs

Now when the sys.doc call is executed the docstring will be cleanly returned to the calling terminal.

Documentation added to execution modules in docstrings will automatically be added to the online web-based documentation.

Add Execution Module Metadata

When writing a Python docstring for an execution module, add information about the module using the following field lists:

```
:maintainer: Thomas Hatch <thatch@saltstack.com, Seth House <shouse@saltstack.com>
:maturity: new
:depends: python-mysqldb
:platform: all
```

The maintainer field is a comma-delimited list of developers who help maintain this module.
The maturity field indicates the level of quality and testing for this module. Standard labels will be determined.
The depends field is a comma-delimited list of modules that this module depends on.
The platform field is a comma-delimited list of platforms that this module is known to run on.

31.28.8 Log Output

You can call the logger from custom modules to write messages to the minion logs. The following code snippet demonstrates writing log messages:

```
import logging

log = logging.getLogger(__name__)

log.info('Here is Some Information')
log.warning('You Should Not Do That')
log.error('It Is Busted')
```

31.28.9 Private Functions

In Salt, Python callable objects contained within an execution module are made available to the Salt minion for use. The only exception to this rule is a callable object with a name starting with an underscore `_`.
Objects Loaded Into the Salt Minion

```python
def foo(bar):
    return bar

class baz:
    def __init__(self, quo):
        pass
```

Objects NOT Loaded into the Salt Minion

```python
def _foobar(baz):  # Preceded with an _
    return baz

cheese = {}  # Not a callable Python object
```

Note: Some callable names also end with an underscore _, to avoid keyword clashes with Python keywords. When using execution modules, or state modules, with these in them the trailing underscore should be omitted.

31.28.10 Useful Decorators for Modules

**Depends Decorator**

When writing execution modules there are many times where some of the module will work on all hosts but some functions have an external dependency, such as a service that needs to be installed or a binary that needs to be present on the system.

Instead of trying to wrap much of the code in large try/except blocks, a decorator can be used.

If the dependencies passed to the decorator don’t exist, then the salt minion will remove those functions from the module on that host.

If a "`fallback_function" is defined, it will replace the function instead of removing it

```python
import logging
from salt.utils.decorators import depends

log = logging.getLogger(__name__)

try:
    import dependency_that_sometimes_exists
except ImportError as e:
    log.trace('Failed to import dependency_that_sometimes_exists: {0}'.format(e))

@depends('dependency_that_sometimes_exists')
def foo():
    '''
    Function with a dependency on the "dependency_that_sometimes_exists" module,
    if the "dependency_that_sometimes_exists" is missing this function will not exist
    '''
    return True
```
```python
def _fallback():
    
    Fallback function for the depends decorator to replace a function with
    
    return "dependency_that_sometimes_exists" needs to be installed for this function to exist

@depends('dependency_that_sometimes_exists', fallback_function=_fallback)
def foo():
    
    Function with a dependency on the "dependency_that_sometimes_exists" module.
    If the "dependency_that_sometimes_exists" is missing this function will be
    replaced with "_fallback"
    
    return True
```

In addition to global dependancies the depends decorator also supports raw booleans.

```python
from salt.utils.decorators import depends
HAS_DEP = False
try:
    import dependency_that_sometimes_exists
    HAS_DEP = True
except ImportError:
    pass

@depends(HAS_DEP)
def foo():
    return True
```

### 31.29 Master Tops

Salt includes a number of built-in subsystems to generate top file data, they are listed listed at Full list of builtin master tops modules.

The source for the built-in Salt master tops can be found here: https://github.com/saltstack/salt/blob/develop/salt/tops

### 31.30 Full list of builtin master tops modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cobbler</td>
<td>Cobbler Tops</td>
</tr>
<tr>
<td>ext_nodes</td>
<td>External Nodes Classifier</td>
</tr>
<tr>
<td>mongo</td>
<td>Read tops data from a mongodb collection</td>
</tr>
<tr>
<td>reclass_adapter</td>
<td>Read tops data from a reclass database</td>
</tr>
</tbody>
</table>

### 31.30.1 salt.tops.cobbler

**Cobbler Tops**

Cobbler Tops is a master tops subsystem used to look up mapping information from Cobbler via its API. The same cobbler" parameters are used for both the Cobbler tops and Cobbler pillar modules.
master_tops:
cobbler: {}
cobbler.url: https://example.com/cobbler_api  # default is http://localhost/cobbler_api
cobbler.user: username  # default is no username
cobbler.password: password  # default is no password

Module Documentation

salt.tops.cobbler.top(**kwargs)
Look up top data in Cobbler for a minion.

31.30.2 salt.tops.ext_nodes

External Nodes Classifier

The External Nodes Classifier is a master tops subsystem that retrieves mapping information from major configuration management systems. One of the most common external nodes classifiers system is provided by Cobbler and is called cobbler-ext-nodes.

The cobbler-ext-nodes command can be used with this configuration:

```yaml
master_tops:
    ext_nodes: cobbler-ext-nodes
```

It is noteworthy that the Salt system does not directly ingest the data sent from the cobbler-ext-nodes command, but converts the data into information that is used by a Salt top file.

Any command can replace the call to `cobbler-ext-nodes' above, but currently the data must be formatted in the same way that the standard `cobbler-ext-nodes' does.

See (admittedly degenerate and probably not complete) example:

```yaml
classes:
    - basepackages
    - database
```

The above essentially is the same as a top.sls containing the following:

```yaml
base:
    *:
        - basepackages
        - database

salt.tops.ext_nodes.top(**kwargs)
Run the command configured
```
31.30.3 salt.tops.mongo

Read tops data from a mongod db collection
This module will load tops data from a mongo collection. It uses the node's id for lookups.

Salt Master Mongo Configuration

The module shares the same base mongo connection variables as `salt.returners.mongo_return`. These variables go in your master config file.

- `mongo.db` - The mongo database to connect to. Defaults to 'salt'.
- `mongo.host` - The mongo host to connect to. Supports replica sets by specifying all hosts in the set, comma-delimited. Defaults to 'salt'.
- `mongo.port` - The port that the mongo database is running on. Defaults to 27017.
- `mongo.user` - The username for connecting to mongo. Only required if you are using mongo authentication. Defaults to ''. 
- `mongo.password` - The password for connecting to mongo. Only required if you are using mongo authentication. Defaults to ''. 

Configuring the Mongo Tops Subsystem

```yaml
master_tops:
  mongo:
    collection: tops
    id_field: _id
    re_replace: ""
    re_pattern: \.example\.com
    states_field: states
    environment_field: environment
```

Module Documentation

```python
salt.tops.mongo.top(**kwargs)
```

Connect to a mongo database and read per-node tops data.

Parameters:

- `collection` - The mongodb collection to read data from. Defaults to 'tops'.
- `id_field` - The field in the collection that represents an individual minion id. Defaults to '_id'.
- `re_pattern` - If your naming convention in the collection is shorter than the minion id, you can use this to trim the name. `re_pattern` will be used to match the name, and `re_replace` will be used to replace it. Backrefs are supported as they are in the Python standard library. If None, no mangling of the name will be performed - the collection will be searched with the entire minion id. Defaults to None.
- `re_replace` - Use as the replacement value in node ids matched with `re_pattern`. Defaults to ''. Feel free to use backreferences here.
- `states_field` - The name of the field providing a list of states.
- `environment_field` - The name of the field providing the environment. Defaults to `environment`. 
31.30.4 salt.tops.reclass_adapter

Read tops data from a reclass database

This master_tops plugin provides access to the reclass database, such that state information (top data) are retrieved from reclass.

You can find more information about reclass at http://reclass.pantsfullofunix.net.

To use the plugin, add it to the master_tops list in the Salt master config and tell reclass by way of a few options how and where to find the inventory:

```
master_tops:
  reclass:
    storage_type: yaml_fs
    inventory_base_uri: /srv/salt
```

This would cause reclass to read the inventory from YAML files in /srv/salt/nodes and /srv/salt/classes.

If you are also using reclass as ext_pillar plugin, and you want to avoid having to specify the same information for both, use YAML anchors (take note of the differing data types for ext_pillar and master_tops):

```
reclass: &reclass
  storage_type: yaml_fs
  inventory_base_uri: /srv/salt
reclass_source_path: ~/code/reclass

ext_pillar:
  - reclass: *reclass

master_tops:
  reclass: *reclass
```

If you want to run reclass from source, rather than installing it, you can either let the master know via the PYTHONPATH environment variable, or by setting the configuration option, like in the example above.

```
salt.tops.reclass_adapter.top(**kwargs)
    Query reclass for the top data (states of the minions).
```

31.31 Full list of builtin wheel modules

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>config</td>
<td>Manage the master configuration file</td>
</tr>
<tr>
<td>error</td>
<td>Error generator to enable integration testing of salt wheel error handling</td>
</tr>
<tr>
<td>file_roots</td>
<td>Read in files from the file_root and save files to the file root</td>
</tr>
<tr>
<td>key</td>
<td>Wheel system wrapper for key system</td>
</tr>
<tr>
<td>minions</td>
<td>Wheel system wrapper for connected minions</td>
</tr>
<tr>
<td>pillar_roots</td>
<td>The pillar_roots wheel module is used to manage files under the pillar roots directories on the master server.</td>
</tr>
</tbody>
</table>

31.31.1 salt.wheel.config

Manage the master configuration file

```
salt.wheel.config.apply(key, value)
    Set a single key
```
Note: This will strip comments from your config file

```
salt.wheel.config.update_config(file_name, yaml_contents)
```
Update master config with yaml_contents.

Writes yaml_contents to a file named file_name.conf under the folder specified by default_include. This folder is named master.d by default. Please look at include-configuration for more information.

Example low data:

```python
data = {
    'username': 'salt',
    'password': 'salt',
    'fun': 'config.update_config',
    'file_name': 'gui',
    'yaml_contents': {'id': 1},
    'client': 'wheel',
    'eauth': 'pam',
}
```

```
salt.wheel.config.values()
```
Return the raw values of the config file

### 31.3.2 salt.wheel.error

Error generator to enable integration testing of salt wheel error handling

```
salt.wheel.error.error(name=None, message='')
```
If name is None Then return empty dict

Otherwise raise an exception with __name__ from name, message from message

CLI Example:

```
salt-wheel error
salt-wheel error.error name="Exception" message="This is an error."
```

### 31.3.3 salt.wheel.file_roots

Read in files from the file_root and save files to the file root

```
salt.wheel.file_roots.find(path, saltenv='base', env=None)
```
Return a dict of the files located with the given path and environment

```
salt.wheel.file_roots.list_env(saltenv='base', env=None)
```
Return all of the file paths found in an environment

```
salt.wheel.file_roots.list_roots()
```
Return all of the files names in all available environments

```
salt.wheel.file_roots.read(path, saltenv='base', env=None)
```
Read the contents of a text file, if the file is binary then
salt.wheel.file_roots.write(data, path, saltenv='base', index=0, env=None)

Write the named file, by default the first file found is written, but the index of the file can be specified to write to a lower priority file root

31.31.4 salt.wheel.key

Wheel system wrapper for key system

salt.wheel.key.accept(match)
Accept keys based on a glob match

salt.wheel.key.accept_dict(match)
Accept keys based on a dict of keys

salt.wheel.key.delete(match)
Delete keys based on a glob match

salt.wheel.key.delete_dict(match)
Delete keys based on a dict of keys

salt.wheel.key.finger(match)
Return the matching key fingerprints

salt.wheel.key.gen(id_=None, keysize=2048)
Generate a key pair. No keys are stored on the master, a keypair is returned as a dict containing pub and priv keys

salt.wheel.key.gen_accept(id_, keysize=2048, force=False)
Generate a key pair then accept the public key. This function returns the key pair in a dict, only the public key is preserved on the master.

salt.wheel.key.key_str(match)
Return the key strings

salt.wheel.key.list(match)
List all the keys under a named status

salt.wheel.key.list_all()
List all the keys

salt.wheel.key.reject(match)
Reject keys based on a glob match

salt.wheel.key.reject_dict(match)
Reject keys based on a dict of keys

31.31.5 salt.wheel.minions

Wheel system wrapper for connected minions

salt.wheel.minions.connected()
List all connected minions on a salt-master

31.31.6 salt.wheel.pillar_roots

The pillar_roots wheel module is used to manage files under the pillar roots directories on the master server.
salt.wheel.pillar_roots.find(path, saltenv='base', env=None)
    Return a dict of the files located with the given path and environment
salt.wheel.pillar_roots.list_env(saltenv='base', env=None)
    Return all of the file paths found in an environment
salt.wheel.pillar_roots.list_roots()
    Return all of the files names in all available environments
salt.wheel.pillar_roots.read(path, saltenv='base', env=None)
    Read the contents of a text file, if the file is binary then
salt.wheel.pillar_roots.write(data, path, saltenv='base', index=0, env=None)
    Write the named file, by default the first file found is written, but the index of the file can be specified to write
to a lower priority file root

31.32 Full list of builtin beacon modules

<table>
<thead>
<tr>
<th>Beacon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>btmp</td>
<td>Beacon to fire events at failed login of users</td>
</tr>
<tr>
<td>diskusage</td>
<td>Beacon to monitor disk usage.</td>
</tr>
<tr>
<td>inotify</td>
<td>Watch files and translate the changes into salt events</td>
</tr>
<tr>
<td>journald</td>
<td>A simple beacon to watch journald for specific entries</td>
</tr>
<tr>
<td>load</td>
<td>Beacon to emit system load averages</td>
</tr>
<tr>
<td>network_info</td>
<td>Beacon to monitor statistics from ethernet adapters</td>
</tr>
<tr>
<td>service</td>
<td>Send events covering service status</td>
</tr>
<tr>
<td>sh</td>
<td>Watch the shell commands being executed actively.</td>
</tr>
<tr>
<td>twilio_txt_msg</td>
<td>Beacon to emit Twilio text messages</td>
</tr>
<tr>
<td>wtmp</td>
<td>Beacon to fire events at login of users as registered in the wtmp file</td>
</tr>
</tbody>
</table>

31.32.1 salt.beacons.btmp

Beacon to fire events at failed login of users

beacons:
   btmp: {}

salt.beacons.btmp.beacon(config)
    Read the last btmp file and return information on the failed logins

   beacons:
      btmp: {}

salt.beacons.btmp.validate(config)
    Validate the beacon configuration

31.32.2 salt.beacons.diskusage

Beacon to monitor disk usage.
New in version 2015.5.0.
salt.beacons.diskusage.beacon(config)
Monitor the disk usage of the minion

Specify thresholds for each disk and only emit a beacon if any of them are exceeded.

```yaml
beacons:
  diskusage:
  - /: 63%
  - /mnt/nfs: 50%
```

salt.beacons.diskusage.validate(config)
Validate the beacon configuration

### 31.32.3 salt.beacons.inotify

Watch files and translate the changes into salt events

**depends**

- pyinotify Python module >= 0.9.5

**Caution** Using generic mask options like open, access, ignored, and closed_nowrite with reactors can easily cause the reactor to loop on itself.

salt.beacons.inotify.beacon(config)
Watch the configured files

Example Config

```yaml
beacons:
  inotify:
    /path/to/file/or/dir:
      mask:
      - open
      - create
      - close_write
      recurse: True
      auto_add: True
```

The mask list can contain the following events (the default mask is create, delete, and modify):

- access File accessed
- attrib File metadata changed
- close_nowrite Unwritable file closed
- close_write Writable file closed
- create File created in watched directory
- delete File deleted from watched directory
- delete_self Watched file or directory deleted
- modify File modified
- moved_from File moved out of watched directory
- moved_to File moved into watched directory
- move_self Watched file moved
- open File opened

The mask can also contain the following options:

- dont_follow Don’t dereference symbolic links
- excl_unlink Omit events for children after they have been unlinked
- oneshot Remove watch after one event

31.32. Full list of builtin beacon modules
onlydir Operate only if name is directory

**recurse:** Recursively watch files in the directory
**auto_add:** Automatically start watching files that are created in the watched directory

```python
salt.beacons.inotify.validate(config)
```
Validate the beacon configuration

### 31.32.4 `salt.beacons.journald`

A simple beacon to watch journald for specific entries

```python
salt.beacons.journald.beacon(config)
```
The journald beacon allows for the systemd journal to be parsed and linked objects to be turned into events.

This beacons config will return all sshd journal entries

```python
beacons:
    journald:
        sshd:
            SYSLOG_IDENTIFIER: sshd
            PRIORITY: 6
```

```python
salt.beacons.journald.validate(config)
```
Validate the beacon configuration

### 31.32.5 `salt.beacons.load`

Beacon to emit system load averages

```python
salt.beacons.load.beacon(config)
```
Emit the load averages of this host.

Specify thresholds for each load average and only emit a beacon if any of them are exceeded.

```python
beacons:
    - load:
        - 1m:
            - 0.0
            - 2.0
        - 5m:
            - 0.0
            - 1.5
        - 15m:
            - 0.1
            - 1.0
```

```python
salt.beacons.load.validate(config)
```
Validate the beacon configuration

### 31.32.6 `salt.beacons.network_info`

Beacon to monitor statistics from ethernet adapters

New in version 2015.5.0.
salt.beacons.network_info.beacon(config)

Emit the network statistics of this host.

Specify thresholds for each network stat and only emit a beacon if any of them are exceeded.

Emit beacon when any values are equal to configured values.

beacons:
  network_info:
    eth0:
      - type: equal
      - bytes_sent: 100000
      - bytes_recv: 100000
      - packets_sent: 100000
      - packets_recv: 100000
      - errin: 100
      - errout: 100
      - dropin: 100
      - dropout: 100

Emit beacon when any values are greater than to configured values.

beacons:
  network_info:
    eth0:
      - type: greater
      - bytes_sent: 100000
      - bytes_recv: 100000
      - packets_sent: 100000
      - packets_recv: 100000
      - errin: 100
      - errout: 100
      - dropin: 100
      - dropout: 100

salt.beacons.network_info.validate(config)

Validate the beacon configuration

31.32.7 salt.beacons.service

Send events covering service status

salt.beacons.service.beacon(config)

Scan for the configured services and fire events

Example Config

beacons:
  service:
    salt-master:
    mysql:

The config above sets up beacons to check for the salt-master and mysql services.

The config also supports two other parameters for each service:
onchangeonly: when `onchangeonly` is True the beacon will fire events only when the service status changes. Otherwise, it will fire an event at each beacon interval. The default is False.

uncleanshutdown: If `uncleanshutdown` is present it should point to the location of a pid file for the service. Most services will not clean up this pid file if they are shutdown uncleanly (e.g. via `kill -9`) or if they are terminated through a crash such as a segmentation fault. If the file is present, then the beacon will add `uncleanshutdown: True` to the event. If not present, the field will be False. The field is only added when the service is NOT running. Omitting the configuration variable altogether will turn this feature off.

Here is an example that will fire an event whenever the state of nginx changes and report an unclean shutdown. This example is for Arch, which places nginx’s pid file in `/run`.

```yaml
beacons:
  service:
    nginx:
      onchangeonly: True
      uncleanshutdown: /run/nginx.pid
```

`salt.beacons.service.validate(config)`
Validate the beacon configuration

### 31.32.8 salt.beacons.sh

Watch the shell commands being executed actively. This beacon requires `strace`.

`salt.beacons.sh.beacon(config)`
Scan the shell `execve` routines. This beacon will convert all login shells

```yaml
beacons:
  sh: {}  # Empty dictionary
```

`salt.beacons.sh.validate(config)`
Validate the beacon configuration

### 31.32.9 salt.beacons.twilio_txt_msg

Beacon to emit Twilio text messages

`salt.beacons.twilio_txt_msg.beacon(config)`
Emit a dict name `texts` whose value is a list of texts.

```yaml
beacons:
  twilio_txt_msg:
    account_sid: "<account sid>
    auth_token: "<auth token>
    twilio_number: "+15555555555"
    interval: 10
```

`salt.beacons.twilio_txt_msg.validate(config)`
Validate the beacon configuration
31.32.10 salt.beacons.wtmp

Beacon to fire events at login of users as registered in the wtmp file

```yaml
beacons:
  wtmp: {}

salt.beacons.wtmp.beacon(config)
  Read the last wtmp file and return information on the logins
  beacons:
    wtmp: {}

salt.beacons.wtmp.validate(config)
  Validate the beacon configuration
```

31.33 Full list of builtin engine modules

<table>
<thead>
<tr>
<th>Engine</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>logstash</td>
<td>An engine that reads messages from the salt event bus and pushes them onto a logstash endpoint.</td>
</tr>
<tr>
<td>sqs_events</td>
<td>An engine that continuously reads messages from SQS and fires them as events.</td>
</tr>
<tr>
<td>test</td>
<td>A simple test engine, not intended for real use but as an example</td>
</tr>
</tbody>
</table>

31.33.1 salt.engines.logstash

An engine that reads messages from the salt event bus and pushes them onto a logstash endpoint.

**configuration**

Example configuration

```yaml
environments:
  engines:
    - logstash: host: log.my_network.com port: 5959

depends logstash
```

salt.engines.logstash.start(**host**, **port=5959**, **tag='salt/engine/logstash'**)

Listen to salt events and forward them to logstash

31.33.2 salt.engines.sqs_events

An engine that continuously reads messages from SQS and fires them as events.

Note that long polling is utilized to avoid excessive CPU usage.

New in version 2015.8.0.

**configuration** This engine can be run on the master or on a minion.

Example Config:

```yaml
environments:
  engines:
    - sqs_events: queue: test profile: my-sqs-profile #optional
```
Explicit sqs credentials are accepted but this engine can also utilize IAM roles assigned to the instance through Instance Profiles. Dynamic credentials are then automatically obtained from AWS API and no further configuration is necessary. More Information available at:


If IAM roles are not used you need to specify them either in a pillar or in the config file of the master or minion, as appropriate:

```yaml
sqs.keyid: GKTADJGHEIQSXMKKRBJ08H
sqs.key: askdjghsdfjkgWupUjasdfklkflgjsdfjajkghs
```

A region may also be specified in the configuration:

```yaml
sqs.region: us-east-1
```

If a region is not specified, the default is us-east-1.

It’s also possible to specify key, keyid and region via a profile:

```yaml
myprofile: keyid: GKTADJGHEIQSXMKKRBJ08H key: askdjghsdfjkgWupUjasdfklkflgjsdfjajkghs region: us-east-1
```

```python
salt.engines.sqs_events.start(queue, profile=None, tag='salt/engine/sqs')
```

Listen to events and write them to a log file

### 31.33.3 salt.engines.test

A simple test engine, not intended for real use but as an example

```python
salt.engines.test.start()
```

Listen to events and write them to a log file

### 31.34 Full list of builtin sdb modules

<table>
<thead>
<tr>
<th>sdb Module</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>couchdb</td>
<td>CouchDB sdb Module</td>
</tr>
<tr>
<td>etcd_db</td>
<td>etcd Database Module</td>
</tr>
<tr>
<td>keyring_db</td>
<td>Keyring Database Module</td>
</tr>
<tr>
<td>memcached</td>
<td>Memcached sdb Module</td>
</tr>
<tr>
<td>sqlite3</td>
<td>SQLite sdb Module</td>
</tr>
</tbody>
</table>

#### 31.34.1 salt.sdb.couchdb

CouchDB sdb Module

```python
maintainer SaltStack
maturity New
depends python2-couchdb
platform all
```
This allows interaction between Salt and a CouchDB [couchdb.apache.org] database. It uses Salt's sdb system to allow for inserts and retrievals using the sdb:// prefix in Salt configuration files.

To use the couchbase sdb module, it must first be configured in the Salt master or minion config. The following arguments are required:

```
couchdb_sdb:
    driver: couchdb
    host: localhost
    port: 5984
    database: salt_sdb
```

One could then query the CouchDB instance via an sdb:// URI such as the following:

```
password: sdb://couchdb_sdb/mykey
```

To use this interface, you must track IDs on your own or have another source to do the map-reduce logic necessary to calculate the ID you wish to fetch.

Additional contributions to build true map-reduce functionality into this module would be welcome.

```
salt.sdb.couchdb.get(key, profile=None)
   Get a value from couchdb by id

salt.sdb.couchdb.set(key, value, profile=None)
   Set a key/value pair in couchdb
```

### 31.34.2 salt.sdb.etcd_db

etcd Database Module

- **maintainer** SaltStack
- **maturity** New
- **depends** python-etcd
- **platform** all

New in version 2015.5.0.

This module allows access to the etcd database using an sdb:// URI. This package is located at [https://pypi.python.org/pypi/python-etcd](https://pypi.python.org/pypi/python-etcd).

Like all sdb modules, the etcd module requires a configuration profile to be configured in either the minion or master configuration file. This profile requires very little. In the example:

```
myetcd:
    driver: etcd
    etcd.host: 127.0.0.1
    etcd.port: 4001
```

The **driver** refers to the etcd module, **etcd.host** refers to the host that is hosting the etcd database and **etcd.port** refers to the port on that host.

```
password: sdb://myetcd/mypassword

salt.sdb.etcd_db.get(key, service=None, profile=None)
   Get a value from the etcd service
```
31.34.3 salt.sdb.keyring_db

Keyring Database Module

- maintainer: SaltStack
- maturity: New
- depends: keyring
- platform: all

This module allows access to the keyring package using an sdb:// URI. This package is located at https://pypi.python.org/pypi/keyring.

Care must be taken when using keyring. Not all keyend backends are supported on all operating systems. Also, many backends require an agent to be running in order to work. For instance, the "Secret Service" backend requires a compatible agent such as gnome-keyring-daemon or kwallet to be running. The keyczar backend does not seem to enjoy the benefits of an agent, and so using it will require either that the password is typed in manually (which is unreasonable for the salt-minion and salt-master daemons, especially in production) or an agent is written for it.

Like all sdb modules, the keyring module requires a configuration profile to be configured in either the minion or master configuration file. This profile requires very little. In the example:

```
mykeyring:
  driver: keyring
  service: system
```

The driver refers to the keyring module, service refers to the service that will be used inside of keyring (which may be likened unto a database table) and mykeyring refers to the name that will appear in the URI:

```
password: sdb://mykeyring/mypassword
```

The underlying backend configuration must be configured via keyring itself. For examples and documentation, see keyring:

https://pypi.python.org/pypi/keyring

New in version 2014.1.4.

31.34.4 salt.sdb.memcached

Memcached sdb Module

- maintainer: SaltStack
- maturity: New
- depends: python-memcached
platform  all

This module allows access to memcached using an sdb:// URI. This package is located at https://pypi.python.org/pypi/python-memcached.

Like all sdb modules, the memcached module requires a configuration profile to be configured in either the minion or master configuration file. This profile requires very little. In the example:

```yaml
mymemcache:
    driver: memcached
    host: localhost
    port: 11211
```

The driver refers to the memcached module, host and port the memcached server to connect to (defaults to localhost and 11211, and mymemcached refers to the name that will appear in the URI:

```yaml
password: sdb://mymemcached/mykey
```

```python
salt.sdb.memcached.get(key, profile=None)
    Get a value from memcached

salt.sdb.memcached.set(key, value, profile=None)
    Set a key/value pair in memcached
```

### 31.34.5 salt.sdb.sqlite3

SQLite sdb Module

- maintainer: SaltStack
- maturity: New
- platform: all

This module allows access to sqlite3 using an sdb:// URI

Like all sdb modules, the sqlite3 module requires a configuration profile to be configured in either the minion or master configuration file. This profile requires very little. For example:

```yaml
mysqlite:
    driver: sqlite3
    database: /tmp/sdb.sqlite
    table: sdb
    create_table: True
```

The driver refers to the sqlite3 module, database refers to the sqlite3 database file. table is the table within the db that will hold keys and values (defaults to sdb). The database and table will be created if they do not exist.

**Advanced Usage:**

Instead of a table name, it is possible to provide custom SQL statements to create the table(s) and get and set values.

```python
salt.sdb.sqlite3.get(key, profile=None)
    Get a value from sqlite3

salt.sdb.sqlite3.set(key, value, profile=None)
    Set a key/value pair in sqlite3
```
## 31.35 Full list of built-in serializers

<table>
<thead>
<tr>
<th>Serializer</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>json</strong></td>
<td>JSON (JavaScript Object Notation) <a href="http://json.org">http://json.org</a> is a subset of JavaScript syntax (ECMA-262 3rd edition) used as a lightweight data interchange format.</td>
</tr>
<tr>
<td><strong>msgpack</strong></td>
<td></td>
</tr>
<tr>
<td><strong>yaml</strong></td>
<td></td>
</tr>
<tr>
<td><strong>yamlex</strong></td>
<td></td>
</tr>
</tbody>
</table>
Salt Best Practices

Salt’s extreme flexibility leads to many questions concerning the structure of configuration files. This document exists to clarify these points through examples and code.

### 32.1 General rules

1. Modularity and clarity should be emphasized whenever possible.
2. Create clear relations between pillars and states.
3. Use variables when it makes sense but don’t overuse them.
4. Store sensitive data in pillar.
5. Don’t use grains for matching in your pillar top file for any sensitive pillars.

### 32.2 Structuring States and Formulas

When structuring Salt States and Formulas it is important to begin with the directory structure. A proper directory structure clearly defines the functionality of each state to the user via visual inspection of the state’s name.

Reviewing the MySQL Salt Formula it is clear to see the benefits to the end-user when reviewing a sample of the available states:

```
/srv/salt/mysql/files/
/srv/salt/mysql/client.sls
/srv/salt/mysql/map.jinja
/srv/salt/mysql/python.sls
/srv/salt/mysql/server.sls
```

This directory structure would lead to these states being referenced in a top file in the following way:

```
base:
  'web*':
    - mysql.client
    - mysql.python
  'db*':
    - mysql.server
```
This clear definition ensures that the user is properly informed of what each state will do.

Another example comes from the vim-formula:

```
/srv/salt/vim/files/
/srv/salt/vim/absent.sls
/srv/salt/vim/init.sls
/srv/salt/vim/map.jinja
/srv/salt/vim/nerdtree.sls
/srv/salt/vim/pyflakes.sls
/srv/salt/vim/salt.sls
```

Once again viewing how this would look in a top file:

```
/srv/salt/top.sls:
```
```
base:
    'web*':
      - vim
      - vim.nerdtree
      - vim.pyflakes
      - vim.salt
    'db*':
      - vim.absent
```

The usage of a clear top-level directory as well as properly named states reduces the overall complexity and leads a user to both understand what will be included at a glance and where it is located.

In addition, Formulas should be used as often as possible.

**Note:** Formulas repositories on the saltstack-formulas GitHub organization should not be pointed to directly from systems that automatically fetch new updates such as GitFS or similar tooling. Instead, formulas repositories should be forked on GitHub or cloned locally, where unintended, automatic changes will not take place.

### 32.3 Structuring Pillar Files

**Pillars** are used to store secure and insecure data pertaining to minions. When designing the structure of the `/srv/pillar` directory, the pillars contained within should once again be focused on clear and concise data which users can easily review, modify, and understand.

The `/srv/pillar/` directory is primarily controlled by `top.sls`. It should be noted that the pillar `top.sls` is not used as a location to declare variables and their values. The `top.sls` is used as a way to include other pillar files and organize the way they are matched based on environments or grains.

An example `top.sls` may be as simple as the following:

```
/srv/pillar/top.sls:
```
```
base:
    '*':
      - packages
```

Or much more complicated, using a variety of matchers:

```
/srv/pillar/top.sls:
```
It is clear to see through these examples how the top file provides users with power but when used incorrectly it can lead to confusing configurations. This is why it is important to understand that the top file for pillar is not used for variable definitions.

Each SLS file within the /srv/pillar/ directory should correspond to the states which it matches.

This would mean that the apache pillar file should contain data relevant to Apache. Structuring files in this way once again ensures modularity, and creates a consistent understanding throughout our Salt environment. Users can expect that pillar variables found in an Apache state will live inside of an Apache pillar:

```
/srv/salt/pillar/apache.sls:
```

```
apache:
  lookup:
    name: httpd
    config:
      tmpl: /etc/httpd/httpd.conf
```

While this pillar file is simple, it shows how a pillar file explicitly relates to the state it is associated with.

### 32.4 Variable Flexibility

Salt allows users to define variables in SLS files. When creating a state variables should provide users with as much flexibility as possible. This means that variables should be clearly defined and easy to manipulate, and that sane defaults should exist in the event a variable is not properly defined. Looking at several examples shows how these different items can lead to extensive flexibility.

Although it is possible to set variables locally, this is generally not preferred:

```
/srv/salt/apache/conf.sls:
```

```
{% set name = 'httpd' %}
{% set tmpl = 'salt://apache/files/httpd.conf' %}

include:
  - apache

apache_conf:
  file.managed:
    - name: {{ name }}
    - source: {{ tmpl }}
    - template: jinja
    - user: root
```
When generating this information it can be easily transitioned to the pillar where data can be overwritten, modified, and applied to multiple states, or locations within a single state:

```
/srv/pillar/apache.sls:
```

```
apache:
  lookup:
    name: httpd
    config:
      tmpl: salt://apache/files/httpd.conf
```

```
/srv/salt/apache/conf.sls:
```

```
{% from "apache/map.jinja" import apache with context %}
include:
  - apache

apache_conf:
  file.managed:
    - name: {{ salt['pillar.get']('apache:lookup:name') }}
    - source: {{ salt['pillar.get']('apache:lookup:config:tmpl') }}
    - template: jinja
    - user: root
    - watch_in:
      - service: apache
```

This flexibility provides users with a centralized location to modify variables, which is extremely important as an environment grows.

### 32.5 Modularity Within States

Ensuring that states are modular is one of the key concepts to understand within Salt. When creating a state a user must consider how many times the state could be re-used, and what it relies on to operate. Below are several examples which will iteratively explain how a user can go from a state which is not very modular to one that is:

```
/srv/salt/apache/init.sls:
```

```
httpd:
  pkg.installed: []
  service.running:
    - enable: True
```

```
/etc/httpd/httpd.conf:
  file.managed:
    - source: salt://apache/files/httpd.conf
    - template: jinja
    - watch_in:
      - service: httpd
```
The example above is probably the worst-case scenario when writing a state. There is a clear lack of focus by naming both the pkg/service, and managed file directly as the state ID. This would lead to changing multiple requires within this state, as well as others that may depend upon the state.

Imagine if a require was used for the httpd package in another state, and then suddenly it's a custom package. Now changes need to be made in multiple locations which increases the complexity and leads to a more error-prone configuration.

There is also the issue of having the configuration file located in the init, as a user would be unable to simply install the service and use the default conf file.

Our second revision begins to address the referencing by using `name`, as opposed to direct ID references:

```
/srv/salt/apache/init.sls:

apache:
    pkg.installed:
        - name: httpd
    service.running:
        - name: httpd
        - enable: True

apache_conf:
    file.managed:
        - name: /etc/httpd/httpd.conf
        - source: salt://apache/files/httpd.conf
        - template: jinja
        - watch_in:
            - service: apache
```

The above init file is better than our original, yet it has several issues which lead to a lack of modularity. The first of these problems is the usage of static values for items such as the name of the service, the name of the managed file, and the source of the managed file. When these items are hard coded they become difficult to modify and the opportunity to make mistakes arises. It also leads to multiple edits that need to occur when changing these items (imagine if there were dozens of these occurrences throughout the state!). There is also still the concern of the configuration file data living in the same state as the service and package.

In the next example steps will be taken to begin addressing these issues. Starting with the addition of a map.jinja file (as noted in the `Formula documentation`), and modification of static values:

```
/srv/salt/apache/map.jinja:

{% set apache = salt['grains.filter_by']({
    'Debian': {
        'server': 'apache2',
        'service': 'apache2',
        'conf': '/etc/apache2/apache.conf',
    },
    'RedHat': {
        'server': 'httpd',
        'service': 'httpd',
        'conf': '/etc/httpd/httpd.conf',
    },
}, merge=salt['pillar.get']('apache:lookup')) %}
```

/srv/pillar/apache.sls:

```
The changes to this state now allow us to easily identify the location of the variables, as well as ensuring they are flexible and easy to modify. While this takes another step in the right direction, it is not yet complete. Suppose the user did not want to use the provided conf file, or even their own configuration file, but the default apache conf. With the current state setup this is not possible. To attain this level of modularity this state will need to be broken into two states.

```
/srv/salt/apache/map.jinja:

{% set apache = salt['grains.filter_by']({
    'Debian': {
        'server': 'apache2',
        'service': 'apache2',
        'conf': '/etc/apache2/apache2.conf',
    },
    'RedHat': {
        'server': 'httpd',
        'service': 'httpd',
        'conf': '/etc/httpd/httpd.conf',
    },
}, merge=salt['pillar.get']('apache:lookup'))) %}
```

```
/srv/pillar/apache.sls:

apache:
    lookup:
        config:
            tmpl: salt://apache/files/httpd.conf
```

```
/srv/salt/apache/init.sls:

{% from "apache/map.jinja" import apache with context %}

apache:
    pkg.installed:
        - name: {{ apache.server }}
    service.running:
        - name: {{ apache.service }}
        - enable: True

apache_conf:
    file.managed:
        - name: {{ apache.conf }}
        - source: {{ salt['pillar.get']('apache:lookup:config:tmpl') }}
        - template: jinja
        - user: root
        - watch_in:
            - service: apache
```

/srv/salt/apache/init.sls:
This new structure now allows users to choose whether they only wish to install the default Apache, or if they wish, overwrite the default package, service, configuration file location, or the configuration file itself. In addition to this the data has been broken between multiple files allowing for users to identify where they need to change the associated data.

### 32.6 Storing Secure Data

Secure data refers to any information that you would not wish to share with anyone accessing a server. This could include data such as passwords, keys, or other information.

As all data within a state is accessible by EVERY server that is connected it is important to store secure data within pillar. This will ensure that only those servers which require this secure data have access to it. In this example a use can go from an insecure configuration to one which is only accessible by the appropriate hosts:

```sls
/srv/salt/mysql/testerdb.sls:

testdb:
  mysql_database.present:
    - name: testerdb

/srv/salt/mysql/user.sls:

include:
  - mysql.testerdb

testdb_user:
  mysql_user.present:
    - name: frank
    - password: "test3rdb"
    - host: localhost
```
Many users would review this state and see that the password is there in plain text, which is quite problematic. It results in several issues which may not be immediately visible.

The first of these issues is clear to most users -- the password being visible in this state. This means that any minion will have a copy of this, and therefore the password which is a major security concern as minions may not be locked down as tightly as the master server.

The other issue that can be encountered is access by users on the master. If everyone has access to the states (or their repository), then they are able to review this password. Keeping your password data accessible by only a few users is critical for both security and peace of mind.

There is also the issue of portability. When a state is configured this way it results in multiple changes needing to be made. This was discussed in the sections above but it is a critical idea to drive home. If states are not portable it may result in more work later!

Fixing this issue is relatively simple, the content just needs to be moved to the associated pillar:

```yaml
/srv/pillar/mysql.sls:

mysql:
  lookup:
    name: testerdb
    password: test3rdb
    user: frank
    host: localhost
```

```yaml
/srv/salt/mysql/testerdb.sls:

testdb:
  mysql_database.present:
    - name: {{ salt['pillar.get']('mysql:lookup:name') }}
```

```yaml
/srv/salt/mysql/user.sls:

include:
  - mysql.testerdb

testdb_user:
  mysql_user.present:
    - name: {{ salt['pillar.get']('mysql:lookup:user') }}
    - password: {{ salt['pillar.get']('mysql:lookup:password') }}
    - host: {{ salt['pillar.get']('mysql:lookup:host') }}
    - require:
      - sls: mysql.testerdb
```

Now that the database details have been moved to the associated pillar file, only machines which are targeted via pillar will have access to these details. Access to users who should not be able to review these details can also be prevented while ensuring that they are still able to write states which take advantage of this information.
The intent of the troubleshooting section is to introduce solutions to a number of common issues encountered by users and the tools that are available to aid in developing States and Salt code.

### 33.1 Troubleshooting the Salt Master

If your Salt master is having issues such as minions not returning data, slow execution times, or a variety of other issues, the following links contain details on troubleshooting the most common issues encountered:

#### 33.1.1 Troubleshooting the Salt Master

**Running in the Foreground**

A great deal of information is available via the debug logging system, if you are having issues with minions connecting or not starting run the master in the foreground:

```
# salt-master -l debug
```

Anyone wanting to run Salt daemons via a process supervisor such as `monit`, `runit`, or `supervisord`, should omit the `-d` argument to the daemons and run them in the foreground.

**What Ports does the Master Need Open?**

For the master, TCP ports 4505 and 4506 need to be open. If you've put both your Salt master and minion in debug mode and don't see an acknowledgment that your minion has connected, it could very well be a firewall interfering with the connection. See our firewall configuration page for help opening the firewall on various platforms.

If you've opened the correct TCP ports and still aren't seeing connections, check that no additional access control system such as SELinux or AppArmor is blocking Salt.

**Too many open files**

The salt-master needs at least 2 sockets per host that connects to it, one for the Publisher and one for response port. Thus, large installations may, upon scaling up the number of minions accessing a given master, encounter:
The solution to this would be to check the number of files allowed to be opened by the user running salt-master (root by default):

[root@salt-master ~]# ulimit -n
1024

If this value is not equal to at least twice the number of minions, then it will need to be raised. For example, in an environment with 1800 minions, the nofile limit should be set to no less than 3600. This can be done by creating the file `/etc/security/limits.d/99-salt.conf`, with the following contents:

<table>
<thead>
<tr>
<th>root</th>
<th>hard</th>
<th>nofile</th>
<th>4096</th>
</tr>
</thead>
<tbody>
<tr>
<td>root</td>
<td>soft</td>
<td>nofile</td>
<td>4096</td>
</tr>
</tbody>
</table>

Replace root with the user under which the master runs, if different.

If your master does not have an `/etc/security/limits.d` directory, the lines can simply be appended to `/etc/security/limits.conf`.

As with any change to resource limits, it is best to stay logged into your current shell and open another shell to run `ulimit -n` again and verify that the changes were applied correctly. Additionally, if your master is running upstart, it may be necessary to specify the nofile limit in `/etc/default/salt-master` if upstart isn't respecting your resource limits:

```
limit nofile 4096 4096
```

Note: The above is simply an example of how to set these values, and you may wish to increase them even further if your Salt master is doing more than just running Salt.

**Salt Master Stops Responding**

There are known bugs with ZeroMQ versions less than 2.1.11 which can cause the Salt master to not respond properly. If you're running a ZeroMQ version greater than or equal to 2.1.9, you can work around the bug by setting the sysctls `net.core.rmem_max` and `net.core.wmem_max` to 16777216. Next, set the third field in `net.ipv4.tcp_rmem` and `net.ipv4.tcp_wmem` to at least 16777216.

You can do it manually with something like:

```
# echo 16777216 > /proc/sys/net/core/rmem_max
# echo 16777216 > /proc/sys/net/core/wmem_max
# echo "4096 87380 16777216" > /proc/sys/net/ipv4/tcp_rmem
# echo "4096 87380 16777216" > /proc/sys/net/ipv4/tcp_wmem
```

Or with the following Salt state:

```bash
1 net.core.rmem_max:
  2   sysctl:
  3     - present
  4     - value: 16777216
  5
1 net.core.wmem_max:
  2   sysctl:
```
Live Python Debug Output

If the master seems to be unresponsive, a SIGUSR1 can be passed to the salt-master threads to display what piece of code is executing. This debug information can be invaluable in tracking down bugs.

To pass a SIGUSR1 to the master, first make sure the minion is running in the foreground. Stop the service if it is running as a daemon, and start it in the foreground like so:

```
# salt-master -l debug
```

Then pass the signal to the master when it seems to be unresponsive:

```
# killall -SIGUSR1 salt-master
```

When filing an issue or sending questions to the mailing list for a problem with an unresponsive daemon, be sure to include this information if possible.

Live Salt-Master Profiling

When faced with performance problems one can turn on master process profiling by sending it SIGUSR2.

```
# killall -SIGUSR2 salt-master
```

This will activate yappi profiler inside salt-master code, then after some time one must send SIGUSR2 again to stop profiling and save results to file. If run in foreground salt-master will report filename for the results, which are usually located under /tmp on Unix-based OSes and c:\temp on windows.

Results can then be analyzed with kcachegrind or similar tool.

Commands Time Out or Do Not Return Output

Depending on your OS (this is most common on Ubuntu due to apt-get) you may sometimes encounter times where your highstate, or other long running commands do not return output.

Note: A number of timing issues were resolved in the 2014.1 release of Salt. Upgrading to at least this version is strongly recommended if timeouts persist.

By default the timeout is set to 5 seconds. The timeout value can easily be increased by modifying the timeout line within your /etc/salt/master configuration file.
Passing the -c Option to Salt Returns a Permissions Error

Using the -c option with the Salt command modifies the configuration directory. When the configuration file is read it will still base data off of the root_dir setting. This can result in unintended behavior if you are expecting files such as /etc/salt/pki to be pulled from the location specified with -c. Modify the root_dir setting to address this behavior.

Salt Master Doesn’t Return Anything While Running jobs

When a command being run via Salt takes a very long time to return (package installations, certain scripts, etc.) the master may drop you back to the shell. In most situations the job is still running but Salt has exceeded the set timeout before returning. Querying the job queue will provide the data of the job but is inconvenient. This can be resolved by either manually using the -t option to set a longer timeout when running commands (by default it is 5 seconds) or by modifying the master configuration file: /etc/salt/master and setting the timeout value to change the default timeout for all commands, and then restarting the salt-master service.

Salt Master Auth Flooding

In large installations, care must be taken not to overwhelm the master with authentication requests. Several options can be set on the master which mitigate the chances of an authentication flood from causing an interruption in service.

Note: recon_default:
The average number of seconds to wait between reconnection attempts.

recon_max: The maximum number of seconds to wait between reconnection attempts.

recon_randomize: A flag to indicate whether the recon_default value should be randomized.

acceptance_wait_time: The number of seconds to wait for a reply to each authentication request.

random_reauth_delay: The range of seconds across which the minions should attempt to randomize authentication attempts.

auth_timeout: The total time to wait for the authentication process to complete, regardless of the number of attempts.

33.1.2 Running state locally

To debug the states, you can use call locally.

\texttt{salt-call -l trace --local state.highstate}

The top.sls file is used to map what SLS modules get loaded onto what minions via the state system.

It is located in the file defined in the file_roots variable of the salt master configuration file which is defined by found in CONFIG_DIR/master, normally /etc/salt/master

The default configuration for the file_roots is:

\texttt{file_roots: base: - /srv/salt}

So the top file is defaulted to the location /srv/salt/top.sls
33.2 Troubleshooting the Salt Minion

In the event that your Salt minion is having issues, a variety of solutions and suggestions are available. Please refer to the following links for more information:

33.2.1 Troubleshooting the Salt Minion

Running in the Foreground

A great deal of information is available via the debug logging system, if you are having issues with minions connecting or not starting run the minion in the foreground:

```
# salt-minion -l debug
```

Anyone wanting to run Salt daemons via a process supervisor such as monit, runit, or supervisord, should omit the `-d` argument to the daemons and run them in the foreground.

What Ports does the Minion Need Open?

No ports need to be opened on the minion, as it makes outbound connections to the master. If you've put both your Salt master and minion in debug mode and don't see an acknowledgment that your minion has connected, it could very well be a firewall interfering with the connection. See our firewall configuration page for help opening the firewall on various platforms.

If you have netcat installed, you can check port connectivity from the minion with the `nc` command:

```
$ nc -v -z salt.master.ip.addr 4505
Connection to salt.master.ip.addr 4505 port [tcp/unknown] succeeded!
$ nc -v -z salt.master.ip.addr 4506
Connection to salt.master.ip.addr 4506 port [tcp/unknown] succeeded!
```

The Nmap utility can also be used to check if these ports are open:

```
# nmap -sS -q -p 4505-4506 salt.master.ip.addr
Starting Nmap 6.40 ( http://nmap.org ) at 2013-12-29 19:44 CST
Nmap scan report for salt.master.ip.addr (10.0.0.10)
Host is up (0.0026s latency).
PORT     STATE     SERVICE
4505/tcp open       unknown
4506/tcp open       unknown
MAC Address: 00:11:22:AA:BB:CC (Intel)
Nmap done: 1 IP address (1 host up) scanned in 1.64 seconds
```

If you've opened the correct TCP ports and still aren't seeing connections, check that no additional access control system such as SELinux or AppArmor is blocking Salt.

Using salt-call

The `salt-call` command was originally developed for aiding in the development of new Salt modules. Since then, many applications have been developed for running any Salt module locally on a minion. These range
from the original intent of salt-call, development assistance, to gathering more verbose output from calls like `state.highstate`

When initially creating your state tree, it is generally recommended to invoke `state.highstate` from the minion with `salt-call`. This displays far more information about the highstate execution than calling it remotely. For even more verbosity, increase the loglevel with the same argument as `salt-minion`:

```
# salt-call -l debug state.highstate
```

The main difference between using `salt` and using `salt-call` is that `salt-call` is run from the minion, and it only runs the selected function on that minion. By contrast, `salt` is run from the master, and requires you to specify the minions on which to run the command using salt's `targeting system`.

**Live Python Debug Output**

If the minion seems to be unresponsive, a SIGUSR1 can be passed to the process to display what piece of code is executing. This debug information can be invaluable in tracking down bugs.

To pass a SIGUSR1 to the minion, first make sure the minion is running in the foreground. Stop the service if it is running as a daemon, and start it in the foreground like so:

```
# salt-minion -l debug
```

Then pass the signal to the minion when it seems to be unresponsive:

```
# killall -SIGUSR1 salt-minion
```

When filing an issue or sending questions to the mailing list for a problem with an unresponsive daemon, be sure to include this information if possible.

**Multiprocessing in Execution Modules**

As is outlined in github issue #6300, Salt cannot use python's multiprocessing pipes and queues from execution modules. Multiprocessing from the execution modules is perfectly viable, it is just necessary to use Salt's event system to communicate back with the process.

The reason for this difficulty is that python attempts to pickle all objects in memory when communicating, and it cannot pickle function objects. Since the Salt loader system creates and manages function objects this causes the pickle operation to fail.

**Salt Minion Doesn’t Return Anything While Running Jobs Locally**

When a command being run via Salt takes a very long time to return (package installations, certain scripts, etc.) the minion may drop you back to the shell. In most situations the job is still running but Salt has exceeded the set timeout before returning. Querying the job queue will provide the data of the job but is inconvenient. This can be resolved by either manually using the `-t` option to set a longer timeout when running commands (by default it is 5 seconds) or by modifying the minion configuration file: `/etc/salt/minion` and setting the `timeout` value to change the default timeout for all commands, and then restarting the salt-minion service.

**Note:** Modifying the minion timeout value is not required when running commands from a Salt Master. It is only required when running commands locally on the minion.
33.3 Running in the Foreground

A great deal of information is available via the debug logging system, if you are having issues with minions connecting or not starting run the minion and/or master in the foreground:

```
salt-master -l debug
salt-minion -l debug
```

Anyone wanting to run Salt daemons via a process supervisor such as `monit`, `runit`, or `supervisord`, should omit the `-d` argument to the daemons and run them in the foreground.

33.4 What Ports do the Master and Minion Need Open?

No ports need to be opened up on each minion. For the master, TCP ports 4505 and 4506 need to be open. If you've put both your Salt master and minion in debug mode and don't see an acknowledgment that your minion has connected, it could very well be a firewall.

You can check port connectivity from the minion with the `nc` command:

```
nc -v -z salt.master.ip 4505
nc -v -z salt.master.ip 4506
```

There is also a firewall configuration document that might help as well.

If you've enabled the right TCP ports on your operating system or Linux distribution's firewall and still aren't seeing connections, check that no additional access control system such as SELinux or AppArmor is blocking Salt.

33.5 Using salt-call

The `salt-call` command was originally developed for aiding in the development of new Salt modules. Since then, many applications have been developed for running any Salt module locally on a minion. These range from the original intent of salt-call, development assistance, to gathering more verbose output from calls like `state.highstate`.

When creating your state tree, it is generally recommended to invoke `state.highstate` with `salt-call`. This displays far more information about the highstate execution than calling it remotely. For even more verbosity, increase the loglevel with the same argument as `salt-minion`:

```
salt-call -l debug state.highstate
```

The main difference between using `salt` and using `salt-call` is that `salt-call` is run from the minion, and it only runs the selected function on that minion. By contrast, `salt` is run from the master, and requires you to specify the minions on which to run the command using salt’s targeting system.

33.6 Too many open files

The salt-master needs at least 2 sockets per host that connects to it, one for the Publisher and one for response port. Thus, large installations may, upon scaling up the number of minions accessing a given master, encounter:
12:45:29,289 [salt.master][INFO] Starting Salt worker process 38
Too many open files
sock != -1 (tcp_listener.cpp:335)

The solution to this would be to check the number of files allowed to be opened by the user running salt-master (root by default):

[root@salt-master ~]# ulimit -n
1024

And modify that value to be at least equal to the number of minions x 2. This setting can be changed in limits.conf as the nofile value(s), and activated upon new a login of the specified user.

So, an environment with 1800 minions, would need 1800 x 2 = 3600 as a minimum.

### 33.7 Salt Master Stops Responding

There are known bugs with ZeroMQ versions less than 2.1.11 which can cause the Salt master to not respond properly. If you're running a ZeroMQ version greater than or equal to 2.1.9, you can work around the bug by setting the sysctls `net.core.rmem_max` and `net.core.wmem_max` to 16777216. Next, set the third field in `net.ipv4.tcp_rmem` and `net.ipv4.tcp_wmem` to at least 16777216.

You can do it manually with something like:

```bash
# echo 16777216 > /proc/sys/net/core/rmem_max
# echo 16777216 > /proc/sys/net/core/wmem_max
# echo "4096 87380 16777216" > /proc/sys/net/ipv4/tcp_rmem
# echo "4096 87380 16777216" > /proc/sys/net/ipv4/tcp_wmem
```

Or with the following Salt state:

```python
net.core.rmem_max:
  - sysctl:
    - present
    - value: 16777216

net.core.wmem_max:
  - sysctl:
    - present
    - value: 16777216

net.ipv4.tcp_rmem:
  - sysctl:
    - present
    - value: 4096 87380 16777216

net.ipv4.tcp_wmem:
  - sysctl:
    - present
    - value: 4096 87380 16777216
```
33.8 Salt and SELinux

Currently there are no SELinux policies for Salt. For the most part Salt runs without issue when SELinux is running in Enforcing mode. This is because when the minion executes as a daemon the type context is changed to initrc_t. The problem with SELinux arises when using salt-call or running the minion in the foreground, since the type context stays unconfined_t.

This problem is generally manifest in the rpm install scripts when using the pkg module. Until a full SELinux Policy is available for Salt the solution to this issue is to set the execution context of salt-call and salt-minion to rpm_exec_t:

```bash
# CentOS 5 and RHEL 5:
chcon -t system_u:system_r:rpm_exec_t:s0 /usr/bin/salt-minion
chcon -t system_u:system_r:rpm_exec_t:s0 /usr/bin/salt-call

# CentOS 6 and RHEL 6:
chcon system_u:object_r:rpm_exec_t:s0 /usr/bin/salt-minion
chcon system_u:object_r:rpm_exec_t:s0 /usr/bin/salt-call
```

This works well, because the rpm_exec_t context has very broad control over other types.

33.9 Red Hat Enterprise Linux 5

Salt requires Python 2.6 or 2.7. Red Hat Enterprise Linux 5 and its variants come with Python 2.4 installed by default. When installing on RHEL 5 from the EPEL repository this is handled for you. But, if you run Salt from git, be advised that its dependencies need to be installed from EPEL and that Salt needs to be run with the python26 executable.

33.10 Common YAML Gotchas

An extensive list of YAML idiosyncrasies has been compiled:

33.10.1 YAML Idiosyncrasies

One of Salt’s strengths, the use of existing serialization systems for representing SLS data, can also backfire. YAML is a general purpose system and there are a number of things that would seem to make sense in an sls file that cause YAML issues. It is wise to be aware of these issues. While reports or running into them are generally rare they can still crop up at unexpected times.

Spaces vs Tabs

YAML uses spaces, period. Do not use tabs in your SLS files! If strange errors are coming up in rendering SLS files, make sure to check that no tabs have crept in! In Vim, after enabling search highlighting with: `:set hlsearch`, you can check with the following key sequence in normal mode(you can hit ESC twice to be sure): `/`, `Ctrl-v`, `Tab`, then hit `Enter`. Also, you can convert tabs to 2 spaces by these commands in Vim: `:set tabstop=2` `expandtab` and then `:retab`. 
Indentation

The suggested syntax for YAML files is to use 2 spaces for indentation, but YAML will follow whatever indentation system that the individual file uses. Indentation of two spaces works very well for SLS files given the fact that the data is uniform and not deeply nested.

Nested Dictionaries

When `dicts` are nested within other data structures (particularly lists), the indentation logic sometimes changes. Examples of where this might happen include `context` and `defaults` options from the `file.managed` state:

```
/etc/http/conf/http.conf:
  file:
    - managed
    - source: salt://apache/http.conf
    - user: root
    - group: root
    - mode: 644
    - template: jinja
    - context:
      custom_var: "override"
    - defaults:
      custom_var: "default value"
      other_var: 123
```

Notice that while the indentation is two spaces per level, for the values under the `context` and `defaults` options there is a four-space indent. If only two spaces are used to indent, then those keys will be considered part of the same dictionary that contains the `context` key, and so the data will not be loaded correctly. If using a double indent is not desirable, then a deeply-nested dict can be declared with curly braces:

```
/etc/http/conf/http.conf:
  file:
    - managed
    - source: salt://apache/http.conf
    - user: root
    - group: root
    - mode: 644
    - template: jinja
    - context: {
      custom_var: "override"
    }
    - defaults: {
      custom_var: "default value",
      other_var: 123
    }
```

Here is a more concrete example of how YAML actually handles these indentations, using the Python interpreter on the command line:

```python
>>> import yaml
>>> yaml.safe_load('''mystate:
...    file.managed:
...      - context:
...        some: var''')
{'mystate': {'file.managed': [{'context': {'some': 'var'}}]}}
>>> yaml.safe_load('''mystate:
...    file.managed:
...      - context:
...        some: var'''}
```
... - context:
...  some: var''')
{'mystate': {'file.managed': [{'some': 'var', 'context': None}]}}

Note that in the second example, some is added as another key in the same dictionary, whereas in the first example, it's the start of a new dictionary. That's the distinction. context is a common example because it is a keyword arg for many functions, and should contain a dictionary.

**True/False, Yes/No, On/Off**

PyYAML will load these values as boolean True or False. Un-capitalized versions will also be loaded as booleans (true, false, yes, no, on, and off). This can be especially problematic when constructing Pillar data. Make sure that your Pillars which need to use the string versions of these values are enclosed in quotes.

**Integers are Parsed as Integers**

NOTE: This has been fixed in salt 0.10.0, as of this release passing an integer that is preceded by a 0 will be correctly parsed.

When passing integers into an SLS file, they are passed as integers. This means that if a state accepts a string value and an integer is passed, that an integer will be sent. The solution here is to send the integer as a string.

This is best explained when setting the mode for a file:

```yaml
/etc/vimrc:
  file:
    - managed
    - source: salt://edit/vimrc
    - user: root
    - group: root
    - mode: 644
```

Salt manages this well, since the mode is passed as 644, but if the mode is zero padded as 0644, then it is read by YAML as an integer and evaluated as an octal value, 0644 becomes 420. Therefore, if the file mode is preceded by a 0 then it needs to be passed as a string:

```yaml
/etc/vimrc:
  file:
    - managed
    - source: salt://edit/vimrc
    - user: root
    - group: root
    - mode: '0644'
```

**YAML does not like ``Double Short Decs''**

If I can find a way to make YAML accept ```Double Short Decs`` then I will, since I think that double short decs would be awesome. So what is a ```Double Short Dec```? It is when you declare a multiple short decs in one ID. Here is a standard short dec, it works great:

```yaml
vim:
  pkg.installed
```

33.10. Common YAML Gotchas
The short dec means that there are no arguments to pass, so it is not required to add any arguments, and it can save space.

YAML though, gets upset when declaring multiple short decs, for the record...

**THIS DOES NOT WORK:**

```yaml
vim:
  pkg.installed
  user.present
```

Similarly declaring a short dec in the same ID dec as a standard dec does not work either...

**ALSO DOES NOT WORK:**

```yaml
fred:
  user.present
  ssh_auth.present:
    - name: AAAAB3NzaC...
    - user: fred
    - enc: ssh-dss
    - require:
      - user: fred
```

The correct way is to define them like this:

```yaml
vim:
  pkg.installed: []
  user.present: []

fred:
  user.present: []
  ssh_auth.present:
    - name: AAAAB3NzaC...
    - user: fred
    - enc: ssh-dss
    - require:
      - user: fred
```

Alternatively, they can be defined the ```old way```; or with multiple ```full deces```:

```yaml
vim:
  pkg:
    - installed
  user:
    - present

fred:
  user:
    - present
  ssh_auth:
    - present
    - name: AAAAB3NzaC...
    - user: fred
    - enc: ssh-dss
    - require:
      - user: fred
```
YAML support only plain ASCII

According to YAML specification, only ASCII characters can be used. Within double-quotes, special characters may be represented with C-style escape sequences starting with a backslash (\). Examples:

- micro: "\u00b5"
- copyright: "\u00a9"
- A: "\x41"
- alpha: "\u0251"
- Alef: "\u05d0"

List of usable Unicode characters will help you to identify correct numbers. Python can also be used to discover the Unicode number for a character:

```
repr(u"Text with wrong characters i need to figure out")
```

This shell command can find wrong characters in your SLS files:

```
find . -name '*.sls' -exec grep --color='auto' -P -n '^[^\x00-\x7F]' {} \;
```

Alternatively you can toggle the yaml_utf8 setting in your master configuration file. This is still an experimental setting but it should manage the right encoding conversion in salt after yaml states compilations.

Underscores stripped in Integer Definitions

If a definition only includes numbers and underscores, it is parsed by YAML as an integer and all underscores are stripped. To ensure the object becomes a string, it should be surrounded by quotes. More information here.

Here's an example:

```
>>> import yaml
>>> yaml.safe_load('2013_05_10')
20130510
```

Automatic datetime conversion

If there is a value in a YAML file formatted 2014-01-20 14:23:23 or similar, YAML will automatically convert this to a Python datetime object. These objects are not msgpack serializable, and so may break core salt functionality. If values such as these are needed in a salt YAML file (specifically a configuration file), they should be formatted with surrounding strings to force YAML to serialize them as strings:

```
>>> import yaml
>>> yaml.safe_load('2014-01-20 14:23:23')
datetime.datetime(2014, 1, 20, 14, 23, 23)
```

33.10. Common YAML Gotchas
Additionally, numbers formatted like XXXX-XX-XX will also be converted (or YAML will attempt to convert them, and error out if it doesn’t think the date is a real one). Thus, for example, if a minion were to have an ID of 4017-16-20 the minion would not start because YAML would complain that the date was out of range. The workaround is the same, surround the offending string with quotes:

```python
>>> import yaml
>>> yaml.safe_load('4017-16-20')
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
  File "/usr/local/lib/python2.7/site-packages/yaml/__init__.py", line 93, in safe_load
    return load(stream, SafeLoader)
  File "/usr/local/lib/python2.7/site-packages/yaml/__init__.py", line 71, in load
    return loader.get_single_data()
  File "/usr/local/lib/python2.7/site-packages/yaml/constructor.py", line 39, in get_single_data
    return self.construct_document(node)
  File "/usr/local/lib/python2.7/site-packages/yaml/constructor.py", line 43, in construct_document
    data = self.construct_object(node)
  File "/usr/local/lib/python2.7/site-packages/yaml/constructor.py", line 88, in construct_object
    data = constructor(self, node)
  File "/usr/local/lib/python2.7/site-packages/yaml/constructor.py", line 312, in construct_yaml_timestamp
    return datetime.date(year, month, day)
ValueError: month must be in 1..12
>>> yaml.safe_load("4017-16-20")
'4017-16-20'
```

### 33.11 Live Python Debug Output

If the minion or master seems to be unresponsive, a SIGUSR1 can be passed to the processes to display where in the code they are running. If encountering a situation like this, this debug information can be invaluable. First make sure the master of minion are running in the foreground:

```bash
salt-master -l debug
salt-minion -l debug
```

Then pass the signal to the master or minion when it seems to be unresponsive:

```bash
killall -SIGUSR1 salt-master
killall -SIGUSR1 salt-minion
```

Also under BSD and Mac OS X in addition to SIGUSR1 signal, debug subroutine set up for SIGINFO which has an advantage of being sent by Ctrl+T shortcut.

When filing an issue or sending questions to the mailing list for a problem with an unresponsive daemon this information can be invaluable.

### 33.12 Salt 0.16.x minions cannot communicate with a 0.17.x master

As of release 0.17.1 you can no longer run different versions of Salt on your Master and Minion servers. This is due to a protocol change for security purposes. The Salt team will continue to attempt to ensure versions are as backwards compatible as possible.
33.13 Debugging the Master and Minion

A list of common master and minion troubleshooting steps provide a starting point for resolving issues you may encounter.
34.1 Overview

In its most typical use, Salt is a software application in which clients, called "minions" can be commanded and controlled from a central command server called a "master".

Commands are normally issued to the minions (via the master) by calling a client script simply called, 'salt'. Salt features a pluggable transport system to issue commands from a master to minions. The default transport is ZeroMQ.

34.2 Salt Client

34.2.1 Overview

The salt client is run on the same machine as the Salt Master and communicates with the salt-master to issue commands and to receive the results and display them to the user.

The primary abstraction for the salt client is called 'LocalClient'.

When LocalClient wants to publish a command to minions, it connects to the master by issuing a request to the master's ReqServer (TCP: 4506)

The LocalClient system listens to responses for its requests by listening to the master event bus publisher (master_event_pub.ipc).

34.3 Salt Master

34.3.1 Overview

The salt-master deamon runs on the designated Salt master and performs functions such as authenticating minions, sending, and receiving requests from connected minions and sending and receiving requests and replies to the `salt' CLI.
34.3.2 Moving Pieces

When a Salt master starts up, a number of processes are started, all of which are called `salt-master` in a process-list but have various role categories.

Among those categories are:

- Publisher
- EventPublisher
- MWorker

34.3.3 Publisher

The Publisher process is responsible for sending commands over the designated transport to connected minions. The Publisher is bound to the following:

- TCP: port 4505
- IPC: publish_pull.ipc

Each salt minion establishes a connection to the master Publisher.

34.3.4 EventPublisher

The EventPublisher publishes events onto the event bus. It is bound to the following:

- IPC: master_event_pull.ipc
- IPC: master_event_pub.ipc

34.3.5 MWorker

Worker processes manage the back-end operations for the Salt Master.

The number of workers is equivalent to the number of `worker_threads` specified in the master configuration and is always at least one.

Workers are bound to the following:

- IPC: workers.ipc

34.3.6 ReqServer

The Salt request server takes requests and distributes them to available MWorker processes for processing. It also receives replies back from minions.

The ReqServer is bound to the following:

- TCP: 4506
- IPC: workers.ipc

Each salt minion establishes a connection to the master ReqServer.
34.3.7 Job Flow

The Salt master works by always publishing commands to all connected minions and the minions decide if the command is meant for them by checking themselves against the command target.

The typical lifecycle of a salt job from the perspective of the master might be as follows:

1. A command is issued on the CLI. For example, `salt my_minion test.ping'.
2) The `salt' command uses LocalClient to generate a request to the salt master by connecting to the ReqServer on TCP:4506 and issuing the job.
3) The salt-master ReqServer sees the request and passes it to an available MWorker over workers.ipc.
4) A worker picks up the request and handles it. First, it checks to ensure that the requested user has permissions to issue the command. Then, it sends the publish command to all connected minions. For the curious, this happens in ClearFuncs.publish().
5) The worker announces on the master event bus that it is about to publish a job to connected minions. This happens by placing the event on the master event bus (master_event_pull.ipc) where the EventPublisher picks it up and distributes it to all connected event listeners on master_event_pub.ipc.
6) The message to the minions is encrypted and sent to the Publisher via IPC on publish_pull.ipc.
7) Connected minions have a TCP session established with the Publisher on TCP port 4505 where they await commands. When the Publisher receives the job over publish_pull, it sends the jobs across the wire to the minions for processing.
8) After the minions receive the request, they decrypt it and perform any requested work, if they determine that they are targeted to do so.
9) When the minion is ready to respond, it publishes the result of its job back to the master by sending the encrypted result back to the master on TCP 4506 where it is again picked up by the ReqServer and forwarded to an available MWorker for processing. (Again, this happens by passing this message across workers.ipc to an available worker.)
10) When the MWorker receives the job it decrypts it and fires an event onto the master event bus (master_event_pull.ipc). (Again for the curious, this happens in AESFuncs._return().
11) The EventPublisher sees this event and re-publishes it on the bus to all connected listeners of the master event bus (on master_event_pub.ipc). This is where the LocalClient has been waiting, listening to the event bus for minion replies. It gathers the job and stores the result.
12) When all targeted minions have replied or the timeout has been exceeded, the salt client displays the results of the job to the user on the CLI.

34.4 Salt Minion

34.4.1 Overview

The salt-minion is a single process that sits on machines to be managed by Salt. It can either operate as a stand-alone daemon which accepts commands locally via `salt-call' or it can connect back to a master and receive commands remotely.

When starting up, salt minions connect _back_ to a master defined in the minion config file. The connect to two ports on the master:

- TCP: 4505 This is the connection to the master Publisher. It is on this port that the minion receives jobs from the master.
- **TCP: 4506** This is the connection to the master ReqServer. It is on this port that the minion sends job results back to the master.

### 34.4.2 Event System

Similar to the master, a salt-minion has its own event system that operates over IPC by default. The minion event system operates on a push/pull system with IPC files at minion_event_<unique_id>_pub.ipc and minion_event_<unique_id>_pull.ipc.

The astute reader might ask why have an event bus at all with a single-process daemon. The answer is that the salt-minion may fork other processes as required to do the work without blocking the main salt-minion process and this necessitates a mechanism by which those processes can communicate with each other. Secondarily, this provides a bus by which any user with sufficient permissions can read or write to the bus as a common interface with the salt minion.

### 34.4.3 Job Flow

When a salt minion starts up, it attempts to connect to the Publisher and the ReqServer on the salt master. It then attempts to authenticate and once the minion has successfully authenticated, it simply listens for jobs.

Jobs normally come either come from the `salt-call` script run by a local user on the salt minion or they can come directly from a master.

### 34.4.4 Master Job Flow

1) A master publishes a job that is received by a minion as outlined by the master's job flow above.

2) The minion is polling its receive socket that's connected to the master Publisher (TCP 4505 on master). When it detects an incoming message, it picks it up from the socket and decrypts it.

3) A new minion process or thread is created and provided with the contents of the decrypted message. The _thread_return() method is provided with the contents of the received message.

4) The new minion thread is created. The _thread_return() function starts up and actually calls out to the requested function contained in the job.

5) The requested function runs and returns a result. [Still in thread.]

6) The result of the function that's run is encrypted and returned to the master's ReqServer (TCP 4506 on master). [Still in thread.]

7) Thread exits. Because the main thread was only blocked for the time that it took to initialize the worker thread, many other requests could have been received and processed during this time.

### 34.5 A Note on ClearFuncs vs. AESFuncs

A common source of confusion is determining when messages are passed in the clear and when they are passed using encryption. There are two rules governing this behaviour:

1) ClearFuncs is used for intra-master communication and during the initial authentication handshake between a minion and master during the key exchange.

2. AESFuncs is used everywhere else.
34.6 Contributing

There is a great need for contributions to Salt and patches are welcome! The goal here is to make contributions clear, make sure there is a trail for where the code has come from, and most importantly, to give credit where credit is due!

There are a number of ways to contribute to Salt development.

For details on how to contribute documentation improvements please review Writing Salt Documentation.

34.6.1 Sending a GitHub pull request

Sending pull requests on GitHub is the preferred method for receiving contributions. The workflow advice below mirrors GitHub's own guide and is well worth reading.

1. Fork saltstack/salt on GitHub.

2. Make a local clone of your fork.

   ```
   git clone git@github.com:my-account/salt.git
   cd salt
   ```

3. Add saltstack/salt as a git remote.

   ```
   git remote add upstream https://github.com/saltstack/salt.git
   ```

4. Create a new branch in your clone.

   ```
   git fetch upstream
   git checkout -b fix-broken-thing upstream/2015.5
   ```

   If you're working on a fix, create your branch from the oldest release branch having the bug. See Which Salt Branch?.

   ```
   git fetch upstream
   git checkout -b add-cool-feature upstream/develop
   ```

   If you're working on a feature, create your branch from the develop branch.

5. Edit and commit changes to your branch.

   ```
   vim path/to/file1 path/to/file2
   git diff
   git add path/to/file1 path/to/file2
   git commit
   ```

   Write a short, descriptive commit title and a longer commit message if necessary.

   ```
   Note: If your change fixes a bug or implements a feature already filed in the issue tracker, be sure to reference the issue number in the commit message body.
   ```
fix broken things in file1 and file2

Fixes #31337. The issue is now eradicated from file1 and file2.

# Please enter the commit message for your changes. Lines starting
# with '#' will be ignored, and an empty message aborts the commit.
# On branch fix-broken-thing
# Changes to be committed:
#   modified:  path/to/file1
#   modified:  path/to/file2

If you get stuck, there are many introductory Git resources on http://help.github.com.

6. Push your locally-committed changes to your GitHub fork,

**Note:** You may want to rebase before pushing to work out any potential conflicts.

```bash
git fetch upstream
git rebase upstream/2015.5 fix-broken-thing
git push --set-upstream origin fix-broken-thing
```

or,

```bash
git fetch upstream
git rebase upstream/develop add-cool-feature
git push --set-upstream origin add-cool-feature
```

7. Find the branch on your GitHub salt fork.

https://github.com/my-account/salt/branches/fix-broken-thing

8. Open a new pull request.

Click on Pull Request on the right near the top of the page,

https://github.com/my-account/salt/pull/new/fix-broken-thing

(a) If your branch is a fix for a release branch, choose that as the base branch (e.g. 2015.5),

https://github.com/my-account/salt/compare/saltstack:2015.5...fix-broken-thing

If your branch is a feature, choose develop as the base branch,

https://github.com/my-account/salt/compare/saltstack:develop...add-cool-feature

(b) Review that the proposed changes are what you expect.

(c) Write a descriptive comment. Include links to related issues (e.g. `Fixes #31337`) in the comment field.

(d) Click Create pull request.

9. Salt project members will review your pull request and automated tests will run on it.

If you recognize any test failures as being related to your proposed changes or if a reviewer asks for modifications:

(a) Make the new changes in your local clone on the same local branch.

(b) Push the branch to GitHub again using the same commands as before.

(c) New and updated commits will be added to the pull request automatically.
(d) Feel free to add a comment to the discussion.

Note: Jenkins

Pull request against saltstack/salt are automatically tested on a variety of operating systems and configurations. On average these tests take 30 minutes. Depending on your GitHub notification settings you may also receive an email message about the test results.

Test progress and results can be found at http://jenkins.saltstack.com/.

34.6.2 Which Salt branch?

GitHub will open pull requests against Salt's main branch, develop, by default. Ideally features should go into develop and bug fixes should go into the oldest supported release branch affected by the bug. See Sending a GitHub pull request.

If you have a bug fix and have already forked your working branch from develop and do not know how to rebase your commits against another branch, then submit it to develop anyway and we'll be sure to backport it to the correct place.

The current release branch

The current release branch is the most recent stable release. Pull requests containing bug fixes should be made against the release branch.

The branch name will be a date-based name such as 2015.5.

Bug fixes are made on this branch so that minor releases can be cut from this branch without introducing surprises and new features. This approach maximizes stability.

The Salt development team will "merge-forward" any fixes made on the release branch to the develop branch once the pull request has been accepted. This keeps the fix in isolation on the release branch and also keeps the develop branch up-to-date.

Note: Closing GitHub issues from commits

This "merge-forward" strategy requires that the magic keywords to close a GitHub issue appear in the commit message text directly. Only including the text in a pull request will not close the issue.

GitHub will close the referenced issue once the commit containing the magic text is merged into the default branch (develop). Any magic text input only into the pull request description will not be seen at the Git-level when those commits are merged-forward. In other words, only the commits are merged-forward and not the pull request.

The develop branch

The develop branch is unstable and bleeding-edge. Pull requests containing feature additions or non-bug-fix changes should be made against the develop branch.

The Salt development team will back-port bug fixes made to develop to the current release branch if the contributor cannot create the pull request against that branch.
34.6.3 Keeping Salt Forks in Sync

Salt is advancing quickly. It is therefore critical to pull upstream changes from upstream into your fork on a regular basis. Nothing is worse than putting hard work into a pull request only to see bunches of merge conflicts because it has diverged too far from upstream.

See also:
GitHub Fork a Repo Guide

The following assumes origin is the name of your fork and upstream is the name of the main saltstack/salt repository.

1. View existing remotes.
   
   ```
   git remote -v
   ```

2. Add the upstream remote.
   
   ```
   # For ssh github
   git remote add upstream git@github.com:saltstack/salt.git
   
   # For https github
   git remote add upstream https://github.com/saltstack/salt.git
   ```

3. Pull upstream changes into your clone.
   
   ```
   git fetch upstream
   ```

4. Update your copy of the develop branch.
   
   ```
   git checkout develop
   git merge --ff-only upstream/develop
   ```

   If Git complains that a fast-forward merge is not possible, you have local commits.
   - Run `git pull --rebase origin develop` to rebase your changes on top of the upstream changes.
   - Or, run `git branch <branch-name>` to create a new branch with your commits. You will then need to reset your develop branch before updating it with the changes from upstream.

   If Git complains that local files will be overwritten, you have changes to files in your working directory. Run `git status` to see the files in question.

5. Update your fork.
   
   ```
   git push origin develop
   ```

6. Repeat the previous two steps for any other branches you work with, such as the current release branch.

34.6.4 Posting patches to the mailing list

Patches will also be accepted by email. Format patches using `git format-patch` and send them to the salt-users mailing list. The contributor will then get credit for the patch, and the Salt community will have an archive of the patch and a place for discussion.
34.6.5 Backporting Pull Requests

If a bug is fixed on develop and the bug is also present on a currently-supported release branch it will need to be back-ported to all applicable branches.

Note: Most Salt contributors can skip these instructions. These instructions do not need to be read in order to contribute to the Salt project! The SaltStack team will back-port fixes on behalf of contributors in order to keep the contribution process easy. These instructions are intended for frequent Salt contributors, advanced Git users, SaltStack employees, or independent souls who wish to back-port changes themselves.

It is often easiest to fix a bug on the oldest supported release branch and then merge that branch forward into develop (as described earlier in this document). When that is not possible the fix must be back-ported, or copied, into any other affected branches.

These steps assume a pull request #1234 has been merged into develop. And upstream is the name of the remote pointing to the main Salt repo.

1. Identify the oldest supported release branch that is affected by the bug.

2. Create a new branch for the back-port by reusing the same branch from the original pull request.
   Name the branch bp-<NNNN> and use the number of the original pull request.
   ```
   git fetch upstream refs/pull/1234/head:bp-1234
   git checkout bp-1234
   ```

3. Find the parent commit of the original pull request.
   The parent commit of the original pull request must be known in order to rebase onto a release branch. The easiest way to find this is on GitHub.
   Open the original pull request on GitHub and find the first commit in the list of commits. Select and copy the SHA for that commit. The parent of that commit can be specified by appending ~1 to the end.

4. Rebase the new branch on top of the release branch.
   - `<release-branch>` is the branch identified in step #1.
   - `<orig-base>` is the SHA identified in step #3 -- don't forget to add ~1 to the end!
   ```
   git rebase --onto <release-branch> <orig-base> bp-1234
   ```
   Note, release branches prior to 2015.5 will not be able to make use of rebase and must use cherry-picking instead.

5. Push the back-port branch to GitHub and open a new pull request.
   Opening a pull request for the back-port allows for the test suite and normal code-review process.
   ```
   git push -u origin bp-1234
   ```

34.6.6 Issue and Pull Request Labeling System

SaltStack uses several labeling schemes to help facilitate code contributions and bug resolution. See the Labels and Milestones documentation for more information.
34.7 Deprecating Code

Salt should remain backwards compatible, though sometimes, this backwards compatibility needs to be broken because a specific feature and/or solution is no longer necessary or required. At first one might think, let me change this code, it seems that it’s not used anywhere else so it should be safe to remove. Then, once there’s a new release, users complain about functionality which was removed and they where using it, etc. This should, at all costs, be avoided, and, in these cases, that specific code should be deprecated.

In order to give users enough time to migrate from the old code behavior to the new behavior, the deprecation time frame should be carefully determined based on the significance and complexity of the changes required by the user.

A deprecation warning should be in place for at least two major releases before the deprecated code and its accompanying deprecation warning are removed. More time should be given for more complex changes. For example, if the current release under development is Sodium, the deprecated code and associated warnings should remain in place and warn for at least Aluminum.

To help in this deprecation task, salt provides salt.utils.warn_until. The idea behind this helper function is to show the deprecation warning to the user until salt reaches the provided version. Once that provided version is equal to salt.utils.warn_until, it will raise a RuntimeError making salt stop its execution. This stoppage is unpleasant and will remind the developer that the deprecation limit has been reached and that the code can then be safely removed.

Consider the following example:

```python
def some_function(bar=False, foo=None):
    if foo is not None:
        salt.utils.warn_until('Aluminum',
            'The `foo` argument has been deprecated and its ' +
            'functionality removed, as such, its usage is no longer ' +
            'required.'
        )
```

Development begins on the Aluminum release when the Magnesium branch is forked from the develop branch. Once this occurs, all uses of the warn_until function targeting Aluminum, along with the code they are warning about should be removed from the code.

34.8 Dunder Dictionaries

Salt provides several special `dunder` dictionaries as a convenience for Salt development. These include __opts__, __context__, __salt__, and others. This document will describe each dictionary and detail where they exist and what information and/or functionality they provide.

34.8.1 __opts__

Available in

- All loader modules

The __opts__ dictionary contains all of the options passed in the configuration file for the master or minion.

**Note:** In many places in salt, instead of pulling raw data from the __opts__ dict, configuration data should be pulled from the salt get functions such as config.get, aka - __salt__['config.get']('foo:bar') The get functions also allow for
dict traversal via the : delimiter. Consider using get functions whenever using __opts__ or __pillar__ and __grains__ (when using grains for configuration data)

The configuration file data made available in the __opts__ dictionary is the configuration data relative to the running daemon. If the modules are loaded and executed by the master, then the master configuration data is available, if the modules are executed by the minion, then the minion configuration is available. Any additional information passed into the respective configuration files is made available.

### 34.8.2 __salt__

Available in

- Execution Modules
- State Modules
- Returners

__salt__ contains the execution module functions. This allows for all functions to be called as they have been set up by the salt loader.

```python
__salt__['cmd.run']('fdisk -l')
__salt__['network.ip_addrs']()
```

### 34.8.3 __grains__

Available in

- Execution Modules
- State Modules
- Returners
- External Pillar

The __grains__ dictionary contains the grains data generated by the minion that is currently being worked with. In execution modules, state modules and returners this is the grains of the minion running the calls, when generating the external pillar the __grains__ is the grains data from the minion that the pillar is being generated for.

### 34.8.4 __pillar__

Available in

- Execution Modules
- State Modules
- Returners

The __pillar__ dictionary contains the pillar for the respective minion.
34.8.5 __context__

__context__ exists in state modules and execution modules.

During a state run the __context__ dictionary persists across all states that are run and then is destroyed when the state ends.

When running an execution module __context__ persists across all module executions until the modules are refreshed; such as when saltutils.sync_all or state.highstate are executed.

A great place to see how to use __context__ is in the cp.py module in salt/modules/cp.py. The fileclient authenticates with the master when it is instantiated and then is used to copy files to the minion. Rather than create a new fileclient for each file that is to be copied down, one instance of the fileclient is instantiated in the __context__ dictionary and is reused for each file. Here is an example from salt/modules/cp.py:

```python
if not 'cp.fileclient' in __context__:
    __context__['cp.fileclient'] = salt.fileclient.get_file_client(__opts__)
```

Note: Because __context__ may or may not have been destroyed, always be sure to check for the existence of the key in __context__ and generate the key before using it.

34.9 External Pillars

Salt provides a mechanism for generating pillar data by calling external pillar interfaces. This document will describe an outline of an ext_pillar module.

34.9.1 Location

Salt expects to find your ext_pillar module in the same location where it looks for other python modules. If the extension_modules option in your Salt master configuration is set, Salt will look for a pillar directory under there and load all the modules it finds. Otherwise, it will look in your Python site-packages salt/pillar directory.

34.9.2 Configuration

The external pillars that are called when a minion refreshes its pillars is controlled by the ext_pillar option in the Salt master configuration. You can pass a single argument, a list of arguments or a dictionary of arguments to your pillar:

```python
ext_pillar:
    - example_a: some argument
    - example_b:
        - argumentA
        - argumentB
    - example_c:
        keyA: valueA
        keyB: valueB
```
34.9.3 The Module

34.9.4 Imports and Logging

Import modules your external pillar module needs. You should first include generic modules that come with stock Python:

```python
import logging
```

And then start logging. This is an idiomatic way of setting up logging in Salt:

```python
log = logging.getLogger(__name__)
```

Finally, load modules that are specific to what you are doing. You should catch import errors and set a flag that the `__virtual__` function can use later.

```python
try:
    import weird_thing
    EXAMPLE_A_LOADED = True
except ImportError:
    EXAMPLE_A_LOADED = False
```

34.9.5 Options

If you define an `__opts__` dictionary, it will be merged into the `__opts__` dictionary handed to the `ext_pillar` function later. This is a good place to put default configuration items. The convention is to name things `module-name.option`.

```python
__opts__ = {'example_a.someconfig': 137}
```

34.9.6 Initialization

If you define an `__init__` function, it will be called with the following signature:

```python
def __init__(__opts__):
    # Do init work here
```

Note: The `__init__` function is ran every time a particular minion causes the external pillar to be called, so don't put heavy initialization code here. The `__init__` functionality is a side-effect of the Salt loader, so it may not be as useful in pillars as it is in other Salt items.

34.9.7 `__virtual__`

If you define a `__virtual__` function, you can control whether or not this module is visible. If it returns `False` then Salt ignores this module. If it returns a string, then that string will be how Salt identifies this external pillar in its `ext_pillar` configuration. If you're not renaming the module, simply return `True` in the `__virtual__` function, which is the same as if this function did not exist, then, the name Salt's `ext_pillar` will use to identify this module is its conventional name in Python.

This is useful to write modules that can be installed on all Salt masters, but will only be visible if a particular piece of software your module requires is installed.
This external pillar will be known as `example_a`

def __virtual__():
    if EXAMPLE_A_LOADED:
        return True
    return False

This external pillar will be known as `something_else`

__virtualname__ = 'something_else'

def __virtual__():
    if EXAMPLE_A_LOADED:
        return __virtualname__
    return False

### 34.9.8 ext_pillar

This is where the real work of an external pillar is done. If this module is active and has a function called `ext_pillar`, whenever a minion updates its pillar this function is called.

How it is called depends on how it is configured in the Salt master configuration. The first argument is always the current pillar dictionary, this contains pillar items that have already been added, starting with the data from `pillar_roots`, and then from any already-ran external pillars.

Using our example above:

```
ext_pillar( id, pillar, 'some argument' )  # example_a
ext_pillar( id, pillar, 'argumentA', 'argumentB' )  # example_b
ext_pillar( id, pillar, keyA='valueA', keyB='valueB' )  # example_c
```

In the example_a case, pillar will contain the items from the `pillar_roots`, in example_b pillar will contain that plus the items added by example_a, and in example_c pillar will contain that plus the items added by example_b. In all three cases, id will contain the ID of the minion making the pillar request.

This function should return a dictionary, the contents of which are merged in with all of the other pillars and returned to the minion. **Note**: this function is called once for each minion that fetches its pillar data.

```
def ext_pillar( minion_id, pillar, *args, **kwargs ):
    my_pillar = {}
    # Do stuff
    return my_pillar
```

You shouldn't just add items to `pillar` and return that, since that will cause Salt to merge data that already exists. Rather, just return the items you are adding or changing. You could, however, use `pillar` in your module to make some decision based on pillar data that already exists.

This function has access to some useful globals:

- `__opts__` A dictionary of mostly Salt configuration options. If you had an `__opts__` dictionary defined in your module, those values will be included.
- `__salt__` A dictionary of Salt module functions, useful so you don't have to duplicate functions that already exist. E.g. `__salt__['cmd.run']('ls -l')` **Note**, runs on the master
- `__grains__` A dictionary of the grains of the minion making this pillar call.
**34.9.9 Example configuration**

As an example, if you wanted to add external pillar via the `cmd_json` external pillar, add something like this to your master config:

```plaintext
ext_pillar:
- cmd_json: 'echo \"\"arg\\"\":\"value\\"\\"'
```

**34.9.10 Reminder**

Just as with traditional pillars, external pillars must be refreshed in order for minions to see any fresh data:

```plaintext
salt '*' saltutil.refresh_pillar
```

**34.10 Installing Salt for development**

Clone the repository using:

```plaintext
git clone https://github.com/saltstack/salt
```

**Note:** tags

Just cloning the repository is enough to work with Salt and make contributions. However, fetching additional tags from git is required to have Salt report the correct version for itself. To do this, first add the git repository as an upstream source:

```plaintext
git remote add upstream https://github.com/saltstack/salt
```

Fetching tags is done with the git `fetch` utility:

```plaintext
git fetch --tags upstream
```

Create a new virtualenv:

```plaintext
virtualenv /path/to/your/virtualenv
```

Avoid making your `virtualenv path too long`. On Arch Linux, where Python 3 is the default installation of Python, use the `virtualenv2` command instead of `virtualenv`.

**Note:** Using system Python modules in the virtualenv

To use already-installed python modules in virtualenv (instead of having pip download and compile new ones), run `virtualenv --system-site-packages` Using this method eliminates the requirement to install the salt dependencies again, although it does assume that the listed modules are all installed in the system PYTHONPATH at the time of virtualenv creation.

Activate the virtualenv:

```plaintext
source /path/to/your/virtualenv/bin/activate
```
Install Salt (and dependencies) into the virtualenv:

```
pip install M2Crypto       # Don't install on Debian/Ubuntu (see below)
pip install pyzmq PyYAML pycrypto msgpack-python jinja2 psutil
pip install -e ./salt      # the path to the salt git clone from above
```

**Note:** Installing M2Crypto

`swig` and `libssl-dev` are required to build M2Crypto. To fix the error command 'swig' failed with exit status 1 while installing M2Crypto, try installing it with the following command:

```
env SWIG_FEATURES="-cpperrswarn -includeall -D__`uname -m`__ -I/usr/include/openssl" pip install M2Crypto
```

Debian and Ubuntu systems have modified openssl libraries and mandate that a patched version of M2Crypto be installed. This means that M2Crypto needs to be installed via apt:

```
apt-get install python-m2crypto
```

This also means that pulling in the M2Crypto installed using apt requires using `--system-site-packages` when creating the virtualenv.

If you're using a platform other than Debian or Ubuntu, and you are installing M2Crypto via pip instead of a system package, then you will also need the `gcc` compiler.

**Note:** Installing psutil

Python header files are required to build this module, otherwise the pip install will fail. If your distribution separates binaries and headers into separate packages, make sure that you have the headers installed. In most Linux distributions which split the headers into their own package, this can be done by installing the `python-dev` or `python-devel` package. For other platforms, the package will likely be similarly named.

**Note:** Installing dependencies on OS X.

You can install needed dependencies on OS X using homebrew or macports. See [OS X Installation](#).

**Warning:** Installing on RedHat-based Distro

If installing from pip (or from source using `setup.py install`), be advised that the `yum-utils` package is needed for Salt to manage packages on RedHat-based systems.

### 34.10.1 Running a self-contained development version

During development it is easiest to be able to run the Salt master and minion that are installed in the virtualenv you created above, and also to have all the configuration, log, and cache files contained in the virtualenv as well.

Copy the master and minion config files into your virtualenv:

```
mkdir -p /path/to/your/virtualenv/etc/salt
cp ./salt/conf/master ./salt/conf/minion /path/to/your/virtualenv/etc/salt/
```

Edit the master config file:

1. Uncomment and change the `user: root` value to your own user.
2. Uncomment and change the `root_dir: /` value to point to `/path/to/your/virtualenv`.  

1944  Chapter 34. Developing Salt
3. If you are running version 0.11.1 or older, uncomment, and change the pidfile: `var/run/salt-master.pid` value to point to `/path/to/your/virtualenv/salt-master.pid`.

4. If you are also running a non-development version of Salt you will have to change the publish_port and ret_port values as well.

Edit the minion config file:

1. Repeat the edits you made in the master config for the user and root_dir values as well as any port changes.

2. If you are running version 0.11.1 or older, uncomment, and change the pidfile: `var/run/salt-minion.pid` value to point to `/path/to/your/virtualenv/salt-minion.pid`.

3. Uncomment and change the master: salt value to point at localhost.

4. Uncomment and change the id: value to something descriptive like `saltdev`. This isn't strictly necessary but it will serve as a reminder of which Salt installation you are working with.

5. If you changed the ret_port value in the master config because you are also running a non-development version of Salt, then you will have to change the master_port value in the minion config to match.

**Note:** Using salt-call with a Standalone Minion

If you plan to run salt-call with this self-contained development environment in a masterless setup, you should invoke salt-call with `-c /path/to/your/virtualenv/etc/salt` so that salt can find the minion config file. Without the -c option, Salt finds its config files in /etc/salt.

Start the master and minion, accept the minion's key, and verify your local Salt installation is working:

```
cd /path/to/your/virtualenv
salt-master -c ./etc/salt -d
salt-minion -c ./etc/salt -d
salt-key -c ./etc/salt -L
salt-key -c ./etc/salt -A
salt -c ./etc/salt '*' test.ping
```

Running the master and minion in debug mode can be helpful when developing. To do this, add `-l debug` to the calls to salt-master and salt-minion. If you would like to log to the console instead of to the log file, remove the `-d`.

**Note:** Too long socket path?

Once the minion starts, you may see an error like the following:

```
zmq.core.error.ZMQError: ipc path "/path/to/your/virtualenv/var/run/salt/minion/minion_event_7824dcbfcd7a8f6755939af78b96249f_pub.ipc" is longer than 107 characters (sizeof(sockaddr_un.sun_path)).
```

This means that the path to the socket the minion is using is too long. This is a system limitation, so the only workaround is to reduce the length of this path. This can be done in a couple different ways:

1. Create your virtualenv in a path that is short enough.

2. Edit the sock_dir minion config variable and reduce its length. Remember that this path is relative to the value you set in root_dir.

**NOTE:** The socket path is limited to 107 characters on Solaris and Linux, and 103 characters on BSD-based systems.

**Note:** File descriptor limits
Ensure that the system open file limit is raised to at least 2047:

```bash
# check your current limit
ulimit -n

# raise the limit. persists only until reboot
# use 'limit descriptors 2047' for c-shell
ulimit -n 2047
```

To set file descriptors on OSX, refer to the *OS X Installation* instructions.

### Changing Default Paths

Instead of updating your configuration files to point to the new root directory and having to pass the new configuration directory path to all of Salt’s CLI tools, you can explicitly tweak the default system paths that Salt expects:

```bash
GENERATE_SALT_SYSPATHS=1 pip --global-option='--salt-root-dir=/path/to/your/virtualenv/' \
    install -e ./salt  # the path to the salt git clone from above
```

You can now call all of Salt’s CLI tools without explicitly passing the configuration directory.

**Additional Options**

In case you want to distribute your virtualenv, you probably don’t want to include Salt’s clone .git/ directory, and, without it, Salt won’t report the accurate version. You can tell setup.py to generate the hardcoded version information which is distributable:

```bash
GENERATE_SALT_SYSPATHS=1 WRITE_SALT_VERSION=1 pip --global-option='--salt-root-dir=/path/to/your/virtualenv/' \
    install -e ./salt  # the path to the salt git clone from above
```

Instead of passing those two environmental variables, you can just pass a single one which will trigger the other two:

```bash
MIMIC_SALT_INSTALL=1 pip --global-option='--salt-root-dir=/path/to/your/virtualenv/' \
    install -e ./salt  # the path to the salt git clone from above
```

This last one will grant you an editable salt installation with hardcoded system paths and version information.

### 34.10.2 Installing Salt from the Python Package Index

If you are installing using easy_install, you will need to define a USE_SETUPTOOLS environment variable, otherwise dependencies will not be installed:

```bash
USE_SETUPTOOLS=1 easy_install salt
```
34.10.3 Editing and previewing the documentation

You need `sphinx-build` command to build the docs. In Debian/Ubuntu this is provided in the `python-sphinx` package. Sphinx can also be installed to a virtualenv using `pip`:

```
pip install sphinx==1.3b2
```

Change to salt documentation directory, then:

```
cd doc; make html
```

- This will build the HTML docs. Run `make` without any arguments to see the available make targets, which include `html`, `man`, and `text`.
- The docs then are built within the `docs/_build/` folder. To update the docs after making changes, run `make` again.
- The docs use `reStructuredText` for markup. See a live demo at http://rst.ninjs.org/.
- The help information on each module or state is culled from the python code that runs for that piece. Find them in `salt/modules/` or `salt/states/`.
- To build the docs on Arch Linux, the `python2-sphinx` package is required. Additionally, it is necessary to tell `make` where to find the proper `sphinx-build` binary, like so:

```
make SPHINXBUILD=sphinx-build2 html
```

- To build the docs on RHEL/CentOS 6, the `python-sphinx10` package must be installed from EPEL, and the following `make` command must be used:

```
make SPHINXBUILD=sphinx-1.0-build html
```

Once you've updated the documentation, you can run the following command to launch a simple Python HTTP server to see your changes:

```
cd _build/html; python -m SimpleHTTPServer
```

34.10.4 Running unit and integration tests

Run the test suite with following command:

```
./setup.py test
```

See here for more information regarding the test suite.

34.10.5 Issue and Pull Request Labeling System

SaltStack uses several labeling schemes to help facilitate code contributions and bug resolution. See the `Labels and Milestones` documentation for more information.
34.11 GitHub Labels and Milestones

SaltStack uses several label categories, as well as milestones, to triage incoming issues and pull requests in the GitHub issue tracker. Labels are used to sort issues by type, priority, severity, status, functional area, functional group, and targeted release and pull requests by status, functional area, functional group, type of change, and test status. Milestones are used to indicate whether an issue is fully triaged or is scheduled to be fixed by SaltStack in an upcoming sprint.

34.11.1 Milestones

All issues are assigned to a milestone, whereas pull requests are almost never assigned to a milestone as the mean lifetime of pull requests is short enough that there is no need to track them temporally.

SaltStack uses milestones to indicate which issues are blocked on submitter or upstream actions, are approved, or are scheduled to be fixed or implemented in an upcoming sprint. If an issue is not attached to a sprint milestone, you are welcome to work on it at your own desire and convenience. If it is attached to a sprint milestone and you have already begun working on it or have a solution in mind or have other ideas related to the issue, you are encouraged to coordinate with the assignee via the GitHub issue tracker to create the best possible solution or implementation.

**Approved** The issue has been validated and has all necessary information.

**Blocked** The issue is waiting on actions by parties outside of SaltStack, such as receiving more information from the submitter or resolution of an upstream issue. This milestone is usually applied in conjunction with the labels Info Needed, Question, Expected Behavior, Won't Fix For Now, or Upstream Bug.

**Under Review** The issue is having further validation done by a SaltStack engineer.

**<Sprint>** The issue is being actively worked on by a SaltStack engineer. Sprint milestones names are constructed from the chemical symbol of the next release's codename and the number of sprints until that release is made. For example, if the next release codename is Neon and there are five sprints until that release, the corresponding sprint milestone will be called Ne 5. See <topics/releases/version_numbers> for a discussion of Salt's release codenames.

34.11.2 Labels

Labels are used to sort and describe issues and pull requests. Some labels are usually reserved for one or the other, though most labels may be applied to both.

New issues will receive at least one label and a milestone, and new pull requests will receive at least one label. Except for the functional area and functional group label categories, issues will generally receive only up to one label per category.

**Type**

Issues are categorized into one of several types. Type labels are almost never used for pull requests. GitHub treats pull requests like issues in many ways, so a pull request could be considered an issue with an implicit Pull Request type label applied.

**Feature** The issue is a request for new functionality including changes, enhancements, refactors, etc.

**Bug** The issue documents broken, incorrect, or confusing behavior. This label is always accompanied by a severity label.

**Duplicate** The issue is a duplicate of another feature request or bug report.

**Upstream Bug** The issue is a result of an upstream issue.
**Question**  The issue is more of a question than a request for new features or a report of broken features, but can sometimes lead to further discussion or changes of confusing or incongruous behavior or documentation.

**Expected Behavior**  The issue is a bug report of intended functionality.

**Priority**

An issue's priority is relative to its *functional area*. If a bug report, for example, about `gitfs` indicates that all users of `gitfs` will encounter this bug, then a P1 label will be applied, even though users who are not using `gitfs` will not encounter the bug. If a feature is requested by many users, it may be given a high priority.

- **P1**  The issue will be seen by all users.
- **P2**  The issue will be seen by most users.
- **P3**  The issue will be seen by about half of users.
- **P4**  The issue will not be seen by most users. Usually the issue is a very specific use case or corner case.

**Severity**

Severity labels are almost always only applied to issues labeled Bug.

- **Blocker**  The issue is blocking an impending release.
- **Critical**  The issue causes data loss, crashes or hangs salt processes, makes the system unresponsive, etc.
- **High Severity**  The issue reports incorrect functionality, bad functionality, a confusing user experience, etc.
- **Medium Severity**  The issue reports cosmetic items, formatting, spelling, colors, etc.

**Functional Area**

Many major components of Salt have corresponding GitHub labels. These labels are applied to all issues and pull requests as is reasonably appropriate. They are useful in organizing issues and pull requests according to the source code relevant to issues or the source code changed by pull requests.

- Execution Module
- File Servers
- Grains
- Multi-Master
- Packaging Related to packaging of Salt, not Salt's support for package management.
- Pillar
- RAET
- Returners
- Runners
- SPM
- Salt-API
- Salt-Cloud
- Salt-SSH
Functional Group

These labels sort issues and pull requests according to the internal SaltStack engineering teams.

Core The issue or pull request relates to code that is central or existential to Salt itself.

Platform The issue or pull request relates to support and integration with various platforms like traditional operating systems as well as containers, platform-based utilities like filesystems, command schedulers, etc., and system-based applications like web servers, databases, etc.

RIoT The issue or pull request relates to support and integration with various abstract systems like cloud providers, hypervisors, API-based services, etc.

Console The issue or pull request relates to the SaltStack enterprise console.

Documentation The issue or pull request relates to documentation.

Status

Status labels are used to define and track the state of issues and pull requests. Not all potential statuses correspond to a label, but some statuses are common enough that labels have been created for them. If a status has not been moved beyond the Blocked milestone, it is very likely that it will only have a status label.

Bugfix - back-port The pull request needs to be back-ported to an older release branch. This is done by recreating the pull request against that branch. Once the back-port is completed, this label is replaced with a Bugfix - [Done] back-ported label. Normally, new features should go into the develop and bug fixes into the oldest supported release branch, see <which-salt-branch>.

Bugfix - [Done] back-ported The pull request has been back-ported to an older branch.

Cannot Reproduce The issue is a bug and has been reviewed by a SaltStack engineer, but it cannot be replicated with the provided information and context. Those involved with the bug will need to work through additional ideas until the bug can be isolated and verified.

Confirmed The issue is a bug and has been confirmed by a SaltStack engineer, who often documents a minimal working example that reproduces the bug.

Fixed Pending Verification The issue is a bug and has been fixed by one or more pull requests, which should link to the issue. Closure of the issue is contingent upon confirmation of resolution from the submitter. If the submitter reports a negative confirmation, this label is removed. If no response is given after a few weeks, then the issue will be assumed fixed and closed.

Info Needed The issue needs more information before it can be verified and resolved. For a feature request this may include a description of the use cases. Almost all bug reports need to include at least the versions of salt and its dependencies, the system type and version, commands used, debug logs, error messages, and relevant configs.

Pending Changes The pull request needs additional changes before it can be merged.
**Pending Discussion** The issue or pull request needs more discussion before it can be closed or merged. The status of the issue or pull request is not clear or apparent enough for definite action to be taken, or additional input from SaltStack, the submitter, or another party has been requested.

If the issue is not a pull request, once the discussion has arrived at a cogent conclusion, this label will be removed and the issue will be accepted. If it is a pull request, the results of the discussion may require additional changes and thus, a Pending Changes label.

**Won't Fix for Now** The issue is legitimate, but it is not something the SaltStack team is currently able or willing to fix or implement. Issues having this label may be revisited in the future.

**Type of Change**

Every pull request should receive a change label. These labels measure the quantity of change as well as the significance of the change. The amount of change and the importance of the code area changed are considered, but often the depth of secondary code review required and the potential repercussions of the change may also advise the label choice.

Core code areas include: state compiler, crypto engine, master and minion and syndic daemons, transport, pillar rendering, loader, transport layer, event system, salt.utils, client, cli, logging, netapi, runner engine, templating engine, top file compilation, file client, file server, mine, salt-ssh, test runner, etc.

Non-core code usually constitutes the specific set of plugins for each of the several plugin layers of Salt: execution modules, states, runners, returners, clouds, etc.

**Minor Change**
- Less than 64 lines changed, or
- Less than 8 core lines changed

**Medium Change**
- Less than 256 lines changed, or
- Less than 64 core lines changed

**Master Change**
- More than 256 lines changed, or
- More than 64 core lines changed

**Expert Change**
- Needs specialized, in-depth review

**Test Status**

These labels relate to the status of the automated tests that run on pull requests. If the tests on a pull request fail and are not overridden by one of these labels, the pull request submitter needs to update the code and/or tests so that the tests pass and the pull request can be merged.

**Lint** The pull request has passed all tests except for the code lint checker.

**Tests Passed** The pull request has passed all tests even though some test results are negative. Sometimes the automated testing infrastructure will encounter internal errors unrelated to the code change in the pull request that cause test runs to fail. These errors can be caused by cloud host and network issues and also Jenkins issues like erroneously accumulating workspace artifacts, resource exhaustion, and bugs that arise from long running Jenkins processes.
Other

These labels indicate miscellaneous issue types or statuses that are common or important enough to be tracked and sorted with labels.

**Awesome** The pull request implements an especially well crafted solution, or a very difficult but necessary change.

**Low Hanging Fruit** The issue is trivial or almost trivial to implement or fix. Issues having this label should be a good starting place for new contributors to Salt.

**Needs Testcase** The issue or pull request relates to a feature that needs test coverage. The pull request containing the tests should reference the issue or pull request having this label, whereupon the label should be removed.

**Regression** The issue is a bug that breaks functionality known to work in previous releases.

**Story** The issue is used by a SaltStack engineer to track progress on multiple related issues in a single place.

**ZD** The issue is related to a Zendesk customer support ticket.

<Release> The issue is scheduled to be implemented by <Release>. See [topics/releases/version_numbers](#) for a discussion of Salt's release codenames.

### 34.12 Logging Internals

**TODO**

### 34.13 Modular Systems

When first working with Salt, it is not always clear where all of the modular components are and what they do. Salt comes loaded with more modular systems than many users are aware of, making Salt very easy to extend in many places.

The most commonly used modular systems are execution modules and states. But the modular systems extend well beyond the more easily exposed components and are often added to Salt to make the complete system more flexible.

#### 34.13.1 Execution Modules

Execution modules make up the core of the functionality used by Salt to interact with client systems. The execution modules create the core system management library used by all Salt systems, including states, which interact with minion systems.

Execution modules are completely open ended in their execution. They can be used to do anything required on a minion, from installing packages to detecting information about the system. The only restraint in execution modules is that the defined functions always return a JSON serializable object.

For a list of all built in execution modules, click [here](#).

For information on writing execution modules, see [this page](#).

#### 34.13.2 Interactive Debugging

Sometimes debugging with `print()` and extra logs sprinkled everywhere is not the best strategy.
IPython is a helpful debug tool that has an interactive python environment which can be embedded in python programs.

First the system will require IPython to be installed.

```bash
# Debian
apt-get install ipython

# Arch Linux
pacman -Syu ipython2

# RHEL/CentOS (via EPEL)
yum install python-ipython
```

Now, in the troubling python module, add the following line at a location where the debugger should be started:

```python
test = 'test123'
import IPython; IPython.embed_kernel()
```

After running a Salt command that hits that line, the following will show up in the log file:

```
[CRITICAL] To connect another client to this kernel, use:
[IPKernelApp] --existing kernel-31271.json
```

Now on the system that invoked embed_kernel, run the following command from a shell:

```bash
# NOTE: use ipython2 instead of ipython for Arch Linux
ipython console --existing
```

This provides a console that has access to all the vars and functions, and even supports tab-completion.

```python
print(test)
test123
```

To exit IPython and continue running Salt, press Ctrl-d to logout.

### 34.13.3 State Modules

State modules are used to define the state interfaces used by Salt States. These modules are restrictive in that they must follow a number of rules to function properly.

**Note:** State modules define the available routines in sls files. If calling an execution module directly is desired, take a look at the `module` state.

### 34.13.4 Auth

The auth module system allows for external authentication routines to be easily added into Salt. The `auth` function needs to be implemented to satisfy the requirements of an auth module. Use the `pam` module as an example.

### 34.13.5 Fileserver

The fileserver module system is used to create fileserver backends used by the Salt Master. These modules need to implement the functions used in the fileserver subsystem. Use the `gitfs` module as an example.
34.13.6 Grains

Grain modules define extra routines to populate grains data. All defined public functions will be executed and MUST return a Python dict object. The dict keys will be added to the grains made available to the minion.

34.13.7 Output

The output modules supply the outputter system with routines to display data in the terminal. These modules are very simple and only require the output function to execute. The default system outputter is the nested module.

34.13.8 Pillar

Used to define optional external pillar systems. The pillar generated via the filesystem pillar is passed into external pillars. This is commonly used as a bridge to database data for pillar, but is also the backend to the libvirt state used to generate and sign libvirt certificates on the fly.

34.13.9 Renderers

Renderers are the system used to render sls files into salt highdata for the state compiler. They can be as simple as the py renderer and as complex as stateconf and pydsl.

34.13.10 Returners

Returners are used to send data from minions to external sources, commonly databases. A full returner will implement all routines to be supported as an external job cache. Use the redis returner as an example.

34.13.11 Runners

Runners are purely master-side execution sequences.

34.13.12 Tops

Tops modules are used to convert external data sources into top file data for the state system.

34.13.13 Wheel

The wheel system is used to manage master side management routines. These routines are primarily intended for the API to enable master configuration.

34.14 Package Providers

This page contains guidelines for writing package providers.
34.14.1 Package Functions

One of the most important features of Salt is package management. There is no shortage of package managers, so in the interest of providing a consistent experience in pkg states, there are certain functions that should be present in a package provider. Note that these are subject to change as new features are added or existing features are enhanced.

list_pkgs

This function should declare an empty dict, and then add packages to it by calling pkg_resource.add_pkg, like so:

```python
__salt__['pkg_resource.add_pkg'](ret, name, version)
```

The last thing that should be done before returning is to execute pkg_resource.sort_pkglist. This function does not presently do anything to the return dict, but will be used in future versions of Salt.

```python
__salt__['pkg_resource.sort_pkglist'](ret)
```

list_pkgs returns a dictionary of installed packages, with the keys being the package names and the values being the version installed. Example return data:

```python
{'foo': '1.2.3-4',
 'bar': '5.6.7-8'}
```

latest_version

Accepts an arbitrary number of arguments. Each argument is a package name. The return value for a package will be an empty string if the package is not found or if the package is up-to-date. The only case in which a non-empty string is returned is if the package is available for new installation (i.e. not already installed) or if there is an upgrade available.

If only one argument was passed, this function return a string, otherwise a dict of name/version pairs is returned.

This function must also accept **kwargs, in order to receive the fromrepo and repo keyword arguments from pkg states. Where supported, these arguments should be used to find the install/upgrade candidate in the specified repository. The fromrepo kwarg takes precedence over repo, so if both of those kwargs are present, the repository specified in fromrepo should be used. However, if repo is used instead of fromrepo, it should still work, to preserve backwards compatibility with older versions of Salt.

version

Like latest_version, accepts an arbitrary number of arguments and returns a string if a single package name was passed, or a dict of name/value pairs if more than one was passed. The only difference is that the return values are the currently-installed versions of whatever packages are passed. If the package is not installed, an empty string is returned for that package.

upgrade_available

Deprecated and destined to be removed. For now, should just do the following:

```python
return __salt__['pkg.latest_version']('name') != ''
```
install

The following arguments are required and should default to None:

1. name (for single-package pkg states)
2. pkgs (for multiple-package pkg states)
3. sources (for binary package file installation)

The first thing that this function should do is call `pkg_resource.parse_targets` (see below). This function will convert the SLS input into a more easily parsed data structure. `pkg_resource.parse_targets` may need to be modified to support your new package provider, as it does things like parsing package metadata which cannot be done for every package management system.

```python
pkg_params, pkg_type = __salt__['pkg_resource.parse_targets'](name, pkgs, sources)
```

Two values will be returned to the `install` function. The first of them will be a dictionary. The keys of this dictionary will be package names, though the values will differ depending on what kind of installation is being done:

- If `name` was provided (and `pkgs` was not), then there will be a single key in the dictionary, and its value will be `None`. Once the data has been returned, if the `version` keyword argument was provided, then it should replace the `None` value in the dictionary.

- If `pkgs` was provided, then `name` is ignored, and the dictionary will contain one entry for each package in the `pkgs` list. The values in the dictionary will be `None` if a version was not specified for the package, and the desired version if specified. See the Multiple Package Installation Options section of the `pkg.installed` state for more info.

- If `sources` was provided, then `name` is ignored, and the dictionary values will be the path/URI for the package.

The second return value will be a string with two possible values: `repository` or `file`. The `install` function can use this value (if necessary) to build the proper command to install the targeted package(s).

Both before and after the installing the target(s), you should run `list_pkgs` to obtain a list of the installed packages. You should then return the output of `salt.utils.compare_dicts()`

```python
return salt.utils.compare_dicts(old, new)
```

remove

Removes the passed package and return a list of the packages removed.

### 34.14.2 Package Repo Functions

There are some functions provided by `pkg` which are specific to package repositories, and not to packages themselves. When writing modules for new package managers, these functions should be made available as stated below, in order to provide compatibility with the `pkgrepo` state.

All repo functions should accept a `basedir` option, which defines which directory repository configuration should be found in. The default for this is dictated by the repo manager that is being used, and rarely needs to be changed.

```python
basedir = '/etc/yum.repos.d'
__salt__['pkg.list_repos'](basedir)
```
**list_repos**

Lists the repositories that are currently configured on this system.

```python
__salt__['pkg.list_repos']()
```

Returns a dictionary, in the following format:

```json
{ 'reponame': 'config_key_1': 'config value 1',
  'config_key_2': 'config value 2',
  'config_key_3': [ 'list item 1 (when appropriate)',
                  'list item 2 (when appropriate)']}
```

**get_repo**

Displays all local configuration for a specific repository.

```python
__salt__['pkg.get_repo'](repo='myrepo')
```

The information is formatted in much the same way as list_repos, but is specific to only one repo.

```json
{ 'config_key_1': 'config value 1',
  'config_key_2': 'config value 2',
  'config_key_3': [ 'list item 1 (when appropriate)',
                  'list item 2 (when appropriate)']}
```

**del_repo**

Removes the local configuration for a specific repository. Requires a repo argument, which must match the locally configured name. This function returns a string, which informs the user as to whether or not the operation was a success.

```python
__salt__['pkg.del_repo'](repo='myrepo')
```

**mod_repo**

Modify the local configuration for one or more option for a configured repo. This is also the way to create new repository configuration on the local system; if a repo is specified which does not yet exist, it will be created.

The options specified for this function are specific to the system; please refer to the documentation for your specific repo manager for specifics.

```python
__salt__['pkg.mod_repo'](repo='myrepo', url='http://myurl.com/repo')
```
34.14.3 Low-Package Functions

In general, the standard package functions as describes above will meet your needs. These functions use the system's native package manager (for instance, yum or the apt tools). In most cases, the package manager is actually separate from the repomanager. For instance, yum is usually a front-end for rpm, and apt is usually a front-end for dpkg. When possible, the package functions that use those package managers directly should do so through the low package functions.

It is normal and sane for \texttt{pkg} to make calls to \texttt{lowpkg}, but \texttt{lowpkg} must never make calls to \texttt{pkg}. This is affects functions which are required by both \texttt{pkg} and \texttt{lowpkg}, but the technique in \texttt{pkg} is more performant than what is available to \texttt{lowpkg}. When this is the case, the \texttt{lowpkg} function that requires that technique must still use the \texttt{lowpkg} version.

\textbf{list\_pkgs}

Returns a dict of packages installed, including the package name and version. Can accept a list of packages; if none are specified, then all installed packages will be listed.

\begin{verbatim}
installed = __salt__['lowpkg.list_pkgs']('foo', 'bar')
\end{verbatim}

Example output:

\begin{verbatim}
{'foo': '1.2.3-4',
 'bar': '5.6.7-8'}
\end{verbatim}

\textbf{verify}

Many (but not all) package management systems provide a way to verify that the files installed by the package manager have or have not changed. This function accepts a list of packages; if none are specified, all packages will be included.

\begin{verbatim}
installed = __salt__['lowpkg.verify']('httpd')
\end{verbatim}

Example output:

\begin{verbatim}
{/etc/httpd/conf/httpd.conf: {'mismatch': ['size', 'md5sum', 'mtime'],
 'type': 'config'}}
\end{verbatim}

\textbf{file\_list}

Lists all of the files installed by all packages specified. If not packages are specified, then all files for all known packages are returned.

\begin{verbatim}
installed = __salt__['lowpkg.file_list']('httpd', 'apache')
\end{verbatim}

This function does not return which files belong to which packages; all files are returned as one giant list (hence the \textit{file\_list} function name. However, This information is still returned inside of a dict, so that it can provide any errors to the user in a sane manner.
{'errors': ['package apache is not installed'],
'files': ['/etc/httpd',
'/etc/httpd/conf',
'/etc/httpd/conf.d',
'...SNIP...']}

file_dict

Lists all of the files installed by all packages specified. If not packages are specified, then all files for all known packages are returned.

installed = __salt__['lowpkg.file_dict']('httpd', 'apache', 'kernel')

Unlike file_list, this function will break down which files belong to which packages. It will also return errors in the same manner as file_list.

{ 'errors': ['package apache is not installed'],
'packages': { 'httpd': [ '/etc/httpd',
'/etc/httpd/conf',
'...SNIP...'],
'kernel': [ '/boot/.vmlinuz-2.6.32-279.el6.x86_64.hmac',
'/boot/System.map-2.6.32-279.el6.x86_64',
'...SNIP...']}

34.15 Reporting Bugs

Salt uses GitHub to track open issues and feature requests.

To file a bug, please navigate to the new issue page for the Salt project.

In an issue report, please include the following information:

- The output of salt --versions-report from the relevant machines. This can also be gathered remotely by using salt <my_tgt> test.versions_report.
- A description of the problem including steps taken to cause the issue to occur and the expected behaviour.
- Any steps taken to attempt to remediate the problem.
- Any configuration options set in a configuration file that may be relevant.
- A reproducible test case. This may be as simple as an SLS file that illustrates a problem or it may be a link to a repository that contains a number of SLS files that can be used together to re-produce a problem. If the problem is transitory, any information that can be used to try and reproduce the problem is helpful.
- [Optional] The output of each salt component (master/minion/CLI) running with the -ldebug flag set.

Note: Please be certain to scrub any logs or SLS files for sensitive data!
34.16 Community Projects That Use Salt

Below is a list of repositories that show real world Salt applications that you can use to get started. Please note that these projects do not adhere to any standards and express a wide variety of ideas and opinions on how an action can be completed with Salt.

https://github.com/terminalmage/djangocon2013-sls
https://github.com/jesusaurus/hpcs-salt-state
https://github.com/gravyboat/hungryadmin-sls
https://github.com/wunki/django-salted

34.17 Salt Topology

Salt is based on a powerful, asynchronous, network topology using ZeroMQ. Many ZeroMQ systems are in place to enable communication. The central idea is to have the fastest communication possible.

34.17.1 Servers

The Salt Master runs 2 network services. First is the ZeroMQ PUB system. This service by default runs on port 4505 and can be configured via the `publish_port` option in the master configuration.

Second is the ZeroMQ REP system. This is a separate interface used for all bi-directional communication with minions. By default this system binds to port 4506 and can be configured via the `ret_port` option in the master.

34.17.2 PUB/SUB

The commands sent out via the salt client are broadcast out to the minions via ZeroMQ PUB/SUB. This is done by allowing the minions to maintain a connection back to the Salt Master and then all connections are informed to download the command data at once. The command data is kept extremely small (usually less than 1K) so it is not a burden on the network.

34.17.3 Return

The PUB/SUB system is a one way communication, so once a publish is sent out the PUB interface on the master has no further communication with the minion. The minion, after running the command, then sends the command’s return data back to the master via the `ret_port`.

34.18 Translating Documentation

If you wish to help translate the Salt documentation to your language, please head over to the Transifex website and signup for an account.

Once registered, head over to the Salt Translation Project, and either click on Request Language if you can’t find yours, or, select the language for which you wish to contribute and click Join Team.

Transifex provides some useful reading resources on their support domain, namely, some useful articles directed to translators.
34.18.1 Building A Localized Version of the Documentation

While you're working on your translation on Transifex, you might want to have a look at how it's rendering.

Install The Transifex Client

To interact with the Transifex web service you will need to install the transifex-client:

```bash
pip install transifex-client
```

Configure The Transifex Client

Once installed, you will need to set it up on your computer. We created a script to help you with that:

```
scripts/setup-transifex-config
```

Download Remote Translations

There's a little script which simplifies the download process of the translations (which isn't that complicated in the first place). So, let's assume you're translating pt_PT, Portuguese(Portugal). To download the translations, execute from the `doc/` directory of your Salt checkout:

```bash
make download-translations SPHINXLANG=pt_PT
```

To download pt_PT, Portuguese(Portugal), and nl, Dutch, you can use the helper script directly:

```
scripts/download-translation-catalog pt_PT nl
```

Build Localized Documentation

After the download process finishes, which might take a while, the next step is to build a localized version of the documentation. Following the pt_PT example above:

```bash
make html SPHINXLANG=pt_PT
```

View Localized Documentation

Open your browser, point it to the local documentation path and check the localized output you've just build.

34.19 Running The Tests

There are requirements, in addition to Salt's requirements, which need to be installed in order to run the test suite. Install one of the lines below, depending on the relevant Python version:

```bash
pip install -r requirements/dev_python26.txt
pip install -r requirements/dev_python27.txt
```
Note: In Salt 0.17, testing libraries were migrated into their own repo. To install them:

```
pip install git+https://github.com/saltstack/salt-testing.git#egg=SaltTesting
```

Failure to install SaltTesting will result in import errors similar to the following:

```
ImportError: No module named salttesting
```

Once all requirements are set, use `tests/runtests.py` to run all of the tests included in Salt’s test suite. For more information, see `--help`.

An alternative way of invoking the test suite is available in `setup.py`:

```
./setup.py test
```

Instead of running the entire test suite, there are several ways to run only specific groups of tests or individual tests:

- Run unit tests only: `./tests/runtests.py --unit-tests`
- Run unit and integration tests for states: `./tests/runtests.py --state`
- Run integration tests for an individual module: `./tests/runtests.py -n integration.modules.virt`
- Run unit tests for an individual module: `./tests/runtests.py -n unit.modules.virt_test`
- Run an individual test by using the class and test name (this example is for the `test_default_kvm_profile` test in the `integration.module.virt`): `./tests/runtests.py -n integration.module.virt.VirtTest.test_default_kvm_profile`

### 34.19.1 Running Unit Tests Without Integration Test Daemons

Since the unit tests do not require a master or minion to execute, it is often useful to be able to run unit tests individually, or as a whole group, without having to start up the integration testing daemons. Starting up the master, minion, and syndic daemons takes a lot of time before the tests can even start running and is unnecessary to run unit tests. To run unit tests without invoking the integration test daemons, simple remove the `/tests` portion of the `runtests.py` command:

```
./runtests.py --unit
```

All of the other options to run individual tests, entire classes of tests, or entire test modules still apply.

### 34.19.2 Running Destructive Integration Tests

Salt is used to change the settings and behavior of systems. In order to effectively test Salt’s functionality, some integration tests are written to make actual changes to the underlying system. These tests are referred to as “destructive tests”. Some examples of destructive tests are changes may be testing the addition of a user or installing packages. By default, destructive tests are disabled and will be skipped.

Generally, destructive tests should clean up after themselves by attempting to restore the system to its original state. For instance, if a new user is created during a test, the user should be deleted after the related test(s) have completed. However, no guarantees are made that test clean-up will complete successfully. Therefore, running destructive tests should be done with caution.
Note: Running destructive tests will change the underlying system. Use caution when running destructive tests.

To run tests marked as destructive, set the `--run-destructive` flag:

```bash
./tests/runtests.py --run-destructive
```

### 34.19.3 Running Cloud Provider Tests

Salt’s testing suite also includes integration tests to assess the successful creation and deletion of cloud instances using `Salt-Cloud` for providers supported by Salt-Cloud.

The cloud provider tests are off by default and run on sample configuration files provided in `tests/integration/files/conf/cloud.providers.d/`. In order to run the cloud provider tests, valid credentials, which differ per provider, must be supplied. Each credential item that must be supplied is indicated by an empty string value and should be edited by the user before running the tests. For example, DigitalOcean requires a client key and an api key to operate. Therefore, the default cloud provider configuration file for DigitalOcean looks like this:

```yaml
digitalocean-config:
  driver: digital_ocean
  client_key: 
  api_key: 
  location: New York 1
```

As indicated by the empty string values, the `client_key` and the `api_key` must be provided:

```yaml
digitalocean-config:
  driver: digital_ocean
  client_key: wFGEwgregeqw3435gDger
  api_key: GDE43t43REGTrkilg43934t34qT43t4dgegerGEGg
  location: New York 1
```

Note: When providing credential information in cloud provider configuration files, do not include the single quotes.

Once all of the valid credentials for the cloud provider have been supplied, the cloud provider tests can be run by setting the `--cloud-provider-tests` flag:

```bash
./tests/runtests.py --cloud-provider-tests
```

### 34.19.4 Running The Tests In A Docker Container

The test suite can be executed under a Docker container using the `--docked` option flag. The Docker container must be properly configured on the system invoking the tests and the container must have access to the internet.

Here’s a simple usage example:

```bash
tests/runtests.py --docked=ubuntu-12.04 -v
```

The full Docker container repository can also be provided:
The SaltStack team is creating some containers which will have the necessary dependencies pre-installed. Running the test suite on a container allows destructive tests to run without making changes to the main system. It also enables the test suite to run under a different distribution than the one the main system is currently using.

The current list of test suite images is on Salt’s docker repository.

Custom docker containers can be provided by submitting a pull request against Salt’s docker Salt test containers repository.

## 34.20 Automated Test Runs

SaltStack maintains a Jenkins server to allow for the execution of tests across supported platforms. The tests executed from Salt’s Jenkins server create fresh virtual machines for each test run, then execute destructive tests on the new, clean virtual machine.

When a pull request is submitted to Salt’s repository on GitHub, Jenkins runs Salt’s test suite on a couple of virtual machines to gauge the pull request’s viability to merge into Salt’s develop branch. If these initial tests pass, the pull request can then merged into Salt’s develop branch by one of Salt’s core developers, pending their discretion. If the initial tests fail, core developers may request changes to the pull request. If the failure is unrelated to the changes in question, core developers may merge the pull request despite the initial failure.

Once the pull request is merged into Salt’s develop branch, a new set of Jenkins virtual machines will begin executing the test suite. The develop branch tests have many more virtual machines to provide more comprehensive results.

There are a few other groups of virtual machines that Jenkins tests against, including past and current release branches. For a full list of currently running test environments, go to http://jenkins.saltstack.com.

### 34.20.1 Using Salt-Cloud on Jenkins

For testing Salt on Jenkins, SaltStack uses `Salt-Cloud` to spin up virtual machines. The script using Salt-Cloud to accomplish this is open source and can be found here: https://github.com/saltstack/salt/blob/develop/tests/jenkins.py

## 34.21 Writing Tests

The salt testing infrastructure is divided into two classes of tests, integration tests and unit tests. These terms may be defined differently in other contexts, but for salt they are defined this way:

- **Unit Test**: Tests which validate isolated code blocks and do not require external interfaces such as `salt-call` or any of the salt daemons.
- **Integration Test**: Tests which validate externally accessible features.

Salt testing uses unittest2 from the python standard library and MagicMock.

### 34.21.1 Naming Conventions

Any function in either integration test files or unit test files that is doing the actual testing, such as functions containing assertions, must start with `test_`: 
def test_user_present(self):

When functions in test files are not prepended with `test_`, the function acts as a normal, helper function and is not run as a test by the test suite.

### 34.21.2 Integration Tests

The integration tests start up a number of salt daemons to test functionality in a live environment. These daemons include 2 salt masters, 1 syndic, and 2 minions. This allows the syndic interface to be tested and master/minion communication to be verified. All of the integration tests are executed as live salt commands sent through the started daemons.

Integration tests are particularly good at testing modules, states, and shell commands.

- Writing integration tests

### 34.21.3 Unit Tests

Unit tests are good for ensuring consistent results for functions that do not require more than a few mocks.

Mocking all external dependencies for unit tests is encouraged but not required as sometimes the isolation provided by completely mocking the external dependencies is not worth the effort of mocking those dependencies.

Overly detailed mocking can also result in decreased test readability and brittleness as the tests are more likely to fail when the code or its dependencies legitimately change. In these cases, it is better to add dependencies to the test runner dependency state, [https://github.com/saltstack/salt-jenkins/blob/master/git/salt.sls](https://github.com/saltstack/salt-jenkins/blob/master/git/salt.sls).

- Writing unit tests

### Integration Tests

The Salt integration tests come with a number of classes and methods which allow for components to be easily tested. These classes are generally inherited from and provide specific methods for hooking into the running integration test environment created by the integration tests.

It is noteworthy that since integration tests validate against a running environment that they are generally the preferred means to write tests.

The integration system is all located under `tests/integration` in the Salt source tree. Each directory within `tests/integration` corresponds to a directory in Salt's tree structure. For example, the integration tests for the `test.py` Salt module that is located in `salt/modules` should also be named `test.py` and reside in `tests/integration/modules`.

### Adding New Directories

If the corresponding Salt directory does not exist within `tests/integration`, the new directory must be created along with the appropriate test file to maintain Salt's testing directory structure.

In order for Salt's test suite to recognize tests within the newly created directory, options to run the new integration tests must be added to `tests/runtests.py`. Examples of the necessary options that must be added can be found here: [https://github.com/saltstack/salt/blob/develop/tests/runtests.py](https://github.com/saltstack/salt/blob/develop/tests/runtests.py). The functions that need to be edited are `setup_additional_options`, `validate_options`, and `run_integration_tests`.

---

34.21. Writing Tests 1965
Integration Classes

The integration classes are located in tests/integration/__init__.py and can be extended therein. There are three classes available to extend:

**ModuleCase**  Used to define executions run via the master to minions and to call single modules and states.

The available methods are as follows:

- **run_function:** Run a single salt function and condition the return down to match the behavior of the raw function call. This will run the command and only return the results from a single minion to verify.
- **state_result:** Return the result data from a single state return
- **run_state:** Run the state.single command and return the state return structure

**SyndicCase**  Used to execute remote commands via a syndic, only used to verify the capabilities of the Syndic.

The available methods are as follows:

- **run_function:** Run a single salt function and condition the return down to match the behavior of the raw function call. This will run the command and only return the results from a single minion to verify.

**ShellCase**  Shell out to the scripts which ship with Salt.

The available methods are as follows:

- **run_script:** Execute a salt script with the given argument string
- **run_salt:** Execute the salt command, pass in the argument string as it would be passed on the command line.
- **run_run:** Execute the salt-run command, pass in the argument string as it would be passed on the command line.
- **run_run_plus:** Execute Salt run and the salt run function and return the data from each in a dict
- **run_key:** Execute the salt-key command, pass in the argument string as it would be passed on the command line.
- **run_cp:** Execute salt-cp, pass in the argument string as it would be passed on the command line.
- **run_call:** Execute salt-call, pass in the argument string as it would be passed on the command line.

Examples

**Module Example via ModuleCase Class**  Import the integration module, this module is already added to the python path by the test execution. Inherit from the integration.ModuleCase class.

Now the workhorse method run_function can be used to test a module:

```python
import os
import integration

class TestModuleTest(integration.ModuleCase):
    '''
    Validate the test module
    '''
    def test_ping(self):
        '''
        test.ping
        '''
```

1966 Chapter 34. Developing Salt
```python
self.assertTrue(self.run_function('test.ping'))

def test_echo(self):
    test.echo
    self.assertIsInstance(self.run_function('test.echo', ['text']), 'text')
```

**Shell Example via ShellCase**  Validating the shell commands can be done via shell tests:

```python
import sys
import shutil
import tempfile
import integration

class KeyTest(integration.ShellCase):
    
    _call_binary_ = 'salt-key'

    def test_list(self):
        test salt-key -L
        data = self.run_key('-L')
        expect = [
            'Unaccepted Keys:',
            'Accepted Keys:',
            'minion',
            'sub_minion',
            'Rejected:', '']
        self.assertIsInstance(data, expect)

This example verifies that the `salt-key` command executes and returns as expected by making use of the `run_key` method.

**Integration Test Files**

Since using Salt largely involves configuring states, editing files, and changing system data, the integration test suite contains a directory named `files` to aid in testing functions that require files. Various Salt integration tests use these example files to test against instead of altering system files and data.

Each directory within `tests/integration/files` contain files that accomplish different tasks, based on the needs of the integration tests using those files. For example, `tests/integration/files/ssh` is used to bootstrap the test runner for salt-ssh testing, while `tests/integration/files/pillar` contains files storing data needed to test various pillar functions.

The `tests/integration/files` directory also includes an integration state tree. The integration state tree can be found at `tests/integration/files/file/base`.

The following example demonstrates how integration files can be used with ModuleCase to test states:
import os
import shutil
import integration

HFILE = os.path.join(integration.TMP, 'hosts')

class HostTest(integration.ModuleCase):
    '''Validate the host state'''
    def setUp(self):
        shutil.copyfile(os.path.join(integration.FILES, 'hosts'), HFILE)
        super(HostTest, self).setUp()
    
    def tearDown(self):
        if os.path.exists(HFILE):
            os.remove(HFILE)
        super(HostTest, self).tearDown()

    def test_present(self):
        '''host.present'''
        name = 'spam.bacon'
        ip = '10.10.10.10'
        ret = self.run_state('host.present', name=name, ip=ip)
        result = self.state_result(ret)
        self.assertTrue(result)

        with open(HFILE) as fp_:
            output = fp_.read()
        self.assertIn('{0}	{1}'.format(ip, name), output)

To access the integration files, a variable named integration.FILES points to the tests/integration/files directory. This is where the referenced host.present sls file resides.

In addition to the static files in the integration state tree, the location integration.TMP can also be used to store temporary files that the test system will clean up when the execution finishes.

**Destructive vs Non-Destructive Tests**

Since Salt is used to change the settings and behavior of systems, one testing approach is to run tests that make actual changes to the underlying system. This is where the concept of destructive integration tests comes into play. Tests can be written to alter the system they are running on. This capability is what fills in the gap needed to properly test aspects of system management like package installation.

Any test that changes the underlying system in any way, such as creating or deleting users, installing packages, or changing permissions should include the @destructive decorator to signal system changes and should be written with care. System changes executed within a destructive test should also be restored once the related tests have completed. For example, if a new user is created to test a module, the same user should be removed after the test is completed to maintain system integrity.

To write a destructive test, import, and use the destructiveTest decorator for the test method:

```python
import integration
from salttesting.helpers import destructiveTest
```
class DestructiveExampleModuleTest(integration.ModuleCase):
    '''
    Demonstrate a destructive test
    '''

    @destructiveTest
    @skipIf(os.geteuid() != 0, 'you must be root to run this test')
    def test_user_not_present(self):
        '''
        This is a DESTRUCTIVE TEST it creates a new user on the minion.
        And then destroys that user.
        '''
        ret = self.run_state('user.present', name='salt_test')
        self.assertSaltTrueReturn(ret)
        ret = self.run_state('user.absent', name='salt_test')
        self.assertSaltTrueReturn(ret)

Cloud Provider Tests

Cloud provider integration tests are used to assess Salt-Cloud’s ability to create and destroy cloud instances for various supported cloud providers. Cloud provider tests inherit from the ShellCase Integration Class.

Any new cloud provider test files should be added to the tests/integration/cloud/providers/ directory. Each cloud provider test file also requires a sample cloud profile and cloud provider configuration file in the integration test file directory located at tests/integration/files/conf/cloud.*.d/.

The following is an example of the default profile configuration file for Digital Ocean, located at: tests/integration/files/conf/cloud.profiles.d/digital_ocean.conf:

digitalocean-test:
    provider: digitalocean-config
    image: Ubuntu 14.04 x64
    size: 512MB

Each cloud provider requires different configuration credentials. Therefore, sensitive information such as API keys or passwords should be omitted from the cloud provider configuration file and replaced with an empty string. The necessary credentials can be provided by the user by editing the provider configuration file before running the tests.

The following is an example of the default provider configuration file for Digital Ocean, located at: tests/integration/files/conf/cloud.providers.d/digital_ocean.conf:

digitalocean-config:
    driver: digital_ocean
    client_key: ''
    api_key: ''
    location: New York 1

In addition to providing the necessary cloud profile and provider files in the integration test suite file structure, appropriate checks for if the configuration files exist and contain valid information are also required in the test class’s setUp function:

class LinodeTest(integration.ShellCase):
    '''
    Integration tests for the Linode cloud provider in Salt-Cloud
    '''

34.21. Writing Tests
def setUp(self):
    '''
    Sets up the test requirements
    '''
    super(LinodeTest, self).setUp()

    # check if appropriate cloud provider and profile files are present
    profile_str = 'linode-config:
    provider = 'linode'
    providers = self.run_cloud('--list-providers')
    if profile_str not in providers:
        self.skipTest(
            'Configuration file for {0} was not found. Check {0}.conf files '
            'in tests/integration/files/conf/cloud.*.d/ to run these tests.'
            .format(provider)
        )

    # check if apikey and password are present
    path = os.path.join(integration.FILES, 
                        'conf', 
                        'cloud.providers.d', 
                        provider + '.conf')
    config = cloud_providers_config(path)
    api = config['linode-config']['linode']['apikey']
    password = config['linode-config']['linode']['password']
    if api == '' or password == '':
        self.skipTest(
            'An api key and password must be provided to run these tests. Check '
            'tests/integration/files/conf/cloud.providers.d/{0}.conf'.format( 
                provider)
        )

Repeatedly creating and destroying instances on cloud providers can be costly. Therefore, cloud provider tests are off by default and do not run automatically. To run the cloud provider tests, the --cloud-provider-tests flag must be provided:

./tests/runtests.py --cloud-provider-tests

Since cloud provider tests do not run automatically, all provider tests must be preceded with the @expensiveTest decorator. The expensive test decorator is necessary because it signals to the test suite that the --cloud-provider-tests flag is required to run the cloud provider tests.

To write a cloud provider test, import, and use the expensiveTest decorator for the test function:

from salttesting.helpers import expensiveTest

@expensiveTest
def test_instance(self):
    '''
    Test creating an instance on Linode
    '''
    name = 'linode-testing'

    # create the instance
    instance = self.run_cloud('p linode-test {0}'.format(name))
    str = '{0}'.format(name)
# check if instance with salt installed returned as expected
try:
    self.assertIn(str, instance)
except AssertionError:
    self.run_cloud('-d {0} --assume-yes'.format(name))
    raise

# delete the instance
delete = self.run_cloud('-d {0} --assume-yes'.format(name))
str = 'True'
try:
    self.assertIn(str, delete)
except AssertionError:
    raise

---

Writing Unit Tests

Introduction

Like many software projects, Salt has two broad-based testing approaches -- integration testing and unit testing. While integration testing focuses on the interaction between components in a sandboxed environment, unit testing focuses on the singular implementation of individual functions.

Preparing to Write a Unit Test

This guide assumes you’ve followed the directions for setting up salt testing.

Unit tests should be written to the following specifications:

- Each raise and return statement needs to be independently tested.
- Unit tests for `salt/.../<module>.py` are contained in a file called `tests/unit/.../<module>_test.py`, e.g. the tests for `salt/modules/fib.py` are in `tests/unit/modules/fib_test.py`.
- Test functions are named `test_<fcn>_<test-name>` where `<fcn>` is the function being tested and `<test-name>` describes the raise or return being tested.
- A reasonable effort needs to be made to mock external resources used in the code being tested, such as APIs, function calls, external data either globally available or passed in through function arguments, file data, etc.
- Test functions should contain only one assertion and all necessary mock code and data for that assertion.

Most commonly, the following imports are necessary to create a unit test:

```python
# Import Salt Testing libs
from salttesting import skipIf, TestCase
from salttesting.helpers import ensure_in_syspath

If you need mock support to your tests, please also import:

from salttesting.mock import NO_MOCK, NO_MOCK_REASON, MagicMock, patch, call
```
A Simple Example

Let’s assume that we're testing a very basic function in an imaginary Salt execution module. Given a module called `fib.py` that has a function called `calculate(num_of_results)`, which given a `num_of_results`, produces a list of sequential Fibonacci numbers of that length.

A unit test to test this function might be commonly placed in a file called `tests/unit/modules/fib_test.py`. The convention is to place unit tests for Salt execution modules in `test/unit/modules/` and to name the tests module suffixed with `_test.py`.

Tests are grouped around test cases, which are logically grouped sets of tests against a piece of functionality in the tested software. Test cases are created as Python classes in the unit test module. To return to our example, here’s how we might write the skeleton for testing `fib.py`:

```python
# Import Salt Testing libs
from salttesting import TestCase

# Import Salt execution module to test
from salt.modules import fib

class FibTestCase(TestCase):
    '''
    This class contains a set of functions that test salt.modules.fib.
    '''
    def test_fib(self):
        '''
        To create a unit test, we should prefix the name with `test_` so
        that it's recognized by the test runner.
        '''
        fib_five = (0, 1, 1, 2, 3)
        self.assertEqual(fib.calculate(5), fib_five)
```

At this point, the test can now be run, either individually or as a part of a full run of the test runner. To ease development, a single test can be executed:

```bash
tests/runtests.py -v -n unit.modules.fib_test
```

This will report the status of the test: success, failure, or error. The `-v` flag increases output verbosity.

To review the results of a particular run, take a note of the log location given in the output for each test:

```bash
Logging tests on /var/folders/nl/d809xbq577l3qr6j3ymtpbq80000gn/T/salt-runtests.log
```

Evaluating Truth

A longer discussion on the types of assertions one can make can be found by reading Python's documentation on unit testing.
Tests Using Mock Objects

In many cases, the purpose of a Salt module is to interact with some external system, whether it be to control a database, manipulate files on a filesystem or something else. In these varied cases, it's necessary to design a unit test which can test the function whilst replacing functions which might actually call out to external systems. One might think of this as `blocking the exits` for code under tests and redirecting the calls to external systems with our own code which produces known results during the duration of the test.

To achieve this behavior, Salt makes heavy use of the `MagicMock` package.

To understand how one might integrate Mock into writing a unit test for Salt, let's imagine a scenario in which we're testing an execution module that's designed to operate on a database. Furthermore, let's imagine two separate methods, here presented in pseudo-code in an imaginary execution module called `db.py`.

```python
def create_user(username):
    qry = 'CREATE USER {0}'.format(username)
    execute_query(qry)

def execute_query(qry):
    # Connect to a database and actually do the query...
```

Here, let's imagine that we want to create a unit test for the `create_user` function. In doing so, we want to avoid any calls out to an external system and so while we are running our unit tests, we want to replace the actual interaction with a database with a function that can capture the parameters sent to it and return pre-defined values. Therefore, our task is clear -- to write a unit test which tests the functionality of `create_user` while also replacing `execute_query` with a mocked function.

To begin, we set up the skeleton of our class much like we did before, but with additional imports for `MagicMock`:

```python
# Import Salt Testing libs
from salttesting import TestCase

# Import Salt execution module to test
from salt.modules import db

# Import Mock libraries
from salttesting.mock import NO_MOCK, NO_MOCK_REASON, MagicMock, patch, call

# Create test case class and inherit from Salt's customized TestCase
# Skip this test case if we don't have access to mock!
@skipIf(NO_MOCK, NO_MOCK_REASON)
class DbTestCase(TestCase):
    def test_create_user(self):
        # First, we replace 'execute_query' with our own mock function
        db.execute_query = MagicMock()

        # Now that the exits are blocked, we can run the function under test.
        db.create_user('testuser')

        # We could now query our mock object to see which calls were made to it.
        # print db.execute_query.mock_calls

        # Construct a call object that simulates the way we expected
        # execute_query to have been called.
        expected_call = call('CREATE USER testuser')
```
# Compare the expected call with the list of actual calls. The test will succeed or fail depending on the output of this assertion.

db.execute_query.assert_has_calls(expected_call)

Modifying __salt__ In Place

At times, it becomes necessary to make modifications to a module's view of functions in its own __salt__ dictionary. Luckily, this process is quite easy.

Below is an example that uses MagicMock's patch functionality to insert a function into __salt__ that's actually a MagicMock instance.

```python
def show_patch(self):
    with patch.dict(my_module.__salt__,
                    {'function.to_replace': MagicMock()}):
        # From this scope, carry on with testing, with a modified __salt__!
```

A More Complete Example

Consider the following function from salt/modules/linux_sysctl.py.

```python
def get(name):
    '''
    Return a single sysctl parameter for this minion
    
    CLI Example:
    .. code-block:: bash
      
      salt '*' sysctl.get net.ipv4.ip_forward
    '''
    cmd = 'sysctl -n {0}'.format(name)
    out = __salt__['cmd.run'](cmd)
    return out
```

This function is very simple, comprising only four source lines of code and having only one return statement, so we know only one test is needed. There are also two inputs to the function, the name function argument and the call to __salt__['cmd.run'](), both of which need to be appropriately mocked.

Mocking a function parameter is straightforward, whereas mocking a function call will require, in this case, the use of MagicMock. For added isolation, we will also redefine the __salt__ dictionary such that it only contains 'cmd.run'.

```python
# Import Salt Libs
from salt.modules import linux_sysctl

# Import Salt Testing Libs
from salttesting import skipIf, TestCase
from salttesting.helpers import ensure_in_syspath
from salttesting.mock import (MagicMock, patch, NO_MOCK,
```
Since `get()` has only one raise or return statement and that statement is a success condition, the test function is simply named `test_get()`. As described, the single function call parameter, `name` is mocked with `net.ipv4.ip_forward` and `__salt__['cmd.run']` is replaced by a MagicMock function object. We are only interested in the return value of `__salt__['cmd.run']`, which MagicMock allows to be specified via `return_value=1`. Finally, the test itself tests for equality between the return value of `get()` and the expected return of 1. This assertion is expected to succeed because `get()` will determine its return value from `__salt__['cmd.run']`, which we have mocked to return 1.

A Complex Example

Now consider the `assign()` function from the same salt/modules/linux_sysctl.py source file.

```python
def assign(name, value):
    
    Assign a single sysctl parameter for this minion
    
    CLI Example:
    .. code-block:: bash
        
        salt '*' sysctl.assign net.ipv4.ip_forward 1
    
    value = str(value)
    sysctl_file = '/proc/sys/{0}.format(name.replace('.', '/'))
    if not os.path.exists(sysctl_file):
        raise CommandExecutionError('sysctl {0} does not exist'.format(name))
    ret = {}
```
This function contains two raise statements and one return statement, so we know that we will need (at least) three tests. It has two function arguments and many references to non-built-in functions. In the tests below you will see that MagicMock’s `patch()` method may be used as a context manager or as a decorator.

There are three test functions, one for each raise and return statement in the source function. Each function is self-contained and contains all and only the mocks and data needed to test the raise or return statement it is concerned with.

```python
from salt.modules import linux_sysctl
from salt.exceptions import CommandExecutionError

@skipIf(NO_MOCK, NO_MOCK_REASON)
class LinuxSysctlTestCase(TestCase):
    '''
    TestCase for salt.modules.linux_sysctl module
    '''
    @patch('os.path.exists', MagicMock(return_value=False))
def test_assign_proc_sys_failed(self):
        '''
        Test assign Proc Sys failed.
        '''
```

# Example:
# # sysctl -w net.ipv4.tcp_rmem="4096 87380 16777216"
# net.ipv4.tcp_rmem = 4096 87380 16777216
regex = re.compile(r'^{0}=\s+{1}$'.format(re.escape(name), re.escape(value)))
if not regex.match(out) or 'Invalid argument' in str(err):
    if data['retcode'] != 0 and err:
        error = err
    else:
        error = out
    raise CommandExecutionError('sysctl -w failed: {}'.format(error))
new_name, new_value = out.split('=', 1)
ret[new_name] = new_value
return ret
Tests if `/proc/sys/<kernel-subsystem>` exists or not

```python
cmd = { 'pid': 1337, 'retcode': 0, 'stderr': '', 'stdout': 'net.ipv4.ip_forward = 1'}
mock_cmd = MagicMock(return_value=cmd)
with patch.dict(linux_sysctl.__salt__, { 'cmd.run_all': mock_cmd }):
    self.assertRaises(CommandExecutionError,
        linux_sysctl.assign,
        'net.ipv4.ip_forward', 1)
```

```python
@patch('os.path.exists', MagicMock(return_value=True))
def test_assign_cmd_failed(self):
    Tests if the assignment was successful or not
    ```
    cmd = { 'pid': 1337, 'retcode': 0, 'stderr': '
        sysctl: setting key "net.ipv4.ip_forward": Invalid argument",
        'stdout': 'net.ipv4.ip_forward = backward'}
    mock_cmd = MagicMock(return_value=cmd)
    with patch.dict(linux_sysctl.__salt__, { 'cmd.run_all': mock_cmd }):
        self.assertRaises(CommandExecutionError,
            linux_sysctl.assign,
            'net.ipv4.ip_forward', 'backward')
```

```python
@patch('os.path.exists', MagicMock(return_value=True))
def test_assign_success(self):
    Tests the return of successful assign function
    ```
    cmd = { 'pid': 1337, 'retcode': 0, 'stderr': '',
        'stdout': 'net.ipv4.ip_forward = 1'}
    ret = { 'net.ipv4.ip_forward': '1'}
    mock_cmd = MagicMock(return_value=cmd)
    with patch.dict(linux_sysctl.__salt__, { 'cmd.run_all': mock_cmd }):
        self.assertEqual(linux_sysctl.assign(
            'net.ipv4.ip_forward', 1), ret)
```

```python
if __name__ == '__main__':
    from integration import run_tests
    run_tests(LinuxSysctlTestCase, needs_daemon=False)
```

34.22 raet

# RAET # Reliable Asynchronous Event Transport Protocol

See also:

RAET Overview

34.22.1 Protocol

Layering:
OSI Layers

Link is hidden from Raet Network is IP host address and Udp Port Transport is Raet transactions, service kind, tail error checking, Could include header signing as part of transport reliable delivery serialization of header Session is session id key exchange for signing. Grouping is Road (like 852 channel) Presentation is Encrypt Decrypt body Serialize Deserialize Body Application is body data dictionary

Header signing spans both the Transport and Session layers.

34.22.2 Header

JSON Header (Tradeoff some processing speed for extensibility, ease of use, readability)

Body initially JSON but support for `packed` binary body

34.22.3 Packet

Header ASCII Safe JSON Header termination: Empty line given by double pair of carriage return linefeed /r/n/r/n 10 13 10 13 ADAD 1010 1101 1010 1101

In json carriage return and newline characters cannot appear in a json encoded string unless they are escaped with backslash, so the 4 byte combination is illegal in valid json that does not have multi-byte unicode characters.

These means the header must be ascii safe so no multibyte utf-8 strings allowed in header.

Following Header Terminator is variable length signature block. This is binary and the length is provided in the header.

Following the signature block is the packet body or data. This may either be JSON or packed binary. The format is given in the json header

Finally is an optional tail block for error checking or encryption details

34.22.4 Header Fields

In UDP header

sh = source host sp = source port dh = destination host dp = destination port

In RAET Header

hk = header kind hl = header length

vn = version number

sd = Source Device ID dd = Destination Device ID cf = Corresponder Flag mf = Multicast Flag

si = Session ID ti = Transaction ID

sk = Service Kind pk = Packet Kind bf = Burst Flag (Send all Segments or Ordered packets without interleaved acks)

oi = Order Index dt = DateTime Stamp

sn = Segment Number sc = Segment Count
pf = Pending Segment Flag  af = All Flag (Resent all Segments not just one)
nk = Auth header kind nl = Auth header length
bk = body kind bl = body length
tk = tail kind tl = tail length

fg = flags packed (Flags) Default `00' hex string 2 byte Hex string with bits (0, 0, af, pf, 0, bf, mf, cf) Zeros are TBD flags

34.22.5 Session Bootstrap

Minion sends packet with SID of Zero with public key of minions Public Private Key pair Master acks packet with SID of Zero to let minion know it received the request

Some time later Master sends packet with SID of zero that accepts the Minion

Minion

34.22.6 Session

Session is important for security. Want one session opened and then multiple transactions within session.

Session ID SID sid

GUID hash to guarantee uniqueness since no guarantee of nonvolatile storage or require file storage to keep last session ID used.

34.22.7 Service Types or Modular Services

Four Service Types

1. One or more maybe (unacknowledged repeat) maybe means no guarantee

2. Exactly one at most (ack with retries) (duplicate detection idempotent) at most means fixed number of retries has finite probability of failing B1) finite retries B2) infinite retries with exponential back-off up to a maximum delay

3. Exactly one of sequence at most (sequence numbered) Receiver requests retry of missing packet with same B1 or B2 retry type

4. End to End (Application layer Request Response) This is two B sub transactions

Initially unicast messaging Eventually support for Multicast

The use case for C) is to fragment large packets as once a UDP packet exceeds the frame size its reliability goes way down So its more reliable to fragment large packets.

Better approach might be to have more modularity. Services Levels

1. Maybe one or more

   (a) Fire and forget no transaction either side

   (b) Repeat, no ack, no dupdet repeat counter send side, no transaction on receive side

   (c) Repeat, no Ack, dupdet repeat counter send side, dup detection transaction receive side

2. More or Less Once
(a) **retry finite, ack no dupdet** retry timer send side, finite number of retries ack receive side no dupdet

3. **At most Once**
   (a) **retry finite, ack, dupdet** retry timer send side, finite number of retries ack receive side dupdet

4. **Exactly once**
   (a) **ack retry** retry timer send side, ack and duplicate detection receive side Infinite retries with exponential backoff

5. **Sequential sequence number**
   (a) reorder escrow
   (b) Segmented packets

6. request response to application layer

Service Features
1. repeats
2. ack retry transaction id
3. sequence number duplicate detection out of order detection sequencing
4. rep-req

Always include transaction id since multiple transactions on same port So get duplicate detection for free if keep transaction alive but if use

A) Maybe one or more B1) At Least One B2) Exactly One C) One of sequence D) End to End

A) Sender creates transaction id for number of repeats but receiver does not keep transaction alive

B1) Sender creates transaction id keeps it for retries. Receiver keeps it to send ack then kills so retry could be duplicate not detected

B2) Sender creates transaction id keeps for retries Receiver keeps tid for acks on any retries so no duplicates.

C) Sender creates TID and Sequence Number. Receiver checks for out of order sequence and can request retry.

D) Application layer sends response. So question is do we keep transaction open or have response be new transaction. No because then we need a rep-req ID so might as well use the same transaction id. Just keep alive until get response.

Little advantage to B1 vs B2 not having duplicates.

So 4 service types
1. Maybe one or more (unacknowledged repeat)
2. Exactly One (At most one) (ack with retry) (duplicate detection idempotent)
3. One of Sequence (sequence numbered)
4. End to End

Also multicast or unicast

Modular Transaction Table

**Sender Side:** Transaction ID plus transaction source sender or receiver generated transaction id Repeat Counter Retry Timer Retry Counter (finite retries) Redo Timer (infinite redos with exponential backoff) Sequence number without acks (look for resend requests) Sequence with ack (wait for ack before sending next in sequence) Segmentation
**Receiver Side:** Nothing just accept packet Acknowledge (can delete transaction after acknowledge) No duplicate detection Transaction timeout (keep transaction until timeout) Duplicate detection save transaction id duplicate detection timeout Request resend of missing packet in sequence Sequence reordering with escrow timeout wait escrow before requesting resend Unsegmentation (request resends of missing segment)

### 34.23 SaltStack Git Policy

The SaltStack team follows a git policy to maintain stability and consistency with the repository.

The git policy has been developed to encourage contributions and make contributing to Salt as easy as possible. Code contributors to SaltStack projects **DO NOT NEED TO READ THIS DOCUMENT**, because all contributions come into SaltStack via a single gateway to make it as easy as possible for contributors to give us code.

The primary rule of git management in SaltStack is to make life easy on contributors and developers to send in code. Simplicity is always a goal!

#### 34.23.1 New Code Entry

All new SaltStack code is posted to the `develop` branch, which is the single point of entry. The only exception is when a bugfix to develop cannot be cleanly merged into a release branch and the bugfix needs to be rewritten for the release branch.

#### 34.23.2 Release Branching

SaltStack maintains two types of releases, **Feature Releases** and **Point Releases**. A feature release is managed by incrementing the first or second release point number, so 0.10.5 -> 0.11.0 signifies a feature release and 0.11.0 -> 0.11.1 signifies a point release, also a hypothetical 0.42.7 -> 1.0.0 would also signify a feature release.

**Feature Release Branching**

Each feature release is maintained in a dedicated git branch derived from the last applicable release commit on develop. All file changes relevant to the feature release will be completed in the develop branch prior to the creation of the feature release branch. The feature release branch will be named after the relevant numbers to the feature release, which constitute the first two numbers. This means that the release branch for the 0.11.0 series is named 0.11.

A feature release branch is created with the following command:

```
# git checkout -b 0.11 # From the develop branch
# git push origin 0.11
```

**Point Releases**

Each point release is derived from its parent release branch. Constructing point releases is a critical aspect of Salt development and is managed by members of the core development team. Point releases comprise bug and security fixes which are cherry picked from develop onto the aforementioned release branch. At the time when a core developer accepts a pull request a determination needs to be made if the commits in the pull request need to be backported to the release branch. Some simple criteria are used to make this determination:

- Is this commit fixing a bug? Backport
• Does this commit change or add new features in any way? Don’t backport
• Is this a PEP8 or code cleanup commit? Don’t backport
• Does this commit fix a security issue? Backport

Determining when a point release is going to be made is up to the project leader (Thomas Hatch). Generally point releases are made every 1-2 weeks or if there is a security fix they can be made sooner.

The point release is only designated by tagging the commit on the release branch with release number using the existing convention (version 0.11.1 is tagged with v0.11.1). From the tag point a new source tarball is generated and published to PyPI, and a release announcement is made.

34.24 Salt Conventions

34.24.1 Writing Salt Documentation

Salt’s documentation is built using the Sphinx documentation system. It can be build in a large variety of output formats including HTML, PDF, ePUB, and manpage.

All the documentation is contained in the main Salt repository. Speaking broadly, most of the narrative documentation is contained within the https://github.com/saltstack/salt/blob/develop/doc subdirectory and most of the reference and API documentation is written inline with Salt’s Python code and extracted using a Sphinx extension.

Style

The Salt project recommends the IEEE style guide as a general reference for writing guidelines. Those guidelines are not strictly enforced but rather serve as an excellent resource for technical writing questions. The NCBI style guide is another very approachable resource.

Point-of-view

Use third-person perspective and avoid ”’I”, ”’we”, ”’you” forms of address. Identify the addressee specifically e.g., ”’users should”, ”’the compiler does”, etc.

Active voice

Use active voice and present-tense. Avoid filler words.

Title capitalization

Document titles and section titles within a page should follow normal sentence capitalization rules. Words that are capitalized as part of a regular sentence should be capitalized in a title and otherwise left as lowercase. Punctuation can be omitted unless it aids the intent of the title (e.g., exclamation points or question marks).

For example:

This is a main heading
==================================

Paragraph.
This is an exciting sub-heading!
--------------------------------

Paragraph.

Serial Commas

According to Wikipedia: In English punctuation, a serial comma or series comma (also called Oxford comma and Harvard comma) is a comma placed immediately before the coordinating conjunction (usually and, or, or nor) in a series of three or more terms. For example, a list of three countries might be punctuated either as "France, Italy, and Spain" (with the serial comma), or as "France, Italy and Spain" (without the serial comma).

When writing a list that includes three or more items, the serial comma should always be used.

Documenting modules

Documentation for Salt's various module types is inline in the code. During the documentation build process it is extracted and formatted into the final HTML, PDF, etc format.

Inline documentation

Python has special multi-line strings called docstrings as the first element in a function or class. These strings allow documentation to live alongside the code and can contain special formatting. For example:

```python
def myfunction(value):
    """
    Upper-case the given value
    
    Usage:
    
    .. code-block:: python
    
        val = 'a string'
        new_val = myfunction(val)
        print(new_val) # 'A STRING'
    
    :param value: a string
    :return: a copy of `value` that has been upper-cased
    """
    return value.upper()
```

Specify a release for additions or changes

New functions or changes to existing functions should include a marker that denotes what Salt release will be affected. For example:

```python
def myfunction(value):
    """
    Upper-case the given value
    
    .. versionadded:: 2014.7.0
    """
```
```python
return value.upper()
```

For changes to a function:

```python
def myfunction(value, strip=False):
    
    Upper-case the given value
    ...
    .. versionchanged:: Boron
       Added a flag to also strip whitespace from the string.

    if strip:
        return value.upper().strip()
    return value.upper()
```

Adding module documentation to the index

Each module type has an index listing all modules of that type. For example: Full list of built-in execution modules, Full list of built-in state modules, Full list of built-in renderer modules. New modules must be added to the index manually.

1. Edit the file for the module type: execution modules, state modules, renderer modules, etc.
2. Add the new module to the alphabetized list.
3. Build the documentation which will generate an .rst file for the new module in the same directory as the index.rst.
4. Commit the changes to index.rst and the new .rst file and send a pull request.

Cross-references

The Sphinx documentation system contains a wide variety of cross-referencing capabilities.

Glossary entries

Link to glossary entries using the term role. A cross-reference should be added the first time a Salt-specific term is used in a document.

A common way to encapsulate master-side functionality is by writing a custom :term:`Runner Function`. Custom Runner Functions are easy to write.

Index entries

Sphinx automatically generates many kind of index entries but it is occasionally useful to manually add items to the index.

One method is to use the index directive above the document or section that should appear in the index.
Another method is to use the `index` role inline with the text that should appear in the index. The index entry is created and the target text is left otherwise intact.

**Information about the `Salt Reactor`**
-----------------------------

Paragraph.

Documents and sections

Each document should contain a unique top-level label of the form:

```yaml
.. _my-page:
```

**My page**

```

Paragraph.
```

Unique labels can be linked using the `ref` role. This allows cross-references to survive document renames or movement.

For more information see :ref:`my-page`.

Note, the `:doc:` role should not be used to link documents together.

Modules

Cross-references to Salt modules can be added using Sphinx's Python domain roles. For example, to create a link to the `test.ping` function:

```
A useful execution module to test active communication with a minion is the `test.ping <salt.modules.test.ping>` function.
```

Salt modules can be referenced as well:

```
The `test module <salt.modules.test>` contains many useful functions for inspecting an active Salt connection.
```

The same syntax works for all module types:

```
One of the workhorse state module functions in Salt is the `file.managed <salt.states.file.managed>` function.
```
**Settings**

Individual settings in the Salt Master or Salt Minion configuration files are cross-referenced using two custom roles, `conf_master` and `conf_minion`.

The `:conf_minion:` `minion ID <id>` setting is a unique identifier for a single minion.

**Building the documentation**

1. Install Sphinx using a system package manager or pip. The package name is often of the form `python-sphinx`. There are no other dependencies.

2. Build the documentation using the provided Makefile or `.bat` file on Windows.

   ```
   cd /path/to/salt/doc
   make html
   ```

3. The generated documentation will be written to the `doc/_build/<format>` directory.

4. A useful method of viewing the HTML documentation locally is the start Python's built-in HTTP server:

   ```
   cd /path/to/salt/doc/_build/html
   python -m SimpleHTTPServer
   ```

   Then pull up the documentation in a web browser at `http://localhost:8000/`.

**34.24.2 Salt Formulas**

Formulas are pre-written Salt States. They are as open-ended as Salt States themselves and can be used for tasks such as installing a package, configuring, and starting a service, setting up users or permissions, and many other common tasks.

All official Salt Formulas are found as separate Git repositories in the `saltstack-formulas` organization on GitHub: [https://github.com/saltstack-formulas](https://github.com/saltstack-formulas)

As a simple example, to install the popular Apache web server (using the normal defaults for the underlying distro) simply include the `apache-formula` from a top file:

```
base:
  'web*':
    - apache
```

**Installation**

Each Salt Formula is an individual Git repository designed as a drop-in addition to an existing Salt State tree. Formulas can be installed in the following ways.
Adding a Formula as a GitFS remote

One design goal of Salt's GitFS fileserver backend was to facilitate reusable States. GitFS is a quick and natural way to use Formulas.

1. **Install and configure GitFS.**

2. Add one or more Formula repository URLs as remotes in the `gitfs_remotes` list in the Salt Master configuration file:

   ```
   gitfs_remotes:
   - https://github.com/saltstack-formulas/apache-formula
   - https://github.com/saltstack-formulas/memcached-formula
   ```

   We strongly recommend forking a formula repository into your own GitHub account to avoid unexpected changes to your infrastructure.

   Many Salt Formulas are highly active repositories so pull new changes with care. Plus any additions you make to your fork can be easily sent back upstream with a quick pull request!

3. Restart the Salt master.

Adding a Formula directory manually

Formulas are simply directories that can be copied onto the local file system by using Git to clone the repository or by downloading and expanding a tarball or zip file of the repository. The directory structure is designed to work with `file_roots` in the Salt master configuration.

1. Clone or download the repository into a directory:

   ```bash
   mkdir -p /srv/formulas
cd /srv/formulas
git clone https://github.com/saltstack-formulas/apache-formula.git
   
   # or
   
mkdir -p /srv/formulas
cd /srv/formulas
wget https://github.com/saltstack-formulas/apache-formula/archive/master.tar.gz
tar xf apache-formula-master.tar.gz
   ```

2. Add the new directory to `file_roots`:

   ```
   file_roots:
   base:
   - /srv/salt
   - /srv/formulas/apache-formula
   ```

3. Restart the Salt Master.

Usage

Each Formula is intended to be immediately usable with sane defaults without any additional configuration. Many formulas are also configurable by including data in Pillar; see the `pillar.example` file in each Formula repository for available options.
Including a Formula in an existing State tree

Formula may be included in an existing sls file. This is often useful when a state you are writing needs to require or extend a state defined in the formula.

Here is an example of a state that uses the epel-formula in a require declaration which directs Salt to not install the python26 package until after the EPEL repository has also been installed:

```
include:
  - epel

python26:
  pkg.installed:
    - require:
      - pkg: epel
```

Including a Formula from a Top File

Some Formula perform completely standalone installations that are not referenced from other state files. It is usually cleanest to include these Formula directly from a Top File.

For example the easiest way to set up an OpenStack deployment on a single machine is to include the openstack-standalone-formula directly from a top.sls file:

```
base:
  'myopenstackmaster':
    - openstack
```

Quickly deploying OpenStack across several dedicated machines could also be done directly from a Top File and may look something like this:

```
base:
  'controller':
    - openstack.horizon
    - openstack.keystone
  'hyper-*':
    - openstack.nova
    - openstack.glance
  'storage-*':
    - openstack.swift
```

Configuring Formula using Pillar

Salt Formulas are designed to work out of the box with no additional configuration. However, many Formula support additional configuration and customization through Pillar. Examples of available options can be found in a file named pillar.example in the root directory of each Formula repository.

Using Formula with your own states

Remember that Formula are regular Salt States and can be used with all Salt's normal state mechanisms. Formula can be required from other States with require declarations, they can be modified using extend, they can made to watch other states with The in versions of requisites.
The following example uses the stock `apache-formula` alongside a custom state to create a vhost on a Debian/Ubuntu system and to reload the Apache service whenever the vhost is changed.

```
# Include the stock, upstream apache formula.
include:
  - apache

# Use the watch_in requisite to cause the apache service state to reload
# apache whenever the my-example-com-vhost state changes.
my-example-com-vhost:
  file:
    - managed
    - name: /etc/apache2/sites-available/my-example-com
    - watch_in:
      - service: apache
```

Don't be shy to read through the source for each Formula!

**Reporting problems & making additions**

Each Formula is a separate repository on GitHub. If you encounter a bug with a Formula please file an issue in the respective repository! Send fixes and additions as a pull request. Add tips and tricks to the repository wiki.

**Writing Formulas**

Each Formula is a separate repository in the saltstack-formulas organization on GitHub.

**Note:** Get involved creating new Formulas

The best way to create new Formula repositories for now is to create a repository in your own account on GitHub and notify a SaltStack employee when it is ready. We will add you to the contributors team on the saltstack-formulas organization and help you transfer the repository over. Ping a SaltStack employee on IRC (#salt on Freenode) or send an email to the salt-users mailing list.

There are a lot of repositories in that organization! Team members can manage which repositories they are subscribed to on GitHub's watching page: [https://github.com/watching](https://github.com/watching).

**Style**

Maintainability, readability, and reusability are all marks of a good Salt sls file. This section contains several suggestions and examples.

```
# Deploy the stable master branch unless version overridden by passing
# Pillar at the CLI or via the Reactor.

deploy_myapp:
  git.latest:
    - name: git@github.com/myco/myapp.git
    - version: {{ salt.pillar.get('myapp:version', 'master') }}
```
Use a descriptive State ID  The ID of a state is used as a unique identifier that may be referenced via other states in requisites. It must be unique across the whole state tree (it is a key in a dictionary, after all).

In addition a state ID should be descriptive and serve as a high-level hint of what it will do, or manage, or change. For example, deploy_webapp, or apache, or reload_firewall.

Use module.function notation  So-called `short-declaration` notation is preferred for referencing state modules and state functions. It provides a consistent pattern of module.function shared between Salt States, the Reactor, Salt Mine, the Scheduler, as well as with the CLI.

```
# Do
apache:
pkg.installed:
  - name: httpd

# Don't
apache:
pkg:
  - installed
  - name: httpd
```

Salt's state compiler will transform `short-decs` into the longer format when compiling the human-friendly highstate structure into the machine-friendly lowstate structure.

Specify the name parameter  Use a unique and permanent identifier for the state ID and reserve name for data with variability.

The name declaration is a required parameter for all state functions. The state ID will implicitly be used as name if it is not explicitly set in the state.

In many state functions the name parameter is used for data that varies such as OS-specific package names, OS-specific file system paths, repository addresses, etc. Any time the ID of a state changes all references to that ID must also be changed. Use a permanent ID when writing a state the first time to future-proof that state and allow for easier refactors down the road.

Comment state files  YAML allows comments at varying indentation levels. It is a good practice to comment state files. Use vertical whitespace to visually separate different concepts or actions.

```
# Start with a high-level description of the current sls file.
# Explain the scope of what it will do or manage.

# Comment individual states as necessary.
update_a_config_file:
  # Provide details on why an unusual choice was made. For example:
  #
  # This template is fetched from a third-party and does not fit our
  # company norm of using Jinja. This must be processed using Mako.
  file.managed:
    - name: /path/to/file.cfg
    - source: salt://path/to/file.cfg.template
    - template: mako

  # Provide a description or explanation that did not fit within the state
  # ID. For example:
  #
```
# Update the application's last-deployed timestamp.
# This is a workaround until Bob configures Jenkins to automate RPM builds of the app.
cmd.run:
    # FIXME: Joe needs this to run on Windows by next quarter. Switch these
    # from shell commands to Salt's file.managed and file.replace state
    # modules.
    - name: |
        touch /path/to/file_last_updated
        sed -e 's/foo/bar/g' /path/to/file_environment
    - onchanges:
        - file: a_config_file

BecarefultouseJinjacommentsforcommentingJinjacodeandYAMLcommentsforcommentingYAMLcode.

# BAD EXAMPLE
# The Jinja in this YAML comment is still executed!
# {% set apache_is_installed = 'apache' in salt.pkg.list_pkgs() %}

# GOOD EXAMPLE
# The Jinja in this Jinja comment will not be executed.
{{ # {% set apache_is_installed = 'apache' in salt.pkg.list_pkgs() %} #}

Easy on the Jinja!

Jinja templating provides vast flexibility and power when building Salt sls files. It can also create an unmaintainable tangle of logic and data. Speaking broadly, Jinja is best used when kept apart from the states (as much as is possible).

Below are guidelines and examples of how Jinja can be used effectively.

### Know the evaluation and execution order

High-level knowledge of how Salt states are compiled and run is useful when writing states.

The default renderer setting in Salt is Jinja piped to YAML. Each is a separate step. Each step is not aware of the previous or following step. Jinja is not YAML aware, YAML is not Jinja aware; they cannot share variables or interact.

- Whatever the Jinja step produces must be valid YAML.
- Whatever the YAML step produces must be a valid highstate data structure. (This is also true of the final step for any of the alternate renderers in Salt.)
- Highstate can be thought of as a human-friendly data structure; easy to write and easy to read.
- Salt's state compiler validates the highstate and compiles it to low state.
- Low state can be thought of as a machine-friendly data structure. It is a list of dictionaries that each map directly to a function call.
- Salt's state system finally starts and executes on each "chunk" in the low state. Remember that requisites are evaluated at runtime.
- The return for each function call is added to the "running" dictionary which is the final output at the end of the state run.

The full evaluation and execution order:
Jinja -> YAML -> Highstate -> low state -> execution

Avoid changing the underlying system with Jinja  Avoid calling commands from Jinja that change the underlying system. Commands run via Jinja do not respect Salt's dry-run mode (test=True)! This is usually in conflict with the idempotent nature of Salt states unless the command being run is also idempotent.

Inspect the local system  A common use for Jinja in Salt states is to gather information about the underlying system. The grains dictionary available in the Jinja context is a great example of common data points that Salt itself has already gathered. Less common values are often found by running commands. For example:

```python
{% set is_selinux_enabled = salt.cmd.run('sestatus') == '1' %}
```

This is usually best done with a variable assignment in order to separate the data from the state that will make use of the data.

Gather external data  One of the most common uses for Jinja is to pull external data into the state file. External data can come from anywhere like API calls or database queries, but it most commonly comes from flat files on the file system or Pillar data from the Salt Master. For example:

```python
{% set some_data = salt.pillar.get('some_data', { 'sane default': True }) %}
[# or #]
{% load_json 'path/to/file.json' as some_data %}
[# or #]
{% load_text 'path/to/ssh_key.pub' as ssh_pub_key %}
[# or #]
{% from 'path/to/other_file.jinja' import some_data with context %}
```

This is usually best done with a variable assignment in order to separate the data from the state that will make use of the data.

Light conditionals and looping  Jinja is extremely powerful for programatically generating Salt states. It is also easy to overuse. As a rule of thumb, if it is hard to read it will be hard to maintain!

Separate Jinja control-flow statements from the states as much as is possible to create readable states. Limit Jinja within states to simple variable lookups.

Below is a simple example of a readable loop:

```python
{% for user in salt.pillar.get('list_of_users', []) %}
[# Ensure unique state IDs when looping. #]
{{ user.name }}-{{ loop.index }}:
  user.present:
    - name: {{ user.name }}
    - shell: {{ user.shell }}
{% endfor %}
```
Avoid putting a Jinja conditionals within Salt states where possible. Readability suffers and the correct YAML indentation is difficult to see in the surrounding visual noise. Parameterization (discussed below) and variables are both useful techniques to avoid this. For example:

```yaml
# ---- Bad example ---- #

apache:
    pkg.installed:
        {% if grains.os_family == 'RedHat' %}
            - name: httpd
        {% elif grains.os_family == 'Debian' %}
            - name: apache2
        {% endif %}

# ---- Better example ---- #

{% if grains.os_family == 'RedHat' %}
    {% set name = 'httpd' %}
{% elif grains.os_family == 'Debian' %}
    {% set name = 'apache2' %}
{% endif %}

apache:
    pkg.installed:
        - name: {{ name }}

# ---- Good example ---- #

{% set name = {
    'RedHat': 'httpd',
    'Debian': 'apache2',
}.get(grains.os_family) %}

apache:
    pkg.installed:
        - name: {{ name }}
```

Dictionaries are useful to effectively "namespace" a collection of variables. This is useful with parameterization (discussed below). Dictionaries are also easily combined and merged. And they can be directly serialized into YAML which is often easier than trying to create valid YAML through templating. For example:

```yaml
# ---- Bad example ---- #

haproxy_conf:
    file.managed:
        - name: /etc/haproxy/haproxy.cfg
        - template: jinja
        {% if 'external_loadbalancer' in grains.roles %}
            - source: salt://haproxy/external_haproxy.cfg
        {% elif 'internal_loadbalancer' in grains.roles %}
            - source: salt://haproxy/internal_haproxy.cfg
        {% endif %}
        - context:
            {% if 'external_loadbalancer' in grains.roles %}
                ssl_termination: True
            {% elif 'internal_loadbalancer' in grains.roles %}
                ssl_termination: False
            {% endif %}
```

34.24. Salt Conventions
{% load_yaml as haproxy_defaults %}

common_settings:
    bind_port: 80

internal_loadbalancer:
    source: salt://haproxy/internal_haproxy.cfg
    settings:
        bind_port: 8080
        ssl_termination: False

external_loadbalancer:
    source: salt://haproxy/external_haproxy.cfg
    settings:
        ssl_termination: True

{% endload %}

{% if 'external_loadbalancer' in grains.roles %}
{% set haproxy = haproxy_defaults['external_loadbalancer'] %}
{% elif 'internal_loadbalancer' in grains.roles %}
{% set haproxy = haproxy_defaults['internal_loadbalancer'] %}
{% endif %}

{% do haproxy.settings.update(haproxy_defaults.common_settings) %}

haproxy_conf:
    file.managed:
        - name: /etc/haproxy/haproxy.cfg
        - template: jinja
        - source: {{ haproxy.source }}
        - context: {{ haproxy.settings | yaml() }}

There is still room for improvement in the above example. For example, extracting into an external file or replacing the if-elif conditional with a function call to filter the correct data more succinctly. However, the state itself is simple and legible, the data is separate and also simple and legible. And those suggested improvements can be made at some future date without altering the state at all!

Avoid heavy logic and programming  Jinja is not Python. It was made by Python programmers and shares many semantics and some syntax but it does not allow for arbitrary Python function calls or Python imports. Jinja is a fast and efficient templating language but the syntax can be verbose and visually noisy.

Once Jinja use within an sls file becomes slightly complicated -- long chains of if-elif-elif-else statements, nested conditionals, complicated dictionary merges, wanting to use sets -- instead consider using a different Salt renderer, such as the Python renderer. As a rule of thumb, if it is hard to read it will be hard to maintain -- switch to a format that is easier to read.

Using alternate renderers is very simple to do using Salt's `''she-bang''` syntax at the top of the file. The Python renderer must simply return the correct highstate data structure. The following example is a state tree of two sls files, one simple and one complicated.

/srv/salt/top.sls:

base:
    '*':
        - common_configuration
        - roles_configuration
Salt Documentation, Release 2015.8.0

/srv/salt/common_configuration.sls:

common_users:
    user.present:
        - names: [larry, curly, moe]

/srv/salt/roles_configuration:

```python
#!py
def run():
    list_of_roles = set()

    # This example has the minion id in the form 'web-03-dev'.
    # Easily access the grains dictionary:
    try:
        app, instance_number, environment = __grains__['id'].split('-')
        instance_number = int(instance_number)
    except ValueError:
        app, instance_number, environment = ['Unknown', 0, 'dev']

    list_of_roles.add(app)

    if app == 'web' and environment == 'dev':
        list_of_roles.add('primary')
        list_of_roles.add('secondary')
    elif app == 'web' and environment == 'staging':
        if instance_number == 0:
            list_of_roles.add('primary')
        else:
            list_of_roles.add('secondary')

    # Easily cross-call Salt execution modules:
    if __salt__['myutils.query_valid_ec2_instance']():
        list_of_roles.add('is_ec2_instance')

    return {
        'set_roles_grains': {
            'grains.present': [
                {'name': 'roles'},
                {'value': list(list_of_roles)},
            ],
        },
    }
```

Jinja Macros  In Salt sls files Jinja macros are useful for one thing and one thing only: creating mini templates that can be reused and rendered on demand. Do not fall into the trap of thinking of macros as functions; Jinja is not Python (see above).

Macros are useful for creating reusable, parameterized states. For example:

```jinja
{% macro user_state(state_id, user_name, shell='/bin/bash', groups=[]) %}
{{ state_id }}:
user.present:
    - name: {{ user_name }}
    - shell: {{ shell }}
{% endmacro %}
```
Macros are also useful for creating one-off `serializers` that can accept a data structure and write that out as a domain-specific configuration file. For example, the following macro could be used to write a php.ini config file:

```
/srv/salt/php.sls:

php_ini:
    file.managed:
    - name: /etc/php.ini
    - source: salt://php.ini.tmpl
    - template: jinja
    - context:
        php_ini_settings: {{ salt.pillar.get('php_ini', {}) | json() }}
```

```
/srv/pillar/php.sls:

php_ini:
    PHP:
        engine: 'On'
        short_open_tag: 'Off'
        error_reporting: 'E_ALL & ~E_DEPRECATED & ~E_STRICT'
```

```
/srv/salt/php.ini.tmpl:

{% macro php_ini_serializer(data) %}
{% for section_name, name_val_pairs in data.items() %}
  [{{ section_name }}]
  {% for name, val in name_val_pairs.items() -%}
  {{ name }} = "{{ val }}"
  {%- endfor %}
  {%- endfor %}
{%- endmacro %}

; File managed by Salt at <{{ source }}>.  
; Your changes will be overwritten.

{{ php_ini_serializer(php_ini_settings) }}
```

### Abstracting static defaults into a lookup table

Separate data that a state uses from the state itself to increases the flexibility and reusability of a state.

An obvious and common example of this is platform-specific package names and file system paths. Another example is sane defaults for an application, or common settings within a company or organization. Organizing such data as a dictionary (aka hash map, lookup table, associative array) often provides a lightweight namespace and allows for quick and easy lookups. In addition, using a dictionary allows for easily merging and overriding static values within a lookup table with dynamic values fetched from Pillar.

A strong convention in Salt Formulas is to place platform-specific data, such as package names and file system paths, into a file named `map.jinja` that is placed alongside the state files.
The following is an example from the MySQL Formula. The `grains.filter_by` function performs a lookup on that table using the `os_family` grain (by default).

The result is that the `mysql` variable is assigned to a subset of the lookup table for the current platform. This allows states to reference, for example, the name of a package without worrying about the underlying OS. The syntax for referencing a value is a normal dictionary lookup in Jinja, such as `{{ mysql['service'] }}` or the shorthand `{{ mysql.service }}`.

```jinja
map.jinja:
{% set mysql = salt['grains.filter_by']({
    'Debian': {
        'server': 'mysql-server',
        'client': 'mysql-client',
        'service': 'mysql',
        'config': '/etc/mysql/my.cnf',
        'python': 'python-mysqldb',
    },
    'RedHat': {
        'server': 'mysql-server',
        'client': 'mysql',
        'service': 'mysqld',
        'config': '/etc/my.cnf',
        'python': 'MySQL-python',
    },
    'Gentoo': {
        'server': 'dev-db/mysql',
        'client': 'dev-db/mysql',
        'service': 'mysql',
        'config': '/etc/mysql/my.cnf',
        'python': 'dev-python/mysql-python',
    },
}, merge=salt['pillar.get']['mysql:lookup']) %}
```

Values defined in the map file can be fetched for the current platform in any state file using the following syntax:

```jinja
{% from "mysql/map.jinja" import mysql with context %}

mysql-server:
  pkg.installed:
    - name: {{ mysql.server }}
  service.running:
    - name: {{ mysql.service }}
```

Collecting common values  Common values can be collected into a `base` dictionary. This minimizes repetition of identical values in each of the `Lookup_dict` sub-dictionaries. Now only the values that are different from the base must be specified of the alternates:

```jinja
map.jinja:
{% set mysql = salt['grains.filter_by']({
    'default': {
        'server': 'mysql-server',
        'client': 'mysql-client',
        'service': 'mysql',
        'config': '/etc/mysql/my.cnf',
        'python': 'python-mysqldb',
```
Overriding values in the lookup table  Allow static values within lookup tables to be overridden. This is a simple pattern which once again increases flexibility and reusability for state files.

The `merge` argument in `filter_by` specifies the location of a dictionary in Pillar that can be used to override values returned from the lookup table. If the value exists in Pillar it will take precedence.

This is useful when software or configuration files is installed to non-standard locations or on unsupported platforms. For example, the following Pillar would replace the `config` value from the call above.

```yaml
mysql:
  lookup:
    config: /usr/local/etc/mysql/my.cnf
```

Note: Protecting Expansion of Content with Special Characters

When templating keep in mind that YAML does have special characters for quoting, flows, and other special structure and content. When a Jinja substitution may have special characters that will be incorrectly parsed by YAML care must be taken. It is a good policy to use the `yaml_encode` or the `yaml_dquote` Jinja filters:

```jinja
{%- set foo = 7.7 %}
{%- set bar = "null" %}
{%- set baz = true %}
{%- set zap = 'The word of the day is "salty".' %}
{%- set zip = '"The quick brown fox . . ."' %}

foo: {{ foo|yaml_encode }}
bar: {{ bar|yamlEncode }}
baz: {{ baz|yaml_encode }}
zap: {{ zap|yaml_encode }}
zip: {{ zip|yaml_dquote }}
```

The above will be rendered as below:

```yaml
foo: 7.7
bar: null
baz: true
zap: "The word of the day is "salty"."
zip: ""The quick brown fox . . .""
```
The filter_by function performs a simple dictionary lookup but also allows for fetching data from Pillar and overriding data stored in the lookup table. That same workflow can be easily performed without using filter_by; other dictionaries besides data from Pillar can also be used.

```jinja
{% set lookup_table = {...} %}
{% do lookup_table.update(salt.pillar.get('my:custom:data')) %}
```

**When to use lookup tables**  The map.jinja file is only a convention within Salt Formulas. This greater pattern is useful for a wide variety of data in a wide variety of workflows. This pattern is not limited to pulling data from a single file or data source. This pattern is useful in States, Pillar and the Reactor, for example.

Working with a data structure instead of, say, a config file allows the data to be cobbled together from multiple sources (local files, remote Pillar, database queries, etc), combined, overridden, and searched.

Below are a few examples of what lookup tables may be useful for and how they may be used and represented.

**Platform-specific information**  An obvious pattern and one used heavily in Salt Formulas is extracting platform-specific information such as package names and file system paths in a file named map.jinja. The pattern is explained in detail above.

**Sane defaults**  Application settings can be a good fit for this pattern. Store default settings along with the states themselves and keep overrides and sensitive settings in Pillar. Combine both into a single dictionary and then write the application config or settings file.

The example below stores most of the Apache Tomcat server.xml file alongside the Tomcat states and then allows values to be updated or augmented via Pillar. (This example uses the BadgerFish format for transforming JSON to XML.)

```
/srv/salt/tomcat/defaults.yaml:

Server:
  '@port': '8005'
  '@shutdown': SHUTDOWN
GlobalNamingResources:
  Resource:
    '@auth': Container
    '@description': User database that can be updated and saved
    '@factory': org.apache.catalina.users.MemoryUserDatabaseFactory
    '@name': UserDatabase
    '@pathname': conf/tomcat-users.xml
    '@type': org.apache.catalina.UserDatabase
  # <...snip...>

/srv/pillar/tomcat.sls:

appX:
  server_xml_overrides:
    Server:
      Service:
        '@name': Catalina
      Connector:
        '@port': '8009'
        '@protocol': AJP/1.3
```
/srv/salt/tomcat/server_xml.sls:

{% import_yaml 'tomcat/defaults.yaml' as server_xml_defaults %}
{% set server_xml_final_values = salt.pillar.get('appX:server_xml_overrides',
    default=server_xml_defaults,
    merge=True) %}

appX_server_xml:
  file.serialize:
    - name: /etc/tomcat/server.xml
    - dataset: {{ server_xml_final_values | json() }}
    - formatter: xml_badgerfish

The `file.serialize` state can provide a shorthand for creating some files from data structures. There are also many examples within Salt Formulas of creating one-off `"serializers"` (often as Jinja macros) that reformat a data structure to a specific config file format. For example, `Nginx vhosts` or the `php.ini`:

```
https://github.com/saltstack-formulas/nginx-formula/blob/5cad4512/nginx/ng/vhosts_config.sls
```

```
https://github.com/saltstack-formulas/php-formula/blob/82e2cd3a/php/ng/files/php.ini
```

**Environment specific information** A single state can be reused when it is parameterized as described in the section below, by separating the data the state will use from the state that performs the work. This can be the difference between deploying Application X and Application Y, or the difference between production and development. For example:

/srv/salt/app/deploy.sls:

```
{% import_yaml 'app/defaults.yaml' as app_defaults %}

{% let app = app_defaults.get(salt.grains.get('role')) %}

deploy_application:
  git.latest:
    - name: {{ app.repo_url }}
    - version: {{ app.version }}
    - target: {{ app.deploy_dir }}

myco/myapp/deployed:
  event.send:
    - data:
      version: {{ app.version }}
    - onchanges:
      - git: deploy_application
```

/srv/salt/app/defaults.yaml:
Single-purpose SLS files

Each sls file in a Formula should strive to do a single thing. This increases the reusability of this file by keeping unrelated tasks from getting coupled together.

As an example, the base Apache formula should only install the Apache httpd server and start the httpd service. This is the basic, expected behavior when installing Apache. It should not perform additional changes such as set the Apache configuration file or create vhosts.

If a formula is single-purpose as in the example above, other formulas, and also other states can include and use that formula with Requisites and Other Global State Arguments without also including undesirable or unintended side-effects.

The following is a best-practice example for a reusable Apache formula. (This skips platform-specific options for brevity. See the full apache-formula for more.)

```
# apache/init.sls
apache:
  pkg.installed:
    [...]
  service.running:
    [...]

# apache/mod_wsgi.sls
include:
  - apache

mod_wsgi:
  pkg.installed:
    [...]
  require:
    - pkg: apache

# apache/conf.sls
include:
  - apache

apache_conf:
  file.managed:
    [...]
  watch_in:
    - service: apache
```

To illustrate a bad example, say the above Apache formula installed Apache and also created a default vhost. The mod_wsgi state would not be able to include the Apache formula to create that dependency tree without also installing the unneeded default vhost.

*Formulas should be reusable.* Avoid coupling unrelated actions together.
Parameterization

Parameterization is a key feature of Salt Formulas and also for Salt States. Parameterization allows a single Formula to be reused across many operating systems; to be reused across production, development, or staging environments; and to be reused by many people all with varying goals.

Writing states, specifying ordering and dependencies is the part that takes the longest to write and to test. Filling those states out with data such as users or package names or file locations is the easy part. How many users, what those users are named, or where the files live are all implementation details that should be parameterized. This separation between a state and the data that populates a state creates a reusable formula.

In the example below the data that populates the state can come from anywhere -- it can be hard-coded at the top of the state, it can come from an external file, it can come from Pillar, it can come from an execution function call, or it can come from a database query. The state itself doesn't change regardless of where the data comes from. Production data will vary from development data will vary from data from one company to another, however the state itself stays the same.

```
{% set user_list = [
    {'name': 'larry', 'shell': 'bash'},
    {'name': 'curly', 'shell': 'bash'},
    {'name': 'moe', 'shell': 'zsh'},
] %}

{% set user_list = salt['pillar.get']('user_list') %}

{% load_json "default_users.json" as user_list %}

{% set user_list = salt['acme_utils.get_user_list']() %}

{% for user in list_list %}
    {{ user.name }}:
    - name: {{ user.name }}
    - shell: {{ user.shell }}
{% endfor %}
```

Configuration

Formulas should strive to use the defaults of the underlying platform, followed by defaults from the upstream project, followed by sane defaults for the formula itself.

As an example, a formula to install Apache should not change the default Apache configuration file installed by the OS package. However, the Apache formula should include a state to change or override the default configuration file.

Pillar overrides

Pillar lookups must use the safe `get()` and must provide a default value. Create local variables using the Jinja set construct to increase readability and to avoid potentially hundreds or thousands of function calls across a large state.
tree.

```jinja
{% from "apache/map.jinja" import apache with context %}
{% set settings = salt['pillar.get']('apache', {}) %}

mod_status:
  file.managed:
    - name: {{ apache.conf_dir }}
    - source: {{ settings.get('mod_status_conf', 'salt://apache/mod_status.conf') }}
    - template: {{ settings.get('template_engine', 'jinja') }}
```

Any default values used in the Formula must also be documented in the `pillar.example` file in the root of the repository. Comments should be used liberally to explain the intent of each configuration value. In addition, users should be able copy-and-paste the contents of this file into their own Pillar to make any desired changes.

### Scripting

Remember that both State files and Pillar files can easily call out to Salt `execution modules` and have access to all the system grains as well.

```jinja
{% if '/storage' in salt['mount.active']() %}
/usr/local/etc/myfile.conf:
  file:
    - symlink
    - target: /storage/myfile.conf
{% endif %}
```

Jinja macros to encapsulate logic or conditionals are discouraged in favor of `writing custom execution modules` in Python.

### Repository structure

A basic Formula repository should have the following layout:

```
foo-formula
  |-- foo/
  |   |-- map.jinja
  |   |-- init.sls
  |   `-- bar.sls
  |-- CHANGELOG.rst
  |-- LICENSE
  `-- pillar.example
     |-- README.rst
        `-- VERSION
```

**See also:**

`template-formula`

The `template-formula` repository has a pre-built layout that serves as the basic structure for a new formula repository. Just copy the files from there and edit them.
README.rst

The README should detail each available .sls file by explaining what it does, whether it has any dependencies on other formulas, whether it has a target platform, and any other installation or usage instructions or tips.

A sample skeleton for the README.rst file:

```===
foo
===

Install and configure the FOO service.

.. note::
   See the full `Salt Formulas installation and usage instructions <http://docs.saltstack.com/en/latest/topics/development/conventions/formulas.html>`_.
```

Available states
================

.. contents::
   :local:

   `foo`
   -------
   Install the `foo` package and enable the service.

   `foo.bar`
   ---------
   Install the `bar` package.

CHANGELOG.rst

The CHANGELOG.rst file should detail the individual versions, their release date and a set of bullet points for each version highlighting the overall changes in a given version of the formula.

A sample skeleton for the CHANGELOG.rst file:

CHANGELOG.rst:

```
foo formula
============

0.0.2 (2013-01-01)
- Re-organized formula file layout
- Fixed filename used for upstart logger template
- Allow for pillar message to have default if none specified
```

Versioning

Formula are versioned according to Semantic Versioning, `http://semver.org/`.
Note: Given a version number MAJOR.MINOR.PATCH, increment the:

1. MAJOR version when you make incompatible API changes,
2. MINOR version when you add functionality in a backwards-compatible manner, and
3. PATCH version when you make backwards-compatible bug fixes.

Additional labels for pre-release and build metadata are available as extensions to the MAJOR.MINOR.PATCH format.

Formula versions are tracked using Git tags as well as the VERSION file in the formula repository. The VERSION file should contain the currently released version of the particular formula.

Testing Formulas

A smoke-test for invalid Jinja, invalid YAML, or an invalid Salt state structure can be performed by with the `state.show_sls` function:

```
salt '*' state.show_sls apache
```

Salt Formulas can then be tested by running each `.sls` file via `state.sls` and checking the output for the success or failure of each state in the Formula. This should be done for each supported platform.

34.24.3 SaltStack Packaging Guide

Since Salt provides a powerful toolkit for system management and automation, the package can be split into a number of sub-tools. While packaging Salt as a single package containing all components is perfectly acceptable, the split packages should follow this convention.

Patching Salt For Distributions

The occasion may arise where Salt source and default configurations may need to be patched. It is preferable if Salt is only patched to include platform specific additions or to fix release time bugs. It is preferable that configuration settings and operations remain in the default state, as changes here lowers the user experience for users moving across distributions.

In the event where a packager finds a need to change the default configuration it is advised to add the files to the master.d or minion.d directories.

Source Files

Release packages should always be built from the source tarball distributed via pypi. Release packages should NEVER use a git checkout as the source for distribution.

Single Package

Shipping Salt as a single package, where the minion, master, and all tools are together is perfectly acceptable and practiced by distributions such as FreeBSD.
Split Package

Salt should always be split in a standard way, with standard dependencies, this lowers cross distribution confusion about what components are going to be shipped with specific packages. These packages can be defined from the Salt Source as of Salt 2014.1.0:

Salt Common

The `salt-common` or `salt` package should contain the files provided by the salt python package, or all files distributed from the `salt/` directory in the source distribution packages. The documentation contained under the `doc/` directory can be a part of this package but splitting out a doc package is preferred. Since salt-call is the entry point to utilize the libs and is useful for all salt packages it is included in the `salt-common` package.

Name

- `salt` OR `salt-common`

Files

- `salt/*`
- `man/salt.7`
- `scripts/salt-call`
- `tests/*`
- `man/salt-call.1`

Depends

- `Python 2.6-2.7`
- `PyYAML`
- `jinja2`

Salt Master

The `salt-master` package contains the applicable scripts, related man pages and init information for the given platform.

Name

- `salt-master`

Files

- `scripts/salt-master`
- `scripts/salt`
- `scripts/salt-run`
- `scripts/salt-key`
- `scripts/salt-cp`
• pkg/<master init data>
• man/salt.1
• man/salt-master.1
• man/salt-run.1
• man/salt-key.1
• man/salt-cp.1
• conf/master

Depends

• Salt Common
• ZeroMQ >= 3.2
• PyZMQ >= 2.10
• PyCrypto
• M2Crypto
• Python MessagePack (Messagepack C lib, or msgpack-pure)

Salt Syndic

The Salt Syndic package can be rolled completely into the Salt Master package. Platforms which start services as part of the package deployment need to maintain a separate salt-syndic package (primarily Debian based platforms). The Syndic may optionally not depend on the anything more than the Salt Master since the master will bring in all needed dependencies, but fall back to the platform specific packaging guidelines.

Name

• salt-syndic

Files

• scripts/salt-syndic
• pkg/<syndic init data>
• man/salt-syndic.1

Depends

• Salt Common
• Salt Master
• ZeroMQ >= 3.2
• PyZMQ >= 2.10
• PyCrypto
• M2Crypto
• Python MessagePack (Messagepack C lib, or msgpack-pure)

Salt Minion

The Minion is a standalone package and should not be split beyond the salt-minion and salt-common packages.

Name

• salt-minion

Files

• scripts/salt-minion
• pkg/<minion init data>
• man/salt-minion.1
• conf/minion

Depends

• Salt Common
• ZeroMQ >= 3.2
• PyZMQ >= 2.10
• PyCrypto
• M2Crypto
• Python MessagePack (Messagepack C lib, or msgpack-pure)

Salt SSH

Since Salt SSH does not require the same dependencies as the minion and master, it should be split out.

Name

• salt-ssh

Files

• scripts/salt-ssh
• man/salt-ssh.1
• conf/cloud*

Depends

• Salt Common
• Python MessagePack (Messagepack C lib, or msgpack-pure)
Salt Cloud

As of Salt 2014.1.0 Salt Cloud is included in the same repo as Salt. This can be split out into a separate package or it can be included in the salt-master package.

Name

- `salt-cloud`

Files

- `scripts/salt-cloud`
- `man/salt-cloud.1`

Depends

- `Salt Common`
- `apache libcloud >= 0.14.0`

Salt Doc

The documentation package is very distribution optional. A completely split package will split out the documentation, but some platform conventions do not prefer this. If the documentation is not split out, it should be included with the `Salt Common` package.

Name

- `salt-doc`

Files

- `doc/*`

Optional Depends

- `Salt Common`
- `Python Sphinx`
- `Make`

34.24.4 Salt Release Process

The goal for Salt projects is to cut a new feature release every four to six weeks. This document outlines the process for these releases, and the subsequent bug fix releases which follow.
Feature Release Process

When a new release is ready to be cut, the person responsible for cutting the release will follow the following steps (written using the 0.16 release as an example):

1. All open issues on the release milestone should be moved to the next release milestone. (e.g. from the 0.16 milestone to the 0.17 milestone)
2. Release notes should be created documenting the major new features and bugfixes in the release.
3. Create an annotated tag with only the major and minor version numbers, preceded by the letter v. (e.g. v0.16) This tag will reside on the develop branch.
4. Create a branch for the new release, using only the major and minor version numbers. (e.g. 0.16)
5. On this new branch, create an annotated tag for the first revision release, which is generally a release candidate. It should be preceded by the letter v. (e.g. v0.16.0RC)
6. The release should be packaged from this annotated tag and uploaded to PyPI as well as the GitHub releases page for this tag.
7. The packagers should be notified on the salt-packagers mailing list so they can create packages for all the major operating systems. (note that release candidates should go in the testing repositories)
8. After the packagers have been given a few days to compile the packages, the release is announced on the salt-users mailing list.
9. Log into RTD and add the new release there. (Have to do it manually)

Maintenance and Bugfix Releases

Once a release has been cut, regular cherry-picking sessions should begin to cherry-pick any bugfixes from the develop branch to the release branch (e.g. 0.16). Once major bugs have been fixes and cherry-picked, a bugfix release can be cut:

1. On the release branch (i.e. 0.16), create an annotated tag for the revision release. It should be preceded by the letter v. (e.g. v0.16.2) Release candidates are unnecessary for bugfix releases.
2. The release should be packaged from this annotated tag and uploaded to PyPI.
3. The packagers should be notified on the salt-packagers mailing list so they can create packages for all the major operating systems.
4. After the packagers have been given a few days to compile the packages, the release is announced on the salt-users mailing list.

Cherry-Picking Process for Bugfixes

Bugfixes should be made on the develop branch. If the bug also applies to the current release branch, then on the pull request against develop, the user should mention @basep1 and ask for the pull request to be cherry-picked. If it is verified that the fix is a bugfix, then the Bugfix -- Cherry-Pick label will be applied to the pull request. When those commits are cherry-picked, the label will be switched to the Bugfix -- [Done] Cherry-Pick label. This allows easy recognition of which pull requests have been cherry-picked, and which are still pending to be cherry-picked. All cherry-picked commits will be present in the next release.

Features will not be cherry-picked, and will be present in the next feature release.
34.24.5 Salt Coding Style

Salt is developed with a certain coding style, while the style is dominantly PEP 8 it is not completely PEP 8. It is also noteworthy that a few development techniques are also employed which should be adhered to. In the end, the code is made to be “Salty”.

Most importantly though, we will accept code that violates the coding style and KINDLY ask the contributor to fix it, or go ahead and fix the code on behalf of the contributor. Coding style is NEVER grounds to reject code contributions, and is never grounds to talk down to another member of the community (There are no grounds to treat others without respect, especially people working to improve Salt)!!

Linting

Most Salt style conventions are codified in Salt's .pylintrc file. This file is found in the root of the Salt project and can be passed as an argument to the pylint program as follows:

```
pylint --rcfile=/path/to/salt/.pylintrc salt/dir/to/lint
```

Strings

Salt follows a few rules when formatting strings:

Single Quotes

In Salt, all strings use single quotes unless there is a good reason not to. This means that docstrings use single quotes, standard strings use single quotes etc.:

```python
def foo():
    '''
    A function that does things
    '''
    name = 'A name'
    return name
```

Formatting Strings

All strings which require formatting should use the `format` string method:

```python
data = 'some text'
more = '{0} and then some'.format(data)
```

Make sure to use indices or identifiers in the format brackets, since empty brackets are not supported by python 2.6. Please do NOT use printf formatting.

Docstring Conventions

Docstrings should always add a newline, docutils takes care of the new line and it makes the code cleaner and more vertical:

GOOD:
def bar():
    
    Here lies a docstring with a newline after the quotes and is the salty way to handle it! Vertical code is the way to go!
    
    return

BAD:

def baz():
    
    '''This is not ok!!'''
    
    return

When adding a new function or state, where possible try to use a `versionadded` directive to denote when the function or state was added.

def new_func(msg=' '):
    
    .. versionadded:: 0.16.0

    Prints what was passed to the function.

    msg : None
        The string to be printed.
    
    print msg

If you are uncertain what version should be used, either consult a core developer in IRC or bring this up when opening your pull request and a core developer will add the proper version once your pull request has been merged. Bugfixes will be available in a bugfix release (i.e. 0.17.1, the first bugfix release for 0.17.0), while new features are held for feature releases, and this will affect what version number should be used in the `versionadded` directive.

Similar to the above, when an existing function or state is modified (for example, when an argument is added), then under the explanation of that new argument a `versionadded` directive should be used to note the version in which the new argument was added. If an argument's function changes significantly, the `versionchanged` directive can be used to clarify this:

def new_func(msg=' ', signature=' '):
    
    .. versionadded:: 0.16.0

    Prints what was passed to the function.

    msg : None
        The string to be printed. Will be prepended with 'Greetings! '.
    
    .. versionchanged:: 0.17.1

    signature : None
        An optional signature.
    
    .. versionadded 0.17.0
    
    print 'Greetings! {0}\n\n{1}'.format(msg, signature)
Dictionaries

Dictionaries should be initialized using {} instead of dict().
See here for an in-depth discussion of this topic.

Imports

Salt code prefers importing modules and not explicit functions. This is both a style and functional preference. The functional preference originates around the fact that the module import system used by pluggable modules will include callable objects (functions) that exist in the direct module namespace. This is not only messy, but may unintentionally expose code python libs to the Salt interface and pose a security problem.

To say this more directly with an example, this is GOOD:

```python
import os
def minion_path():
    path = os.path.join(self.opts['cachedir'], 'minions')
    return path
```

This on the other hand is DISCOURAGED:

```python
from os.path import join
def minion_path():
    path = join(self.opts['cachedir'], 'minions')
    return path
```

The time when this is changed is for importing exceptions, generally directly importing exceptions is preferred:

This is a good way to import exceptions:

```python
from salt.exceptions import CommandExecutionError
```

Absolute Imports

Although absolute imports seems like an awesome idea, please do not use it. Extra care would be necessary all over salt's code in order for absolute imports to work as supposed. Believe it, it has been tried before and, as a tried example, by renaming salt.modules.sysmod to salt.modules.sys, all other salt modules which needed to import sys would have to also import absolute_import, which should be avoided.

Vertical is Better

When writing Salt code, vertical code is generally preferred. This is not a hard rule but more of a guideline. As PEP 8 specifies, Salt code should not exceed 79 characters on a line, but it is preferred to separate code out into more newlines in some cases for better readability:

```python
import os

os.chmod(
    os.path.join(self.opts['sock_dir'],
        'minion_event_pub.ipc'),
    34.24)
```
Where there are more line breaks, this is also apparent when constructing a function with many arguments, something very common in state functions for instance:

```python
def managed(name,
            source=None,
            source_hash='',
            user=None,
            group=None,
            mode=None,
            template=None,
            makedirs=False,
            context=None,
            replace=True,
            defaults=None,
            env=None,
            backup='',
            **kwargs):
```

**Note:** Making function and class definitions vertical is only required if the arguments are longer than 80 characters. Otherwise, the formatting is optional and both are acceptable.

---

**Line Length**

For function definitions and function calls, Salt adheres to the PEP-8 specification of at most 80 characters per line. Non function definitions or function calls, please adopt a soft limit of 120 characters per line. If breaking the line reduces the code readability, don’t break it. Still, try to avoid passing that 120 characters limit and remember, vertical is better... unless it isn’t

---

**Indenting**

Some confusion exists in the python world about indenting things like function calls, the above examples use 8 spaces when indenting comma-delimited constructs.

The confusion arises because the pep8 program INCORRECTLY flags this as wrong, where PEP 8, the document, cites only using 4 spaces here as wrong, as it doesn't differentiate from a new indent level.

Right:

```python
def managed(name,
            source=None,
            source_hash='',
            user=None)
```

WRONG:

```python
def managed(name,
            source=None,
            source_hash='',
            user=None)
```
Lining up the indent is also correct:

```python
def managed(name,
source=None,
source_hash=''
user=None)
```

This also applies to function calls and other hanging indents.

pep8 and Flake8 (and, by extension, the vim plugin Syntastic) will complain about the double indent for hanging indents. This is a known conflict between pep8 (the script) and the actual PEP 8 standard. It is recommended that this particular warning be ignored with the following lines in ~/.config/flake8:

```plaintext
[flake8]
ignore = E226,E241,E242,E126
```

Make sure your Flake8/pep8 are up to date. The first three errors are ignored by default and are present here to keep the behavior the same. This will also work for pep8 without the Flake8 wrapper -- just replace all instances of `flake8` with `pep8`, including the filename.

**Code Churn**

Many pull requests have been submitted that only churn code in the name of PEP 8. Code churn is a leading source of bugs and is strongly discouraged. While style fixes are encouraged they should be isolated to a single file per commit, and the changes should be legitimate, if there are any questions about whether a style change is legitimate please reference this document and the official PEP 8 (http://legacy.python.org/dev/peps/pep-0008/) document before changing code. Many claims that a change is PEP 8 have been invalid, please double check before committing fixes.
See the version numbers page for more information about the version numbering scheme.

### 35.1 Latest Stable Release

*Salt 2015.8.0 Release Notes - Codename Beryllium*

### 35.2 Previous Releases

#### 35.2.1 Salt 2015.8.0 Release Notes - Codename Beryllium

**2015.8.0 Detailed Change List**

Extended changelog courtesy of Todd Stansell ([https://github.com/tjstansell/salt-changelogs](https://github.com/tjstansell/salt-changelogs))

*Generated at: 2015-09-09T18:15:43Z*

This list includes all pull requests merged into the 2015.8 branch between the forking of the branch from develop and the release of 12015.8.0.

**Statistics:**

- Total Merges: 682
- Total Issue references: 342
- Total PR references: 866

**Pull Requests:**

- #26993: *(whiteinge)* Backport #26975
- #26970: *(cachedout)* Revert `"better path query parsing in fileserver"
- #26980: *(terminalmage)* Use human-readable cachedirs for gitfs-backed winrepo
- #26969: *(TheBigBear)* URL of salt windows downloads has changed
- #26968: *(TheBigBear)* URL of salt windows downloads has changed
- #26958: *(s0undt3ch)* Bradthuber bootstrap command line help doc update
- #26949: *(rallytime)* Back-port #25148 to 2015.8
- #26914: (cro) Add salt-proxy script and manpage to setup.py so they will get installed.
- #26909: (terminalmage) Don’t try to git clone from /tmp on Windows
- #26910: (s0undt3ch) Sometimes the event system is just too fast
- #26905: (s0undt3ch) Exit the loop if run_once is true
- #26897: (msteed) spm file hash part dekus
- #26900: (s0undt3ch) If no tag is passed, don’t actually subscribe to anything.
- #26880: (s0undt3ch) Restore backwards compatibility to salt.utils.event
- #26896: (msteed) spm remove: use pkgfiles to calculate file hashes
- #26891: (jtand) Fixed an unboundlocalerror
- #26892: (cachedout) Make the testing ioloop the current one
- #26886: (jtand) Gets the azure version correctly on python-azure 1.0.0
- #26870: (rallytime) Back-port #26834 to 2015.8
- #26865: (dmurphy18) Fix apt preferences for apts, repos for pbuilder building for Debian
- #26873: (terminalmage) Properly handle getting local config values in older git versions
- #26869: (rallytime) Fix provider --> driver change for salt-cloud lxc
- #26858: (terminalmage) Fix a couple version checks for git state and execution module
- #26853: (UtahDave) Fix salt-cloud on windows
- #26852: (basepi) [2015.8] Only reference msgpack if it imported successfully
- #26835: (terminalmage) Backport #26572 to 2015.8
- #26836: (jacobhammons) Added rst source for salt-proxy man page, added build and copy lines ...
- #26818: (terminalmage) Support empty repositories in git.latest
- #26819: (rallytime) Make sure we’re calling _validate_name in the correct place in 2015.8 Linode driver
- #26841: (l2ol33rt) Fix reference before assignment in sqs engine
- #26822: (terminalmage) Add some missing imports for masterless winrepo
- #26831: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
- #26826: (techhat) Pass a package name to unregister_file()
- #26757: (cachedout) Fix various filehandle leaks
- #26816: (gtmanfred) rev defaults to HEAD
- #26801: (jacobhammons) Added doc for dockerng minion configuration options
- #26808: (anlutro) Fix git init argument formatting
- #26807: (terminalmage) Move salt.utils.itersplit() to salt.utils.iterutils.split()
- #26796: (jacobhammons) Add doc for __states__
- #26764: (sjorge) salt.utils.is_proxy() is no longer always true on SunOS/Illumos/SmartOS
- #26772: (sjorge) pull in smartos `virt` module from develop
- #26726: (terminalmage) Redact HTTPS Basic Auth in states/funcs which deal with git remotes
- #26769: (terminalmage) Use --track to set tracking branch on older git versions
• #26765: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #26761: (sjorge) fix SPM paths on smartos/illumos esky
• #26751: (terminalmage) Fixes for masterless winrepo
• #26745: (rallytime) Make sure pyrax configs are in place before checking for deps
• #26746: (rallytime) Make sure nova configs are set before checking for dependencies
• #26750: (basepi) [2015.8] Add __utils__ to state modules
• #26752: (cro) Fix typo in some diagram labels
• #26747: (basepi) [2015.8] Add __states__ to state modules, for cross-calling states
• #26744: (basepi) [2015.8] Fix issue from #26717
• #26737: (dmurphy18) Fix to allow for package naming other than just salt
• #26742: (rallytime) Only warn about vsphere deprecation if vsphere is configured
• #26733: (sjorge) Refactor of smartos_vmadm module
• #26735: (s0und3ch) Add .hg and .cvs to spm_build_exclude
• #26720: (UtahDave) Updates for winrepo in 2015.8 to support jinja, while maintaining backwards compat
• #26719: (jodv) Backport 26532 to 2015.8
• #26721: (rallytime) Linode Driver Cleanup
• #26707: (techhat) Add top_level_dir to FORMULAs
• #26723: (s0und3ch) Handle SPM paths in the setup script
• #26717: (basepi) [2015.8] Revert loader changes from #26645
• #26712: (techhat) Move SPM paths around
• #26680: (TheBigBear) add more python libs info in `--versions-report`
• #26716: (terminalmage) Allow git identity to be a list
• #26691: (garethgreenaway) Fixes to ipset module for 2015.8
• #26701: (kev009) Ignore the first element of kern.disks split, which is the sysctl name (new disks grain)
• #26678: (terminalmage) Restructure git.latest rewrite to work better when following HEAD
• #26679: (rallytime) Back-port #26661 to 2015.8
• #26684: (techhat) Add reactor formulas to spm
• #26682: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #26671: (rallytime) Warn users if cloud driver dependencies are missing.
• #26674: (rallytime) Back-port #26583 to 2015.8
• #26670: (techhat) Set up SPM to install -conf packages
• #26657: (jfindlay) top file compilation fixes
• #26659: (TheBigBear) minor doc edits - spelling
• #26654: (jfindlay) merge `#26650`
• #26657: (jtand) Added git version check to git module
• #26649: (twangboy) Fixed Lint for real in win_repo.py

35.2. Previous Releases 2019
#26608: (jacobhammons) 2015.8.0 release notes and doc/conf.py updates

#26646: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8

#26645: (rallytime) Back-port #26390 to 2015.8

#26642: (twangboy) Added function to render winrepo Jinja

#26625: (twangboy) Correctly detect packages with no version, docs

#26575: (msteed) Update spm for integration into raas

#26635: (cro) Don't report windows as a proxy.

#26622: (rallytime) [2015.8] Also add -Z to script args for cloud tests

#26619: (rallytime) Apply cloud test fixes from 2015.5 to 2015.8

#26603: (terminalmage) Fixes for git.latest, git module integration tests, etc.

#26577: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8

#26534: (cachedout) Bump required Tornado version to 4.2.1

#26566: (cachedout) Don't stacktrace trying to publish without a master

#26541: (terminalmage) Make winrepo execution module use the same code as the runner

#26530: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8

#26570: (cachedout) Fix haproxy docs to be valid

#26562: (cachedout) Fix suprious error message with systemd-detect

#26557: (jfindlay) add docs to #26550

#26544: (nmadhok) Do not raise KeyError when calling avail_images if VM/template is in disconnected state

#26501: (terminalmage) Update git_pillar docs, add git.list_worktrees function

#26521: (terminalmage) Work around upstream git bug when cloning repo as root

#26518: (krak3n) Fix for "#25492"_

#26514: (evverx) Unmask a runtime masked services too

#26529: (mnalt) bugfix: fix service.enable for missing rc.conf

#26516: (techhat) Move more path operations into SPM loader

#26533: (cachedout) Fix too aggressive even init check

#26522: (cro) Do not load package provider if its not a proxy

#26531: (cachedout) Fix failing event tests and modify event init

#26433: (cro) Add support for default proxy config options, change default location of proxy config and log to /etc/salt/proxy and /var/log/proxy

#26504: (nmadhok) [Backport] Adding ability to specify the virtual hardware version when creating VM

#26517: (cachedout) Better fix for opensuse tornado httpclient

#26479: (rallytime) Don't allow VMs with duplicate names to be created in EC2/AWS

#26488: (cachedout) Don't pass unsupported kwarg to tornado

#26451: (terminalmage) Use `rpm -qa` instead of repoquery to list installed packages

#26491: (jacobhammons) doc site css fix for tiny fonts that appeared in code or pre tags in ...
• #26442: (rallytime) Hide API Key from debug logs for Linode Driver
• #26441: (rallytime) Refactor a few linode functions to be useful with salt-cloud command
• #26485: (s0undt3ch) One more missed typo
• #26495: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #26492: (cachedout) Fix schedule test error on py26
• #26489: (cachedout) Fixing more tarfile tests on py2.6
• #26475: (cachedout) Better object checking on asyncreq cleanup
• #26477: (cachedout) Fix integration.modules.git.GitModuleTest.test_archive on py26
• #26469: (jtand) --annotate and --message aren't valid options in older versions of git.
• #26439: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #26464: (rallytime) Back-port #26456 to 2015.8
• #26463: (rallytime) Back-port #26455 to 2015.8
• #26449: (s0undt3ch) The CLI options are not meant to include underscores.
• #26270: (sjorge) salt.modules.network now supports SmartOS and SunOS < Solaris 11
• #26436: (TheBigBear) minor edits
• #26410: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #26427: (anlutro) git.latest with no rev: fix concatenation error (NoneType and str)
• #26307: (cachedout) Fix bug in top file ordering
• #26428: (cro) Update docs to reflect new pillar structure
• #26429: (cachedout) Add release note regarding tcp transport on freebsd
• #26418: (driskell) Fix forward-merged caching from 2015.5 into 2015.8 to be compatible with the new match_func
• #26252: (DmitryKuzmenko) Issues/24048 http client 2015.8
• #26413: (evverx) Fix service.[start,restart,reload,force-reload] for masked services
• #26393: (dmurphy18) Added option parameters to make_repo to allow for configuration settings
• #26422: (TheBigBear) no dots in SLS filename __AND__ any directories (incl git repos)
• #26323: (0xf10e) Fix Credentials used in glance Exec Module
• #26341: (terminalmage) Rewrite git state and execution modules
• #26419: (terminalmage) Only use pygit2.errors if it exists
• #26423: (ellasp) doc - Correct function name for peer configuration
• #26401: (cachedout) Adapt proxy minion to tornado (w/lint)
• #26400: (rallytime) Back-port #26318 to 2015.8
• #26397: (s0undt3ch) A single isinstance() check for all types is enough
• #26385: (gtmanfred) don't require volume endpoint in nova driver
• #26287: (techhat) Break out SPM components into loaders
• #26384: (TheBigBear) Fix shell quoting for cmd.run
• #26391: (rallytime) Back-port #26367 to 2015.8
• #26383: (rallytime) Allow the creation of a VM without a profile
• #26375: (s0undt3ch) [2015.8] Schema DictItem required attribute fixes
• #26363: (garethgreenaway) Fixes to mount state 2015.8
• #26347: (0xf10e) Load `pkgng` as `pkg` on FreeBSD 9 when providers:pkg == `pkgng`
• #26361: (TronPaul) sign security token
• #26346: (TronPaul) Fix s3 using IAM credentials
• #26331: (mnalt) fix bug in sysrc to allow for empty rc variables
• #26334: (rallytime) Call salt.utils.cloud.bootstrap in GCE Driver provisioning
• #26308: (dmurphy18) Support for environment overrides building packages
• #26279: (TheScriptSage) Merge changes for pull `#26083`_ and pull `#25632`_ into 2015.8
• #26224: (cachedout) Cleanup of a few cases to move to salt.utils.fopen
• #26260: (nmadhok) Correct spelling of integration in docs
• #26226: (rallytime) Fix `#25463`_
• #26248: (nmadhok) Initial commit of unit tests for vmware cloud driver
• #26228: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #26244: (nmadhok) Backport additions to VMware cloud driver from develop to 2015.8 branch
• #26235: (sjorge) salt.utils.is_smartos_zone, inverse of is_smartos_globalzone
• #26221: (sjorge) SmartOS grain fixes
• #26218: (terminalmage) Add warning about file.recurse unicode errors with vim swap files.
• #26214: (rallytime) Back-port #24878 to 2015.8
• #26211: (techhat) Move SPM to its own directory
• #26197: (TronPaul) Fix GitFS when whitelisting base
• #26200: (anlutro) Make it possible to run salt-cloud as current user
• #26201: (kev009) Avoid VBOX storage emulation bugs in FreeBSD disks grain
• #26188: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #26194: (basepi) Allow virtual grains to be generated even if virt-what is not available
• #26176: (rallytime) Back-port #26165 to 2015.8
• #26169: (terminalmage) Fix attribute error in gitsf's find_file functions
• #26170: (nmadhok) [Backport] Make sure variable is a dictionary before popping something from it.
• #26143: (nmadhok) VMware cloud driver fixes [forward port from 2015.5 into 2015.8]
• #26173: (jacobhammons) Updates to cloud docs for the provider > driver change
• #26125: (evverx) Use timedatectl set-timezone to tzsetting if available
• #26145: (sjorge) smartos_imgadm cleanup
• #26148: (terminalmage) Refactor winrepo support
• #26128: (sjorge) imgadm.avail should return multiple results
• #26109: (jfindlay) fix quote indent
• #26089: (anlutro) User state/module: fix coercion of None into string `"None" in GECOS
• #26081: (cachedout) Move invocation routine up
• #26086: (rallytime) Back-port #26019 to 2015.8
• #26087: (rallytime) Back-port #26059 to 2015.8
• #26052: (tjand) Rh_ip fix
• #26078: (cachedout) Fix missing key in error return
• #26074: (basepi) [2015.8] Re-apply #25358 in 2015.8
• #26069: (jfindlay) fix win_firewall.delete_rule
• #26066: (s0und3ch) [2015.8] Update to latest bootstrap stable release v2015.06.08
• #26049: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #26026: (anlutro) Fix htpasswd result false positive in test mode
• #26037: (rallytime) Back-port #25489 to 2015.8
• #26004: (techhat) Allow updating a single SPM repo at a time
• #26012: (cachedout) Merge kwargs into opts for tcp client
• #26007: (anlutro) file.managed: wrap os.remove in if isfile, don't remove on success
• #26009: (terminalmage) Add winrepo and dockerng information to 2015.8.0 release notes
• #26006: (basepi) Revert #25727 in favor of #25645
• #26001: (cachedout) Fix failing tests
• #25978: (anlutro) Correct service state changes in test mode
• #25982: (sjorge) salt.modules.smartos_* limit to global zone only
• #25989: (rallytime) Back-port #25832 to 2015.8
• #25988: (cachedout) Move #25642 to 2015.8
• #25999: (s0und3ch) Include subschema defaults
• #25997: (s0und3ch) Allow getting a defaults dictionary from schema defaults
• #25979: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #25902: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
• #25956: (anlutro) Fix user argument to cron functions
• #25946: (sjorge) Fix for salt.utils.decorators under esky
• #25957: (anlutro) Remove temporary file after file.managed with checkcmd
• #25874: (rallytime) Back-port #25668 to 2015.8
• #25929: (sjorge) salt.module.pkgin's __virtual__() should not return None if pkg_info is not present
• #25952: (garethgreenaway) Log when event.fire and event.fire_master fail 2015.8
• #25944: (sjorge) Smartos libcrypto nonesky fix
• #25906: (dmurphy18) Cherry-pick of pkgbuild changes from develop branch
• #25925: (sjorge) Create default log location in smartos esky buildscript
• #25928: (cachedout) Fix stacktrace for non-existant states
• #25922: (jackson) Correct max_wait -> max_auth_wait in MultiMinion
• #25907: (rallytime) Back-port #25892 to 2015.8
• #25910: (terminalmage) Pass osarch to check_32()
• #25849: (basepi) Repress template error for GPG renderer (can't seek an OrderedDict)
• #25868: (rallytime) Back-port #25404 to 2015.8
• #25896: (cachedout) Lint
• #25876: (jackson) Fixes for 2015.8
• #25867: (rallytime) Back-port #25370 to 2015.8
• #25845: (jacobhammons) updated versionadded
• #25836: (jackson) Keep track of SyncWrapper's IOLoop usage
• #25859: (0xf10e) warn_until(Carbon,...) instead of Boron
• #25505: (0xf10e) Glance state module for 2015.8 "Beryllium"
• #25843: (jtand) Fixed a lint error in parsers.py
• #25835: (techhat) spm update_repo doesn't always require arguments
• #25837: (jacobhammons) regenerated man pages
• #25830: (sjorge) Loading of libcrypto on smartos esky fixed
• #25808: (jfindlay) add highstate opts to config/__init__.py, update docs
• #25820: (sjorge) Prerequisite to fix the smartos libcrypto loading
• #25781: (anlutro) Fix iptables.build_rule
• #25764: (gtmanfred) allow use of cloudnetworks in ssh_interface
• #25736: (jfindlay) insert explicit formatter number
• #25742: (rallytime) Back-port #25731 to 2015.8
• #25741: (rallytime) Back-port #25727 to 2015.8
• #25712: (cachedout) Fix outputter for state.apply
• #25698: (rallytime) Back-port #25659 to 2015.8
• #25690: (anlutro) Fix highstate duration alignment (again)
• #25684: (davidjb) Fix doc around Include/Exclude for states
• #25549: (techhat) Switch Scaleway to salt.utils.cloud.bootstrap()
• #25667: (jfindlay) add 2015.8.0rc2 autogenerated changelog
• #25653: (anlutro) Properly align highstate duration sum
• #25663: (rallytime) Back-port #25638 to 2015.8
• #25639: (terminalmage) Don't do pre-flight check on git_pillar if it is not configured
• #25587: (cachedout) Fix prereq in salt.state
• #25628: (anlutro) Highstate output: show duration in seconds instead of milliseconds when appropriate
• #25631: (basepi) Remove trailing whitespace
- #25627: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
- #25626: (basepi) Fix the highstate outputer if `duration` is not present
- #25601: (terminalmage) Fix error message when local bin pkg path is not absolute
- #25595: (terminalmage) Bring git_pillar up to feature parity with gitfs
- #25619: (cachedout) Lint stateconf changes
- #25578: (davidjb) Allow parent relative includes in state files
- #25610: (s0undt3ch) [2015.8] Update the bootstrap script to latest release v2015.07.22
- #25599: (jfindlay) fix transport settings in #25596
- #25596: (jfindlay) Tcp test
- #25591: (garethgreenaway) Return data for scheduled jobs in 2015.8 default to True.
- #25588: (basepi) Fix some of the retcode work from #23105
- #25583: (jtand) Fixed lint error where pprint wasn't imported.
- #25572: (rallytime) Back-port #25570 to 2015.8
- #25575: (rallytime) Make Sure Scaleway driver works with deprecation paths
- #25564: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
- #25566: (techhat) Fix download process for SPM repo updates
- #25553: (techhat) Switch SoftLayer to salt.utils.cloud.bootstrap()
- #25552: (techhat) Update pricing for SoftlayerHW
- #25547: (techhat) Switch Parallels to salt.utils.cloud.bootstrap()
- #25548: (techhat) Switch Proxmox to salt.utils.cloud.bootstrap()
- #25543: (techhat) Switch GCE to salt.utils.cloud.bootstrap()
- #25546: (techhat) Switch CloudStack to salt.utils.cloud.bootstrap()
- #25558: (cachedout) Lint config_test
- #25515: (s0undt3ch) salt.utils.schema fixes
- #25514: (garethgreenaway) fixes to schedule.add documentation in 2015.8
- #25508: (s0undt3ch) [2015.8] Update bootstrap script to latest stable release, v2015.07.17
- #25501: (basepi) Add optional job end time to the local_cache returner
- #25491: (s0undt3ch) Let's call it for what it is!
- #25462: (rallytime) Wrap is_profile_configured calls in try/except block
- #25439: (rallytime) Reduce digital_ocean API call frequency
- #25451: (s0undt3ch) Salt-SSH Scan roster bugfixes (And Py3 support)
- #25449: (rizarowski) Exclude dotfiles and directories from minion key lists (Fixes `#25448`)
- #25421: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
- #25412: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
- #25415: (bechitold) [docs] declare YAML as code block
- #25407: (rallytime) Back-port #23236 to 2015.8
2026 Chapter 35. Release notes

- #25409: (rallytime) Back-port #24422 to 2015.8
- #25394: (rallytime) Back-port #25355 to 2015.8
- #25393: (rallytime) Back-port #25289 to 2015.8
- #25387: (cachedout) Lint #25319
- #25319: (ruzarowski) [cloud:EC2] Move SourceDest logic to _update_enis and add alias for delete_interface_on_terminate
- #25310: (anlutro) Add an ```is list``` test to the jinja environment
- #25264: (ruzarowski) Fix AttributeError in fileserver update_opts
- #25372: (rallytime) Don't stacktrace when provisioning instances with softlayer* drivers
- #25315: (ruzarowski) [cloud:EC2] Move handling of AssociatePublicIpAddress to associate_eip/allocate_new_eip logic depending on value type
- #25312: (ruzarowski) [cloud:EC2] Introduce eni Name property to set name tag value after its creation
- #25311: (ruzarowski) [cloud:EC2] Add ability to attach an existing eni
- #25280: (rallytime) Remove deprecation warnings for Beryllium
- #25329: (twangboy) Fixed some documentation errors
- #25300: (s0undt3ch) Fix ordering issue & Added requirements support
- #25283: (jfndlay) ensure ret is always defined
- #25252: (jfndlay) make args optional with default values in win_firewall.delete_rule
- #25257: (notpeter) Document SourceDestCheck added in #25242.
- #25298: (twangboy) Continue if profile not found
- #25296: (twangboy) Fixed file.comment for windows
- #25254: (rallytime) Change version added/changed references from Beryllium to 2015.8.0
- #25285: (thusoy) Remove error logging of missing victorops keys
- #25266: (ruzarowski) cloud: EC2 eni property SourceDestCheck is a AttributeBooleanValue
- #25216: (jfndlay) replace shell code with native python code
- #25278: (rallytime) Don't require size for all cloud drivers when checking profile configs
- #25271: (basepi) [2015.8] Merge forward from 2015.5 to 2015.8
- #25263: (techhat) Allow non-standard HTTP requests on tornado
- #25253: (s0undt3ch) Remove the deprecation warning. The driver has been renamed.
- #25248: (techhat) Do not resize while iterating
- #25244: (rallytime) Remove parted deprecations and fix failing tests
- #25242: (ruzarowski) Make SourceDestCheck flag available to network interface definition
- #25226: (nmadhok) Backporting fix for issue `#25223` on 2015.8 branch
- #25234: (krak3n) Fix: Bug in boto_asg state argument passing to boto_asg module
- #25222: (rallytime) Back-port #25219 to 2015.8
- #25188: (rallytime) Use linode status descriptions instead of ints when logging status to CLI
- #25203: (s0undt3ch) Added DictConfig with tests & More tests
The 2015.8.0 feature release of Salt contains several major new features. As usual the release notes are not exhaustive and primarily include the most notable additions and improvements. Hundreds of bugs have been fixed and many modules have been substantially updated and added.

New SaltStack Installation Repositories

SaltStack now provides installation repositories for several platforms, with more to come. See the following links for instructions:

- Red Hat / CentOS 5, 6, 7
- Debian 8
- Windows
- FreeBSD

Send Event on State Completion

A *fire_event* global state keyword argument was added that allows any state to send an event upon completion. Useful for custom progress bars and checking in on long state runs. See *fire_event*.

ZeroMQ socket monitoring

If *zmq_monitor* is enabled, log all ZMQ events for socket monitoring purposes. Verbose, but useful.

SPM (Salt Package Manager)

Allows Salt formulas to be packaged for ease of deployment. See *spm*.

Specify a Single Environment for Top Files

A new *default_top* option was added to load the state top file from a single, specific environment, rather than merging top data across all environments. Additionally, new *top_file_merge_strategy* and *env_order* options were added for more control over top file merging. See *The Top File*. 

---

35.2. Previous Releases

---

2027
Tornado TCP Transport

Implemented a pure-TCP transport, in addition to ZeroMQ and RAET. The new transport uses Tornado, which allows Salt to use a standardized set of libraries for asynchronous behavior, which should greatly improve reliability and performance.

Note: Tornado is considered experimental in this release. The following known issues were being investigated at the time of release:

- TCP tests show performance degradation over time (issue 26051)
- TCP transport stacktrace on windows minion: Future exception was never retrieved (issue 25718)
- [freebsd] TCP transport not working in 2015.8.0rc3 (issue 26364)

Proxy Minion Enhancements

Proxy Minions have undergone a significant overhaul in 2015.8, see Proxy Minion Enhancements.

Core Changes

- Add system version info to versions_report, which appears in both salt --versions-report and salt '*' test.versions_report. Also added is an alias test.versions to test.versions_report (issue 21906)
- Add colorized console logging support. This is activated by using ‘%(colorlevel)s, %(colormsg)s, %(colorprocess)s, %(colorname)s’ in log_fmt_console in the config file for any of salt-master, salt-minion, and salt-cloud.

Git Pillar

The git external pillar has been rewritten to bring it up to feature parity with gitfs. Support for pygit2 has been added, bringing with it the ability to access authenticated repositories.

Using the new features will require updates to the git ext_pillar configuration, further details can be found in the pillar.git_pillar docs.

Salt Cloud Improvements

- Pricing data from several cloud providers (GCE, DigitalOcean, SoftLayer_HW, EC2)
- All cloud providers now use standardized bootstrapping code.
- Modified the Linode Salt Cloud driver to use Linode's native API instead of depending on apache-libcloud or linode-python.

Salt Cloud Changes

- Changed the default behavior of rename_on_destroy to be set to True in the EC2 and AWS drivers.
- Changed the default behavior of the EC2 and AWS drivers to always check for duplicate names of VMs before trying to create a new VM. Will now throw an error similarly to other salt-cloud drivers when trying to create a VM of the same name, even if the VM is in the terminated state.
When querying for VMs in `digital_ocean.py`, the number of VMs to include in a page was changed from 20 (default) to 200 to reduce the number of API calls to Digital Ocean.Ocean.

### State and Execution Module Improvements

- New and improved Docker state and execution modules (`state` and `execution module`).

### Git State and Execution Modules Rewritten

The git state and execution modules have gone through an extensive overhaul.

#### Changes in the `git.latest` State

- The `branch` argument has been added, allowing for a custom branch name to be used in the local checkout maintained by the `git.latest` state. This can be helpful in avoiding ambiguous refs in the local checkout when a tag is used as the `rev` argument. If no `branch` is specified, then the state uses the value of `rev` as the branch name.
- The `always_fetch` argument no longer has any effect, and will be removed in a future release. The state now detects whether or not a fetch is needed based on comparisons made between the local and remote repositories.
- The `force_fetch` argument has been added to force a fetch if the fetch is not a fast-forward (for instance, if someone has done a reset and force-pushed to the remote repository).
- The `remote_name` argument has been deprecated and renamed to `remote`.
- The `force` argument has been deprecated and renamed to `force_clone` to reduce ambiguity with the other `force` arguments.
- Using SHA1 hashes (full or shortened) in the `rev` argument is now properly supported.
- Non-fast-forward merges are now detected before the repository is updated, and the state will not update the repository if the change is not a fast-forward. Non-fast-forward updates must be overridden with the `force_reset` argument. If `force_reset` is set to `True`, the state will only reset the repository if it cannot be fast-forwarded. This is in contrast to the earlier behavior, in which a hard-reset would be performed every time the state was run if `force_reset` was set to `True`.
- A `git pull` is no longer performed by this state, dropped in favor of a fetch-and-merge (or fetch-and-reset) workflow.

**`git.config_unset` state added**  This state allows for configuration values (or entire keys) to be unset. See [here](#) for more information and example SLS.

**`git.config` State Renamed to `git.config_set`** To reduce confusion after the addition of `git.config_unset`, the `git.config` state has been renamed to `git.config_set`. The old config.get name will still work for a couple releases, allowing time for SLS files to be updated.

In addition, this state now supports managing multivar git configuration values. See [here](#) for more information and example SLS.

**Initial Support for Git Worktrees in Execution Module**  Several functions have been added to the execution module to manage `worktrees` (a feature new to Git 2.5.0). State support does not exist yet, but will follow soon.
New Functions in Git Execution Module

- `git.config_get_regexp`
- `git.config_unset`
- `git.is_worktree`
- `git.list_branches`
- `git.list_tags`
- `git.list_worktrees`
- `git.merge_base`
- `git.merge_tree`
- `git.rev_parse`
- `git.version`
- `git.worktree_rm`
- `git.worktree_add`
- `git.worktree_prune`

Changes to Functions in Git Execution Module

**git.add**

- `--verbose` is now implied when running the `git add` command, to provide a list of the files added in the return data.

**git.archive**

- Now returns `True` when the `git archive` command was successful, and otherwise raises an error.
- The `overwrite` argument has been added to prevent an existing archive from being overwritten by this function.
- The `fmt` argument has been deprecated and renamed to `format`.
- Trailing slash no longer implied in `prefix` argument, must be included if this argument is passed.

**git.checkout**

- The `rev` argument is now optional when using `-b` or `-B` in `opts`, allowing for a branch to be created (or reset) using HEAD as the starting point.

**git.clone**

- The `name` argument has been added to specify the name of the directory in which to clone the repository. If this option is specified, then the clone will be made within the directory specified by the `cwd`, instead of at that location.
- The `repository` argument has been deprecated and renamed to `url`. 


git.config_get

- The setting_name argument has been deprecated and renamed to key.
- The global argument has been added, to query the global git configuration
- The all argument has been added to return a list of all values for the specified key, allowing for all values in a multivar to be returned.
- The cwd argument is now optional if global is set to True

git.config_set

- The value(s) of the key being set are now returned
- The setting_name argument has been deprecated and renamed to key.
- The setting_value argument has been deprecated and renamed to value.
- The is_global argument has been deprecated and renamed to global.
- The multivar argument has been added to specify a list of values to set for the specified key. The value argument is not compatible with multivar.
- The add argument has been added to add a value to a key (this essentially just adds an --add to the git config command that is run to set the value).

git.fetch

- The force argument has been added to force the fetch when it is not a fast-forward. This could have been achieved in previous Salt versions by including --force in the opts argument, this argument is just for convenience and to match the usage of other functions with force arguments.
- The refspecs argument has been added to allow for one or more refspecs to be provided which override the one(s) specified by the remote.remote_name.fetch git configuration option.

git.ls_remote

- The repository argument has been deprecated and renamed to remote.
- The branch argument has been deprecated and renamed to ref.
- The opts argument has been added to allow for additional CLI options to be passed to the git ls-remote command.

git.merge

- The branch argument has been deprecated and renamed to rev.

git.status

- Return data has been changed from a list of lists to a dictionary containing lists of files in the modified, added, deleted, and untracked states.
**git.submodule**

- Added the `command` argument to allow for operations other than `update` to be run on submodules, and deprecated the `init` argument. To do a submodule update with `init=True` moving forward, use `command=update opts='--init'`.

- OpenStack Glance API V2 execution module
- Amazon VPC state module
- RallyDev execution module
- BambooHR execution module
- Stormpath execution, state modules
- Remove unused argument `timeout` in `jboss7.status`.
- Deprecate `enabled` argument in `pkgrepo.managed` in favor of `disabled`.
- Archive module changes: In the `archive.tar` and `archive.cmd_unzip` module functions, remove the arbitrary prefixing of the options string with `-`. An options string beginning with a `--long-option`, would have uncharacteristically needed its first `-` removed under the former scheme. Also, tar will parse its options differently if short options are used with or without a preceding `-`, so it is better to not confuse the user into thinking they’re using the non- `-` format, when really they are using the with- `-` format.

- Added `__states__` to state modules, for cross-calling states. This enables using existing states when writing custom states. See [cross calling states](#).

**Windows Improvements**

- Enhanced the windows minion silent installation with command line parameters to configure the salt master and minion name. See [Silent Installer Options](#).
- Improved user management with additional capabilities in the user module for Windows.
- Improved patch management with a new module for managing windows updates (`win_wua`).
- Turned on multi-processing by default for windows in minion configuration.

**Windows Software Repo Changes**

Several config options have been renamed to make their naming more consistent. For a list of the winrepo config options, see [here](#) for master config options, and [here](#) for configuration options for masterless Windows minions.

On the master, the `winrepo.update_git_repos` runner has been updated to use either `pygit2` or `GitPython` to checkout the git repositories containing repo data. If `pygit2` or `GitPython` is installed, existing winrepo git checkouts should be removed after upgrading to 2015.8.0, to allow them to be checked out again by running `winrepo.update_git_repos`.

This enhancement also brings new functionality, see the [Windows Software Repository](#) documentation for more information.

If neither `GitPython` nor `pygit2` are installed, then Salt will fall back to the pre-existing behavior for `winrepo.update_git_repos`, and a warning will be logged in the master log.

**Note:** Standalone Windows minions do not support the new `GitPython/pygit2` functionality, and will instead use the `git.latest` state to keep repositories up-to-date. More information on how to use the Windows Software Repo on a standalone minion can be found [here](#).
Win System Module

The unit of the `timeout` parameter in the `system.halt`, `system.poweroff`, `system.reboot`, and `system.shutdown` functions has been changed from seconds to minutes in order to be consistent with the Linux timeout setting. ([issue 24411](https://github.com/saltstack/salt/issues/24411)) Optionally, the unit can be reverted to seconds by specifying `in_seconds=True`.

Other Improvements

- Sanitize sensitive fields in `http.query`
- Allow authorization to be read from Django and eauth
- Add templating to SMTP returner
- New REST module for SDB
- Added `rest_timeout` config option and timeout argument to jobs api call
- Provide config options for Raet lane and road buffer count. (Useful for BSD kernels)
- Implemented ZeroMQ socket monitor for master and minion
- Add end time to master job cache for jobs (optional, off by default)
- Tornado is now the default backend for `http.request`
- Support `pillerenv` selection as it's done for `saltenv`
- `salt` was updated to use python-crypto version 2.6.1, which removes the dependency on python-m2crypto.

Deprecations

- The `digital_ocean.py` Salt Cloud driver was removed in favor of the `digital_ocean_v2.py` driver as DigitalOcean has removed support for APIv1. The `digital_ocean_v2.py` was renamed to `digital_ocean.py` and supports DigitalOcean's APIv2.
- The `vsphere.py` Salt Cloud driver has been deprecated in favor of the `vmware.py` driver.
- The `openstack.py` Salt Cloud driver has been deprecated in favor of the `nova.py` driver.
- The use of `provider` in Salt Cloud provider files to define cloud drivers has been deprecated in favor of using `driver`. Both terms will work until the Nitrogen release of Salt. Example provider file:

```bash
my-ec2-cloud-config:
id: 'HJGRYCLJLJKJYG'
key: 'kdjgfsqmwoormgl/aserigjksjhasdfgjn'
private_key: /etc/salt/my_test_key.pem
keyname: my_test_key
securitygroup: default
driver: ec2
```

- The use of `lock` has been deprecated and from `salt.utils.fopen`, `salt.utils.files.fopen` should be used instead.
- The following args have been deprecated from the `rabbitmq_vhost.present` state: `user`, `owner`, `conf`, `write`, `read`, and `runas`.
- The use of `runas` has been deprecated from the `rabbitmq_vhost.absent` state.
- Support for output in `mine.get` was removed. `--out` should be used instead.
• The use of `delim` was removed from the following functions in the `match` execution module: `pillar_pcre`, `pillar`, `grain_pcre`,

**Major Bug Fixes**

• Fixed minion failover to next master on DNS errors ([issue 21082](#))
• Fixed memory consumption in SaltEvents ([issue 25557](#))
• Don't lookup outside system path in which() util ([issue 24085](#))
• Fixed broken jobs rest api call ([issue 23408](#))
• Fixed stale grains data using in modules ([issue 24073](#))
• Added ssh_identities_only config flag for ssh-agent configured environments ([issue 24096](#))
• Fixed ```object has no attribute`` errors for Raet transport ([issue 21640](#))
• Flush event returners before master exit ([issue 22814](#))
• Fix `CommandExecutionError` in grains generation with `lspci` missing ([issue 23342](#))
• Fix salt-ssh against CentOS 7 when python-zmq not installed ([issue 23503](#))
• Fix salt-ssh issues related to out-of-date six module ([issue 20949](#))
• Fix salt-ssh thin generation after previous run was interrupted ([issue 24376](#))
• Use proper line endings on Windows with ```file.managed`` w/contents ([issue 25675](#))
• Fixed broken comment/uncomment functions in `file.py` ([issue 24620](#))
• Fixed problem with unicode when changing computer description ([issue 12255](#))
• Fixed problem with chocolatey module not loading ([issue 25717](#))
• Fixed problem adding users to groups with spaces in the name ([issue 25144](#))
• Fixed problem adding full name to user account ([issue 25206](#))
• Fixed gem module stack trace ([issue 21041](#))
• Fixed problem with `file.managed` when `test=True` ([issue 20441](#))
• Fixed problem with powershell hanging while waiting for user input ([issue 13943](#))
• Fixed problem where the salt-minion service would not consistently start ([issue 25272](#))
• Fixed problem where `pkg.refresh_db` would return True even when `winrepo.p` was not found ([issue 18919](#))
• Could someone please provide end to end example for Proxy Minion with REST ([issue 25500](#))
• Proxy minions stopped working between 2014.7 and 2015.5 ([issue 25053](#))
• Proxy minion documentation includes outdated code sample ([issue 24018](#))
• Proxy Minion documentation missing grains example ([issue 18273](#))
• Improve process management in proxy minion ([issue 12024](#))
• Proxy minion never comes up with message ```I am XXX and I am not supposed to start any proxies.``` ([issue 25908](#))
• Fixed an issue that caused an exception when using Salt mine from pillar. ([issue 11509](#))
35.2.2 Salt 2015.5.0 Release Notes - Codename Lithium

The 2015.5.0 feature release of Salt is focused on hardening Salt and mostly on improving existing systems. A few major additions are present, primarily the new Beacon system. Most enhancements have been focused around improving existing features and interfaces.

As usual the release notes are not exhaustive and primarily include the most notable additions and improvements. Hundreds of bugs have been fixed and many modules have been substantially updated and added.

**Warning:** In order to fix potential shell injection vulnerabilities in salt modules, a change has been made to the various `cmd` module functions. These functions now default to `python_shell=False`, which means that the commands will not be sent to an actual shell.

The largest side effect of this change is that ‘shellisms’, such as pipes, will not work by default. The modules shipped with salt have been audited to fix any issues that might have arisen from this change. Additionally, the `cmd` state module has been unaffected, and use of `cmd.run` in jinja is also unaffected. `cmd.run` calls on the CLI will also allow shellisms.

However, custom execution modules which use shellisms in `cmd` calls will break, unless you pass `python_shell=True` to these calls.

As a temporary workaround, you can set `cmd_safe: False` in your minion and master configs. This will revert the default, but is also less secure, as it will allow shell injection vulnerabilities to be written in custom code. We recommend you only set this setting for as long as it takes to resolve these issues in your custom code, then remove the override.

**Note:** Starting in this version of salt, `pillar_opts` defaults to False instead of True. This means that master opts will not be present in minion pillar, and as a result, `config.get` calls will not include master opts.

We recommend pillar is used for configuration options which need to make it to the minion.

**Beacons**

The beacon system allows the minion to hook into system processes and continually translate external events into the salt event bus. The primary example of this is the `inotify` beacon. This beacon uses inotify to watch configured files or directories on the minion for changes, creation, deletion etc.

This allows for the changes to be sent up to the master where the reactor can respond to changes.

**Sudo Minion Settings**

It is now possible to run the minion as a non-root user and for the minion to execute commands via sudo. Simply add `sudo_user: root` to the minion config, run the minion as a non-root user and grant that user sudo rights to execute `salt-call`.

**Lazy Loader**

The Lazy Loader is a significant overhaul of Salt’s module loader system. The Lazy Loader will lazily load modules on access instead of all on start. In addition to a major performance improvement, this ‘sandbox’ modules so a bad/broken import of a single module will only affect jobs that require accessing the broken module. ([issue: 20274)]

**Enhanced Active Directory Support**

The eauth system for LDAP has been extended to support Microsoft Active Directory out of the box. This includes Active Directory and LDAP group support for eauth.
Salt Documentation, Release 2015.8.0

Salt LXC Enhancements

The LXC systems have been overhauled to be more consistent and to fix many bugs. This overhaul makes using LXC with Salt much easier and substantially improves the underlying capabilities of Salt’s LXC integration.

Salt SSH

- Additional configuration options and command line flags have been added to configure the scan roster on the fly
- Added support for `state.single` in `salt-ssh`
- Added support for `publish.publish`, `publish.full_data`, and `publish.runner` in `salt-ssh`
- Added support for `mine.get` in `salt-ssh`

New Windows Installer

The new Windows installer changes how Salt is installed on Windows. The old installer used bbfreeze to create an isolated python environment to execute in. This made adding modules and python libraries difficult. The new installer sets up a more flexible python environment making it easy to manage the python install and add python modules.

Instead of frozen packages, a full python implementation resides in the bin directory (C:\salt\bin). By executing pip or easy_install from within the Scripts directory (C:\salt\bin\Scripts) you can install any additional python modules you may need for your custom environment.

The .exe's that once resided at the root of the salt directory (C:\salt) have been replaced by .bat files and should function the same way as the .exe's in previous versions.

The new Windows Installer will not replace the minion config file and key if they already exist on the target system. Only the salt program files will be replaced. C:\salt\conf and C:\salt\var will remain unchanged.

Removed Requests Dependency

The hard dependency on the requests library has been removed. Requests is still required by a number of cloud modules but is no longer required for normal Salt operations.

This removal fixes issues that were introduced with requests and salt-ssh, as well as issues users experienced from the many different packaging methods used by requests package maintainers.

Python 3 Updates

While Salt does not YET run on Python 3 it has been updated to INSTALL on Python 3, taking us one step closer. What remains is getting the test suite to the point where it can run on Python 3 so that we can verify compatibility.

RAET Additions

The RAET support continues to improve. RAET now supports multi-master and many bugs and performance issues have been fixed. RAET is much closer to being a first class citizen.
Modified File Detection

A number of functions have been added to the RPM-based package managers to detect and diff files that are modified from the original package installs. This can be found in the new pkg.modified functions.

Reactor Update

Fix an infinite recursion problem for runner/wheel reactor jobs by passing a `'user` (Reactor) to all jobs that the reactor starts. The reactor skips all events created by that username -- thereby only reacting to events not caused by itself. Because of this, runner and wheel executions from the runner will have user `"Reactor"` in the job cache.

Misc Fixes/Additions

- SDB driver for etcd. ([issue: 22043])
- Add `only_upgrade` argument to apt-based `pkg.install` to only install a package version if the package is already installed. (Great for security updates!)
- Joyent now requires a `keyname` to be specified in the provider configuration. This change was necessitated upstream by the 7.0+ API.
- Add `args` argument to `cmd.script_retcode` to match `cmd.script` in the `cmd` module. ([issue: 21122])
- Fixed bug where TCP keepalive was not being sent on the defined interval on the return port (4506) from minion to master. ([issue: 21465])
- LocalClient may now optionally raise SaltClientError exceptions. If using this class directly, checking for and handling this exception is recommended. ([issue: 21501])
- The SAuth object is now a singleton, meaning authentication state is global (per master) on each minion. This reduces sign-ins of minions from 3->1 per startup.
- Nested outputter has been optimized, it is now much faster.
- Extensive fileserver backend updates.

Deprecations

- Removed parameter keyword argument from `eselect.exec_action` execution module.
- Removed `runas` parameter from the following pip` execution module functions: `install, uninstall, freeze, list_, list_upgrades, upgrade_available, upgrade`. Please migrate to user.
- Removed `runas` parameter from the following pip state module functions: `installed, removed, up-to-date`. Please migrate to user.
- Removed `quiet` option from all functions in `cmdmod` execution module. Please use `output_loglevel=quiet` instead.
- Removed parameter argument from `eselect.set_state`. Please migrate to `module_parameter` or `action_parameter`.
- The `salt_events` table schema has changed to include an additional field called `master_id` to distinguish between events flowing into a database from multiple masters. If `event_return` is enabled in the master config, the database schema must first be updated to add the `master_id` field. This alteration can be accomplished as follows:

  ```sql
  ALTER TABLE salt_events ADD master_id VARCHAR(255) NOT NULL;
  ```

35.2. Previous Releases
Known Issues

- In multi-master mode, a minion may become temporarily unresponsive if modules or pillars are refreshed at the same time that one or more masters are down. This can be worked around by setting `auth_timeout` and `auth_tries` down to shorter periods.

35.2.3 Salt 2015.5.1 Release Notes

release 2015-05-20

Version 2015.5.1 is a bugfix release for 2015.5.0.

Changes:

- `salt.runners.cloud.action()` has changed the `fun` keyword argument to `func`. Please update any calls to this function in the cloud runner.

Extended Changelog Courtesy of Todd Stansell (https://github.com/tjstansell/salt-changelogs):

PR #23989: *(rallytime)* Backport #23980 to 2015.5 @ 2015-05-20T19:33:41Z
  - PR #23980: (iggy) template: jinja2 -> jinja | refs: #23989
  - 117ecb1 Merge pull request #23989 from rallytime/bp-23980
  - 8f8557c template: jinja2 -> jinja

PR #23988: *(rallytime)* Backport #23977 to 2015.5 @ 2015-05-20T19:13:36Z
  - PR #23977: (ionutbalautoiu) Fixed glance image_create | refs: #23988
  - d4f1ba0 Merge pull request #23988 from rallytime/bp-23977
  - 46fc7c6 Fixed glance image_create

PR #23986: *(basepi)* [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-20T18:41:33Z
  - PR #23967d Merge pull request #23986 from basepi/merge-forward-2015.5
  - 0b78156 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  - 314e4db Merge pull request #23965 from hvnsweeting/20147-fix-gitfs-gitpython-exception
  - 2576301 handle all exception gitpython can raise

PR #23985: *(UtahDave)* Add 2014.7.5-2 and 2015.5.0-2 Windows installer download links @ 2015-05-20T18:32:44Z
  - 9d1130e Merge pull request #23985 from UtahDave/2015.5local
  - 10338d0 Add links to Windows 2015.5.0-2 install downloads
  - b84f975 updated Windows 2014.7.5-2 installer download link

PR #23983: *(rallytime)* Version added tags for https_user and https_pass args new in 2015.5.0 @ 2015-05-20T18:05:27Z
  - ca7729d Merge pull request #23983 from rallytime/versionadded_git_options
  - 14ae22 Version added tags for https_user and https_pass args new in 2015.5.0

PR #23970: *(jayeshka)* adding system unit test case @ 2015-05-20T17:12:57Z
  - b06df57 Merge pull request #23970 from jayeshka/system-unit-test
• 89eb008 adding system unit test case
PR #23967: (jayeshka) adding states/memcached unit test case @ 2015-05-20T17:12:26Z
  • 38d5f75 Merge pull request #23967 from jayeshka/memcached-states-unit-test
  • 8ef240 adding states/memcached unit test case
PR #23966: (jayeshka) adding states/modjk unit test case @ 2015-05-20T17:11:48Z
  • 868e807 Merge pull request #23966 from jayeshka/modjk-states-unit-test
  • 422a964 adding states/modjk unit test case
PR #23942: (jacobhammons) Updates to sphinx saltstack2 doc theme @ 2015-05-20T15:43:54Z
  • 6316490 Merge pull request #23942 from jacobhammons/2015.5
  • 3102c8 Updates to sphinx saltstack2 doc theme
PR #23874: (joejulian) Validate keyword arguments to be valid @ 2015-05-20T04:53:40Z
  • ISSUE #23872: (joejulian) create_ca_signed_cert can error if dereferenced dict is used for args | refs: #23874
  • 587957b Merge pull request #23874 from joejulian/2015.5_tls_validate_kwargs
  • 30102c8 Fix py3 and ordering inconsistency problems.
  • 493f7ad Validate keyword arguments to be valid
PR #23960: (rallytime) Backport #22114 to 2015.5 @ 2015-05-20T04:37:09Z
  • PR #22114: (dmyerscough) Fixing KeyError when there are no additional pages | refs: #23960
  • 00c5c22 Merge pull request #23960 from rallytime/bp-22114
  • f3e1d63 Catch KeyError
  • 306b1ea Fixing KeyError
  • 6b2c6a2 Fix PEP8 complaint
  • 239e50f Fixing KeyError when there are no additional pages
PR #23961: (rallytime) Backport #23944 to 2015.5 @ 2015-05-20T04:35:41Z
  • PR #23944: (ryan-lane) Add missing loginclass argument to _changes call | refs: #23961
  • 4648b46 Merge pull request #23961 from rallytime/bp-23944
  • 970d19a Add missing loginclass argument to _changes call
PR #23948: (jfindlay) augeas.change state now returns changes as a dict @ 2015-05-20T04:00:10Z
  • 8cb5cd3 Merge pull request #23948 from jfindlay/augeas_changes
  • f09b8a0 augeas.change state now returns changes as a dict
PR #23957: (rallytime) Backport #23951 to 2015.5 @ 2015-05-20T03:04:24Z
  • PR #23951: (ryan-lane) Do not check perms in file.copy if preserve | refs: #23957
  • 2d185f7 Merge pull request #23957 from rallytime/bp-23951
  • 996b431 Update file.py
  • 85d461f Do not check perms in file.copy if preserve
  • PR #23956: (rallytime) Backport #23906 to 2015.5 @ 2015-05-20T03:04:14Z
Salt Documentation, Release 2015.8.0

- ISSUE #23839: (gladiatr72) wonky loader syndrome | refs: #23906
- ISSUE #23373: (tnypex) reactor/orchestrate race condition on salt['pillar.get'] | refs: #23906
- PR #23906: (gladiatr72) Added exception handler to trap the `RuntimeError` raised when | refs: #23956
  - 9d87fd3 add proper marker for format argument
  - 197688e Added exception handler to trap the `RuntimeError` raised when `Depends.enforce_dependency()` class method fires unsuccessfully. There appears to be no synchronization within the `Depends` decorator class wrt the class global `dependency_dict` which results in incomplete population of any loader instantiation occurring at the time of one of these exceptions.

- **PR #23955: (rallytime) Backport #19305 to 2015.5 @ 2015-05-20T03:03:55Z**
  - ISSUE #19852: (TaiSHiNet) DigitalOcean APIv2 can't delete machines when there is only 1 page | refs: #19305
  - ISSUE #19304: (TaiSHiNet) DigitalOcean API v2 cannot delete VMs on 2nd page | refs: #19305
  - PR #19305: (TaiSHiNet) Fixes droplet listing past page 1 | refs: #19305
    - da3f919 Merge pull request #19305 from rallytime/bp-19305
    - bbf2429 Fixes droplet listing past page 1

- **PR #23940: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-19T22:37:58Z**
  - ISSUE #23820: (UtahDave) 2014.7.5 schedule error | refs: #23881
  - ISSUE #22131: (quixoten) `unexpected keyword argument 'merge''' on 2014.7.2 (salt-ssh) | refs: #23887
  - PR #23939: (basepi) Add extended changelog to 2014.7.6 release notes
  - PR #23887: (basepi) [2014.7] Bring salt-ssh pillar.get in line with mainline pillar.get
  - PR #23881: (garethgreenaway) Fixes to schedule module in 2014.7
    - 02a78fc Merge pull request #23881 from basepi/salt-ssh.pillar.get.22131
    - 36f0065 Merge remote-tracking branch 'upstream/2014.7' into merge-forward-2015.5
      - 9133912 Merge pull request #23939 from basepi/v2014.7.6release
        - 32b65dc Add extended changelog to 2014.7.6 release notes
      - 0031ca2 Merge pull request #23881 from garethgreenaway/23820_2014_7_schedule_list_issue
        - b207f2a Missing continue in the list function when deleting unused attributes.
      - 63bd21e Merge pull request #23887 from basepi/salt-ssh.pillar.get.22131
        - bc84502 Bring salt-ssh pillar.get in line with mainline pillar.get

- **PR #23932: (rallytime) Backport #23908 to 2015.5 @ 2015-05-19T21:41:28Z**
  - PR #23908: (nleib) fix connection function to mongo | refs: #23932
  - ee4c01b Merge pull request #23932 from rallytime/bp-23908
  - 5d520c9 fix connection function to mongo

- **PR #23931: (rallytime) Backport #23880 to 2015.5 @ 2015-05-19T21:41:18Z**
  - PR #23880: (bastiaanb) if setting client_config_dir to `~`, expand path | refs: #23931
  - 70bd407 Merge pull request #23931 from rallytime/bp-23880
- 8ce59a2 if setting client_config_dir to `~`, expand path
- PR #23898: (kiorky) Lxc profiles | refs: #23897 @ 2015-05-19T21:08:28Z
  - ISSUE #23847: (kiorky) lxc: systemd containers cant be seeded | refs: #23806 #23898 #23897 #23808
  - ISSUE #23833: (kiorky) lxc.set_dns fails intermittently | refs: #23898 #23807 #23897 #23808
  - ISSUE #23772: (cheuschober) lxc.init fails to bootstrap container | refs: #23806 #23898 #23807 #23897 #23808
  - ISSUE #23658: (arthurlogilab) [salt-cloud lxc] too verbose, shows host: True multiple times when starting
    | refs: #23898 #23897
  - ISSUE #23657: (arthurlogilab) [salt-cloud lxc] NameError: global name `__salt__` is not defined | refs: #23727 #23898 #23897
- PR #23897: (kiorky) Lxc seed and prof ports | refs: #23898
- PR #23808: (kiorky) Lxc seed and prof ports | refs: #23807 #23897
- PR #23807: (kiorky) Lxc profiles | refs: #23898
- PR #23806: (kiorky) Lxc seeding | refs: #23807
- 5bdbf0a Merge pull request #23898 from makinacorpus/lxc_profiles
- d9051a0 lxc: systemd support
- e8d674f lxc: chroot fallback toggle
- e2887a0 lxc: sync func name with develop
- e96e345 lxc more fixes (lxc.set_dns)
- fdb6424 lxc: Fix salt config (no more a kwarg)
- 63e63fa repair salt cloud lxc api on develop
- 80eabe2 lxc salt cloud doc
- 73f229d lxc: unificate saltconfig/master/master_port
- 0bc1f08 lxc: refactor a bit saltcloud/lxc interface
- 7a80370 lxc: get networkprofile from saltcloud
- 47acb2e lxc: default net profile has now correct options
- 7eadf48 lxc: select the appropriate default bridge
- PR #23922: (garethgreenaway) Fixes to debian_ip.py @ 2015-05-19T18:50:53Z
  - ISSUE #23900: (hashi825) salt ubuntu network building issue 2015.5.0 | refs: #23922
  - b818f72 Merge pull request #23922 from garethgreenaway/23900_2015_5_bonding_interface_fixes
  - 0bb5a36 Fixing issue reported when using bonded interfaces on Ubuntu. Attributes should be bond-, but
    the code was attempting to split just on bond_. Fix accounts for both, but the debian_ip.py module will
    write out bond attributes with bond-
- PR #23925: (jpic) Fixed wrong path in LXC cloud documentation @ 2015-05-19T18:23:56Z
  - PR #23924: (jpic) Fixed wrong path in LXC cloud documentation | refs: #23925
  - b1e98a3 Merge pull request #23925 from jpic/fix/wrong_lxc_path
  - a4bcd75 Fixed wrong path in LXC cloud documentation
- PR #23894: (whiteinge) Add __all__ attribute to Mock class for docs @ 2015-05-19T17:17:35Z
- 7f6a716 Merge pull request #23894 from whiteinge/doc-mock__all__
- 6eecea46 Add __all__ attribute to Mock class for docs

**PR #23884:** (jfindlay) Fix locale.set_locale on debian @ 2015-05-19T15:51:22Z
- ISSUE #23767: (chrini) Salt system.locale fails on non existent default locale | refs: #23884
- 8108a9b Merge pull request #23884 from jfindlay/fix_locale
- 91c2d51 use append_if_not_found in locale.set_locale
- e632603 (re)generate /etc/default/locale

**PR #23866:** (jfindlay) backport #23834, change portage.dep.strip_empty to list comprehension @ 2015-05-19T15:50:43Z
- PR #23834: (Arabus) Avoid deprecation warning from portage.dep.strip_empty() | refs: #23866
- 6bae12f Merge pull request #23866 from jfindlay/flag_strip
- aa032cc replace portage.dep.strip_empty() with list comprehension
- 7576872 Proper replacement for portage.dep.strip_empty() with list comprehension, pep8fix
- 2851a5c Switch portage.dep.strip_empty(...) to filter(None,...) to avoid deprecation warning and do essentially the same

**PR #23917:** (corywright) Split debian bonding options on dash instead of underscore @ 2015-05-19T15:44:35Z
- ISSUE #23904: (mbrgm) Network config bonding section cannot be parsed when attribute names use dashes | refs: #23917
- a67a008 Merge pull request #23917 from corywright/issue23904
- c06f8cf Split debian bonding options on dash instead of underscore

**PR #23909:** (jayeshka) `str` object has no attribute `capitalized` @ 2015-05-19T15:41:53Z
- e8fcd09 Merge pull request #23909 from jayeshka/file-exe-module
- e422d9d `str` object has no attribute `capitalized`

**PR #23903:** (garethgreenaway) Adding docs for missing schedule state module parameters. @ 2015-05-19T06:29:34Z
- c73bf38 Merge pull request #23903 from garethgreenaway/missing_docs_schedule_state
- acd8ab9 Adding docs for missing schedule state module parameters.

**f7eb70c** changed previous release to 2014.7.6

**608059f** Merge branch `2015.5` of https://github.com/jacobhammons/salt into 2015.5
- a56697b Merge branch `2015.5` of https://github.com/saltstack/salt into 2015.5
- 1c2af5c Merge branch `2015.5` of https://github.com/saltstack/salt into 2015.5
- ef58128 Merge branch `2015.5` of https://github.com/saltstack/salt into 2015.5
- 8664e8b Merge branch `2015.5` of https://github.com/saltstack/salt into 2015.5-2
- 46eb265 saltstack2 sphinx theme updates
- e7442d3 Merge branch `2015.5` of https://github.com/saltstack/salt into 2015.5
- ee3c1bd missed one
- 3872921 More updates to sphinx2 theme
- fcd4865 Merge branch `2015.5' of https://github.com/saltstack/salt into 2015.5
- 8c32152 removed TOC numbering, additional tweaks to layout.html
- 73daef Merge branch `2015.5' of https://github.com/saltstack/salt into 2015.5
- 16d8a75 saltstack2 sphinx theme and build settings

**PR #23806:** (kiorky) Lxc seeding | refs: #23807 @ 2015-05-18T23:18:33Z
- ISSUE #23847: (kiorky) lxc: systemd containers cant be seeded | refs: #23806 #23898 #23897 #23808
- ISSUE #23772: (cheuschober) lxc.init fails to bootstrap container | refs: #23806 #23898 #23807 #23897 #23808
- ff3cc7d Merge pull request #23806 from makinalcorpus/lxc_seeding
- 61b7aad runners/lxc: optim

**PR #23892:** (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-18T23:07:57Z
- PR #23891: (basepi) Update the release notes index page
- PR #23888: (basepi) Update the 2014.7.6 release notes with CVE details
- PR #23871: (rallytime) Backport #23848 to 2014.7
- PR #23848: (dumol) Updated installation docs for SLES 12. | refs: #23871
- 5f1a93d Merge pull request #23892 from basepi/merge-forward-2015.5
- c2eed77 Merge remote-tracking branch `upstream/2014.7' into merge-forward-2015.5
- 17c5810 Merge pull request #23891 from basepi/releasenotes
  * dec153b Update the release notes index page
- a93e58f Merge pull request #23888 from basepi/v2014.7.6release
  * 49921b6 Update the 2014.7.6 release notes with CVE details
- 5073028 Merge pull request #23871 from rallytime/bp-23848
  * 379c09c Updated for SLES 12.

**PR #23875:** (rallytime) Backport #23838 to 2015.5 @ 2015-05-18T22:28:55Z
- PR #23838: (gtmanfred) add refresh_beacons and sync_beacons | refs: #23875
- 66d1335 Merge pull request #23875 from rallytime/bp-23838
- 3174227 Add versionadded directives to new beacon saltutil functions
- 4a94b2c add refresh_beacons and sync_beacons

**PR #23876:** (rallytime) Switch digital ocean tests to v2 driver @ 2015-05-18T22:17:13Z
- d294cf2 Merge pull request #23876 from rallytime/switch_digital_ocean_tests_v2
- dce9b54 Remove extra line
- 4acf58e Switch digital ocean tests to v2 driver

**PR #23882:** (garethgreenaway) Fixes to scheduler in 2015.5 @ 2015-05-18T22:09:24Z
- ISSUE #23792: (neogenix) Salt Scheduler Incorrect Response (True, should be False) | refs: #23882
- b97ad48c Merge pull request #23882 from garethgreenaway/23792_2015_5_wrong_return_code
- 37dbde6 Job already exists in schedule, should return False.
• PR #23868: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-18T18:35:54Z
  – ISSUE #20198: (jcftang) virt.get_graphics, virt.get_nics are broken, in turn breaking other things | refs: #23809
  – PR #23823: (gtmanfred) add link local for ipv6
  – PR #23810: (rallytime) Backport #23757 to 2014.7
  – PR #23809: (rallytime) Fix virtualport section of virt.get_nics loop
  – PR #23802: (gtmanfred) if it is ipv6 ip_to_int will fail
  – PR #23757: (clan) use abspath, do not eliminating symlinks | refs: #23810
  – PR #23573: (vdesjardins) Scan all available networks for public and private IPs | refs: #23802
  – PR #21487: (rallytime) Backport #21469 to 2014.7 | refs: #23809
  – PR #21469: (vdesjardins) fixes #20198: virt.get_graphics and virt.get_nics calls in module virt | refs: #21487
  – 61c922e Merge pull request #23868 from basepi/merge-forward-2015.5
  – c9ed233 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  – aee00c8 Merge pull request #23810 from rallytime/bp-23757
    * fb32c32 use abspath, do not eliminating symlinks
  – 6b3352b Merge pull request #23809 from rallytime/virt_get_nics_fix
    * 0616fb7 Fix virtualport section of virt.get_nics loop
  – 188f03f Merge pull request #23823 from gtmanfred/2014.7
    * 5ef006d add link local for ipv6
  – f3ca682 Merge pull request #23802 from gtmanfred/2014.7
    * 2da98b5 if it is ipv6 ip_to_int will fail
• PR #23863: (rahulhan) Adding states/timezone.py unit test @ 2015-05-18T17:02:19Z
  – 433f873 Merge pull request #23863 from rahulhan/states_timezone_unit_test
  – 72fcabc Adding states/timezone.py unit test
• PR #23862: (rahulhan) Adding states/tomcat.py unit tests @ 2015-05-18T17:02:10Z
  – 37b3ee5 Merge pull request #23862 from rahulhan/states_tomcat_unit_test
  – 65d7752 Adding states/tomcat.py unit tests
• PR #23860: (rahulhan) Adding states/test.py unit tests @ 2015-05-18T17:01:49Z
  – dde7207 Merge pull request #23860 from rahulhan/states_test_unit_test
  – 1f4c868 Adding states/test.py unit tests
• PR #23859: (rahulhan) Adding states/sysrc.py unit tests @ 2015-05-18T17:01:46Z
  – 3c9bb813 Merge pull request #23859 from rahulhan/states_sysrc_unit_test
  – 6a903b0 Adding states/sysrc.py unit tests
• PR #23812: (rallytime) Backport #23790 to 2015.5 @ 2015-05-18T15:30:34Z
  – PR #23790: (aboe76) updated suse spec file to version 2015.5.0 | refs: #23812
  – 4cf30a7 Merge pull request #23812 from rallytime/bp-23790
- 3f65631 updated suse spec file to version 2015.5.0

- **PR #23811**: (rallytime) Backport #23786 to 2015.5 @ 2015-05-18T15:30:27Z
  - **PR #23786**: (kaithar) Log the error generated that causes returns.mysql.returner to except. | refs: #23811
  - c6f939a Merge pull request #23811 from rallytime/bp-23786
  - 346f30b Log the error generated that causes returns.mysql.returner to except.

- **PR #23850**: (jayeshka) adding sysbench unit test case @ 2015-05-18T15:28:04Z
  - ce60582 Merge pull request #23850 from jayeshka/sysbench-unit-test
  - 280abde adding sysbench unit test case

- **PR #23843**: (The-Loeki) Fix erroneous virtual:physical core grain detection @ 2015-05-18T15:24:22Z
  - 060902f Merge pull request #23843 from The-Loeki/patch-1
  - 9e2cf60 Fix erroneous virtual:physical core grain detection

- **PR #23816**: (Snergster) Doc for #23685 Added prereq, caution, and additional mask information @ 2015-05-18T15:18:03Z
  - Issue #23815: (Snergster) [beacons] inotify errors on subdir creation | refs: #23816
  - 3257a9b Merge pull request #23816 from Snergster/23685-doc-fix
  - 0fca49d Added prereq, caution, and additional mask information

- **PR #23832**: (ahus1) make saltify provider use standard boostrap procedure @ 2015-05-18T02:18:29Z
  - **PR #23829**: (ahus1) make saltify provider use standard boostrap procedure | refs: #23832
  - 3df3b85 Merge pull request #23832 from ahus1/ahus1_saltify_bootstrap_2015.5
  - f5b1734 fixing problem in unit test
  - cba47f6 make saltify to use standard bootstrap procedure, therefore providing all options like master_sign_pub_file

- **PR #23791**: (optix2000) Psutil compat @ 2015-05-16T04:05:54Z
  - 8ec4fb2 Merge pull request #23791 from optix2000/psutil_compat
  - 5470cf5 Fix pylint errors and sloppy inline comments
  - 64634b6 Update psutil.pid_list to use psutil.pids
  - 5dd6d69 Fix imports that aren't in __all__
  - 8a1da33 Fix test cases by mocking psutil_compat
  - 558798d Fix net_io_counters deprecation issue
  - 8140f92 Override unnecessary pylint errors
  - 7d02ad4 Fix some of the mock names for the new API
  - 9b3023e Fix overloaded getters/setters. Fix line lengths
  - 180eb87 Fix whitespace
  - f8edf72 Use new psutil API in ps module
  - e48982f Fix version checking in psutil_compat
  - 93ee411 Create compatibility psutil. psutil 3.0 drops 1.0 API, but we still support old psutil versions.
• **PR #23782**: (terminalmage) Replace `''command -v''` with `''which''` and get rid of spurious log messages @ 2015-05-16T04:30:30Z
  - 40517b Merge pull request #23782 from terminalmage/issue23772
  - 056419 More ignore_retcode to suppress spurious log msgs
  - b4c48e6 Ignore return code in lxc.attachable
  - 08658c0 Replace `''command -v''` with `''which''`

• **PR #23783**: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-15T21:38:51Z
  - ISSUE #22959: (highlyunavailable) Windows Salt hangs if file.directory is trying to write to a drive that doesn’t exist
  - ISSUE #22332: (rallytime) [salt-ssh] Add a check for host in /etc/salt/roster | refs: #23748
  - ISSUE #16424: (stanvit) salt-run cloud.create fails with saltify
  - PR #23748: (basepi) [2014.7] Log salt-ssh roster render errors more assertively and verbosely
  - PR #23731: (twangboy) Fixes #22959: Trying to add a directory to an unmapped drive in windows
  - PR #23730: (rallytime) Backport #23729 to 2014.7
  - PR #23729: (rallytime) Partially merge #23437 (grains fix) | refs: #23730
  - PR #23688: (twangboy) Added inet_pton to utils/validate/net.py for ip.set_static_ip in windows
  - PR #23488: (celscape) LXC cloud fixes
  - PR #23437: (cedwards) Grains item patch | refs: #23729
  - cb2eb40 Merge pull request #23783 from basepi/merge-forward-2015.5
  - 9df51ca __opts__get

  - 51d23ed Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
    - d9af0c3 Merge pull request #23488 from cellscape/lxc-cloud-fixes
      - 64250a6 Remove profile from opts after creating LXC container
      - c4047d2 Set destroy=True in opts when destroying cloud instance
      - 9e1311a Store instance names in opts when performing cloud action
      - 934bc57 Correctly pass custom env to lxc-attach
      - 7fb85f7 Preserve test=True option in cloud states
      - 9771b5a Fix detection of absent LXC container in cloud state
      - fb24f0c Report failure when failed to create/clone LXC container
      - 2d9aa2b Avoid shadowing variables in lxc module
      - 792e102 Allow to override profile options in lxc.cloud_init_interface
      - 42bd64b Return changes on successful lxc.create from salt-cloud
      - 4409eab Return correct result when creating cloud LXC container
      - 377015c Issue #16424: List all providers when creating salt-cloud instance without profile

  - 808bbe1 Merge pull request #23748 from basepi/salt-ssh.roster.host.check
    - bc53e04 Log entire exception for render errors in roster
    - 753de6a Log render errors in roster to error level
• e01a7a9 Always let the real YAML error through
  * 72e360 Merge pull request #23731 from twangboy/fix_22959
  * 88e5495 Fixes #22959: Trying to add a directory to an unmapped drive in windows
  * 2610195 Merge pull request #23730 from rallytime/bp-23729
  * 1877cae adding support for nested grains to grains.item
  * 3e9df88 Merge pull request #23688 from twangboy/fix_23415
    * 6a91169 Fixed unused-import pylint error
    * 5e25b3f fixed pylint errors
    * 1a96766 Added inet_pton to utils/validate/net.py for ip.set_static_ip in windows

• PR #23781: (jfindlay) fix unit test mock errors on arch @ 2015-05-15T19:40:07Z
  - 982f873 Merge pull request #23781 from jfindlay/fix_locale_tests
  - 14c711e fix unit test mock errors on arch

• PR #23740: (jfindlay) Binary write @ 2015-05-15T18:10:44Z
  - ISSUE #23566: (rks2286) Salt-cp corrupting the file after transfer to minion | refs: #23740
  - 916b1c4 Merge pull request #23740 from jfindlay/binary_write
  - 626930a update incorrect comment wording
  - a978f5c always use binary file write mode on windows

• PR #23736: (jfindlay) always load pip execution module @ 2015-05-15T18:10:16Z
  - ISSUE #23682: (chrish42) Pip module requires system pip, even when not used (with env_bin) | refs: #23736
  - 348645e Merge pull request #23736 from jfindlay/fix_pip
  - b8867a8 update pip tests
  - 040bbc4 only check pip version in one place
  - 6c453a5 check for executable status of bin_env
  - 3337257 always load the pip module as pip could be anywhere

• PR #23770: (cellscape) Fix cloud LXC container destruction @ 2015-05-15T17:38:59Z
  - 10cedfb Merge pull request #23770 from cellscape/fix-cloud-lxc-destruction
  - 4f6021c Fix cloud LXC container destruction

• PR #23759: (lisa2lisa) fixed the problem for not beable to revoke .., for more detail https... @ 2015-05-15T17:38:38Z
  - ddea822 Merge pull request #23759 from lisa2lisa/iss23664
  - a29f161 fixed the problem for not beable to revoke .., for more detail https://github.com/saltstack/salt/issues/23201, fixed mysql cannot create user with pure digit password, for more info https://github.com/saltstack/salt/issues/23664

• PR #23769: (cellscape) Fix file_roots CA lookup in salt.utils.http.get_ca_bundle @ 2015-05-15T16:21:49Z
  - 10615ff Merge pull request #23769 from cellscape/utils-http-ca-file-roots
  - 8e90f32 Fix file_roots CA lookup in salt.utils.http.get_ca_bundle

35.2. Previous Releases 2047
- **PR #23765**: (jayeshka) adding states/makeconf unit test case @ 2015-05-15T14:29:43Z
  - fd8a1b7 Merge pull request #23765 from jayeshka/makeconf_states-unit-test
  - 26e31af adding states/makeconf unit test case
- **PR #23760**: (ticsax) [doc] document refresh argument @ 2015-05-15T14:23:47Z
  - ee13b08 Merge pull request #23760 from ticosax/2015.5
  - e3ca859 document refresh argument
- **PR #23766**: (jayeshka) adding svn unit test case @ 2015-05-15T14:23:18Z
  - a017f72 Merge pull request #23766 from jayeshka/svn-unit-test
  - 19939cf adding svn unit test case
- **PR #23751**: (rallytime) Backport #23737 to 2015.5 @ 2015-05-15T03:58:37Z
  - ISSUE #23734: (bradthurb) 2015.5.0 modules/archive.py ZipFile instance has no attribute `_exit_` - only python 2.6? | refs: #23737
  - PR #23737: (bradthurb) fix for 2015.5.0 modules/archive.py ZipFile instance has no attribute... | refs: #23751
  - 0ed9d45 Merge pull request #23751 from rallytime/bp-23737
  - 8d1eb32 fix for 2015.5.0 modules/archive.py ZipFile instance has no attribute `_exit_` - only python 2.6? #23734
- **PR #23710**: (kiorky) Get more useful output from stateful commands @ 2015-05-14T21:58:10Z
  - ISSUE #23709: (kiorky) cmdmod: enhancement is really needed for stateful commands | refs: #23710
  - d73984e Merge pull request #23710 from makinacorpus/i23709
  - c706909 Get more useful output from stateful commands
- **PR #23724**: (rallytime) Backport #23609 to 2015.5 @ 2015-05-14T19:34:22Z
  - PR #23609: (kaidokert) file_map: chown created directories if not root #23608 | refs: #23724
  - cdf421b Merge pull request #23724 from rallytime/bp-23609
  - fe3a762 file_map: chmod created directories if not root
- **PR #23723**: (rallytime) Backport #23568 to 2015.5 @ 2015-05-14T19:34:11Z
  - PR #23568: (techhat) Allow Salt Cloud to use either SCP or SFTP, as configured | refs: #23723
  - 94f9099 Merge pull request #23723 from rallytime/bp-23568
  - bbc34a Allow Salt Cloud to use either SCP or SFTP, as configured
- **PR #23725**: (rallytime) Backport #23691 to 2015.5 @ 2015-05-14T19:32:30Z
  - PR #23691: (dennisjac) add initial configuration documentation for varstack pillar | refs: #23725
  - 137e5ee Merge pull request #23725 from rallytime/bp-23691
  - 28a846e add initial configuration documentation for varstack pillar
- **PR #23722**: (rallytime) Backport #23472 to 2015.5 @ 2015-05-14T19:31:52Z
  - PR #23472: (techhat) Allow neutron network list to be used as pillar data | refs: #23722
  - 0c00995 Merge pull request #23722 from rallytime/bp-23472
  - c3d0f39 Change version added tag for backport
- 023e88f Allow neutron network list to be used as pillar data

- **PR #23727:** (jfindlay) fix npm execution module stacktrace @ 2015-05-14T18:14:12Z
  - **ISSUE #23657:** (arthurlogilab) [salt-cloud lxc] NameError: global name `__salt__` is not defined | refs: #23727 #23898 #23897
  - cbf4ca8 Merge pull request #23727 from jfindlay/npm_salt
  - 05392f2 fix npm execution module stacktrace

- **PR #23718:** (rahulhan) Adding states/user.py unit tests @ 2015-05-14T17:15:38Z
  - ef536d5 Merge pull request #23718 from rahulhan/states_user_unit_tests
  - a0d27db Adding states/user.py unit tests

- **PR #23720:** (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-14T17:13:02Z
  - ISSUE #23604: (Azidburn) service.dead on systemd Minion create an Error Message | refs: #23607
  - ISSUE #23548: (kkaig) grains.list_present produces incorrect (?) output | refs: #23674
  - ISSUE #23403: (iamfil) salt.runners.cloud.action fun parameter is replaced | refs: #23680
  - PR #23680: (cachedout) Rename kwarg in cloud runner
  - PR #23674: (cachedout) Handle lists correctly in grains.list_present
  - PR #23672: (twangboy) Fix user present
  - PR #23670: (rallytime) Backport #23607 to 2014.7
  - PR #23607: (Azidburn) Fix for #23604. No error reporting. Exitcode !=0 are ok | refs: #23670
  - a529d74 Merge pull request #23720 from basepi/merge-forward-2015.5
  - 06a3ebd Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  - 1b86460 Merge pull request #23680 from cachedout/issue_23403
  - d5986c2 Rename kwarg in cloud runner
  - cd64af0 Merge pull request #23674 from cachedout/issue_23548
  - d322a19 Merge pull request #23672 from twangboy/fixed_present
  - 731e7af Merge branch `2014.7` of https://github.com/saltstack/salt into fixed_present
  - d6f70a4 Fixed user.present to create password in windows
  - 43f7025 Merge pull request #23670 from rallytime/bp-23607
  - ed30dc4 Fix for #23604. No error reporting. Exitcode !=0 are ok

- **PR #23704:** (jayeshka) adding states/lvs_server unit test case @ 2015-05-14T14:22:10Z
  - da323db Merge pull request #23704 from jayeshka/lvs_server_states-unit-test
  - da323db adding states/lvs_server unit test case

- **PR #23703:** (jayeshka) adding states/lvs_service unit test case @ 2015-05-14T14:21:23Z
  - f95ca31 Merge pull request #23703 from jayeshka/lvs_service_states-unit-test
  - 66717c8 adding states/lvs_service unit test case

- **PR #23702:** (jayeshka) Remove superfluous return statement. @ 2015-05-14T14:20:42Z
- 07e987e Merge pull request #23702 from jayeshka/fix_lvs_service
- ecf218 fix lvs_service

- **PR #23686**: (jfindlay) remove superflous return statement @ 2015-05-14T14:20:18Z
  - 39973d4 Merge pull request #23686 from jfindlay/fix_lvs_server
  - 5aae73 remove superflous return statement

- **PR #23690**: (rallytime) Backport #23424 to 2015.5 @ 2015-05-13T23:04:36Z
  - PR #23424: (jfindlay) Added python_shell=True for refresh_db in pacman.py | refs: #23690
  - be7c7ef Merge pull request #23690 from rallytime/bp-23424
  - 94574b7 Added python_shell=True for refresh_db in pacman.py

- **PR #23681**: (cachedout) Start on 2015.5.1 release notes @ 2015-05-13T19:44:22Z
  - 1a0db43 Merge pull request #23681 from cachedout/2015_5_1_release_notes
  - bdbba6 Start on 2015.5.1 release notes

- **PR #23679**: (jfindlay) Merge #23616 @ 2015-05-13T19:03:53Z
  - PR #23616: (Snergster) virtual returning none warning fixed in dev but missed in 2015.5 | refs: #23679
  - b54075a Merge pull request #23679 from jfindlay/merge_23616
  - 6e15e19 appease pylint's blank line strictures
  - 8750680 virtual returning none warning fixed in dev but missed in 2015.5

- **PR #23675**: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-13T18:35:54Z
  - ISSUE #23611: (hubez) master_type set to `failover` but `master` is not of type list but of type <type `str'> | refs: #23637
  - ISSUE #23479: (danielmorlock) Typo in pkg.removed for Gentoo? | refs: #23558
  - ISSUE #23452: (michaelforge) minion crashed with empty grain | refs: #23639
  - ISSUE #23411: (dr4Ke) grains.append should work at any level of a grain | refs: #23440
  - ISSUE #23355: (dr4Ke) salt-ssh: `sources: salt://' files from `pkg` state are not included in salt_state.tgz | refs: #23530
  - ISSUE #23110: (martinhoefling) Copying files from gitfs in file.recurse state fails
  - ISSUE #23004: (b18) 2014.7.5 - Windows - pkg.list_pkgs - `nxlog” never shows up in output. | refs: #23433
  - ISSUE #22908: (karanjad) Add failhard option to salt orchestration | refs: #23389
  - ISSUE #22141: (Deshke) grains.get_or_set_hash render error if hash begins with `\'%’” | refs: #23640
  - PR #23661: (rallytime) Merge #23640 with whitespace fix
  - PR #23640: (cachedout) Add warning to get_or_set_hash about reserved chars | refs: #23661
  - PR #23639: (cachedout) Handle exceptions raised by _virtual_
  - PR #23637: (cachedout) Convert str master to list
  - PR #23606: (twangboy) Fixed checkbox for starting service and actually starting it
  - PR #23595: (rallytime) Backport #23549 to 2014.7
  - PR #23594: (rallytime) Backport #23496 to 2014.7
- PR #23593: (rallytime) Backport #23442 to 2014.7
- PR #23592: (rallytime) Backport #23389 to 2014.7
- PR #23573: (techhat) Scan all available networks for public and private IPs | refs: #23802
- PR #23558: (jfindlay) reorder emerge command line
- PR #23554: (jleroy) Debian: Hostname always updated
- PR #23551: (dr4Ke) grains.append unit tests, related to #23474
- PR #23549: (vr-jack) Update __init__.py | refs: #23595
- PR #23537: (tdorantt) Update changelog
- PR #23530: (dr4Ke) salt-ssh state: fix including all salt:// references
- PR #23496: (martinhoefling) Fix for issue #23110 | refs: #23594
- PR #23474: (dr4Ke) Fix grains.append in nested dictionary grains #23411
- PR #23442: (clan) add directory itself to keep list | refs: #23593
- PR #23440: (dr4Ke) fix grains.append in nested dictionary grains #23411 | refs: #23474
- PR #23433: (twangboy) Obtain all software from the registry
- PR #23389: (cachedout) Correct fail_hard typo | refs: #23592
- e480f13 Merge pull request #23675 from basepi/merge-forward-2015.5
- bd63548 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  * 0f006ac Merge pull request #23661 from rallytime/merge-23640
  - 4427f42 Whitespace fix
  - dd91154 Add warning to get_or_set_hash about reserved chars
  * 84e2ef8 Merge pull request #23639 from cachedout/issue_23452
  - d418b49 Syntax error!
  - 45b4015 Handle exceptions raised by __virtual__
  * bd9b94b Merge pull request #23637 from cachedout/issue_23611
  - 56cb1f5 Fix typo
  - f6fcf19 Convert str master to list
  * f20c0e4 Merge pull request #23595 from rallytime/bp-23549
  - 6efca0 Update __init__.py
  * 1aca86 Merge pull request #23594 from rallytime/bp-23496
  - d5ae1d2 Fix for issue #23110 This resolves issues when the freshly created directory is removed by fileserver.update.
  * 2c221c7 Merge pull request #23593 from rallytime/bp-23442
  - 39869a1 check w/ low['name'] only
  - 304cc49 another fix for file defined w/ id, but require name
  - 8814d41 add directory itself to keep list
  * fadd1ef Merge pull request #23606 from twangboy/fix_installer
• 038331e Fixed checkbox for starting service and actually starting it
  – acdd3fc Fix lint
• 680e88f Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  * 10b3f0f Merge pull request #23592 from rallytime/bp-23389
    – 734cc43 Correct fail_hard typo
  * cd34b9b Merge pull request #23573 from techhat/novaquery
    – f92db5e Linting
    – 26e00d3 Scan all available networks for public and private IPs
  * 2a72cd7 Merge pull request #23558 from jfindlay/fix_ebuild
    – 4540fb reorder emerge command line
  * a66a3c Merge pull request #23530 from dr4Ke/fix_salt-ssh_to_include_pkg_sources
    – 5df6a80 fix pylint warning
    – d0549e5 salt-ssh state: fix including all salt:// references
  * 55c3869 Merge pull request #23433 from twangboy/list_pkgs_fix
    – 8ab5b1b Fix pylint error
    – 2d11d65 Obtain all software from the registry
  * 755bed0 Merge pull request #23554 from jleroy/debian-hostname-fix
    – 5ff749e Debian: Hostname always updated
  * 6ec87ce Merge pull request #23551 from dr4Ke/grains.append_unit_tests
    – ebf9df fix pylint errors
    – c495404 unit tests for grains.append module function
    – 0c9a323 use MagickMock
    – c838a22 unit tests for grains.append module function
  * e96c5c5 Merge pull request #23474 from dr4Ke/fix_grains.append_nested
    – 01a5bb grains.get, parameter delimititer, versionadded: 2014.7.6
    – b39f504 remove debugging output
    – b6e15e2 fix grains.append in nested dictionary grains #23411
  * ab7e1ae Merge pull request #23537 from t0rrant/patch-1
    – 8e03cc9 Update changelog

• PR #23669: (rallytime) Backport #23586 to 2015.5 @ 2015-05-13T18:27:11Z
  – PR #23586: (Lothiraldan) Fix salt.state.file._unify_sources_and_hashes when sources is used without sources_hashes | refs: #23669
  – 0dad6be Merge pull request #23669 from rallytime/bp-23586
  – ef4c6ad Remove another unused import
  – 73cfda7 Remove unused import
  – 52b68d6 Use the zip_longest from six module for python 3 compatibility
- 18d5ff9 Fix salt.state.file._unify_sources_and_hashes when sources is used without sources_hashes

- **PR #23662**: (rallytime) Merge #23642 with pylint fix @ 2015-05-13T15:46:51Z
  - **PR #23642**: (cachedout) Let saltmod handle lower-level exceptions gracefully | refs: #23662
  - fabef75 Merge pull request #23662 from rallytime/merge-23642
  - aa7bbd8 Remove unused import
  - 9e666d4c Let saltmod handle lower-level exceptions gracefully

- **PR #23622**: (jfindlay) merge #23508 @ 2015-05-13T15:36:49Z
  - **PR #23508**: (cro) Port mysql returner to postgres using jsonb datatype | refs: #23622
  - 072b927 Merge pull request #23622 from jfindlay/pgjsonb
  - 454322c appease pylint's proscription on blank line excess
  - 57c6171 Get time with timezone correct also in job return.
  - e109d0f Get time with timezone correct.
  - 21e06b9 Fix SQL, remove unneeded imports.
  - 653f360 Stop making changes in 2 places.
  - d6daa0 Typo.
  - 7d748b8f SSL is handled differently by Pg, so don't set it here.
  - cc7c377 Fill alter_time field in salt_events with current time with timezone.
  - 43defe9 Port mysql module to Postgres using jsonb datatypes

- **PR #23651**: (jayeshka) adding solr unit test case @ 2015-05-13T15:26:15Z
  - c1bdd4d Merge pull request #23651 from jayeshka/solr-unit-test
  - 6e05148 adding solr unit test case

- **PR #23649**: (jayeshka) adding states/libvirt unit test case @ 2015-05-13T15:24:48Z
  - ee43411 Merge pull request #23649 from jayeshka/libvirt_states-unit-test
  - 0fb923a adding states/libvirt unit test case

- **PR #23648**: (jayeshka) adding states/linux_acl unit test case @ 2015-05-13T15:24:11Z
  - c7fc466 Merge pull request #23648 from jayeshka/linux_acl_states-unit-test
  - 3f0ab29 removed error.
  - 11081c1 adding states/linux_acl unit test case

- **PR #23650**: (jayeshka) adding states/kmod unit test case @ 2015-05-13T15:09:18Z
  - 4c8a7ba Merge pull request #23650 from jayeshka/kmod_states-unit-test
  - 1987015 adding states/kmod unit test case

- **PR #23633**: (jayeshka) made changes to test_interfaces function. @ 2015-05-13T06:51:07Z
  - bc8faf1 Merge pull request #23633 from jayeshka/win_network-2015.5-unit-test
  - 093661d made changes to test_interfaces function.

- **PR #23619**: (jfindlay) fix kmod.present processing of module loading @ 2015-05-13T01:16:56Z
  - 7df3579 Merge pull request #23619 from jfindlay/fixed_kmod_state
• PR #23598: (rahulhan) Adding states/win_dns_client.py unit tests @ 2015-05-12T21:47:36Z
  - d4f3095 Merge pull request #23598 from rahulhan/states_win_dns_client_unit_test
  - d08d885 Adding states/win_dns_client.py unit tests
• PR #23597: (rahulhan) Adding states/vbox_guest.py unit tests @ 2015-05-12T21:46:30Z
  - 8116ea1 Merge pull request #23597 from rahulhan/states_vbox_guest_unit_test
  - 6a2909e Removed errors
  - 4cde78a Adding states/vbox_guest.py unit tests
• PR #23615: (rallytime) Backport #23577 to 2015.5 @ 2015-05-12T21:19:11Z
  - PR #23577: (msciciel) Fix find and remove functions to pass database param | refs: #23615
  - 029ff11 Merge pull request #23615 from rallytime/bp-23577
  - 6f74477 Fix find and remove functions to pass database param
• PR #23603: (rahulhan) Adding states/winrepo.py unit tests @ 2015-05-12T18:40:12Z
  - b858953 Merge pull request #23603 from rahulhan/states_winrepo_unit_test
  - a668e70 Adding states/winrepo.py unit tests
• PR #23602: (rahulhan) Adding states/win_path.py unit tests @ 2015-05-12T18:39:37Z
  - 3cbdb66 Merge pull request #23602 from rahulhan/states_win_path_unit_test
  - 122c29f Adding states/win_path.py unit tests
• PR #23600: (rahulhan) Adding states/win_network.py unit tests @ 2015-05-12T18:39:01Z
  - 39b0e88 Merge pull request #23600 from rahulhan/states_win_network_unit_test
  - b418404 removed lint error
  - 1be8023 Adding states/win_network.py unit tests
• PR #23599: (rahulhan) Adding win_firewall.py unit tests @ 2015-05-12T18:37:49Z
  - 10243a7 Merge pull request #23599 from rahulhan/states_win_firewall_unit_test
  - 6cda890 Adding win_firewall.py unit tests
• PR #23601: (basepi) Add versionadded for jboss module/state @ 2015-05-12T17:22:59Z
  - e73071d Merge pull request #23601 from basepi/jboss.version.added
  - 0174c8f Add versionadded for jboss module/state
• PR #23469: (sundayt3ch) Call the windows specific function not the general one @ 2015-05-12T16:47:22Z
  - 9beb7bc Merge pull request #23469 from sundayt3ch/hotfix/call-the-win-func
  - 83e88a3 Call the windows specific function not the general one
• PR #23583: (jayeshka) adding states/ipset unit test case @ 2015-05-12T16:31:55Z
  - d2f0975 Merge pull request #23583 from jayeshka/ipset_states-unit-test
  - 4330cf4 adding states/ipset unit test case
• PR #23582: (jayeshka) adding states/keyboard unit test case @ 2015-05-12T16:31:17Z
  - 82a47e8 Merge pull request #23582 from jayeshka/keyboard_states-unit-test
- fa94d7a adding states/keyboard unit test case

- **PR #23581**: (jayeshka) adding states/layman unit test case @ 2015-05-12T16:30:36Z
  - 77e5b28 Merge pull request #23581 from jayeshka/layman_states-unit-test
  - 297b055 adding states/layman unit test case

- **PR #23580**: (jayeshka) adding smf unit test case @ 2015-05-12T16:29:58Z
  - cbe3282 Merge pull request #23580 from jayeshka/smf-unit-test
  - 4f97191 adding smf unit test case

- **PR #23572**: (The-Loeki) Fix regression of #21355 introduced by #21603 @ 2015-05-12T16:28:05Z
  - ISSUE #21603: (ipmb) ssh_auth.present fails on key without comment | refs: #23572 #23572
  - PR #21355: (The-Loeki) Fix for comments containing whitespaces
  - 16a3338 Merge pull request #23572 from The-Loeki/ssh_auth_fix
  - d8248dd Fix regression of #21355 introduced by #21603

- **PR #23565**: (garethgreenaway) fix to aptpkg module @ 2015-05-12T16:25:46Z
  - ISSUE #23490: (lichtamberg) salt.modules.aptpkg.upgrade should have default `\$\$dist_upgrade=False` | refs: #23565
  - f843f89 Merge pull request #23565 from garethgreenaway/2015_2_aptpkg_upgrade_default_to_upgrade
  - 97ae514 aptpkg.upgrade should default to upgrade instead of dist_upgrade.

- **PR #23550**: (jfindlay) additional mock for rh_ip_test_test_build_bond @ 2015-05-12T15:17:16Z
  - ISSUE #23473: (terminalmage) unit.modules.rh_ip_test.RhipTestCase.test_build_bond is not properly mocked | refs: #23550
  - c1157cd Merge pull request #23550 from jfindlay-fix_rh_ip_test
  - e9b94d3 additional mock for rh_ip_test_test_build_bond

- **PR #23552**: (garethgreenaway) Fix for an issue caused by a previous pull request @ 2015-05-11T21:54:59Z
  - b59332b Merge pull request #23552 from garethgreenaway/2015_5_returner_fix_broken_previous_pr
  - 7d70e2b Passed argumentes in the call_fetch_profile_opts to were in the wrong order

- **PR #23547**: (slinu3d) Added AWS v4 signature support for 2015.5 @ 2015-05-11T21:52:24Z
  - d0f9682 Merge pull request #23547 from slinu3d/2015.5
  - f3fb5b5 Fixed urlparse and urlencode calls
  - 802dbdb Added AWS v4 signature support for 2015.5

- **PR #23544**: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-11T18:02:06Z
  - ISSUE #23159: (aneeshusa) Unused validator
  - ISSUE #20518: (ekle) module s3.get does not support eu-central-1 | refs: #23467
  - ISSUE #563: (chutz) pidfile support for minion and master daemons | refs: #23460 #23461
  - PR #23538: (cro) Update date in LICENSE file
  - PR #23505: (aneeshusa) Remove unused ssh config validator. Fixes #23159.
  - PR #23467: (slinu3d) Added AWS v4 signature support
  - PR #23460: (s0undt3ch) [2014.7] Update to latest stable bootstrap script v2015.05.07

35.2. Previous Releases

2055
Salt Documentation, Release 2015.8.0

- **PR #23444**: (techhat) Add create_attach_volume to nova driver
- **PR #23439**: (techhat) Add wait_for_passwd_maxtries variable
- 06c6a1f Merge pull request #23544 from basepi/merge-forward-2015.5
- f8a36bc Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  * b79fed3 Merge pull request #23538 from cro/licupdate
    - 345efe2 Update date in LICENSE file
  * a123a36 Merge pull request #23505 from aneeshusa/remove-unused-ssh-config-validator
    - 90af167 Remove unused ssh config validator. Fixes #23159.
  * ca2c21a Merge pull request #23467 from slinu3d/2014.7
    - 0b4081d Fixed pylint error at line 363
    - 5be5eb5 Fixed pylink errors
    - e64f374 Fixed lint errors
    - b9d1ac4 Added AWS v4 signature support
  * e6f9eec Merge pull request #23444 from techhat/novacreateattach
    - ebdbea3 Add create_attach_volume to nova driver
  * e331463 Merge pull request #23460 from s0undt3ch/bootstrap-script-2014.7
    - edcd0c4 Update to latest stable bootstrap script v2015.05.07
  * 7a8ce1a Merge pull request #23439 from techhat/maxtries
    - 0ad3ff2 Add wait_for_passwd_maxtries variable
- **PR #23470**: (twangboy) Fixed service.restart for salt-minion @ 2015-05-11T17:54:47Z
  - ISSUE #23426: (twangboy) Can't restart salt-minion on 64 bit windows (2015.5.0) | refs: #23470
  - aa5b896 Merge pull request #23470 from twangboy/fix_svc_restart
  - b3f284c Fixed tests
  - ad44d79 Fixed service.restart for salt-minion
- **PR #23539**: (rahulhan) Adding states/virtualenv_mod.py unit tests @ 2015-05-11T17:02:31Z
  - 67988b2 Merge pull request #23539 from rahulhan/states_virtualenv_mod_unit_test
  - 750bb07 Adding states/virtualenv_mod.py unit tests
- 6f0cf2e Merge remote-tracking branch `upstream/2015.2` into 2015.5
  - ISSUE #23244: (freimer) Caller not available in reactors | refs: #23245
  - **PR #23509**: (keesbos) Catch the unset (empty/None) environment case
  - **PR #23423**: (cachedout) Remove jid_event from state.orch
  - **PR #23245**: (freimer) Add Caller functionality to reactors.
  - c966196 Merge pull request #23423 from cachedout/remove_jid_event_from_orch
    * f81aab7 Remove jid_event from state.orch
  - 2bb09b7 Merge pull request #23509 from keesbos/Catch_empty_environment
    * 6dedeac Catch the unset (empty/None) environment case
6d42f30 Merge pull request #23245 from freimer/issue_23244
   * 24cf6eb Add Caller functionality to reactors.

- PR #23513: (gladiatr72) short-circuit auto-failure of iptables.delete state @ 2015-05-11T15:18:33Z
  - c3f0d8 Merge pull request #23513 from gladiatr72/rfc_stop_iptables.check_from_short-circuiting_position-only_delete_rule
  - c71714c short-circuit auto-failure of iptables.delete state if position argument is set without the other accoutrements that check_rule requires.

- PR #23534: (jayeshka) adding states/ini_manage unit test case @ 2015-05-11T14:32:06Z
  - 4e77f6f Merge pull request #23534 from jayeshka/ini_manage_states-unit-test
  - 831223c adding states/ini_manage unit test case

- PR #23533: (jayeshka) adding states/hipchat unit test case @ 2015-05-11T14:30:22Z
  - 11ba9ed Merge pull request #23533 from jayeshka/hipchat-states-unit-test
  - 41d1b3 adding states/hipchat unit test case

- PR #23532: (jayeshka) adding states/ipmi unit test case @ 2015-05-11T14:28:15Z
  - e542113 Merge pull request #23532 from jayeshka/ipmi-states-unit-test
  - fc364a adding states/ipmi unit test case

- PR #23531: (jayeshka) adding service unit test case @ 2015-05-11T14:27:12Z
  - 9ba8f6f Merge pull request #23531 from jayeshka/service-unit-test
  - 3ad5314 adding service unit test case

- PR #23517: (garethgreenaway) fix to returners @ 2015-05-11T14:20:51Z
  - ISSUE #23512: (Code-Vortex) hipchat_returner / slack_returner not work correctly | refs: #23517
  - 32838cd Merge pull request #23517 from garethgreenaway/23512_2015_5_returners_with_profiles
  - 81e31e2 fix for returners that utilize profile attributes. code in the if else statement was backwards. #23512

- PR #23502: (rahulhan) Adding states/win_servermanager.py unit tests @ 2015-05-08T19:47:18Z
  - 6be7c8d Merge pull request #23502 from rahulhan/states_win_servermanager_unit_test
  - 2490074 Adding states/win_servermanager.py unit tests

- PR #23495: (jayeshka) adding seed unit test case @ 2015-05-08T17:30:38Z
  - 6048578 Merge pull request #23495 from jayeshka/seed-unit-test
  - 3f134bc adding seed unit test case

- PR #23494: (jayeshka) adding sensors unit test case @ 2015-05-08T17:30:18Z
  - 70bc3c1 Merge pull request #23494 from jayeshka/sensors-unit-test
  - 1fa48a3 adding sensors unit test case

- PR #23493: (jayeshka) adding states/incron unit test case @ 2015-05-08T17:29:59Z
  - b981b20 Merge pull request #23493 from jayeshka/incron-states-unit-test
  - cc7b617 adding states/incron unit test case

- PR #23492: (jayeshka) adding states/influxdb_database unit test case @ 2015-05-08T17:29:51Z
Chapter 35. Release notes

- 4019c49 Merge pull request #23492 from jayeshka/influxdb_database-states-unit-test
- e1fcac8 adding states/influxdb_database unit test case

- PR #23491: (jayeshka) adding states/influxdb_user unit test case @ 2015-05-08T16:24:07Z
  - d317a77 Merge pull request #23491 from jayeshka/influxdb_user-states-unit-test
  - 9d4043f adding states/influxdb_user unit test case

- PR #23477: (galet) LDAP auth: Escape filter value for group membership search @ 2015-05-07T22:04:48Z
  - e0b2a73 Merge pull request #23477 from galet/ldap-filter-escaping
  - 9d4043f adding states/influxdb_user unit test case

- PR #23476: (cachedout) Lint beacon @ 2015-05-07T19:55:36Z
  - PR #23431: (UtahDave) Beacon fixes | refs: #23476
    - e1719fe Merge pull request #23476 from cachedout/lint_23431
    - 8d1f20 Lint beacon

- PR #23431: (UtahDave) Beacon fixes | refs: #23476 @ 2015-05-07T19:53:47Z
  - 1e299ed Merge pull request #23431 from UtahDave/beacon_fixes
  - 152f223 remove unused import
  - 81198f9 fix interval logic and example
  - 5504778 update to proper examples
  - 6890439 fix list for mask
  - ee7b579 remove custom interval code.

- PR #23468: (rahulhan) Adding states/win_system.py unit tests @ 2015-05-07T19:20:50Z
  - ea55c44 Merge pull request #23468 from rahulhan/states_win_system_unit_test
  - 33f8c12 Adding states/win_system.py unit tests

- PR #23466: (UtahDave) minor spelling fix @ 2015-05-07T19:19:06Z
  - e6e1114 Merge pull request #23466 from UtahDave/2015.5local
  - b2c399a minor spelling fix

- PR #23461: (s0undt3ch) [2015.5] Update to latest stable bootstrap script v2015.05.07 @ 2015-05-07T19:16:18Z
  - ISSUE #563: (chutz) pidfile support for minion and master daemons | refs: #23460 #23461
  - 4eeb1e6 Merge pull request #23461 from s0undt3ch/hotfix/bootstrap-script
  - 638c63d Update to latest stable bootstrap script v2015.05.07

- PR #23450: (jayeshka) adding scsi unit test case @ 2015-05-07T19:00:28Z
  - 8651278 Merge pull request #23450 from jayeshka/scsi-unit-test
  - e7269ff adding scsi unit test case

- PR #23449: (jayeshka) adding s3 unit test case @ 2015-05-07T18:59:45Z
  - 8b374ae Merge pull request #23449 from jayeshka/s3-unit-test
  - 85786bf adding s3 unit test case

- PR #23448: (jayeshka) adding states/keystone unit test case @ 2015-05-07T18:58:59Z
PR #23447: (jayeshka) adding states/grafana unit test case @ 2015-05-07T18:58:20Z
- 23d7e7e Merge pull request #23447 from jayeshka/grafana-states-unit-test
- 7e90a4a adding states/grafana unit test case

PR #23438: (techhat) Gate requests import @ 2015-05-07T07:22:58Z
- 1fd0bc2 Merge pull request #23438 from techhat/gaterequests
- d5b15fc Gate requests import

PR #23429: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-07T05:35:13Z
- ISSUE #17245: (tomashavlas) localemod does not generate locale for Arch | refs: #23307 #23397
- PR #23425: (basepi) [2014.7] Fix typo in FunctionWrapper
- PR #23422: (cro) $HOME should not be used, some shells don’t set it.
- PR #23414: (jfindlay) 2015.2 -> 2015.5
- PR #23409: (terminalmage) Update Lithium docstrings in 2014.7 branch | refs: #23410
- PR #23404: (hvnsweeting) saltapi cherrypy: initialize var when POST body is empty
- PR #23397: (jfindlay) add more flexible whitespace to locale_gen search
- PR #23385: (rallytime) Backport #23346 to 2014.7
- PR #23346: (ericfode) Allow file_map in salt-cloud to handle folders. | refs: #23385
- 3c4f734 Merge pull request #23429 from basepi/merge-forward-2015.5
- 7729834 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
- 644eb75 Merge pull request #23422 from cro/gce_sh_home
  * 4ef9e6b Don't use $HOME to find user's directory, some shells don't set it
- ef17ab4 Merge pull request #23425 from basepi/functionwrapper_typo
  * c390737 Fix typo in FunctionWrapper
- 1b13ec0 Merge pull request #23385 from rallytime/bp-23346
  * 9efe13c more linting fixes
  * cf131ec9 cleaned up some pylint errors
  * f981699 added logic to sftp_file and file_map to allow folder uploads using file_map
- f8c7a62 Merge pull request #23414 from jfindlay/update_branch
  * 8074d16 2015.2 -> 2015.5
- 54b3bd4 Merge pull request #23404 from hvnsweeting/cherrypy-post-emptybody-fix
  * f85f8f9 initialize var when POST body is empty
- 160f703 Merge pull request #23409 from terminalmage/update-lithium-docstrings-2014.7
  * be97d01 Fix sphinx typo
  * 20006b0 Update Lithium docstrings in 2014.7 branch
- aa5fba0 Merge pull request #23397 from jfindlay/fix_locale_gen
* 0941fef add more flexible whitespace to locale_gen search

  - ISSUE #23294: *(variia)* file.replace fails to append if repl string partially available | refs: #23350
  - ISSUE #23026: *(adelcast)* Incorrect salt-syndic logfile and pidfile locations | refs: #23341
  - ISSUE #22742: *(hvnsweeting)* salt-master says: ``This master address: `salt' was previously resolvable but now fails to resolve!`` | refs: #23344
  - ISSUE #19114: *(pykler)* salt-ssh and gpg pillar renderer | refs: #23272 #23347 #23188
  - ISSUE #17245: *(tomashavlas)* localemod does not generate locale for Arch | refs: #23307 #23397
  - ISSUE #580: *(thatch45)* recursive watch not being caught | refs: #23324
  - ISSUE #552: *(jhutchins)* Support require and watch under the same state dec | refs: #23324
  - PR #23368: *(kaithar)* Backport #23367 to 2014.7
  - PR #23367: *(kaithar)* Put the sed insert statement back in to the output. | refs: #23368
  - PR #23350: *(lorenegordon)* Append/prepend: search for full line
  - PR #23344: *(cachedout)* Explicitely set file_client on master
  - PR #23341: *(cachedout)* Fix syndic pid and logfile path
  - PR #23324: *(s0undt3ch)* [2014.7] Update to the latest stable release of the bootstrap script v2015.05.04
  - PR #23318: *(cellscape)* Honor seed argument in LXC container initialization
  - PR #23311: *(cellscape)* Fix new container initialization in LXC runner | refs: #23318
  - PR #23307: *(jfindlay)* check for /etc/locale.gen
  - PR #23272: *(basepi)* [2014.7] Allow salt-ssh minion config overrides via master config and roster | refs: #23347
  - PR #18368: *(basepi)* Merge forward from 2014.7 to develop | refs: #23367 #23368
  - PR #589: *(epoelke)* add --quiet and --outfile options to saltkey | refs: #23324
  - PR #567: *(bastichealaar)* Added upstart module | refs: #23324
  - PR #560: *(UtahDave)* The runs feature that was added in 93423aa2e5e4b7de6452090b0039560d2b13... | refs: #23324
  - PR #504: *(SEJeff)* File state goodies | refs: #23324
  - 1fb8445 Merge pull request #23396 from basepi/merge-forward-2015.2
  - 2766c8c Fix typo in FunctionWrapper
  - fd09ceda Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.2
    * 0c76dd4 Merge pull request #23368 from kaithar/bp-23367
      * 77f419 Pylint fix
    * 8d9ac6d1 Put the sed insert statement back in to the output.
  * 3493c1 Merge pull request #23350 from lorenegordon/file.replace_assume_line
    * b60e224 Append/prepend: search for full line
* 7be5c48 Merge pull request #23341 from cachedout/issue_23026
  - e98e65e Fix tests
  - 6011b43 Fix syndic pid and log file path
* ea61abf Merge pull request #23272 from basepi/salt-ssh.minion.config.19114
  - c223309 Add version added
  - be740ff Lint
  - c23375 Missing comma
  - 8e3e8e0 Pass the minion_opts through the FunctionWrapper
  - cb69cd0 Match the master config template in the master config reference
  - 87fc31e Add Salt-SSH section to master config template
  - 91dd9dc Add ssh_minion_opts to master config ref
  - c273ea1 Add minion config to salt-ssh doc
  - a6bb76 Add minion_opts to roster docs
  - 5212c35 Accept minion_opts from the target information
  - e2099b6 Process ssh_minion_opts from master config
  - 3b6421e Revert `Work around bug in salt-ssh in config.get for gpg renderer`
  - 494953a Remove the strip (embracing multi-line YAML dump)
  - fe87f0f Dump multi-line yaml into the SHIM
  - b751a72 Inject local minion config into shim if available
* 4f760dd Merge pull request #23347 from basepi/salt-ssh.functionwrapper.contains.19114
  - 3059e3 Backport FunctionWrapper.__contains__
* 02658b1 Merge pull request #23344 from cachedout/issue_22742
  - 5adc96c Explicitly set file_client on master
* ba7605d Merge pull request #23318 from cellscape/honor-seed-argument
  - 2281b1e Honor seed argument in LXC container initialization
* 4ac4509 Merge pull request #23307 from jfindlay/fix_locale_gen
  - 101199a check for /etc/locale.gen
* f790f42 Merge pull request #23324 from s0undt3ch/bootstrap-script-2014.7
* 6643e47 Update to the latest stable release of the bootstrap script v2015.05.04

- 23d4feb Merge remote-tracking branch `upstream/2015.2` into 2015.5

- PR #23412: (rahulhan) Adding states/win_update.py unit tests @ 2015-05-06T18:31:09Z
  - b3c1672 Merge pull request #23412 from rahulhan/states_win_update_unit_test
  - 9bc1519 Removed unwanted imports
  - f12bfcf Adding states/win_update.py unit tests

- PR #23413: (terminalmage) Update manpages for 2015.2 -&gt; 2015.5 @ 2015-05-06T17:12:57Z
  - f2d7646 Merge pull request #23413 from terminalmage/update-manpages
2015.8.0

- 23fa440 Update manpages to reflect 2015.2 rename to 2015.5
- 0fdaa73 Fix missed docstring updates from 2015.2 -> 2015.5
- 4fe85ba Add missing RST file

- **PR #23410**: (terminalmage) Update Lithium docstrings in 2015.2 branch @ 2015-05-06T15:53:52Z
  - PR #23409: (terminalmage) Update Lithium docstrings in 2014.7 branch | refs: #23410
  - bafbea7 Merge pull request #23410 from terminalmage/update-lithium-docstrings-2015.2
  - d395565 Update Lithium docstrings in 2015.2 branch

- **PR #23407**: (jayeshka) adding rsync unit test case @ 2015-05-06T15:52:23Z
  - 02ef41a Merge pull request #23407 from jayeshka/rsync-unit-test
  - a4dd836 adding rsync unit test case

- **PR #23406**: (jayeshka) adding states/lxc unit test case @ 2015-05-06T15:51:50Z
  - 58ec2a2 Merge pull request #23406 from jayeshka/lxc-states-unit-test
  - 32a0d03 adding states/lxc unit test case

- **PR #23395**: (basepi) [2015.2] Add note to 2015.2.0 release notes about master opts in pillar @ 2015-05-05T22:15:20Z
  - 8837d00 Merge pull request #23395 from basepi/2015.2.0masteropts
  - b261c95 Add note to 2015.2.0 release notes about master opts in pillar

- **PR #23393**: (basepi) [2015.2] Add warning about python_shell changes to 2015.2.0 release notes @ 2015-05-05T22:12:46Z
  - f79a6d5 Merge pull request #23393 from basepi/2015.2.0python_shell
  - b2f033f Add CLI note
  - 48e7b3e Add warning about python_shell changes to 2015.2.0 release notes

- **PR #23380**: (gladiatr72) Fix for double output with static salt cli/v2015.2 @ 2015-05-05T21:44:28Z
  - a977776 Merge pull request #23380 from gladiatr72/fixed_for_double_output_with_static__salt_CLI/v2015.2
  - c47fd7 Actually removed the static bits from below the else: fold this time.
  - 4ee3679 Fix for incorrect output with salt CLI --static option

- **PR #23379**: (rahulhan) Adding states/rabbitmq_cluster.py @ 2015-05-05T21:44:06Z
  - 5c9543c Merge pull request #23379 from rahulhan/states_rabbitmq_cluster_test
  - 04c22d1 Adding states/rabbitmq_cluster.py

- **PR #23377**: (rahulhan) Adding states/xmpp.py unit tests @ 2015-05-05T21:43:35Z
  - 430f080 Merge pull request #23377 from rahulhan/states_xmpp_test
  - 32923b5 Adding states/xmpp.py unit tests

- **PR #23335**: (steverweber) 2015.2: include doc in master config for module_dirs @ 2015-05-05T21:28:58Z
  - 8c057e6 Merge pull request #23335 from steverweber/2015.2
  - 5e3bae9 help installing python pysphere lib
  - 97513b0 include module_dirs
  - 36b1c87 include module_dirs
• **PR #23362:** (jayeshka) adding states/zk_concurrency unit test case @ 2015-05-05T15:50:06Z
  - 1648253 Merge pull request #23362 from jayeshka/zk_concurrency-states-unit-test
  - f60dda4 adding states/zk_concurrency unit test case

• **PR #23363:** (jayeshka) adding riak unit test case @ 2015-05-05T14:23:05Z
  - 1cdaeed Merge pull request #23363 from jayeshka/riak-unit-test
  - f9da6db adding riak unit test case

### 35.2.4 Salt 2015.5.2 Release Notes

**Release** 2015-06-10

Version 2015.5.2 is a bugfix release for 2015.5.0.

Extended Changelog Courtesy of Todd Stansell [https://github.com/tjstansell/salt-changelogs](https://github.com/tjstansell/salt-changelogs):

**PR #24346:** (rallytime) Backport #24271 to 2015.5 @ 2015-06-03T18:44:31Z

**PR #24271:** (randybias) Fixed the setup instructions

  refs: #24346
  - 76927c9 Merge pull request #24346 from rallytime/bp-24271
  - 04067b6 Fixed the setup instructions

**PR #24345:** (rallytime) Backport #24013 to 2015.5 @ 2015-06-03T18:39:41Z

**ISSUE #24012:** (jbq) Enabling a service does not create the appropriate rc.d symlinks on Ubuntu

  refs: #24013

**PR #24013:** (jbq) Fix enabling a service on Ubuntu #24012

  refs: #24345
  - 4afa03d Merge pull request #24345 from rallytime/bp-24013
  - 16e0732 Fix enabling a service on Ubuntu #24012

**PR #24365:** (jacobhammons) Fixes for PDF build errors @ 2015-06-03T17:50:02Z

  - c3392c2 Merge pull request #24365 from jacobhammons/DocFixes
  - 0fc1902 Fixes for PDF build errors

**PR #24313:** (nicholascapo) Fix #22991 Correctly set result when test=True @ 2015-06-03T14:49:18Z

  **ISSUE #22991:** (nicholascapo) npm.installed ignores test=True * ae681a4 Merge pull request #24313 from nicholascapo/fix-22991-npm.installed-test-true * ac9644c Fix #22991 npm.installed correctly set result on test=True

**PR #24312:** (nicholascapo) Fix #18966: file.serialize supports test=True @ 2015-06-03T14:49:06Z

  **ISSUE #18966:** (bechtoldt) file.serialize ignores test=True * d57a9a2 Merge pull request #24312 from nicholascapo/fix-18966-file.serialize-test-true * e7328e7 Fix #18966 file.serialize correctly set result on test=True

**PR #24302:** (jfindlay) fix pkg hold/unhold integration test @ 2015-06-03T03:27:43Z

  - 6b694e3 Merge pull request #24302 from jfindlay/pkg_tests
  - c2db0b1 fix pkg hold/unhold integration test

**PR #24349:** (rallytime) Remove references to mount_points in ec2 docs @ 2015-06-03T01:54:09Z
ISSUE #14021: (mathrawka) EC2 doc mentions mount_point, but unable to use properly
refs: #24349
  • aca8447 Merge pull request #24349 from rallytime/fix-14021
  • a235b11 Remove references to mount_points in ec2 docs

PR #24328: (dr4Ke) Fix state grains silently fails 2015.5 @ 2015-06-02T15:18:46Z
ISSUE #24319: (dr4Ke) grains state shouldn't fail silently * 88a997e Merge pull request #24328 from dr4Ke/fix_state_grains_silently_fails_2015.5 * 8a63d1e fix state grains silently fails #24319
  • ca1af20 grains state: add some tests

PR #24310: (techhat) Add warning about destroying maps @ 2015-06-02T03:01:28Z
ISSUE #24036: (arthurlogilab) [salt-cloud] Protect against passing command line arguments as names for the --destroy command
  refs: #24310

ISSUE #9772: (s0undt3ch) Delete VM’s in a map does not delete them all
refs: #24310
  • 7dc99bb Merge pull request #24310 from techhat/mapwarning
  • ca535a6 Add warning about destroying maps

PR #24281: (steverweber) ipmi docfix @ 2015-06-01T17:45:36Z
  • 02bfb25 Merge pull request #24281 from steverweber/ipmi_docfix
  • dd36f2c yaml formatting
  • f6def3 include api_kg kwarg in ipmi state
  • a7d4e97 doc cleanup
  • 0ded2fd save more cleanup to doc
  • 08872f2 fix name api_key to api_kg
  • 165a387 doc fix add api_kg kwargs
  • 1ec7888 cleanup docs

PR #24287: (jfindlay) fix pkg test on ubuntu 12.04 for realz @ 2015-06-01T14:16:37Z
  • 73cd2cb Merge pull request #24287 from jfindlay/pkg_test
  • 98944d8 fix pkg test on ubuntu 12.04 for realz

PR #24279: (rallytime) Backport #24263 to 2015.5 @ 2015-06-01T04:29:34Z
PR #24263: (cdarwin) Correct usage of import_yaml in formula documentation
  refs: #24279
  • 02017a0 Merge pull request #24279 from rallytime/bp-24263
  • beftc7c Correct usage of import_yaml in formula documentation

PR #24277: (rallytime) Put a space between after_jump commands @ 2015-06-01T04:28:26Z

ISSUE #24226: (c4urself) iptables state needs to keep ordering of flags
refs: #24277
  • 2ba696d Merge pull request #24277 from rallytime/fix_iptables_jump
- e2d1606 Move after_jump split out of loop
- d14f130 Remove extra loop
- 42ed532 Put a space between after_jump commands

**PR #24262: (basepi) More dictupdate after #24142 @ 2015-05-31T04:09:37Z**

**PR #24142: (basepi) Optimize dictupdate.update and add #24097 functionality**

ref: #24262

**PR #24097: (kiorky) Optimize dictupdate**

ref: #24142

- 113eba3 Merge pull request #24262 from basepi/dictupdatefix
- 0c4832c Raise a typeerror if non-dict types
- be21aaa Pylint
- bb8a6c6 More optimization
- c933249 py3 compat
- ff6b2a7 Further optimize dictupdate.update()
- c73f5ba Remove unused valtype

**PR #24269: (kiorky) zfs: Fix spurrious retcode hijacking in virtual @ 2015-05-30T17:47:49Z**

- 785d5a1 Merge pull request #24269 from makinacorpus/zfs
- 0bf23ce zfs: Fix spurrious retcode hijacking in virtual

**PR #24257: (jfindlay) fix pkg mod integration test on ubuntu 12.04 @ 2015-05-29T23:09:00Z**

- 3d885c0 Merge pull request #24257 from jfindlay/pkg_tests
- 9508924 fix pkg mod integration test on ubuntu 12.04

**PR #24260: (basepi) Fix some typos from #24080 @ 2015-05-29T22:54:58Z**

**ISSUE #23657: (arthurlogilab) [salt-cloud lxc] NameError: global name '__salt__' is not defined**

ref: #24080 #23982

**PR #24080: (kiorky) Lxc consistency2**

ref: #24260 #23982 #24066

**PR #24066: (kiorky) Merge forward 2015.5 -> develop**

ref: #23982

**PR #24065: (kiorky) continue to fix #23883**

ref: #24080 #24066

**PR #23982: (kiorky) lxc: path support**

ref: #24080

- 08a1075 Merge pull request #24260 from basepi/lxctypos24080
- 0fa1ad3 Fix another lxc typo
- 669938f s/you ll/you'll/

**PR #24080: (kiorky) Lxc consistency2**
refs: #24260 #23982 #24066
@ 2015-05-29T22:51:54Z

ISSUE #23657: (arthurlogilab) [salt-cloud lxc] NameError: global name '__salt__' is not defined
refs: #24080 #23982

PR #24066: (kiorky) Merge forward 2015.5 -> develop
refs: #23982

PR #24065: (kiorky) continue to fix #23883
refs: #24080 #24066

PR #23982: (kiorky) lxc: path support
refs: #24080
  • 75590cf Merge pull request #24080 from makinacorpus/lxc_consistency2
  • 81f8067 lxc: fix old lxc test
  • 458f506 seed: lint
  • 96b8d55 Fix seed.mkconfig yamldump
  • 76db68 lxc/aplynet: conservative
  • ce7096f variable collision
  • 8a8b28d lxc: lint
  • 458b18b more lxc docs
  • ef1f952 lxc docs: typos
  • d67a43d more lxc docs
  • 608da5e modules/lxc: merge resolution
  • 27c4689 modules/lxc: more consistent comparsion
  • 07c365a lxc: merge conflict spotted
  • 9993915 modules/lxc: rework settings for consistency
  • ce11d83 lxc: Global doc refresh
  • 61ed2f5 clouds/lxc: profile key is conflicting

PR #24247: (rallytime) Backport #24220 to 2015.5 @ 2015-05-29T21:40:01Z

ISSUE #24210: (damonnk) salt-cloud vsphere.py should allow key_filename param
refs: #24220

PR #24220: (djcrabhat) adding key_filename param to vsphere provider
refs: #24247
  • da14f3b Merge pull request #24247 from rallytime/bp-24220
  • 0b1041d adding key_filename param to vsphere provider

PR #24254: (rallytime) Add deprecation warning to Digital Ocean v1 Driver @ 2015-05-29T21:39:25Z

PR #22731: (dmyerscough) Decommission DigitalOcean APIv1 and have users use the new DigitalOcean APIv2
refs: #24254
- 21d6126 Merge pull request #24254 from rallytime/add_deprecation_warning_digitalocean
- cafe37b Add note to docs about deprecation
- ea0f1e0 Add deprecation warning to digital ocean driver to move to digital_ocean_v2

PR #24252: (aboe76) Updated suse spec to 2015.5.1 @ 2015-05-29T21:38:45Z
- dac055d Merge pull request #24252 from aboe76/opensuse_package
- 0ad617d Updated suse spec to 2015.5.1

PR #24251: (garethgreenaway) Returners broken in 2015.5 @ 2015-05-29T21:37:52Z
- 49e7fe8 Merge pull request #24251 from garethgreenaway/2015_5_returner_brokenness
- 5df6b52 The code calling cfg as a function vs treating it as a dictionary and using get is currently backwards causing returners to fail when used from the CLI and in scheduled jobs.

PR #24255: (rallytime) Clarify digital ocean documentation and mention v1 driver deprecation @ 2015-05-29T21:37:07Z
ISSUE #21498: (rallytime) Clarify Digital Ocean Documentation
refs: #24255
- bfb9461 Merge pull request #24255 from rallytime/clarify_digital_ocean_driver_docs
- 8d51f75 Clarify digital ocean documentation and mention v1 driver deprecation

PR #24232: (rallytime) Backport #23308 to 2015.5 @ 2015-05-29T21:36:46Z
PR #23308: (thusoy) Don't merge: Add missing jump arguments to iptables module
refs: #24232
- 41f5756 Merge pull request #24232 from rallytime/bp-23308
- 2733f66 Import string
- 9097cca Add missing jump arguments to iptables module

PR #24245: (Sacro) Unset PYTHONHOME when starting the service @ 2015-05-29T20:00:31Z
- a95982c Merge pull request #24245 from Sacro/patch-2
- 6632d06 Unset PYTHONHOME when starting the service

PR #24121: (hvnsweeting) deprecate setting user permission in rabbitmq_vhost.present @ 2015-05-29T15:55:40Z
- 1504c76 Merge pull request #24121 from hvnsweeting/rabbitmq-host-deprecate-set-permission
- 2223158 deprecate setting user permission in rabbitmq_host.present

PR #24179: (merll) Changing user and group only possible for existing ids. @ 2015-05-29T15:52:43Z
PR #24169: (merll) Changing user and group only possible for existing ids.
refs: #24179
- ba02f65 Merge pull request #24179 from Precis/fixed-file-uid-gid-2015.0
- ee4c9d5 Use ids if user or group is not present.

PR #24229: (msteed) Fix auth failure on syndic with external_auth @ 2015-05-29T15:04:06Z
ISSUE #24147: (paclat) Syndication issues when using authentication on master of masters.
Salt Documentation, Release 2015.8.0

refs: #24229

• 9fbf066 Merge pull request #24229 from msteeed/issue-24147
• 482d1cf Fix auth failure on syndic with external_auth

PR #24234: (jayeshka) adding states/quota unit test case. @ 2015-05-29T14:14:27Z

• 19fa43c Merge pull request #24234 from jayeshka/quota-states-unit-test
• c233565 adding states/quota unit test case.

PR #24217: (jfindlay) disable intermittently failing tests @ 2015-05-29T03:08:39Z

ISSUE #40: (thatch45) Clean up timeouts

refs: #22857

PR #23623: (jfindlay) Fix /jobs endpoint’s return

refs: #24217

PR #22857: (jacksontj) Fix /jobs endpoint’s return

refs: #23623

• e15142c Merge pull request #24217 from jfindlay/disable_bad_tests
• 6b62804 disable intermittently failing tests

PR #24199: (ryan-lane) Various fixes for boto_route53 and boto_elb @ 2015-05-29T03:02:41Z

• ce8e43b Merge pull request #24199 from lyft/route53-fix-elb
• d8dc9a7 Better unit tests for boto_elb state
• 62f214b Remove cnames_present test
• 7b9ae82 Lint fix
• b74b0d1 Various fixes for boto_route53 and boto_elb

PR #24142: (basepi) Optimize dictupdate.update and add #24097 functionality

refs: #24262

@ 2015-05-29T03:00:56Z

PR #24097: (kiorky) Optimize dictupdate

refs: #24142 #24142

PR #21968: (ryanwohara) Verifying the key has a value before using it. * a43465d Merge pull request #24142 from basepi/dictupdate24097 * 5c6e210 Deepcopy on merge_recurse

• a13c84a Fix None check from #21968
• 9ef2c64 Add docstring
• 8579429 Add in recursive_update from #24097
• 8599143 if key not in dest, don’t recurse
• d8a8b5 Rename klass to valtype

PR #24208: (jayeshka) adding states/ports unit test case. @ 2015-05-28T23:06:33Z

• 526698b Merge pull request #24208 from jayeshka/ports-states-unit-test
• 657b709 adding states/ports unit test case.
PR #24219: (jfindlay) find zfs without modinfo  @ 2015-05-28T21:07:26Z

ISSUE #20635: (dennisjac) 2015.2.0rc1: zfs errors in log after update
refs: #24219
- d00945f Merge pull request #24219 from jfindlay/zfs_check
- 15d4019 use the salt loader in the zfs mod
- 5599b67 try to search for zfs if modinfo is unavailable

PR #24190: (msteed) Fix issue 23815  @ 2015-05-28T20:10:34Z

ISSUE #23815: (Snrgster) [beacons] inotify errors on subdir creation * 3dc4b85 Merge pull request #24190 from msteed/issue-23815 * 086a1a9 lint
- 65de62f fix #23815
- d04e916 spelling
- db9f682 add inotify beacon unit tests

PR #24211: (rallytime) Backport #24205 to 2015.5  @ 2015-05-28T18:28:15Z

PR #24205: (hazelesque) Docstring fix in salt.modules.yumpkg.hold
refs: #24211
- 436634b Merge pull request #24211 from rallytime/bp-24205
- 23284b5 Docstring fix in salt.modules.yumpkg.hold

PR #24212: (terminalmage) Clarify error in rendering template for top file  @ 2015-05-28T18:26:20Z

- cc58624 Merge pull request #24212 from terminalmage/clarify-error-msg
- ca807fb Clarify error in rendering template for top file

PR #24213: (The-Loeki) ShouldFix _- troubles in debian_ip  @ 2015-05-28T18:24:39Z

ISSUE #23904: (mbrgm) Network config bonding section cannot be parsed when attribute names use dashes
refs: #23917

ISSUE #23900: (hashi825) salt ubuntu network building issue 2015.5.0
refs: #23922

PR #23922: (garethgreenaway) Fixes to debian_ip.py
refs: #24213

PR #23917: (corywright) Split debian bonding options on dash instead of underscore
refs: #24213
- 9825160 Merge pull request #24213 from The-Loeki/patch-3
- a68d515 ShouldFix _- troubles in debian_ip

PR #24214: (basepi) 2015.5.1release  @ 2015-05-28T16:23:57Z

- 071751d Merge pull request #24214 from basepi/2015.5.1release
- e5ba31b 2015.5.1 release date
- 768494c Update latest release in docs

PR #24202: (rallytime) Backport #24186 to 2015.5  @ 2015-05-28T05:16:48Z
PR #24186: (thcipriani) Update salt vagrant provisioner info
   refs: #24202
   • c2f1f6b Merge pull request #24202 from rallytime/bp-24186
   • db793dd Update salt vagrant provisioner info

PR #24192: (rallytime) Backport #20474 to 2015.5 @ 2015-05-28T05:16:18Z
   PR #20474: (djcrabhat) add sudo, sudo_password params to vsphere deploy to allow for non-root deploys
   refs: #24192
   • 8a085a2 Merge pull request #24192 from rallytime/bp-20474
   • fd3c783 add sudo, sudo_password params to deploy to allow for non-root deploys

PR #24184: (rallytime) Backport #24129 to 2015.5 @ 2015-05-28T05:15:08Z
   PR #24129: (pengyao) Wheel client doc
   refs: #24184
   • 7cc535b Merge pull request #24184 from rallytime/bp-24129
   • 722a662 fixed a typo
   • 565eb46 Add cmd doc for WheelClient

PR #24183: (rallytime) Backport #19320 to 2015.5 @ 2015-05-28T05:14:36Z
   PR #19320: (clan) add `state_output_profile` option for profile output
   refs: #24183
   • eb0af70 Merge pull request #24183 from rallytime/bp-19320
   • 55db1bf state_output_profile default to True
   • 9919227 fix type: statei -> state
   • 0549ca6 add `state_output_profile` option for profile output

PR #24201: (whiteinge) Add list of client libraries for the rest_cherrypy module to the top-level documentation @ 2015-05-28T02:12:09Z
   • 1b5bf23 Merge pull request #24201 from whiteinge/rest_cherrypy-client-libs
   • 5f71802 Add list of client libraries for the rest_cherrypy module
   • 28f77f7 Fix rest_cherrypy config example indentation

PR #24195: (rallytime) Merge #24185 with a couple of fixes @ 2015-05-27T22:18:37Z
   PR #24185: (jacobhammons) Fixes for doc build errors
   refs: #24195
   • 3307ec2 Merge pull request #24195 from rallytime/merge-24185
   • d8daa9d Merge #24185 with a couple of fixes
   • 634d56b Fixed pylon error
   • 0689815 Fixes for doc build errors

PR #24166: (jayeshka) adding states/pkgng unit test case. @ 2015-05-27T20:27:49Z
   • 7e400bc Merge pull request #24166 from jayeshka/pkgng-states-unit-test
- 2234bb0 adding states/pkgng unit test case.

**PR #24189** (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-05-27T20:26:31Z

PR #24178: (rallytime) Backport #24118 to 2014.7, too. PR #24159: (rallytime) Fill out modules/keystone.py CLI Examples PR #24158: (rallytime) Fix test_valid_docs test for tls module PR #24118: (trevor-h) removed deprecated pymongo usage

refs: #24139 #24178

- 9fcda79 Merge pull request #24189 from basepi/merge-forward-2015.5
- 8839e9c Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
- 9d7331c Merge pull request #24178 from rallytime/bp-24118
  - e2217a0 removed deprecated pymongo usage as no longer functional with pymongo > 3.x
- 4e8c503 Merge pull request #24159 from rallytime/keystone_doc_examples
  - dadac8d Fill out modules/keystone.py CLI Examples
- fc10ee8 Merge pull request #24158 from rallytime/fixedoc_error
  - 49a517e Fix test_valid_docs test for tls module

**PR #24181** (jtand) Fixed error where file was evaluated as a symlink in test_absent @ 2015-05-27T18:26:28Z

- 2303dec Merge pull request #24181 from jtand/file_test
- 5f0e601 Fixed error where file was evaluated as a symlink in test_absent

**PR #24180** (terminalmage) Skip libvirt tests if not running as root @ 2015-05-27T18:18:47Z

- a16276a Merge pull request #24180 from terminalmage/fix-libvirt-test
- 72e7416 Skip libvirt tests if not running as root

**PR #24165** (jayeshka) adding states/portage_config unit test case. @ 2015-05-27T17:15:08Z

- 1fbc5b2 Merge pull request #24165 from jayeshka/portage_config-states-unit-test
- 8cf1505 adding states/portage_config unit test case.

**PR #24164** (jayeshka) adding states/pecl unit test case. @ 2015-05-27T17:14:26Z

- 4747856 Merge pull request #24164 from jayeshka/pecl-states-unit-test
- 5e6a5b3 adding states/pecl unit test case.

**PR #24160** (The-Loeki) small enhancement to data module; pop() @ 2015-05-27T17:03:10Z

- cd4a19 Merge pull request #24160 from The-Loeki/patch-1
- 2175ff3 doc & merge fix
- eba382c small enhancement to data module; pop() (The-Loeki)

**PR #24153** (techhat) Batch mode sometimes improperly builds lists of minions to process @ 2015-05-27T16:21:53Z

- 1af8c83 adding states/pagerduty unit test case.

- 1af8c83 adding states/pagerduty unit test case.
PR #24156: *(basepi) [2015.5]* Merge forward from 2014.7 to 2015.5  @ 2015-05-27T15:05:01Z

**ISSUE #23464**: *(tibold)* cmd_iter_no_block() blocks

refs: #24093

PR #24125: *(hvnsweeting)* Fix rabbitmq test mode  PR #24093: *(msteed)* Make LocalClient.cmd_iter_no_block() not block  PR #24008: *(davidjb)* Correct reST formatting for states.cmd documentation  PR #23933: *(jacobhammons)* sphinx saltstack2 doc theme * b9507d1 Merge pull request #24156 from basepi/merge-forward-2015.5 * e52b5ab Remove stray >>>>>>

- 7dfbd92 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  - c0d32e0 Merge pull request #24125 from hvnsweeting/fix-rabbitmq-test-mode
    * 71862c6 enhance log
    * 28e2594 change according to new output of rabbitmq module functions
    * cd0212e processes and returns better output for rabbitmq module
  - 39a8f30 Merge pull request #24093 from msteed/issue-23464
    * fd35903 Fix failing test
    * 41b344c Make LocalClient.cmd_iter_no_block() not block
  - 5bffd30 Merge pull request #24008 from davidjb/2014.7
    * 8b8d029 Correct reST formatting for documentation
  - 1aa0420 Merge pull request #23933 from jacobhammons/2014.7
  - a3613e6 removed numbering from doc TOC
  - 78b737c removed 2015.* release from release notes, updated index page to remove PDF/epub links
  - e867f7d Changed build settings to use saltstack2 theme and update release versions.
  - 81ed9c9 sphinx saltstack2 doc theme

PR #24145: *(jfindlay)* attempt to decode win update package  @ 2015-05-26T23:20:20Z

**ISSUE #24102**: *(bormotov)* win_update encondig problems

refs: #24145

- 05745fa Merge pull request #24145 from jfindlay/win_update_encoding
  - cc5e17e attempt to decode win update package

PR #24123: *(kiorky)* fix service enable/disable change  @ 2015-05-26T21:24:19Z

**ISSUE #24122**: *(kiorky)* service.dead is no more stateful: services does not handle correctly enable/disable change state

refs: #24123

- 7024789 Merge pull request #24123 from makinacorpus/ss
  - 2e2e1d2 fix service enable/disable change

PR #24146: *(rallytime)* Fixes the boto_vpc_test failure on CentOS 5 tests  @ 2015-05-26T20:15:19Z

- 51c3cec Merge pull request #24146 from rallytime/fix_centos_boto_failure
  - ac0f97d Fixes the boto_vpc_test failure on CentOS 5 tests

PR #24144: *(twangboy)* Compare Keys ignores all newlines and carriage returns  @ 2015-05-26T19:25:48Z
ISSUE #24052: (twangboy) v2015.5.1 Changes the way it interprets the minion_master.pub file
refs: #24089 #24144

ISSUE #23566: (rks2286) Salt-cp corrupting the file after transfer to minion
refs: #24144 #23740

PR #23740: (jfindlay) Binary write
refs: #24144
• 1c91a21 Merge pull request #24144 from twangboy/fix_24052
• c197b41 Compare Keys removing all newlines and carriage returns

PR #24139: (rallytime) Backport #24118 to 2015.5 @ 2015-05-26T18:24:27Z

PR #24118: (trevor-h) removed deprecated pymongo usage
refs: #24139 #24178
• 0841667 Merge pull request #24139 from rallytime/bp-24118
• 4bb519b removed deprecated pymongo usage as no longer functional with pymongo > 3.x

PR #24138: (rallytime) Backport #24116 to 2015.5 @ 2015-05-26T18:23:51Z

PR #24116: (awdrius) Fixed typo in chown username (ending dot) that fails the command.
refs: #24138
• 742eca2 Merge pull request #24138 from rallytime/bp-24116
• 7f08641 Fixed typo in chown username (ending dot) that fails the command.

PR #24137: (rallytime) Backport #24105 to 2015.5 @ 2015-05-26T18:23:40Z

PR #24105: (cedwards) Updated some beacon-specific documentation formatting
refs: #24137
• e01536d Merge pull request #24137 from rallytime/bp-24105
• f0778a0 Updated some beacon-specific documentation formatting

PR #24136: (rallytime) Backport #24104 to 2015.5 @ 2015-05-26T15:58:47Z

ISSUE #23364: (pruiz) Unable to destroy host using proxmox cloud: There was an error destroying machines: 501 Server Error: Method `DELETE /nodes/pmx1/openvz/openvz/100` not implemented
Only try to stop a VM if it’s not already stopped. (fixes #23364)
refs: #24136
• 89cdf97 Merge pull request #24136 from rallytime/bp-24104
• c538884 Only try to stop a VM if it’s not already stopped. (fixes #23364)

PR #24135: (rallytime) Backport #24083 to 2015.5 @ 2015-05-26T15:58:27Z

PR #24083: (swdream) fix code block syntax
refs: #24135
• 67c4373 Merge pull request #24135 from rallytime/bp-24083
• e1d06f9 fix code block syntax

PR #24131: (jayeshka) adding states/mysql_user unit test case @ 2015-05-26T15:58:10Z
• a83371e Merge pull request #24131 from jayeshka/mysql_user-states-unit-test
• ed1ef69 adding states/mysql_user unit test case

PR #24130: *(jayeshka)* **adding states/ntp unit test case**  @ 2015-05-26T15:57:29Z

• 1dc1d2a Merge pull request #24130 from jayeshka/ntp-states-unit-test
• ede4af adding states/ntp unit test case

PR #24128: *(jayeshka)* **adding states/openstack_config unit test case**  @ 2015-05-26T15:56:08Z

• 3943417 Merge pull request #24128 from jayeshka/openstack_config-states-unit-test
• ca9e0f adding states/openstack_config unit test case

PR #24127: *(jayeshka)* **adding states/npm unit test case**  @ 2015-05-26T15:55:18Z

• 23f25c4 Merge pull request #24127 from jayeshka/npm-states-unit-test
• c3ecab adding states/npm unit test case

PR #24077: *(anlutro)* **Change how state_verbose output is filtered**  @ 2015-05-26T15:41:11Z

ISSUE #24009: *(hvnsweeting)* **state_verbose False summary is wrong**

refs: #24077

• 07488a4 Merge pull request #24077 from alprs/fix-outputter_highstate_nonverbose_count
• 7790408 Change how state_verbose output is filtered

PR #24119: *(jfindlay)* **Update contrib docs**  @ 2015-05-26T15:37:01Z

• 224820f Merge pull request #24119 from jfindlay/update_contrib_docs
• fa2d411 update example release branch in contrib docs
• a0b76b5 clarify git rebase instructions
• 3517e00 fix contribution docs link typos
• 651629c backport dev contrib doc updates to 2015.5

PR #23928: *(joejulian)* **Add the ability to replace existing certificates**  @ 2015-05-25T19:47:26Z

• 5488c4a Merge pull request #23928 from joejulian/2015.5_tls_module_replace_existing
• 4a4cbbd Add the ability to replace existing certificates

PR #24078: *(jfindlay)* **if a charmap is not supplied, set it to the codeset**  @ 2015-05-25T19:39:19Z

ISSUE #23221: *(Reiner030)* **Debian Jessie: locale.present not working again**

refs: #24078

• dd90ef0 Merge pull request #24078 from jfindlay/locale_charmap
• 5eb97f0 if a charmap is not supplied, set it to the codeset

PR #24088: *(jfindlay)* **pkg module integration tests**  @ 2015-05-25T19:39:02Z

• 739b2ef rework yumpkg refresh_db so args are not mandatory

PR #24089: *(jfindlay)* **allow override of binary file mode on windows**  @ 2015-05-25T19:38:44Z

ISSUE #24052: *(twangboy)* **v2015.5.1 Changes the way it interprets the minion_master.pub file**

refs: #24089 #24144
- 517552c Merge pull request #24089 from jfindlay/binary_write
- b2259a6 allow override of binary file mode on windows

PR #24092: (jfindlay) collect scattered contents edits, ensure it's a str @ 2015-05-25T19:38:10Z

    ISSUE #23973: (mschiff) state file.managed: setting contents_pillar to a pillar which is a list throws exception instead giving

refs: #24092
- 121ab9f Merge pull request #24092 from jfindlay/file_state
- cfa0f13 collect scattered contents edits, ensure it's a str

PR #24112: (The-Loeki) thin_gen breaks when thinver doesn't exist @ 2015-05-25T19:37:47Z

    - 84e665de Merge pull request #24112 from The-Loeki/patch-1
    - 3464ea thin_gen breaks when thinver doesn't exist

PR #24108: (jayeshka) adding states/mysql_query unit test case @ 2015-05-25T12:30:48Z

    - ec509ed Merge pull request #24108 from jayeshka/mysql_query-states-unit-test
    - ec50450 adding states/mysql_query unit test case

PR #24110: (jayeshka) adding varnish unit test case @ 2015-05-25T12:30:21Z

    - f2e5d6c Merge pull request #24110 from jayeshka/varnish-unit-test
    - e119889 adding varnish unit test case

PR #24109: (jayeshka) adding states/mysql_grants unit test case @ 2015-05-25T12:29:53Z

    - 4fca2b4 Merge pull request #24109 from jayeshka/mysql_grants-states-unit-test
    - 11a93cb adding states/mysql_grants unit test case

PR #24028: (nleib) send a disable message to disable puppet @ 2015-05-25T04:02:11Z

    - 6b43c9a Merge pull request #24028 from nleib/2015.5
    - 15f24b4 update format of string in disabled msg
    - 7690e5b remove trailing whitespaces
    - 56a9720 Update puppet.py
    - 9686391 Update puppet.py
    - 33f3d8e send a disable message to disable puppet

PR #24100: (jfindlay) adding states/file unit test case @ 2015-05-24T05:17:54Z

    PR #23963: (jayeshka) adding states/file unit test case

refs: #24100
- 52c9aca Merge pull request #24100 from jfindlay/merge_23963
- 7d59deb adding states/file unit test case

PR #24098: (galet) Systemd not recognized properly on Oracle Linux 7 @ 2015-05-24T04:07:31Z

    ISSUE #21446: (dpheasant) check for systemd on Oracle Linux

refs: #24098
- 0eb9f15 Merge pull request #24098 from galet/2015.5
• 4d6ab21 Systemd not recognized properly on Oracle Linux 7

PR #24090: (jfindlay) adding states/mount unit test case  @ 2015-05-22T23:02:57Z

PR #24062: (jayeshka) adding states/mount unit test case
ref: #24090
• 8e04db7 Merge pull request #24090 from jfindlay/merge_24062
• a81a922 adding states/mount unit test case

PR #24086: (rallytime) Backport #22806 to 2015.5  @ 2015-05-22T21:18:20Z

ISSUE #22574: (unicolet) error when which is not available
ref: #22806

PR #22806: (jfindlay) use cmd.run_all instead of cmd.run Stdout
ref: #24086
• c00795f Merge pull request #24086 from rallytime/bp-22806
• f728f55 use cmd.run_all instead of cmd.run Stdout

PR #24024: (jayeshka) adding states/mongodb_user unit test case  @ 2015-05-22T20:53:19Z

• 09de253 Merge pull request #24024 from jayeshka/mongodb_user-states-unit-test
• f31dc92 resolved errors
• d038b1f adding states/mongodb_user unit test case

PR #24065: (kiorky) continue to fix #23883
ref: #24080 #24066
@ 2015-05-22T18:59:21Z

ISSUE #24017: (arthurlogilab) [salt-cloud openstack] TypeError: unhashable type: 'dict' on map creation
ref: #24029
• 429adfe Merge pull request #24029 from makinacorpus/fixproviders
• 412b39b Fix providers handling

PR #23936: (jfindlay) remove unreachable returns in file state  @ 2015-05-22T16:26:49Z

• a42ccc Merge pull request #23936 from jfindlay/file_state
• ac29c0c also validate file.recurse source parameter
• 57f7388 remove unreachable returns in file state

PR #24063: (jayeshka) removed tuple index error  @ 2015-05-22T14:58:20Z

• 8b69b41 Merge pull request #24063 from jayeshka/mount-states-module
• b9745d5 removed tuple index error

PR #24057: (rallytime) Backport #22572 to 2015.5  @ 2015-05-22T05:36:25Z

PR #22572: (The-Loeki) Small docfix for GitPillar
refs: #24057
- 02ac4aa Merge pull request #24057 from rallytime/bp-22572
- 49aad84 Small docfix for GitPillar

PR #24040: (rallytime) Backport #24027 to 2015.5 @ 2015-05-21T23:43:54Z

ISSUE #23088: (wfhg) Segfault when adding a Zypper repo on SLES 11.3
refs: #24027

PR #24027: (wfhg) Add baseurl to salt.modules.zypper.mod_repo
refs: #24040
- 82deo59 Merge pull request #24040 from rallytime/bp-24027
- 37d25d8 Added baseurl as alias for url and mirrorlist in salt.modules.zypper.mod_repo.

PR #24039: (rallytime) Backport #24015 to 2015.5 @ 2015-05-21T23:43:25Z

PR #24015: (YanChii) minor improvement of solarisips docs & fix typos
refs: #24039
- d909781 Merge pull request #24039 from rallytime/bp-24015
- 6bfaa94 minor improvement of solarisips docs & fix typos

PR #24038: (rallytime) Backport #19599 to 2015.5 @ 2015-05-21T23:43:10Z

ISSUE #19598: (fayetted) ssh_auth.present test=true incorrectly reports changes will be made
refs: #19599

PR #19599: (fayetted) Fix ssh_auth test mode, compare lines not just key
refs: #24038
- 4a0f254 Merge pull request #24038 from rallytime/bp-19599
- ea00d3e Fix ssh_auth test mode, compare lines not just key

PR #24046: (rallytime) Remove key management test from digital ocean cloud tests @ 2015-05-21T22:32:04Z
- 42b87f1 Merge pull request #24046 from rallytime/remove_key_test
- 1d031ca Remove key management test from digital ocean cloud tests

PR #24044: (cro) Remove spurious log message, fix typo in doc @ 2015-05-21T22:31:49Z
- eff54b1 Merge pull request #24044 from cro/pgjsonb
- de06633 Remove spurious log message, fix typo in doc

PR #24001: (msteed) issue #23883 @ 2015-05-21T20:32:30Z

ISSUE #23883: (kaithar) max_event_size seems broken * ac32000 Merge pull request #24001 from msteed/issue-23883 * bea97a8 issue #23883

PR #23995: (kiorky) Lxc path pre @ 2015-05-21T17:26:03Z
- f7fae26 Merge pull request #23995 from makinacorpus/lxc_path_pre
- 319282a lint
- 1dc67e5 lxc: versionadded
- fcad7cb lxc: states improvements

35.2. Previous Releases
- 644bd72 lxc: more consistence for profiles
- 139372c lxc: remove merge cruf
- 725b046 lxc: Repair merge

PR #24032: (kartiksubbarao) Update augeas_cfg.py @ 2015-05-21T17:03:42Z

   ISSUE #16383: (interjection) salt.states.augeas.change example from docs fails with exception
   refs: #24032
   - 26d6851 Merge pull request #24032 from kartiksubbarao/augeas_insert_16383
   - 368edcd Update augeas_cfg.py

PR #24025: (jayeshka) adding timezone unit test case @ 2015-05-21T16:50:53Z

   - 55c9245 Merge pull request #24025 from jayeshka/timezone-unit-test
   - 1ec33e2 removed assertion error
   - 16ecb28 adding timezone unit test case

PR #24023: (jayeshka) adding states/mongodb_database unit test case @ 2015-05-21T16:49:17Z

   - e243617 Merge pull request #24023 from jayeshka/mongodb_database-states-unit-test
   - 5e9ac7e adding states/mongodb_database unit test case

PR #24022: (jayeshka) adding states/modjk_worker unit test case @ 2015-05-21T16:48:29Z

   - b37bd9 Merge pull request #24022 from jayeshka/modjk_worker-states-unit-test
   - 05c0a98 adding states/modjk_worker unit test case

PR #24005: (msteed) issue #23776 @ 2015-05-21T01:55:34Z

   ISSUE #23776: (enblde) Presence change events constantly reporting all minions as new in 2015.5 * 701c51b
   Merge pull request #24005 from msteed/issue-23776 * 62e67d8 issue #23776

PR #23996: (neogenix) iptables state generates a 0 position which is invalid in iptables cli #23950 @ 2015-05-20T22:44:27Z

   ISSUE #23950: (neogenix) iptables state generates a 0 position which is invalid in iptables cli
   refs: #23996
   - 17bc0b Merge pull request #23996 from neogenix/2015.5-23950
   - ad417a5 fix for #23950

PR #23994: (rallytime) Skip the gpodder pkgrepo test for Ubuntu 15 - they don't have vivid ppa up yet @ 2015-05-20T21:18:21Z

   - 4cb8773 Merge pull request #23994 from rallytime/skip_test_ubuntu_15
   - 9e0ec07 Skip the gpodder pkgrepo test - they don't have vivid ppa up yet

35.2.5 Salt 2015.5.3 Release Notes

Extended Changelog Courtesy of Todd Stansell (https://github.com/tjstansell/salt-changelogs):

Generated at: 2015-07-01T19:40:52Z

Statistics:
  - Total Merges: 177
• Total Issue references: 81
• Total PR references: 231

Changes:

• PR #25096: (jfindlay) Postgres group test @ 2015-07-01T18:48:26Z
  – PR #24330: (jayeshka) adding states/postgres_group unit test case. | refs: #25096
  – 21709aa Merge pull request #25096 from jfindlay/postgres_group_test
  – 3c379dc declobber postgres group unit test mocking
  – a162ff8 adding states/postgres_group unit test case.

• PR #25085: (jfindlay) accept all sources in the file state @ 2015-07-01T18:23:45Z
  – ISSUE #25041: (wt) REGRESSION: pillar.get of integer fails to render in sls | refs: #25085
  – 0a84640 Merge pull request #25085 from jfindlay/fix_file
  – 937a252 remove unnecessary file state tests
  – 6f238e9 integration test file.managed sources
  – a5978d3 iterate an iterable source otherwise list+str it

• PR #25095: (jfindlay) Win groupadd unit tests @ 2015-07-01T18:18:53Z
  – PR #24207: (jayeshka) adding win_groupadd unit test case. | refs: #25095
  – a983942 Merge pull request #25095 from jfindlay/win_groupadd_test
  – 564dfbd depend on win libs rather than mocking them
  – 9b9aeb8 resolved all errors.
  – aaf8935 adding win_groupadd unit test case.

• PR #25089: (jfindlay) fix minion sudo @ 2015-07-01T15:53:16Z
  – ISSUE #21520: (jfindlay) sudo.salt_call is broken | refs: #25089
  – PR #20226: (thatch45) Allow sudo priv escalation | refs: #25089
  – 7c8d2a8 Merge pull request #25089 from jfindlay/fix_sudo
  – d8f91d4 add some apprehension to the sudo exec module
  – a9269c0 adding sudo exec module docs
  – e4a40b7 comment whitespace in minion config
  – 44cb167 adding sudo_user minion config docs
  – d461060 adding sudo_user minion config to default

• PR #25099: (driskell) Fix broken batch results @ 2015-07-01T15:51:29Z
  – ISSUE #24875: (ahammond) ValueError: list.remove(x): x not in list in File ```/usr/lib/python2.6/site-packages/salt/cli/batch.py```, line 179, in run active.remove(minion) | refs: #25099
  – 4d6078e Merge pull request #25099 from driskell/patch-1
  – 59b23e5 Fix broken batch results

• PR #25083: (steverweber) ipmi: get_sensor_data would always fail @ 2015-06-30T20:57:21Z
  – 4635079 Merge pull request #25083 from steverweber/fix_ipmi_stat
- 836f48c include _ in IpmiCommand
- 817e434 get_sensor_data would always fail

**PR #25067**: (The-Loeki) Fix for maxdepth=0 in find @ 2015-06-30T20:54:06Z
- 15f2a40 Merge pull request #25067 from The-Loeki/patch-1
- 61edad3 Fix for maxdepth=0 in find

**PR #25078**: (terminalmage) Use smaller number for upper limit of mac_user’s _first_avail_uid helper function @ 2015-06-30T20:53:24Z
- 58d933c Merge pull request #25078 from terminalmage/fix-mac-uid
- df2ab7e Use smaller number for upper limit of mac_user’s _first_avail_uid helper function

**PR #25045**: (garethgreenaway) Fixes to debian_ip.py in 2015.5 @ 2015-06-30T17:36:43Z
- ISSUE #24521: (multani) State network.managed fails on Debian (Jessie) | refs: #25045
- ebd6cde Merge pull request #25045 from garethgreenaway/24521_debian_networking
- 6f2a6e9 having proto default to static since it’s needed to build the template.

**PR #25065**: (lorenbgordon) Add download links for 2015.5.1-3 and 2015.5.2 Windows installers @ 2015-06-30T15:29:31Z
- ISSUE #25057: (TheBigBear) why is there still no newer salt-minion for windows than ver. 2015.5.0-2? no 2015.5.1 or 2015.5.2?
- ae31b27 Merge pull request #25065 from lorenbgordon/update-windows-installer-links
- 40a0c13 Add download links for 2015.5.1-3 and 2015.5.2, Fixes #25057

**PR #25052**: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-30T01:05:00Z
- ISSUE #15209: (hubez) file.manage: source_hash not working with s3:// (2014.7.0rc1) | refs: #25011
- PR #25011: (notpeter) Add s3 to protocols for remote source_hash (2014.7 backport)
- ddae60 Merge pull request #25052 from basepi/merge-forward-2015.5
- 2c5e664 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
- a7154e7 Merge pull request #25011 from notpeter/s3_2014.7_backport
  * 8b8af64 Add s3 to protocols for remote source_hash

**PR #25038**: (jfindlay) versionadded @ 2015-06-29T19:49:27Z
- PR #24747: (msciciel) add get_route function to network module | refs: #25038
- c7003d4 Merge pull request #25038 from jfindlay/versionadded
- d6dc69 versionadded

**PR #24747**: (msciciel) add get_route function to network module | refs: #25038 @ 2015-06-29T16:51:43Z
- 28c87ca Merge pull request #24747 from msciciel/2015.5
- 79b4ec2 network module lint fix
- 0b6e78 network module: fix for ipv6
- f3d184c add get_route function to network module

**PR #24975**: (ryan-lane) Fix update of undefined env var in npm module @ 2015-06-29T16:45:05Z
- 46a9677 Merge pull request #24975 from lyft/npm-module-fix
- 6fde581 Try byte literals rather than unicode strings in the env
- c8514de Fix update of undefined env var in npm module

- **PR #24986**: (heewa) Don't modify empty change @ 2015-06-29T16:44:17Z
  - 9cf8550 Merge pull request #24986 from heewa/fixed-pkg-hold-when-errored
  - d47a448 Don't modify empty change

- **PR #24999**: (rallytime) Provide a less confusing error when cloud provider is misconfigured @ 2015-06-29T16:43:31Z
  - ISSUE #24969: (bradthuber) salt-cloud 2015.5.0: missing azure dependency results in misleading error | refs: #24999
  - ece897d Merge pull request #24999 from rallytime/cloud_error_help
  - 1e81a88 Clean up
  - be19a67 Provide a less confusing error when cloud provider is misconfigured

- **PR #24987**: (heewa) Don't try to cache a template when it's not a file @ 2015-06-29T14:02:59Z
  - 4af15cf Merge pull request #24987 from heewa/trying-to-cache-no-file
  - 9ae0c78 Don't try to cache a template when it's not a file

- **PR #25022**: (jfindlay) revise label and milestone documentation @ 2015-06-29T13:51:24Z
  - 8eeadb Merge pull request #25022 from jfindlay/label_docs
  - 8575192 revise label and milestone documentation

- **PR #25029**: (jayeshka) adding redismod unit test case. @ 2015-06-29T13:50:33Z
  - 89c2e01 Merge pull request #25029 from jayeshka/redismod-unit-test
  - e3045be adding redismod unit test case.

- **PR #24995**: (rallytime) Fix deprecated pymongo usage causing errors in latest pymongo @ 2015-06-27T22:28:56Z
  - **PR #24175**: (trevor-h) fix deprecated pymongo usage causing errors in latest pymongo | refs: #24995
  - 6425252 Merge pull request #24995 from rallytime/tops_mongo
  - a3c1063 fix deprecated pymongo usage causing errors in latest pymongo

- **PR #24994**: (garethgreenaway) Another Fix to gpg.py in 2015.5 @ 2015-06-27T22:28:15Z
  - ISSUE #24862: (dkatsanikakis) gpg.import_key returns error after succesfully completed | refs: #24966 #24994
  - e9aa11 Merge pull request #24994 from garethgreenaway/2015_5_24862_gpg_import_key
  - d2f0d8f variable was referenced before assignment. Just removing the variable and checking the return from distutils.version.LooseVersion directly.

- **PR #24988**: (jayeshka) adding states/supervisord unit test case. @ 2015-06-27T22:24:42Z
  - ebd666e Merge pull request #24988 from jayeshka/supervisord-states-unit-test
  - bb0a6d5 adding states/supervisord unit test case.

- **PR #25007**: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-26T21:28:57Z
  - ISSUE #24915: (jtand) Salt-cloud not working in 2014.7.6 | refs: #24944
  - **PR #24944**: (techhat) Double-check main_cloud_config

35.2. Previous Releases 2081
- PR #24936: (jtand) Fixed ps module to not use deprecated psutil commands
- 0487c3c Merge pull request #25007 from basepi/merge-forward-2015.5
- 4980fd5 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
- a11e4c6 Merge pull request #24944 from techhat/issue24915
  * 59c3081 Double-check main_cloud_config
- d26a544 Merge pull request #24936 from jtand/psutil
  * bdb7a19 Fixed ps module to not use deprecated psutil commands

- PR #25003: (jacobhammons) Updated man pages @ 2015-06-26T19:13:41Z
  - 91a60e1 Merge pull request #25003 from jacobhammons/man-pages
  - cf97a4a Updated man pages

- PR #25002: (jacobhammons) sphinx html theme updates @ 2015-06-26T18:39:14Z
  - a60a2c4 Merge pull request #25002 from jacobhammons/doc-announcements
  - f88344 sphinx html theme updates

- PR #24977: (rallytime) Only warn about digital ocean deprecation if digital ocean is configured @ 2015-06-25T23:54:46Z
  - a791b23 Merge pull request #24977 from rallytime/do_move_warning
  - 6b54422 Only warn about digital ocean deprecation if digital ocean is configured

- PR #24966: (garethgreenaway) Fixes to gpg.py in 2015.5 @ 2015-06-25T19:58:49Z
  - ISSUE #24862: (dkatsanikakis) gpg.import_key returns error after succesfully completed | refs: #24966 #24994
  - a71c1b7 Merge pull request #24966 from garethgreenaway/2015_5_24862_gpg_import_key
  - 55eb73b fixing unit tests.
  - 80c24be Fixing an issue with the import_key method. Different results depending on which gnupg python module is installed.

- PR #24965: (jacksontj) Fix memory leak in saltnado @ 2015-06-25T18:48:03Z
  - ISSUE #24846: (mavenAtHouzz) Memory leak issue in rest_tornado EventListener | refs: #24965
  - 8622184 Merge pull request #24965 from jacksontj/2015.5
  - 48b5e16 pylint
  - 87ada4 Fix memory leak in saltnado

- PR #24948: (jfindlay) fix some malformed doc links and anchors @ 2015-06-25T15:51:38Z
  - 773c4cf Merge pull request #24948 from jfindlay/doc_links
  - 1529b92 fix some malformed doc links and anchors

- PR #24886: (anlutro) Be more careful about stripping away root_dir from directory options @ 2015-06-25T15:50:11Z
  - ISSUE #24885: (anlutro) Master config - Directories starting with a dot have the dot stripped when root_dir is . | refs: #24886
  - 4ebc01e Merge pull request #24886 from alprs/fix-root_dir_bug
  - 52caaf3d os.sep is the correct directory separator constant
0ecbf26 Be more careful about stripping away root_dir from directory options

- **PR #24930:** (jacksontj) Don't refetch file templates 100% of the time-- Performance optimization for templated files @ 2015-06-24T22:47Z
  - f52f7e1 Merge pull request #24930 from jacksontj/2015.5
  - 5fb7534 Only parse the source if we have one
  - e03a6fa Add support for sources of managed files to be local
  - 4cf78a0 pylint
  - d70914e Don't refetch the template 100% of the time-- Performance optimization for templated files

- **PR #24935:** (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-24T18:17:54Z
  - **PR #24918:** (BretFisher) SmartOSSMF minion startup fix
  - **PR #473:** (whiteinge) Added a couple functions to work with the minion file cache | refs: #24918
  - 925a4d9 Merge pull request #24935 from basepi/merge-forward-2015.5
  - 8d8bf34 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  - eeb05a1 Merge pull request #24918 from BretFisher/minion-start-smartos-smf-fix
    * d7fb0c Smartos smf minion fix

- **PR #24873:** (jfindlay) convert osrelease grain to str before str op @ 2015-06-24T16:43:08Z
  - **ISSUE #24826:** (rakai93) rh_service.py: `int` object has no attribute `startswith` | refs: #24873
  - 4e8ed0d Merge pull request #24873 from jfindlay/rh_service
  - febe65f convert osrelease grain to str before str op

- **PR #24923:** (jayeshka) adding states/status unit test case. @ 2015-06-24T15:50:07Z
  - 90819f9 Merge pull request #24923 from jayeshka/status-states-unit-test
  - baec650 adding states/status unit test case.

- **PR #24902:** (cro) Fix minion failover, document same @ 2015-06-24T15:20:43Z
  - 2dd24ec Merge pull request #24902 from cro/fixfo2
  - 90c73ff References to documentation.
  - f0e9204 Add references to failover parameters in conf
  - 9da96a8 Docs
  - e2314f0 Move comment.
  - b9a756f Fix master failover and add documentation for same. Factor in syndics. Syndics will not failover (yet).

- **PR #24926:** (rallytime) Back-port #22263 to 2015.5 @ 2015-06-24T15:09:40Z
  - **PR #22263:** (cachedout) Prevent a load from being written if one already exists | refs: #24926
  - 087ee09 Merge pull request #24926 from rallytime/bp-22263
  - 8c9d29c Prevent a load from being written if one already exists

- **PR #24900:** (rallytime) Back-port #24848 to 2015.5 @ 2015-06-24T15:09:18Z
  - **PR #24848:** (nmadhok) Correcting bash code blocks | refs: #24900
  - b34a74f Merge pull request #24900 from rallytime/bp-24848
- d2b5456 Correcting bash code blocks

- **PR #24899**: (rallytime) Back-port #24847 to 2015.5 @ 2015-06-24T15:09:01Z
  - **PR #24847**: (borutmrak) unset size parameter for lxc.create when backing=zfs | refs: #24899
  - a54e8e8 Merge pull request #24899 from rallytime/bp-24847
  - 1e4ec7a unset size parameter for lxc.create when backing=zfs

- **PR #24898**: (rallytime) Back-port #24845 to 2015.5 @ 2015-06-24T15:06:09Z
  - **PR #24845**: (porterjames) fix bug in docker.loaded | refs: #24898
  - d4dd8d2 Merge pull request #24898 from rallytime/bp-24845
  - 6930855 Merge pull request #24897 from rallytime/bp-24839

- **PR #24897**: (rallytime) Back-port #24839 to 2015.5 @ 2015-06-24T15:05:35Z
  - **ISSUE #24799**: (infestdead) Forced remount because options changed when no options changed (glusterfs)
  - **PR #24839**: (infestdead) fix for issue #24799 | refs: #24897
  - a4f807c Merge pull request #24897 from rallytime/bp-24839

- **PR #24891**: (jayeshka) adding states/ssh_known_hostsunittestcase. @ 2015-06-23T16:46:58Z
  - 1650233 Merge pull request #24891 from jayeshka/ssh_known_hostsunittestcase.

- **PR #24874**: (dkiser) Fix for salt-cloud when ssh key used to auth and using sudo. @ 2015-06-22T23:46:08Z
  - **ISSUE #24870**: (dkiser) salt-cloud fails on sudo password prompt when using ssh key to auth | refs: #24874
  - c32aae9 Merge pull request #24874 from dkiser/salt-cloud-24870
  - 6c31143 Fix key error for the PR to fix #24870.
  - bdcf7d8 Fix pylint for #24874.

- **PR #24880**: (dkiser) Fix to allow password for salt-cloud to be set outside of a vm specif... @ 2015-06-22T23:44:59Z
  - **ISSUE #24871**: (dkiser) salt-cloud fails to honor `password` in cloud options before raising an exception | refs: #24880
  - ddaa21c Merge pull request #24880 from dkiser/salt-cloud-24871
  - 4f6c035 Fix to allow password for salt-cloud to be set outside of a vm specific context.

- **PR #24852**: (pruiz) Fix issue 24851: regular expression so it now matches packages with `.` or `~` at pkg name @ 2015-06-22T20:37:13Z
  - 3902b16 Merge pull request #24852 from pruiz/issue-24851
  - 73adb1d Fix regular expression so it now matches packages with `.` or `~` at pkg name.

- **PR #24861**: (jayeshka) adding states/ssh_auth unit test case. @ 2015-06-22T16:20:01Z
  - 6c5b788 Merge pull request #24861 from jayeshka/ssh_auth-states-unit-test
  - e5d7b0d adding states/ssh_auth unit test case.
- **PR #24824**: (kev009) Detect bhyve virtual type for FreeBSD guests @ 2015-06-22T15:24:35Z
  - ISSUE #23478: (calvinhp) grains.get virtual reports `physical` on bhyve FreeBSD VM | refs: #24824
  - 9e3321c Merge pull request #24824 from kev009/grains-bhyve-bsd
  - a226209 Detect bhyve virtual type for freebsd guests
- **PR #24795**: (anlutro) Fix state.apply for salt-ssh @ 2015-06-22T15:23:57Z
  - ISSUE #24746: (anlutro) state.apply doesn't seem to work | refs: #24795
  - 7b07ef9 Merge pull request #24795 from alprs/fix-salt_ssh_state_apply
  - 905840b Fix state.apply for salt-ssh
- **PR #24832**: (jacksontj) Don't incur a `__load_all` of the lazy_loader while looking for mod_init. @ 2015-06-22T15:17:10Z
  - PR #20540: (jacksontj) Loader no merge: Don't allow modules to `merge` | refs: #24832
  - PR #20481: (jacksontj) Add submodule support to LazyLoader | refs: #20540
  - PR #20473: (jacksontj) Add `disabled` support | refs: #20481
  - PR #20274: (jacksontj) Loader overhaul to LazyLoader | refs: #20473
  - PR #12327: (jacksontj) Add a LazyLoader class which will lazily load modules (with the given lo... | refs: #20274
  - 31d4c13 Merge pull request #24832 from jacksontj/2015.5
  - cfa7c0a pylint
  - be18439 Don't incur a `__load_all` of the lazy_loader while looking for mod_init.
- **PR #24834**: (rallytime) Back-port #24811 to 2015.5 @ 2015-06-19T18:43:49Z
  - ISSUE #14666: (luciddr34m3r) salt-cloud GoGrid exception when using map file | refs: #24811
  - PR #24811: (rallytime) Add notes to map and gogrind docs -- don't use -P with map files | refs: #24834
  - 2d8148f Merge pull request #24834 from rallytime/bp-24811
  - e2684ec Add notes to map and gogrind docs -- don't use -P with map files
- **PR #24790**: (rallytime) Back-port #24741 to 2015.5 @ 2015-06-19T17:25:58Z
  - PR #24741: (CameronNemo) Improve Upstart enable/disable handling | refs: #24790
  - d2ed63 Merge pull request #24790 from rallytime/bp-24741
  - a54245f Add missing import
  - 4ce6370 salt.modules.upstart: fix lint errors
  - aec53ec Improve Upstart enable/disable handling
- **PR #24789**: (rallytime) Back-port #24717 to 2015.5 @ 2015-06-19T17:00Z
  - PR #24717: (gthb) virtualenv.managed: document user and no_chown | refs: #24789
  - 645e62a Merge pull request #24789 from rallytime/bp-24717
  - 9ac4deb virtualenv.managed: document user and no_chown
- **PR #24823**: (jayeshka) adding states/splunk_search unit test case. @ 2015-06-19T17:14:12Z
  - 0a6c70f Merge pull request #24823 from jayeshka/splunk_search-states-unit-test
  - 98831a8 adding states/splunk_search unit test case.

35.2. Previous Releases 2085
• **PR #24809**: (jodv) Correctly create single item list for failover master type with string value for master opt @ 2015-06-19T15:22:20Z
  - 4c5a708 Merge pull request #24809 from jodv/single_item_master_list
  - 18ceebc single item list vs. list of characters

• **PR #24802**: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-18T20:11:58Z
  - **ISSUE #24776**: (nmadhok) --static option in salt raises ValueError and has been broken for a very long time | refs: #24777
  - **ISSUE #21318**: (thanatos) get_full_returns raises KeyError | refs: #24769
  - **ISSUE #18994**: (njhartwell) salt.client.get_cli_returns errors when called immediately after run_job | refs: #24769
  - **ISSUE #17041**: (xenophon) Confusing Salt error messages due to limited/incomplete PowerShell command error handling | refs: #24690
  - **ISSUE #19**: (thatch45) Sending a faulty command kills all the minions!
  - **PR #24780**: (nmadhok) Backporting PR #24777 to 2014.7 branch
  - **PR #24779**: (nmadhok) Backporting Changes to 2014.7 branch | refs: #24777
  - **PR #24778**: (nmadhok) Backporting PR #24777 to 2015.2 branch | refs: #24777
  - **PR #24777**: (nmadhok) Fixing issue where --static option fails with ValueError Fixes #24776 | refs: #24778
  - **PR #24769**: (msteed) Fix stacktrace in get_cli_returns()
  - **PR #24690**: (twangboy) Report powershell output instead of error
  - ae05e70 Merge pull request #24802 from basepi/merge-forward-2015.5
  - 5b7a65d Merge pull request #19 from twangboy/merge-forward-fixes
      * 98e7e90 Fixed test failures for Colton
  - b949856 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
      * 4281dff Merge pull request #24780 from nmadhok/backport-2014.7-24777
          · c5b0d9 Backporting PR #24777 to 2014.7 branch
      * f3c5c62 Merge pull request #24769 from msteed/issue-21318
          · f40a9d5 Fix stacktrace in get_cli_returns()
      * 59db246 Merge pull request #24690 from twangboy/fix_17041
          · 7a01538 Added additional reporting
          · d84ad5d Fixed capitalization... Failed and Already
          · e955245 Merge branch `2014.7` of https://github.com/saltstack/salt into fix_17041
          · 144bff2 Report powershell output instead of error
  - **PR #24798**: (jtand) Revert `"adding states/postgres_database unit test case."` @ 2015-06-18T17:56:17Z
  - **PR #24329**: (jayeshka) adding states/postgres_database unit test case. | refs: #24798
  - daa76c3 Merge pull request #24329 from saltstack/revert-24329-postgres_database-states-unit-test
  - 179ce03 Revert `"adding states/postgres_database unit test case."
  - **PR #24791**: (rallytime) Back-port #24749 to 2015.5 @ 2015-06-18T17:43:15Z
- **PR #24749**: (obestwalter) add windows specific default for multiprocessing | refs: #24791
- 7073a9f Merge pull request #24791 from rallytime/bp-24749
- be43b2b add windows specific default for multiprocessing
- **PR #24792**: (rallytime) Back-port #24757 to 2015.5 @ 2015-06-18T15:58:35Z
  - **PR #24577**: (cachedout) Fix loader call in pyobjects | refs: #24792
  - **PR #24668**: (grischa) enable virtual package names in pyobjects render | refs: #24721 #24757
  - 1a158e8 Merge pull request #24792 from rallytime/bp-24757
  - 6c804f0 Fix loader call in pyobjects
- **PR #24768**: (jfindlay) fix yum versionlock on RHEL/CentOS 5, disable corresponding test @ 2015-06-18T15:13:12Z
  - 0f92982 Merge pull request #24768 from jfindlay/pkg_mod
  - 7a26c2b disable pkg.hold test for RHEL/CentOS 5
  - 4cadc93 use correct yum versionlock pkg name on centos 5
- **PR #24778**: (nmadhok) Backporting PR #24777 to 2015.2 branch | refs: #24777 @ 2015-06-18T14:53:04Z
  - ISSU #24776: (nmadhok) --static option in salt raises ValueError and has been broken for a very long time | refs: #24777
  - **PR #24777**: (nmadhok) Backporting Changes to 2014.7 branch | refs: #24777
  - **PR #24777**: (nmadhok) Fixing issue where --static option fails with ValueError | Fixes #24776 | refs: #24778
  - 39f088a Merge pull request #24778 from nmadhok/backport-2015.2-24777
  - ae3701f Backporting PR #24777 to 2015.2 branch
- **PR #24774**: (zefrog) Fix lxc lvname parameter command @ 2015-06-18T14:49:06Z
  - 2a4f65f Merge pull request #24774 from zefrog/fix-lxc-lvname-param
  - 21e0cd4 Fixed typo in lxc module: lvname parameter typo
  - 283d86e Fixed bug in lxc module: lvname using wrong parameter in cmd
- **PR #24782**: (jayeshka) adding states/slack unit test case. @ 2015-06-18T14:33:55Z
  - fd73390 Merge pull request #24782 from jayeshka/slack-states-unit-test
  - e2b6214 adding states/slack unit test case.
- **PR #24771**: (jacksontj) Always extend requisites, instead of replacing them @ 2015-06-18T14:29:09Z
  - ISSUE #24770: (jacksontj) Requisite and Requisite_in don’t play nice together | refs: #24771
  - c9e90af Merge pull request #24771 from jacksontj/2015.5
  - b1211c5 Re-enable tests for complex prereq and prereq_in
  - 378f6bf Only merge when the merge is of requisites
- **PR #24766**: (msteed) Remove doc references to obsolete minion opt @ 2015-06-17T21:36:55Z
  - 5fe4de8 Merge pull request #24766 from msteed/undoc-dns_check
  - f92a769 Remove doc references to obsolete minion opt
- **PR #24329**: (jayeshka) adding states/postgres_database unit test case. | refs: #24798 @ 2015-06-17T19:11:02Z
Chapter 35. Release notes

- a407ab7 Merge pull request #24329 from jayeshka/postgres_database-states-unit-test
- ee06f1a adding states/postgres_database unit test case.

- **PR #24632**: (jacobhammons) Doc bug fixes @ 2015-06-17T18:40:02Z
  - ISSUE #24560: (hydroside) Documentation missing on parameter | refs: #24632
  - ISSUE #24547: (dragonpaw) Artifactory docs say module is `jboss7`. | refs: #24632
  - ISSUE #24375: (companykitchen-dev) Custom grain won’t sync under any circumstances | refs: #24632
  - ISSUE #24275: (kartiksubbarao) augeas issue with apache and recognizing changes that have been already made | refs: #24632
  - ISSUE #24163: (tbaker57) enable_gpu_grains default value confusion | refs: #24632
  - 3ff6eff Merge pull request #24632 from jacobhammons/bug-fixes
  - 7c52012 Fixed typos
  - c7cdd41 Doc bug fixes Refs #24547 Refs #24275 Refs #24375 Refs #24163

- **PR #24607**: (garethgreenaway) fixes to minion.py @ 2015-06-17T18:16:42Z
  - ISSUE #24198: (ahammond) salt-call event.send doesn’t send events from minion | refs: #24607
  - 9995f64 Merge pull request #24607 from garethgreenaway/2015_5_sending_events_multi_master
  - 8abd3f0 A fix if you have multiple masters configured and try to fire events to the minion. Currently they fail silently. Might be the cause of #24198.

- **PR #24755**: (rallytime) Remove SALT_CLOUD_REQS from setup.py @ 2015-06-17T17:42:25Z
  - bf2dd94 Merge pull request #24755 from rallytime/fix_setup_15
  - 48769a5 Remove SALT_CLOUD_REQS from setup.py

- **PR #24740**: (rallytime) Backport #24720 to 2015.5 @ 2015-06-17T16:43:37Z
  - **PR #24720**: (TheScriptSage) Issue 24621 - AD/LDAP Group Auth Issue | refs: #24740
  - 3d53d79 Merge pull request #24740 from rallytime/bp-24720
  - a9bcdb5 Updating master.py to properly check against groups when user is only authed against group. Tested against unit.auth_test.

- **PR #24723**: (rallytime) Back-port #20124 to 2015.5 @ 2015-06-17T16:43:20Z
  - **PR #20124**: (cgtx) add init system to default grains | refs: #24723
  - ac2851b Merge pull request #24723 from rallytime/bp-20124
  - d4d061b fix infinite loop introduced by #20124 when the init system is not in the supported_inits list
  - 0c7fa0f Optimizations for #20124
  - f353454 add init system to default grains (resolve #20124)

- **PR #24754**: (anlutro) salt-cloud documentation - Add information about linode location @ 2015-06-17T16:04:48Z
  - 78cd09b Merge pull request #24754 from alprs/docs-add_linode_location_option
  - d88e071 add information about linode location

- **PR #24748**: (jayeshka) adding states/serverdensity_device unit test case. @ 2015-06-17T15:39:07Z
  - d5554f7 Merge pull request #24748 from jayeshka/serverdensity_device-states-unit-test
• PR #24739: (rallytime) Back-port #24735 to 2015.5 @ 2015-06-17T15:47Z
  - PR #24735: (notpeter) Add 2015.5 codename to version numbers docs | refs: #24739
  - 0b7e7ef Merge pull request #24739 from rallytime/bp-24735
  - 64c565d Add .0 to version number
  - 5ed801b Add codenames for 2015.5 and future versions. Trailing newline.

• PR #24732: (msteed) Fix stacktrace when --summary is used @ 2015-06-17T03:25Z
  - ISSUE #24111: (yermulnik) cli option `--summary' got broken after upgrade to 2015.5.1 | refs: #24732
  - c8713f2 Merge pull request #24732 from msteed/issue-24111
  - 54b33dd Fix stacktrace when --summary is used

• PR #24721: (rallytime) Back-port #24668 to 2015.5 @ 2015-06-17T03:47Z
  - PR #24668: (grischa) enable virtual package names in pyobjects renderer | refs: #24721 #24757
  - 70d3781 Merge pull request #24721 from rallytime/bp-24668
  - 68fb5af fixing other test
  - ba4f262 fixing text for virtual support in pyobjects
  - b349d91 enable virtual package names in pyobjects renderer

• PR #24718: (rallytime) Added some missing config documentation to the vsphere driver @ 2015-06-17T03:19:35Z
  - ISSUE #21923: (Fluro) Salt cloud not running provisioning script as root | refs: #24718
  - ISSUE #17241: (hasues) Salt-Cloud for vSphere needs additional documentation | refs: #24718
  - 1b9de89 Merge pull request #24718 from rallytime/update_vsphere_docs
  - bfdebb6 Added some missing config documentation to the vsphere driver

• PR #24714: (rallytime) Remove cloud-requirements.txt @ 2015-06-17T03:17:04Z
  - 64857c7 Merge pull request #24714 from rallytime/remove_cloud_reqs_15
  - 67b796d Remove cloud-requirements.txt

• PR #24733: (msteed) Include Tornado in versions report @ 2015-06-17T03:13:53Z
  - ISSUE #24439: (bechtoldt) Add tornado version to versions report | refs: #24733
  - f96b1d6 Merge pull request #24733 from msteed/issue-24439
  - 76cfef0 Include Tornado in versions report

• PR #24737: (jacksontj) Move AES command logging to trace @ 2015-06-17T01:48:11Z
  - a861fe0 Merge pull request #24737 from jacksontj/2015.5
  - a4ed41a Move AES command logging to trace

• PR #24724: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-16T22:46:27Z
  - ISSUE #24196: (johnccfm) Exception when using user.present with Windows | refs: #24646
  - PR #24646: (twangboy) Fixed user.present on existing user
  - 0d2dc46 Merge pull request #24724 from basepi/merge-forward-2015.5
– 4641028 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
– a18dada Merge pull request #24646 from twangboy/fix_24196
  * a208e1d Fixed user.present on existing user
• **PR #24701**: (jayeshka) adding states/selinux unit test case. @ 2015-06-16T15:27:29Z
  – 3d33fe7 Merge pull request #24701 from jayeshka/selinux-states-unit-test
  – 0c136fd adding states/selinux unit test case.
• **PR #24687**: (cachedout) Note about minimum worker_threads @ 2015-06-15T20:46:23Z
  – 2e287a9 Merge pull request #24687 from cachedout/min_worker_threads
  – b7bb7ea Note about minimum worker_threads
• **PR #24688**: (cachedout) Update AUTHORS @ 2015-06-15T20:46:03Z
  – 432478c Merge pull request #24688 from cachedout/update_authors
  – 3f6880e Better email
  – 6c7b773 Update AUTHORS
• **PR #24649**: (cachedout) Improved error reporting for failed states @ 2015-06-15T16:04:20Z
  – ISSUE #22385: (cachedout) States which require unavailable modules should display the reason | refs: #24649
  – 9a2b50d Merge pull request #24649 from cachedout/issue_22385
  – b9fe792 States will now return the reason behind failure if a module could not be loaded
• **PR #24673**: (jayeshka) adding states/schedule unit test case. @ 2015-06-15T15:24:52Z
  – 66e9e16 Merge pull request #24673 from jayeshka/schedule-states-unit-test
  – 54aaa5 Adding states/schedule unit test case.
• **PR #24663**: (kartiksubbarao) Update augeas_cfg.py @ 2015-06-15T15:18:48Z
  – ISSUE #24661: (kartiksubbarao) augeas.change doesn’t support setting empty values | refs: #24663
  – 5eb19c4 Merge pull request #24663 from kartiksubbarao/patch-2
  – e18db50 Update augeas_cfg.py
• **PR #24667**: (dkiser) fix for #24583 clouds/openstack.py kerying first time succeeds @ 2015-06-14T21:58:58Z
  – ISSUE #24583: (dkiser) salt-cloud keyring password referenced before assignment | refs: #24667
  – 4450432 Merge pull request #24667 from dkiser/fixed-cloud-keyring
  – c92c05f fix for #24583 clouds/openstack.py kerying first time succeeds
• **PR #24659**: (kartiksubbarao) Update aliases.py @ 2015-06-13T17:31:42Z
  – ISSUE #24537: (kartiksubbarao) alias.present doesn’t update alias values that are substrings of the existing value | refs: #24659
  – 4c64ee9 Merge pull request #24659 from kartiksubbarao/patch-1
  – d683474 Update aliases.py
• **PR #24644**: (cro) Merge forward 2014.7->2015.5 @ 2015-06-12T21:31:41Z
  – PR #24643: (cro) Add reference to salt-announce mailing list
  – PR #24620: (twangboy) Fixed comment and uncomment functions in file.py
89eb616 Merge pull request #24644 from cro/2014.7-2015.5-20150612
- 4136dc3 Merge forward from 2014.7 to 2015.5
- b99484f Merge pull request #24643 from cro/saltannounce
  * ecb0623 Add salt-announce mailing list.
- 635121e Merge pull request #24620 from twangboy/fix_24215
  * d7a9999 Fixed comment and uncomment functions in file.py

• PR #24642: (basepi) Revert `fix target rule, remove unneeded quotation mark` @ 2015-06-12T20:14:26Z
  - PR #24595: (tankywoo) fix target rule, remove unneeded quotation mark | refs: #24642
  - b896a0d Merge pull request #24642 from saltstack/revert-24595-fix-iptables-target
  - 5f3224 Revert `fix target rule, remove unneeded quotation mark`

• PR #24628: (jayeshka) adding states/reg unit test case. @ 2015-06-12T17:29:11Z
  - 01092c2 Merge pull request #24628 from jayeshka/reg_states-unit-test
  - af1bd8f adding states/reg unit test case.

• PR #24631: (rallytime) Back-port #24591 to 2015.5 @ 2015-06-12T16:54:32Z
  - ISSUE #24494: (arnoutpierre) Computed comments in jinja states | refs: #24591
  - ISSUE #24073: (primechuck) State.highstate uses stale grain data. | refs: #24492
  - ISSUE #23359: (BalintSzigeti) init.sls parsing issue | refs: #24591
  - ISSUE #21217: (Colstuwix) Maybe a bug for jinja render? | refs: #24591
  - PR #24591: (tibaker57) Add some documentation surrounding Jinja vs yaml comments - | refs: #24631
  - PR #24492: (DmitryKuzmenko) Don’t remove grains from opts
  - 5f491f9 Merge pull request #24631 from rallytime/bp-24591
  - f13cd41 Add extra clarification why jinja comments are needed.
  - 2374971 Fix typo
  - 6a91747 Add some documentation surrounding Jinja comments - refs #24492, #21217, #23359

• PR #24616: (garethgreenaway) additional logging in state.py module @ 2015-06-12T16:25:39Z
  - f23f99e Merge pull request #24616 from garethgreenaway/2015.5_logging_disabled_states
  - 4db0feef Adding some logging statement to give feedback when states, including highstate, are disabled. Useful when running from scheduler.

• PR #24595: (tankywoo) fix target rule, remove unneeded quotation mark | refs: #24642 @ 2015-06-12T16:23:22Z
  - 6dccb0c Merge pull request #24595 from tankywoo/fix-iptables-target
  - 10a5160 fix target rule, remove unneeded quotation mark

• PR #24604: (jfindlay) fix pkg module integration tests @ 2015-06-12T16:04:26Z
  - 8ac3d94 Merge pull request #24604 from jfindlay/pkg_tests
  - d88b22 fix pkg module integration tests on CentOS 5
  - fb91b40 fix pkg module integration tests on ubuntu 12

• PR #24600: (basepi) [2015.5] Remove __kwarg__ from salt-ssh keyword args @ 2015-06-12T04:21:29Z

### 35.2. Previous Releases
• PR #24608: (basepi) [2015.5] Normalize salt-ssh flat roster minion IDs to strings @ 2015-06-11T21:35:07Z
  - ISSUE #22843: (Xiol) salt-ssh roster doesn't support integers as host keys | refs: #24608
  - 832916f Merge pull request #24608 from basepi/salt-ssh.flat.roster.integers.22843
  - 381820f Normalize salt-ssh flat roster minion IDs to strings

• PR #24605: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-11T19:15:21Z
  - PR #24589: (BretFisher) Fixed Mine example for jinja code block
  - 4eb5bb2 Merge pull request #24605 from basepi/merge-forward-2015.5
  - f96c502 Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  - d83928a Merge pull request #24589 from BretFisher/patch-1
    * 65a1133 Fixed Mine example for jinja code block

• PR #24598: (jacobhammons) 2015.5.2 release changes @ 2015-06-11T21:35:07Z
  - ISSUE #24457: (ryan-lane) When selecting the version of docs on the docs site, it brings you to the homepage | refs: #24598
  - ISSUE #24250: (jfindlay) have version links on docs page link to that version of the current page | refs: #24598
  - e0bb177 Merge pull request #24598 from jacobhammons/doc-fixes
  - f3f34dd 2015.5.2 release changes Refs #24250 Refs #24457

• PR #24588: (basepi) Fixes for saltmod.function for salt-ssh @ 2015-06-11T16:15:21Z
  - ISSUE #20615: (aurynn) 2014.7.1: salt/states/saltmod using incorrect return dict for orchestrate | refs: #24588
  - 26930b4 Merge pull request #24588 from basepi/salt-ssh.orchestrate.20615
  - 826936c Movedocumentationintodocstringinsteadofcomments
  - de052e7 Assign `return` to `ret` if necessary in saltmod.function
  - 34ff989 Convert keyword args to key=value strings in salt-ssh

• PR #24593: (jayeshka) adding states/redismod unit test case. @ 2015-06-11T15:55:27Z
  - 5a21ad1 Merge pull request #24593 from jayeshka/redismod_states-unit-test
  - 3b95744 adding states/redismod unit test case.

• PR #24581: (rallytime) Disabled some flaky tests until we can figure out how to make them more reliable @ 2015-06-11T15:51:41Z
  - ISSUE #40: (thatch45) Clean up timeouts | refs: #22857
  - PR #24217: (jfindlay) disable intermittently failing tests | refs: #24581
  - PR #23623: (jfindlay) Fix /jobs endpoint's return | refs: #24217
  - PR #22857: (jacksontj) Fix /jobs endpoint's return | refs: #23623
  - 8ff886e Merge pull request #24581 from rallytime/disable_some_flaky_tests
  - c82f135 Disabled some flaky tests until we can figure out how to make them more reliable
• PR #24566: (jayeshka) adding states/rdp unit test case. @ 2015-06-11T02:14:39Z
  – a570d7f Merge pull request #24566 from jayeshka/rdp_states-unit-test
  – 273b994 adding states/rdp unit test case.

• PR #24551: (joejulian) 2015.5 dont pollute environment @ 2015-06-11T02:13:06Z
  – ISSUE #24480: (kiorky) [CRITICAL] [2015.5] tls breaks tzinfo | refs: #24551
  – 20ada1f Merge pull request #24551 from joejulian/2015.5_dont_pollute_environment
  – cfc3b43 Don't pollute the TZ environment variable
  – cba8d3f pep8
  – 9cb7015 Mark keyword version adds
  – 76e2583 Merge tls changes from develop

• PR #24574: (jacobhammons) Refs #19901 @ 2015-06-10T20:09:23Z
  – ISSUE #19901: (clinta) State cache is not documented | refs: #24468
  – bb2fd6a Merge pull request #24574 from jacobhammons/19901
  – e2a2946 Refs #19901

• PR #24577: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-10T19:46:22Z
  – ISSUE #24427: (fayetted) 2015.5.1-3 Windows 64Bit Minion fails to start after install | refs: #24530
  – PR #24530: (twangboy) Start Minion Service on Silent Install
  – b03166c Merge pull request #24577 from basepi/merge-forward-2015.5
  – e1d45cc Merge remote-tracking branch 'upstream/2014.7' into merge-forward-2015.5
  – d376390 Merge pull request #24530 from twangboy/fix_24427
    * 673e1d8 Added missing panel.bmp for installer
    * cc50218 Start Minion Service on Silent Install

• PR #24571: (jacobhammons) Refs #24235 @ 2015-06-10T17:02:18Z
  – ISSUE #24235: (tomasfejfar) Difference between running from minion and from master | refs: #24468
  – 3ec457b Merge pull request #24571 from jacobhammons/24235
  – 8df5d53 Refs #24235

• PR #24565: (pille) fix backtrace, when listing plugins @ 2015-06-10T16:33:11Z
  – fe07eb5 Merge pull request #24565 from pille/munin-ignore-broken-symlinks
  – 8511a6c fix backtrace, when listing plugins

• PR #24554: (ryan-lane) Fix yes usage for pecl defaults @ 2015-06-09T23:59:49Z
  – 251cbf9 Merge pull request #24554 from lyft/pecl-module-fix
  – 56a9cfc Fix yes usage for pecl defaults

• PR #24535: (rallytime) Back-port #24518 to 2015.5 @ 2015-06-09T20:06:18Z
  – PR #24518: (rallytime) Merge #24448 with Pylint Fixes | refs: #24535
  – PR #24448: (codertux) Update modules path for operating systems using systemd | refs: #24518
  – dbd49b4 Merge pull request #24535 from rallytime/bp-24518
- fc75197 Pylint fix
- 3e08840 Update modules path for operating systems using systemd

- **PR #24538**: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-09T17:27:20Z
  - PR #24513: (jquast) bugfix use of `iteritem` in 2014.7 branch
  - PR #24511: (jquast) bugfix: trailing "...done" in rabbitmq output | refs: #24513
  - 485ed3c Merge pull request #24538 from basepi/merge-forward-2015.5
  - 6a8039d Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  - 6ebc476 Merge pull request #24513 from jquast/2014.7-bugfix-iteritem
    * 2be0180 bugfix use of `iteritem` in 2014.7 branch

- **PR #24495**: (jayeshka) adding states/rabbitmq_vhost unit test case. @ 2015-06-09T15:33:23Z
  - 73e6388 Merge pull request #24495 from jayeshka/rabbitmq_vhost_states-unit-test
  - 31889e3 cosmetic change.
  - cf501cf resolved error.
  - 4bb6087 Merge branch '2015.5' of https://github.com/saltstack/salt into rabbitmq_vhost_states-unit-test
  - 3ad7714 adding states/rabbitmq_vhost unit test case.

- **PR #24445**: (jayeshka) adding states/pyrax_queues unit test case. @ 2015-06-09T15:28:45Z
  - bf1abcc Merge pull request #24445 from jayeshka/pyrax_queues_states-unit-test
  - ea27cef adding states/pyrax_queues unit test case.

- **PR #24490**: (aneeshusa) Fix pacman.list_upgrades for new python_shell default. @ 2015-06-09T15:13:16Z
  - 0247e8d Merge pull request #24490 from aneeshusa/fixed-pacman-list-upgrades
  - 980e1cb lint fix.
  - dca33f1 Fix pacman.list_upgrades for new python_shell default.

- **PR #24517**: (steverweber) small fixes to the ipmi docs @ 2015-06-09T15:10:14Z
  - 6268dbd Merge pull request #24517 from steverweber/ipmi_doc
  - 6413712 lint
  - e78aae9 more small fixes to the ipmi docs

- **PR #24524**: (jayeshka) any() takes list oy tuple. @ 2015-06-09T13:49:42Z
  - 3728bf3 Merge pull request #24524 from jayeshka/rabbitmq_vhost states-module
  - 01c99ad any() takes list oy tuple.

- **PR #24482**: (eliasp) `docker.running` needs now the `image` param. @ 2015-06-09T04:43:04Z
  - dd23de8 Merge pull request #24482 from eliasp/2015.5-states.dockerio-docker.running-doc
  - 5de741d `docker.running` needs now the `image` param.

- **PR #24515**: (basepi) [2015.5] Add xml library to the salt-thin @ 2015-06-09T04:10:06Z
  - ISSUE #23503: (jfindlay) salt-ssh fails on CentOS 7 when python-zmq is not installed | refs: #24515
  - 2a727c3 Merge pull request #24515 from basepi/susexml23503
  - 078b33e Add xml library to the thin

2094  Chapter 35. Release notes
• PR #24497: (jayeshka) adding states/rbenv unit test case. @ 2015-06-09T03:56:10Z
  - fce99a Merge pull request #24497 from jayeshka/rbenv_states-unit-test
  - 79d343a adding states/rbenv unit test case.
• PR #24496: (jayeshka) adding states/rabbitmq_user unit test case. @ 2015-06-09T03:55:23Z
  - 2bcba4b1 Merge pull request #24496 from jayeshka/rabbitmq_user_states-unit-test
  - 7d96f27 adding states/rabbitmq_user unit test case.
• PR #24481: (eliasp) Fix typo (licnese → license). @ 2015-06-09T03:55:23Z
  - 02a507b Merge pull request #24481 from eliasp/2015.5-salt.states.powerpath-license_typo
  - 1280054 Fix typo (licnese → license).
• PR #24467: (thenewwazoo) Fix dockerio bound volumes @ 2015-06-09T03:55:23Z
  - 5ad3db5 Merge pull request #24467 from thenewwazoo/fix-dockerio-bound-volumes
  - db4e3dc Let's raise an exception if create fails
  - d1d85d5 Add logging
  - ddc63f0 Fix volumehandling when creating containers
• PR #24504: (rallytime) Move vspheredeprecation to 2015.5 @ 2015-06-08T22:43:05Z
  - PR #24487: (namdhok) Deprecating vsphere cloud driver in favor of vmware cloud driver | refs: #24504
  - d236fbd Merge pull request #24504 from rallytime/move_vsphere_deprecation_2015.5
  - d876535 Add Getting Started with VSphere doc to 2015.5
  - b685ebc Add vSphere deprecation warnings to 2015.5
• PR #24506: (rallytime) Backport #24450 to 2015.5 @ 2015-06-08T22:42:14Z
  - PR #24450: (ruzarowski) Fix salt cli runs with batch-size set | refs: #24506
  - cb55460 Merge pull request #24506 from rallytime/bp-24450
  - 1c0fca2 Backport #24450 to 2015.5
• PR #24498: (rallytime) Added ``CLI Example'' to make failing test happy on 2015.5 @ 2015-06-08T15:48:40Z
  - 3173fd1 Merge pull request #24498 from rallytime/fix_doc_failure_fifteen
  - d992ef4 Added ``CLI Example'' to make failing test happy on 2015.5
• PR #24471: (anlutro) Set up salt-ssh file logging @ 2015-06-08T15:26:49Z
  - 3639e41 Merge pull request #24471 from alprs/fixed-salt_ssh_logging
  - 6a11ec8 set up salt-ssh file logging
• PR #24469: (jfindlay) correctly handle user environment info for npm @ 2015-06-08T15:26:02Z
  - ISSUE #24231: (tarwich) npm.bootstrap | refs: #24469
  - 551e70f Merge pull request #24469 from jfindlay/npm_env
  - 8140c9e6 update npm's user info envs
  - cb572f8 add env parameter to npm.uninstall
• PR #24468: (jacobhammons) Bug fixes and build errors @ 2015-06-08T15:25:40Z
  - ISSUE #24268: (tkent-xetus) Ability to specify revision for win_gitrepos undocumented | refs: #24468
- ISSUE #24235: (tomasfejfar) Difference between running from minion and from master | refs: #24468
- ISSUE #24193: (abng88) Update ext_pillar docs to mention that this feature is supported masterless as well | refs: #24468
- ISSUE #24172: (zhujihe) Can lists be passed in the pillar on the command line on version 2015.5.0? | refs: #24468
- ISSUE #23211: (lloesche) Document that salt:// escapes special characters in filenames | refs: #24468
- ISSUE #19901: (clinta) State cache is not documented | refs: #24468
- ISSUE #19801: (ksalman) How are grains static? | refs: #24468
- 0d9e0c2 Merge pull request #24468 from jacobhammons/doc-fixes
- 1035959 Appended .0 to version added
- d45c4ed Bug fixes and build errors Refs #23211 Refs #24268 Refs #24235 Refs #24193 Refs #24172 Refs #19901 Refs #19801

- PR #24465: (jfindlay) catch exception from software repositories @ 2015-06-08T15:25:19Z
  - ISSUE #24318: (favadi) uncaught exception for pkgrepo.absent for invalid PPA | refs: #24465
  - be6905a Merge pull request #24465 from jfindlay/unknown_ppa
  - 19c9128 catch exception from software repositories

- PR #24464: (jfindlay) fix typo in modules/mount.py @ 2015-06-08T15:25:07Z
  - ISSUE #24296: (objectx) mount.mount calls file.mkdir with incorrect named argument | refs: #24464
  - 58d1ea8 Merge pull request #24464 from jfindlay/file.mkdir
  - 6e8c444 fix typo in modules/mount.py

- PR #24461: (dkiser) fix for #24434 @ 2015-06-08T15:24:53Z
  - ISSUE #24434: (dkiser) multimaster failover fails due to logic from issue #23611
  - 4f332a7 Merge pull request #24461 from dkiser/multimaster_minion_fix
  - 1944a74 fix for #24434

- PR #24479: (ahusl) change `\``path`` to `\``name`` for `\``file`` operations @ 2015-06-07T17:56:11Z
  - 8917416 Merge pull request #24479 from ahusl/patch-1
  - 7d6b60c change `\``path`` to `\``name`` for `\``file`` operations

- PR #24475: (rallytime) Back-port #24454 to 2015.5 @ 2015-06-07T01:29:32Z
  - PR #24454: (rhertzog) Strip extraneous newline character added in last environment variable | refs: #24475
  - 8618d5b Merge pull request #24475 from rallytime/bp-24454
  - a793c19 Avoid extraneous newline character added in last environment variable

- PR #24474: (rallytime) Back-port #24420 to 2015.5 @ 2015-06-07T01:29:11Z
  - ISSUE #24407: (aboeye) Please expand salt module random | refs: #24420
  - PR #24420: (aboeye) added random integer module to mod_random.py | refs: #24474
  - 61658ff Merge pull request #24474 from rallytime/bp-24420
  - 4219b40 Fix lint error and update version added to 2015.5.3
• PR #24472: (varia) ensure {} output is not treated as change in module.py state, fixes #...
  @ 2015-06-07T14:45:44Z
  - ISSUE #24233: (varia) yumpkg.group_install keeps returning state change
  - 508d7dd Merge pull request #24472 from varia/Fix-yumpkg_group_install-return-change-
  - 2e0609f Fix for # in inner strings in yaml arguments

• PR #24466: (basepi) [2015.5] Fix for # in inner strings in yaml arguments @ 2015-06-06T14:35:56Z
  - ISSUE #18045: (dstokes) Pillar kwargs parse error with # | refs: #24466
  - ISSUE #8585: (UtahDave) `#` in single quoted option on cli not making it into the execution module |
    | refs: #24466
  - 0292e67 Merge pull request #24466 from basepi/fixhashinargs 18045
  - 2e0609f Fix for # in inner strings in yaml arguments

• PR #24456: (rallytime) Back-port #24441 to 2015.5 @ 2015-06-05T22:32:25Z
  - PR #24441: (arthurlogilab) [doc] Alignment fix on external_auth documentation | refs: #24456
  - ced558a Merge pull request #24456 from rallytime/bp-24441
  - 7002855 yaml indentation should be 2 spaces
  - 2e0609f Fix for # in inner strings in yaml arguments

• PR #24398: (kiorky) VirtualName for states.apt | refs: #24399 @ 2015-06-05T17:40:04Z
  - ISSUE #24397: (kiorky) on debian: states.apt should use virtualname as it shadows system apt module |
    | refs: #24398 #24399 #24400
  - PR #24399: (kiorky) Versionvirtual | refs: #24398
  - c0ff411 Merge pull request #24398 from makinacorpus/aptv
  - 785d277 VirtualName for states.apt

• PR #24447: (jayeshka) adding states/rabbitmq_policy unit test case. @ 2015-06-05T15:26:11Z
  - 3626340 Merge pull request #24447 from jayeshka/rabbitmq_policy_states-unit-test
  - 9b038ab adding states/rabbitmq_policy unit test case.

• PR #24446: (jayeshka) adding states/rabbitmq_plugin unit test case. @ 2015-06-05T15:25:33Z
  - 8445a3f Merge pull request #24446 from jayeshka/rabbitmq_plugin_states-unit-test
  - cb9c9a adding states/rabbitmq_plugin unit test case.

• PR #24426: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-06-05T03:59:11Z
  - ISSUE #24276: (markuskramerlgitt) Live salt-master Profiling with SIGUSR2 fails
  - PR #24405: (jacksontj) Fix for #24276
  - PR #24395: (hvnswetting) handle exceptions when received data is not in good shape
  - PR #24305: (twangboy) Added documentation, fixed formatting
  - 9cc388 Merge pull request #24426 from basepi/merge-forward-2015.5
  - eafa20c Merge remote-tracking branch `upstream/2014.7` into merge-forward-2015.5
  * 83f853b Merge pull request #24405 from jacksontj/2014.7

35.2. Previous Releases
- 2c7afae Fix for #24276
  * cef919e Merge pull request #24395 from hvnsweeting/handle-exception-get-file
    - bb798a0 handle exceptions when received data is not in good shape
  * efb1a9 Merge pull request #24305 from twangboy/win_path_docs
  * 36804253 Fixed pylint error caused by `|P... added r
  * bc42a4b triple double quotes to triple single quotes
  * 77cd930 Added documentation, fixed formatting

- **PR #24429:** (jacobhammons) Salt cloud doc updates, build errors and bug fixes @ 2015-06-05T00:27:38Z
  - ISSUE #24309: (steverweber) missing docs | refs: #24429
  - 5d738b8 Merge pull request #24429 from jacobhammons/cloud-doc-updates
  - 1f7a13d Salt cloud doc updates, build errors and bug fixes Refs #24309

- **PR #24408:** (rallytime) Backport #24392 to 2015.5 @ 2015-06-04T22:09Z
  - PR #24392: (quixoten) Fix "No such file or directory" in grains/core.py | refs: #24408
  - cdff02 Merge pull request #24408 from rallytime/bp-24392
  - ff7461b Use path found by salt.utils.which

- **PR #24380:** (rallytime) Backport #24357 to 2015.5 @ 2015-06-04T20:13:51Z
  - PR #24357: (zhujinhe) fix invoke issues of Jinja Macros example | refs: #24380
  - a6a1f87 Merge pull request #24380 from rallytime/bp-24357
  - f08c875 fix invoke issues of Jinja Macros example

- **PR #24388:** (pengyao) fixes #24358 @ 2015-06-04T20:07:40Z
  - ISSUE #24358: (pengyao) Netapi SSH client don't support ssh_user and ssh_passwd arguments | refs: #24388
  - 86ce9deb Merge pull request #24388 from pengyao/sshclient-kwargs
  - 5c08ca4 fixes #24358

- **PR #24367:** (terminalmage) Improve error message when module does not exist @ 2015-06-04T20:07:12Z
  - ISSUE #22958: (highlyunavailable) Weird error when typoing a command | refs: #24367
  - 72d2ae7 Merge pull request #24367 from terminalmage/issue22958
  - d0d7a54 Improve error message when module does not exist

- **PR #24412:** (jfindlay) backport #23387 @ 2015-06-04T20:06:03Z
  - ISSUE #23101: (gravyboat) Create a docs page for labels | refs: #23387
  - PR #23387: (rallytime) Add some ```What are all these labels for?``` documentation | refs: #24412
  - a628778 Merge pull request #24412 from jfindlay/bp-23387
  - bff8577 Make sure the parameters are in the correct order
  - 9f53809 Add ```Change``` label parameters
  - b27a15e Remove ```workaround``` wording
  - 9ff35a Some small fixes
- 54a7089 Link the new labels doc in contributing and hacking docs
- 375695e Add pull request label definitions
- de94563 Add Feature Request label definition
- 684f291 Add issue definition and augment functional areas section
- 2da13dd Start a ```what are all of these labels for?``` doc

• **PR #24336:** (twangboy) Added line to give more descriptive error @ 2015-06-04T19:56:00Z
  - ISSUE #24154: (ssgward) Exception when running cp.get_url | refs: #24336
  - 485116c Merge pull request #24336 from twangboy/fix_cp_get_url
  - 37b11f9 Added line to give more descriptive error

• **PR #24413:** (techhat) Add more namespaced functions to GoGrid driver @ 2015-06-04T19:51:22Z
  - b3d39cc Merge pull request #24413 from techhat/gogridnamespace
  - 1b397cb Adding blank line
  - da08cc9 Add more namespaced functions to GoGrid driver

• **PR #24399:** (kiorky) Versionvirtual | refs: #24398 @ 2015-06-04T18:02:22Z
  - ISSUE #24397: (kiorky) on debian: states.apt should use virtualname as it shadows system apt module | refs: #24398 #24399 #24399 #24400
  - PR #24398: (kiorky) VirtualName for states.apt | refs: #24399
    - 27f109b Merge pull request #24399 from makinacorpus/versionvirtual
    - 235c78d Use apt_pkg.version_compare if available
    - 1c0cd45 reindent block to isolate conflict on merge forward
    - 699ceca use var to isolate conflict on merge forward

• **PR #24371:** (joejulian) 2015.5 tls module tests @ 2015-06-04T15:20:16Z
  - deaee68 Merge pull request #24371 from joejulian/2015.5_tls_module_tests
  - 4c5dee1 Add @destructiveTest decorator to destructive tests
  - 274bd4d Accept results from older pyOpenSSL
  - 161f913 All cert info should be in UTC always
  - 9affcca See the whole diff if dict compare fails
  - 94f6208 Ignore extensions for now. Resolve this as part of fixing issue 24338.
  - 84900d3 Mask lint warning for unused imported module
  - 5675b78 Do not test if PyOpenSSL is not installed
  - 563ce66 Add tls tests

• **PR #24403:** (jayeshka) adding states/process unit test case. @ 2015-06-04T15:19:01Z
  - 84686ee Merge pull request #24403 from jayeshka/process_states-unit-test
  - fcb71fb adding states/process unit test case.

• **PR #24402:** (jayeshka) adding states/pyenv unit test case. @ 2015-06-04T15:18:11Z
  - 35de8d7 Merge pull request #24402 from jayeshka/pyenv_states-unit-test
- 5f263ab adding states/pyenc unit test case.

- **PR #24401**: (jayeshka) adding states/powerpath unit test case. @ 2015-06-04T15:17:46Z
  - 632f838 Merge pull request #24401 from jayeshka/powerpath-states-unit-test
  - 49f927 adding states/powerpath unit test case.

- **PR #24400**: (kiorky) Aptversion @ 2015-06-04T15:17:19Z
  - ISSUE #24397: (kiorky) on debian: states.apt should use virtualname as it shadows system apt module | refs: #24398 #24398 #24399 #24399 #24400
  - 0a6e5e0 Merge pull request #24400 from makinacorpus/aptversion
  - e15cb93 Use apt_pkg.version_compare if available
  - 953725a Fix too much quoting in apt.version_cmp

- **PR #24385**: (jeanpralo) Fix salt.modules.dockerio.start method @ 2015-06-04T15:00:22Z
  - a904055 Merge pull request #24385 from jeanpralo/Fix-binds-dockerio.start
  - a0fed31 binds dict if not specified should remain to none otherwise docker-py will try to create a new host config and all volume and ports binds are lost. config should be done at the creation of the container not when we start it

- **PR #24381**: (jtand) Disabled flaky test to review later @ 2015-06-04T14:57:43Z
  - 9890bc4 Merge pull request #24381 from jtand/seed_test
  - 7570ae9 Disabled flaky test to review later

- **PR #24382**: (basepi) [2015.5] Handle CommandExecutionError in grains commands, Fixes #23342 @ 2015-06-04T14:04:04Z
  - ISSUE #23342: (philipsd6) salt-ssh 2015.2.0rc2 fails when target doesn't have lspci available | refs: #24382
  - b3fa8fe Merge pull request #24382 from basepi/grainscommandnotfound23342
  - 85b91d6 Handle CommandExecutionError in grains commands

- **PR #24379**: (Starblade42) Fixes an issue where Pagerduty states/modules couldn't find their profile in the Pillar @ 2015-06-04T12:41:13Z
  - 52587a4 Merge pull request #24379 from Starblade42/2015.5
  - b93dc5e Linting!
  - 2dd5904 Fixes an issue where Pagerduty states/modules couldn't find it's profile in the Pillar

- **PR #24366**: (terminalmage) Use yes $\n' instead of printf `\n' for pecl commands @ 2015-06-03T21:28:58Z
  - 3ca35d1 Merge pull request #24366 from terminalmage/pecl-yes
  - dcd9ad8 Use yes $\n' instead of printf `\n' for pecl commands

- **PR #24348**: (kiorky) Try to close input pipes before calling lxc-start @ 2015-06-03T19:38:07Z
  - ISSUE #24284: (kiorky) systemd lxc containers need use_vt=True at lxc-start stage | refs: #24348
  - PR #548: (Lanzaa) Salt is now platform dependent. Use get_python_lib(1) | refs: #24348
  - 86a3b31 Merge pull request #24348 from makinacorpus/lxcpre
  - 0cb11a2 lxc: typo
  - d71efa6 Try to close input pipes before calling lxc-start
35.2.6 Salt 2015.5.4 Release Notes

Version 2015.5.4 is a bugfix release for 2015.5.0.

Changes:

- The `cron.present` state now correctly defaults to state ID as identifier.
- When querying for VMs in `digital_ocean_v2.py`, the number of VMs to include in a page was changed from 20 (default) to 20 to reduce the number of API calls to Digital Ocean.
- The `vmware` Salt-Cloud driver was back-ported from the develop branch in order for installations of Salt that are older than 2015.8.0 to be able to use the `vmware` driver without stack-tracing on various deprecation paths that were implemented in the 2015.8.0 release.

Changes for v2015.5.3..v2015.5.4

Extended changelog courtesy of Todd Stansell (https://github.com/tjstansell/salt-changelogs):

Generated at: 2015-08-13T20:23:30Z

Statistics:

- Total Merges: 247
- Total Issue references: 140
- Total PR references: 330

Changes:

- PR #26292: (jquast) Rabbitmq 3.2.4 on Ubuntu has "...done", not "...done" @ 2015-08-13T19:53:29Z
- PR #26296: (jquast) bugfix missing `runas=None` for rabbitmqctl cmds (backport to 2015.5) @ 2015-08-13T19:52:40Z
- PR #26293: (jfindlay) Fix #26268 @ 2015-08-13T19:48:06Z
  - ISSUE #25618: (twangboy) Fix reg.py to work with the registry properly | refs: #26268
  - PR #26268: (twangboy) Multiple improvements to reg executionmod and state mod | refs: #26293
- PR #26290: (rallytime) Only call convert_to_arn when action name is provided @ 2015-08-13T18:48:58Z
  - ISSUE #25192: (deuscapturus) 2015.5.2 boto_cloudwatch_alarm.present not working. | refs: #26290
- PR #26288: (bbinet) allow to delete grains which value is False @ 2015-08-13T18:24:36Z
- PR #26265: (rallytime) Don't make changes when test=True for openstack present/absent funcs @ 2015-08-13T16:30:31Z
  - ISSUE #24882: (nmadhok) salt.states.openstack_config.present and salt.states.openstack_config.absent make changes when test=True | refs: #26263
- PR #26265: (rallytime) Don't stacktrace on query return in ec2.create_snapshot @ 2015-08-13T16:28:48Z
  - ISSUE #24484: (codehotter) clouds/ec2.py: create_snapshot throws exception | refs: #26265
- PR #26285: (stanislavb) Remove explicit version from instance identity URL @ 2015-08-13T16:25:32Z
- PR #26275: (cachedout) Re-init modules on multi-master reconnect @ 2015-08-13T15:52:50Z
- PR #26273: (garethgreenaway) Fixes to schedule module in 2015.5 @ 2015-08-13T15:34:43Z
- PR #26271: (rallytime) Fix del_root_vol_on_destroy and del_all_vols_on_destroy functionality on ec2 @ 2015-08-12T23:22:47Z
- ISSUE #24483: (codehotter) clouds/ec2.py: del_root_vol_on_destroy and del_all_vols_on_destroy not working | refs: #26271
  - PR #26219: (anlutro) cron: make identifier default to state ID @ 2015-08-12T18:42:33Z
    - ISSUE #25958: (anlutro) Cron identifier does not default to state ID as documented | refs: #26219
  - PR #26257: (rallytime) Back-port #26237 to 2015.5 @ 2015-08-12T18:40:35Z
    - ISSUE #26207: (fullermd) group members setting fails with obscure error message on FreeBSD | refs: #26237
    - PR #26237: (silenius) fix issue #26207 | refs: #26257
  - PR #26258: (nmadhok) Fix permission on tests/runtests.py on 2015.5 branch @ 2015-08-12T18:40:04Z
  - PR #26261: (nmadhok) Correct spelling of integration in runtests.py on 2015.5 branch @ 2015-08-12T18:14:48Z
    - PR #2015: (thekuffs) Esky / bbfreeze support
  - PR #26247: (nmadhok) Initial commit of unit tests for vmware cloud driver @ 2015-08-12T16:58:24Z
  - PR #26246: (nmadhok) Backport additions to VMware cloud driver from develop to 2015.5 branch @ 2015-08-12T15:11:26Z
  - PR #26239: (opdude) Fixed documentation to match function name @ 2015-08-12T14:48:52Z
  - PR #26232: (garethgreenaway) Fix to trust_key in gpg module for 2015.5. @ 2015-08-12T04:48:27Z
  - PR #26084: (twangboy) Added python_shell=True, quoted user input @ 2015-08-10T21:29:35Z
    - ISSUE #25802: (jefftucker) Running module `npm.list` fails on Windows for masterless minion | refs: #26084
  - PR #26183: (cro) Fix LDAP configuration issue. @ 2015-08-10T19:09:41Z
  - PR #26186: (jacobhammons) regenerated man pages @ 2015-08-10T19:07:44Z
  - PR #26182: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-08-10T19:00:10Z
    - ISSUE #25961: (getabc) [2015.5.3-2] salt-winrepo.git/salt-minion.sls fails certificate `*.wpengine.com` or `wpengine.com` | refs: #26047
    - ISSUE #25751: (basepi) Document master finger more prominently | refs: #26088
    - PR #26116: (corux) file.replace fails if repl string is an invalid regex and append/prepend is used
    - PR #26088: (jacobhammons) Master finger
    - PR #26047: (jacobhammons) Updated windows download links in the docs to https://repo.saltstack.com
  - PR #26000: (driskell) Implement full event caching for subscribed tags @ 2015-08-10T16:57:17Z
    - ISSUE #25998: (driskell) Event subsystem discarding required events during --batch breaking it for slow running commands | refs: #26000
  - PR #26175: (rallytime) Back-port #26153 to 2015.5 @ 2015-08-10T18:22:32Z
    - PR #26153: (loa) Fix dockerio state documentation typo | refs: #26175
  - PR #26177: (rallytime) Back-port #26147 to 2015.5 @ 2015-08-10T18:22:01Z
    - ISSUE #26024: (jpic) lxc_conf_unset in cloud.profile is ignored
    - PR #26147: (martinhoefling) Fixes #26024 | refs: #26177
  - PR #26179: (rallytime) Back-port #25404 to 2015.5 @ 2015-08-10T18:21:50Z
    - ISSUE #21082: (clinta) master_type failover does not failover on DNS errors | refs: #25404
• PR #26180: (jfindlay) fix processing of state.template @ 2015-08-10T18:21:38Z
  - ISSUE #26112: (wt) state.template fails with unclear error with template with only an include | refs: #26180

• PR #26172: (nmadhok) [Backport] Make sure variable is a dictionary before popping something from it. @ 2015-08-10T18:21:38Z
  - ISSUE #26162: (nmadhok) VMware cloud driver create function failing with traceback on latest develop | refs: #26163 #26172
  - PR #26163: (nmadhok) Make sure variable is a dictionary before popping something from it.

• PR #26168: (cachedout) Fix slack docs @ 2015-08-10T14:57:18Z
  - ISSUE #26168: (cachedout) SALT.STATES.SLACKDocupdate | refs: #26168

• PR #26140: (nmadhok) VMware cloud driver fixes @ 2015-08-10T13:15:58Z
  - ISSUE #26140: (steverweber) cloud vmware driver does not provide mac_address unless vmware tools is running | refs: #26137 #26140
  - PR #26137: (steverweber) use device mac address if vmtools not active @ 2015-08-09T02:19:52Z

• PR #26111: (anlutro) Better error messages when virtualenv creation fails @ 2015-08-07T21:42:09Z

• PR #26110: (jfindlay) check for sources before adding them to cmd str @ 2015-08-07T21:33:23Z
  - ISSUE #26093: (freedba) archive.tar bug | refs: #26110

• PR #26106: (vr-jack) Update __init__.py @ 2015-08-07T21:15:55Z

• PR #26101: (rallytime) Back-port #25984 to 2015.5 @ 2015-08-07T18:56:26Z
  - ISSUE #25983: (jmdcal) Trying to get md5 of local zip | refs: #25984
  - PR #25984: (jmdcal) Support local files without md5sum | refs: #26101

• PR #26080: (techhat) Fix string checking in s3fs @ 2015-08-06T23:36:09Z

• PR #26079: (cachedout) Update docs to remove state.over @ 2015-08-06T23:35:26Z
  - ISSUE #26039: (basepi) Update scheduler docs to use orchestrate instead of overstate | refs: #26079
• PR #26058: (opdude) Fix choco version on chocolatey versions below 0.9.9 @ 2015-08-06T18:50:10Z

• PR #26068: (jfindlay) fix autoruns.list looking in wrong directory @ 2015-08-06T18:49:48Z

• PR #26065: (stundt3ch) [2015.5] Update to latest bootstrap stable release v2015.06.08 @ 2015-08-06T17:09:35Z
  – ISSUE #634: (loupgraroublond) /srv/salt/_grains/ not documented | refs: #26065
  – ISSUE #631: (fatbox) Can't extend the same item multiple times | refs: #26065
  – ISSUE #625: (whiteinge) cmd.run state user flag is not working | refs: #25506 #632

– ISSUE #634: (loupgraroublond) /srv/salt/_grains/notdocumented|refs: #26065
– ISSUE #631: (fatbox) Can't extend the same item multiple times|refs: #26065
– ISSUE #625: (whiteinge) cmd.run state user flag is not working|refs: #25506 #632

• PR #26061: (gmcwhistler) Patch for issue #25994 @ 2015-08-06T17:07:34Z
  – ISSUE #25994: (gmcwhistler) module.ilotempfilecreationin__execute_cmdresultsinTypeError: cannot concatenate `str' and `int' objects

• PR #26064: (stundt3ch) Don't stacktrace when trying to get the default locale. @ 2015-08-06T16:11:05Z
  – ISSUE #26063: (saltstack-bot) not working with salt-cloud shows unknown locale error | refs: #26064

• PR #26048: (jacobhammons) Updated windows download links in the docs to https://repo.saltstack.com @ 2015-08-05T22:59:50Z

• PR #26044: (rallytime) Make sure the key we're comparing is also lowercase @ 2015-08-05T22:59:50Z
  – ISSUE #25616: (rallytime) [2015.5] Provisioning Linodes Stacktraces | refs: #26044

• PR #26042: (jfindlay) fix test mode logic in state docs @ 2015-08-05T19:23:07Z

• PR #26036: (nicholascapo) survey.hash: Remove manually printed text @ 2015-08-05T19:21:59Z
  – ISSUE #24460: (nicholascapo) Survey runner does not follow --out flag | refs: #26036

• PR #26030: (opdude) Fix a bug in choco version that returned odd data @ 2015-08-05T16:30:25Z

• PR #26032: (jfindlay) add test logic to state result doc @ 2015-08-05T16:28:32Z

• PR #26031: (alekti) Revert `Add file as supported protocol for file source_hash. Fixes #23764" @ 2015-08-05T15:32:01Z
  – ISSUE #23764: (es1o) source_hash from local file is not supported. | refs: #25750

• PR #26021: (anlutro) Documentation: Specify versionadded for git.present shared argument @ 2015-08-05T17:07:34Z
  – ISSUE #23764: (es1o) source_hash from local file is not supported. | refs: #25750

• PR #26020: (alekti) Correctly resolve conflict merging pull 25750 to 2015.5 @ 2015-08-05T14:16:58Z
  – ISSUE #23764: (es1o) source_hash from local file is not supported. | refs: #25750
  – PR #25750: (alekti) Add file as supported protocol for file source_hash. Fixes #25701. | refs: #26020

• PR #26016: (basepi) Revert `Deep merge of pillar lists" @ 2015-08-05T04:59:52Z
  – ISSUE #22241: (masterkorp) Salt master not properly generating the map | refs: #25358
  – PR #25358: (dkiser) Deep merge of pillar lists | refs: #26016

• PR #25992: (twangboy) Refactor win_system.py @ 2015-08-05T04:54:18Z
  – ISSUE #12255: (eliasp) `system.set_computer_desc' fails with non-ASCII chars | refs: #25992
- ISSUE #3: (thatch45) libvirt module
  - PR #26002: (twangboy) Fixed regex to account for comment character followed by whitespace @ 2015-08-04T22:28:1Z
  - ISSUE #25948: (twangboy) Fix uncomment function to handle spaces | refs: #26002
- PR #25970: (jfindlay) accept addition of layman overlay @ 2015-08-04T15:42:28Z
  - ISSUE #25949: (godlike64) layman.add does not work with unofficial overlays | refs: #25970
- PR #25971: (basepi) [2015.5] salt.modules.reg Add spaces for strings split across multiple lines @ 2015-08-04T14:36:31Z
- PR #25990: (rallytime) Back-port #25976 to 2015.5 @ 2015-08-04T14:36:53Z
  - PR #25976: (fleaflicker) Typo in help output | refs: #25990
- PR #25996: (attiasr) fix msiexec package remove @ 2015-08-04T14:36:31Z
- PR #25966: (rallytime) Back-port #25864 to 2015.5 @ 2015-08-03T18:48:26Z
  - ISSUE #25863: (peterdemin) pkg.installed fails on already installed package if it is in versionlock.list | refs: #25864
  - PR #25864: (peterdemin) state.pkg.installed fix | refs: #25966
- PR #25967: (rallytime) Back-port #25917 to 2015.5 @ 2015-08-03T18:48:02Z
  - PR #25917: (jmdcal) adding missing format string | refs: #25967
- PR #25895: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-08-03T17:12:37Z
  - ISSUE #23764: (es1o) source_hash from local file is not supported. | refs: #25895
  - PR #25850: (ssgward) Need to add packages to --versions-report | refs: #25941
- PR #25951: (garethgreenaway) Log when event.fire and event.fire_master fail. @ 2015-08-03T00:19:45Z
- PR #25942: (jfindlay) typo in minion doc @ 2015-07-31T23:34:55Z
  - ISSUE #25838: (grep-linux) docs disable_modules documentation typo | refs: #25942
- PR #25938: (jacobhammons) Doc on using syndic with multimaster @ 2015-07-31T23:05:0Z
  - PR #14690: (jacksontj) Multi syndic | refs: #25938
- PR #25848: (twangboy) Added allusers="1" when installing msi @ 2015-07-31T23:33:17Z
  - ISSUE #25839: (twangboy) ALLUSERS="1" should be a default when installing MSI's | refs: #25848
- PR #25898: (jfindlay) clarify and expand syndic docs @ 2015-07-31T20:01:23Z
- PR #25927: (jacksontj) Pass actual renderers to the Reactor’s Compiler @ 2015-07-31T20:00:17Z
  - ISSUE #25852: (UtahDave) Salt loader is not loading Salt vars in reactor python renderer | refs: #25927
- PR #25921: (cachedout) Handle non-ascii in state log @ 2015-07-31T17:41:30Z
- ISSUE #25810: (nvx) winpkg highstate fails when a new package name contains a unicide character | refs: #25921
- PR #25919: (TheBigBear) Minor update to msi un-installer info @ 2015-07-31T17:39:48Z
- PR #25905: (rallytime) Back-port #25982 to 2015.5 @ 2015-07-30T23:24:19Z
  - PR #25892: (TheBigBear) Update 7-zip msi un-installer instructions | refs: #25905
- PR #25890: (rallytime) Back-port #25890 to 2015.5 @ 2015-07-30T23:45:43Z
  - ISSUE #25698: (AkhterAli) Update schedule.py
- ISSU #25577: (yellow1912) Wrong indentation in document | refs: #25696
- PR #25696: (AkhterAli) Update schedule.py
- PR #25892: (TheBigBear) Update 7-zip msi un-installer instructions | refs: #25905
- PR #25890: (rallytime) Back-port #25885 to 2015.5 @ 2015-07-30T23:02:34Z
  - ISSUE #25478: (zyio) salt-ssh - Unable to locate current thin version | refs: #25862
  - ISSUE #25026: (sylvia-wang) salt-ssh ```Failure deploying thin``` when using salt module functions | refs: #25862
  - PR #25862: (zyio) Adding SCP_NOT_FOUND exit code | refs: #25875
- PR #25873: (rallytime) Back-port #25873 to 2015.5 @ 2015-07-30T17:33:55Z
  - PR #25855: (puneetk) Patch 3 | refs: #25873
- PR #25871: (rallytime) Back-port #25829 to 2015.5 @ 2015-07-30T17:33:43Z
  - PR #25829: (peterdemin) Fixed typo in salt.states.saltmod.function doc string | refs: #25871
- PR #25869: (rallytime) Back-port #25788 to 2015.5 @ 2015-07-30T17:33:33Z
  - ISSUE #24002: (csakoda) File lock contention on windows minions causing highstate crash | refs: #25788
  - PR #25788: (opdude) Catch a hard crash when running highstate on windows | refs: #25869
- PR #25853: (davidjb) Make ssh-id-wrapper accessible to non-root users @ 2015-07-30T16:49:47Z
  - ISSU #19532: (stolendog) salt-ssh running git clone with not root user | refs: #25853
- PR #25856: (jfindlay) expand minion reauth scalability documentation @ 2015-07-30T15:33:17Z
- **ISSUE #25447**: *(spo0nman)* SaltMaster is crippled with Minion Re-Authentication | refs: #25856

- **PR #25840**: *(jfindlay)* add note to winrepo state docs about required grain @ 2015-07-30T14:38:27Z
  - **ISSUE #25801**: *(themalkolm)* Update docs that salt.states.winrepo requires *role: salt-master* in grains. | refs: #25840

- **PR #25846**: *(jfindlay)* rework deprecation documentation for release names @ 2015-07-30T13:26:21Z
  - **ISSUE #25827**: *(0xf10e)* ``Deprecating Code'' doesn't mention Usage of `warn_until()` w/ Release Names | refs: #25846

- **PR #25833**: *(jahamn)* Allows cp.push to recreate empty files @ 2015-07-29T16:14:48Z
  - **ISSUE #23288**: *(UtahDave)* cp.push fails to recreate empty files. | refs: #25833

- **PR #25831**: *(rallytime)* Add salt:// to key_url options to docs for pkgrepo.managed @ 2015-07-29T14:38:27Z
  - **ISSUE #11474**: *(JensRantil)* pkgrepo.managed key_url: *salt:// always use base env* | refs: #25831

- **PR #25807**: *(rallytime)* Provide helpful error when using actions with a mapfile @ 2015-07-29T15:30:15Z
  - **ISSUE #25258**: *(nickw8)* windowsminionreponotupdating | refs: #25798

- **PR #25792**: *(rallytime)* Back-port #25688 to 2015.5 @ 2015-07-28T19:37:17Z
  - **PR #25688**: *(bclermont)* Don’t acquire lock if there is no formatter | refs: #25792

- **PR #25749**: *(jahamn)* Allow zpool.create on character devices @ 2015-07-28T17:35:59Z
  - **ISSUE #25437**: *(lorentgordon)* Stacktrace on Windows when running pkg.list_pkgs | refs: #25598 #25763

- **PR #25793**: *(rallytime)* Back-port #25730 to 2015.5 @ 2015-07-28T19:37:34Z
  - **PR #25730**: *(sjorge)* patchelf lives in pkgsrc | refs: #25793

- **PR #25796**: *(cachedout)* Remove debug from docs @ 2015-07-28T17:35:59Z

- **PR #25749**: *(jahamn)* Allow zpool.create on character devices @ 2015-07-28T16:01:40Z
  - **ISSUE #24920**: *(voileux)* module.zpool.create on character device is not possible by salt | refs: #25749

- **PR #25685**: *(twangboy)* Fixed regex issues with comment and uncomment @ 2015-07-28T15:29:49Z

- **PR #25763**: *(twangboy)* Fix 25437 | refs: #25797 @ 2015-07-28T15:29:27Z
  - **ISSUE #25437**: *(lorentgordon)* Stacktrace on Windows when running pkg.list_pkgs | refs: #25598 #25763

- **PR #25752**: *(thatch45)* State top saltenv @ 2015-07-28T01:02:10Z

- **PR #25755**: *(twangboy)* Fixed problem with dunder functions not being passed @ 2015-07-27T19:31:22Z
  - **ISSUE #25717**: *(twangboy)* Problem with chocolatey module not loading | refs: #25755

- **PR #25648**: *(twangboy)* Clarified functionality of reg module, fixed state to work with new module @ 2015-07-27T19:30:33Z
  - **ISSUE #25352**: *(m03)* reg.absent reporting incorrect results | refs: #25648
  - **ISSUE #1**: *(thatch45)* Enable regex on the salt cli
• PR #25740: (rallytime) Back-port #25722 to 2015.5 @ 2015-07-27T16:08:40Z
  - ISSUE #25154: (uvsmtid) All data mixed on STDOUT together should generate valid JSON output | refs: #25722
  - ISSUE #25153: (uvsmtid) Multiple results should generate valid JSON output | refs: #25722
  - PR #25722: (uvsmtid) Minor docs changes to emphasize JSON output problems without --static option | refs: #25740
• PR #25739: (rallytime) Back-port #25709 to 2015.5 @ 2015-07-27T16:08:27Z
  - PR #25709: (colekowalski) add direct-io-mode to mount_invisible_options | refs: #25739
  - PR #25699: (rallytime) Back-port #25660 to 2015.5 | refs: #25709
  - PR #25660: (colekowalski) add glusterfs’ direct-io-mode to mount_invisible_keys | refs: #25699 #25709
• PR #25738: (rallytime) Back-port #25671 to 2015.5 @ 2015-07-27T16:08:23Z
  - PR #25671: (niq000) added a parameter so verifying SSL is now optional instead of hard-coded | refs: #25738
• PR #25737: (rallytime) Back-port #25608 to 2015.5 @ 2015-07-27T16:08:18Z
  - ISSUE #25229: (rall0r) Module git.latest kills target directory when test=True | refs: #25608
  - PR #25608: (rall0r) Fix: prevent git.latest from removing target | refs: #25737
• PR #25733: (davidjb) Avoid IndexError when listing mounts if mount output ends in newline @ 2015-07-27T16:08:05Z
• PR #25705: (blackduckx) Support for setmaugeas command. @ 2015-07-27T16:07:10Z
  - ISSUE #22460: (onmeac) Command setmaugeas is not supported (yet) | refs: #25705
• PR #25703: (cachedout) Return to str for master_type for 2015.5 @ 2015-07-27T16:06:22Z
• PR #25702: (twangboy) Fixed win_user module for groups with spaces in the name @ 2015-07-27T15:06:33Z
  - ISSUE #25144: (johncefm) user.present on Windows fails to add user to groups if group name contains a space | refs: #25702
• PR #25711: (twangboy) Fixed problem with win_servermanager.list_installed @ 2015-07-27T15:05:48Z
  - ISSUE #25351: (m03) win_servermanager.list_installed failing with "IndexError: list index out of range" | refs: #25711
• PR #25714: (cachedout) Display warning when progressbar can’t be loaded @ 2015-07-25T00:10:13Z
  - ISSUE #25435: (yee379) progressbar dependency missing | refs: #25714
• PR #25699: (rallytime) Back-port #25660 to 2015.5 | refs: #25709 @ 2015-07-24T22:11:40Z
  - PR #25660: (colekowalski) add glusterfs’ direct-io-mode to mount_invisible_keys | refs: #25699 #25709
• PR #25694: (s0undt3ch) Salt-SSH fix for #25689 @ 2015-07-24T21:41:57Z
  - ISSUE #25689: (anlutro) Minion log in salt-ssh | refs: #25694
• PR #25710: (jahamn) Integration Testcase for Issue 25250 @ 2015-07-24T20:57:33Z
  - ISSUE #25250: (anlutro) ‘force’ option in copy state deletes target file | refs: #25461 #25710
• PR #25680: (basepi) [2015.5] Move cmd.run.jinja aliasing to a wrapper class to prevent side effects @ 2015-07-24T19:52:10Z
  - PR #25049: (terminalmage) Fix cmd.run when cross-called in a state/execution module | refs: #25680
• PR #25682: (basepi) [2015.5] Fix parsing args with just a hash (#) @ 2015-07-24T19:52:01Z

• PR #25695: (stanislavb) Configurable AWS region & region from IAM metadata @ 2015-07-24T19:36:40Z

• PR #25645: (kev009) Fix pkgng provider to work with a sources list and the underlying pkg... @ 2015-07-24T16:33:18Z

• PR #25677: (aneeshusa) Fix pacman.list_upgrades when refresh=True. @ 2015-07-24T16:30:06Z

• PR #25675: (UtahDave) Use OS line endings with contents on file.managed @ 2015-07-24T16:29:50Z

– ISSUE #25674: (UtahDave) file.managed with contents parameter uses wrong line endings on Windows | refs: #25675

• PR #25676: (basepi) Update release candidate docs to 2015.8.0rc2 @ 2015-07-23T20:29:37Z

• PR #25666: (nmadhok) Check if the properties exist before looping over them causing KeyError @ 2015-07-23T17:55:40Z

– ISSUE #25665: (nmadhok) salt-cloud VMware driver fails with KeyErrors if there's any existing machine in the VMware infrastructure in (invalid state) | refs: #25666

• PR #25656: (anlutro) Fix locale detection in debian/gentoo @ 2015-07-23T16:46:40Z

• PR #25661: (rallytime) Back-port #25624 to 2015.5 @ 2015-07-23T16:26:48Z

  – PR #25624: (bobrik) Fix typo in get_routes example for debian_ip | refs: #25661

• PR #25662: (rallytime) Back-port #25638 to 2015.5 @ 2015-07-23T16:26:40Z

  – ISSUE #15209: (hubez) file.manage: source_hash not working with s3:// (2014.7.0rc1) | refs: #25638

  – PR #25638: (TronPaul) fix bad merge in 99fc7ec | refs: #25662

• PR #25644: (cachedout) pillar doc fix @ 2015-07-22T22:57:23Z

  – ISSUE #25413: (zizkebab) pillar_opts default behavior is not reflected in the docs | refs: #25644

• PR #25642: (cachedout) Warn on pillar schedule delete @ 2015-07-22T22:04:12Z

  – ISSUE #25540: (dennisjac) salt highstate schedule cannot be removed | refs: #25642

• PR #25598: (twangboy) Fixed problem trying to load file with name of boolean type @ 2015-07-22T17:07:49Z

  – ISSUE #25437: (lorenjordan) Stacktrace on Windows when running pkg.list_pkgs | refs: #25598 #25763

  – 7b79e43 Merge pull request #25598 from twangboy/fixed_25437

• PR #25604: (terminalmage) Move patching of mock_open to within test @ 2015-07-22T16:53:55Z

  – ISSUE #25323: (terminalmage) unit.modules.tls_test fails with older mock | refs: #25604

• PR #25609: (stundtSCh) [2015.5] Update the bootstrap script to latest release v2015.07.22 @ 2015-07-22T16:28:52Z

  – ISSUE #630: (syphernl) Allow for an include statement in config files | refs: #25609

  – PR #627: (chjohnst) add saltversion grain | refs: #25609

• PR #25603: (terminalmage) Add version_cmp function to yumpkg.py @ 2015-07-22T15:42:29Z

  – ISSUE #21912: (rvora) pkg.latest not updating the package on CentOS though yum reports an update available | refs: #25603

• PR #25590: (garethgreenaway) 2015.5 scheduled jobs return data @ 2015-07-21T21:57:42Z

  – ISSUE #25560: (dennisjac) scheduled highstate runs don't return results to the job cache | refs: #25590

• PR #25584: (rallytime) Back-port #24054 and #25576 to 2015.5 @ 2015-07-21T21:16:38Z

35.2. Previous Releases 2109
– PR #25576: (pcn) s3fs breaks when fetching files from s3 | refs: #25584
– PR #24054: (mgwilliams) s3.head: return useful data | refs: #25584

- PR #25589: (jahamn) Fixes ssh_known_host not taking port into account @ 2015-07-21T21:15:06Z
  - ISSUE #23626: (mirko) salt state `ssh_known_hosts` doesn't take `port` into account | refs: #25589

- PR #25573: (EvSDK) Do not execute bootstrap script twice @ 2015-07-21T18:20:04Z
  - PR #25465: (EvSDK) 2015.5.3 LXC module fixes | refs: #25573

- PR #25580: (attiasr) use explicit utf-8 decoding (#25532) @ 2015-07-21T15:40:49Z
  - ISSUE #25532: (attiasr) salt/modules/win_pkg.py list_pkgs is broken (encoding issues) | refs: #25556
    #25580

- PR #25568: (twangboy) Fixed win_useradd module to add fullname @ 2015-07-21T14:30:25Z
  - ISSUE #25206: (jfindlay) fullname issues with user.add state on windows | refs: #25568

- PR #25561: (twangboy) Fixed the gem module to work on windows... without injection @ 2015-07-20T21:12:15Z
  - ISSUE #21041: (deuscapturus) state module gem.installed not working on Windows. | refs: #25430
    #25561 #25428

- PR #25542: (twangboy) Fixed the gem module to work on windows | refs: #25561

- PR #25521: (cachedout) Fix outputter for state.orch @ 2015-07-20T19:30:14Z

- PR #25563: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-07-20T19:27:36Z
  - PR #25416: (cachedout) Fix broken keyword

- PR #25552: (cachedout) Lint win_pkg @ 2015-07-20T17:46:29Z

- PR #25556: (attiasr) fix for #25532 @ 2015-07-20T17:45:11Z
  - ISSUE #25532: (attiasr) salt/modules/win_pkg.py list_pkgs is broken (encoding issues) | refs: #25556
    #25580

- PR #25554: (jfindlay) verify_ssl=True for s3 ext pillar @ 2015-07-20T17:43:38Z
  - ISSUE #25538: (stanislavb) S3 ext_pillar configuration requires verify_ssl | refs: #25554

- PR #25551: (rallytime) Backport #25530 to 2015.5 @ 2015-07-20T17:43:00Z
  - PR #25530: (andre-luiz-dos-santos) The variable name must be last | refs: #25551

- PR #25533: (attiasr) port 445 for windows bootstraping @ 2015-07-20T15:13:06Z

- PR #25525: (gtmanfred) add make _prepare an alias for postinitio @ 2015-07-20T15:12:38Z
  - ISSUE #25432: (gtmanfred) [2015.5.3][raet] raet error with SaltRaetRoadStackJoiner | refs: #25525

- PR #25519: (rallytime) Backport vmware driver to 2015.5 branch @ 2015-07-20T15:11:26Z
  - ISSUE #25511: (rallytime) Make provider --> driver change backward compatible | refs: #25519 #25519
  - ISSUE #23574: (CedNantes) Failed to Deploy Salt-Minion on a Win 2012 R2 using vmware Cloud Driver from Develop branch | refs: #25519

- PR #25542: (Oro) Fix hipchat.send_message when using API v2 @ 2015-07-20T15:09:13Z

- PR #25531: (rallytime) Back-port #25529 to 2015.5 @ 2015-07-18T19:16:10Z
  - PR #25529: (davidjb) Fix minor typo in best practice example | refs: #25531

- PR #25528: (davidjb) Fix typo in extend declaration doco @ 2015-07-18T14:22:06Z
• PR #25517: (rallytime) Back-port #25486 to 2015.5 @ 2015-07-17T21:49:26Z
  - ISSUE #25486: (whiteinge) Highstate outputter not used for state.apply | refs: #25517
  - PR #25485: (attiasr) fix file downloads on windows
• PR #25516: (rallytime) Back-port #25483 to 2015.5 @ 2015-07-17T21:49:05Z
  - ISSUE #25479: (alexandrsushko) multiple mount.mouted of one device | refs: #25483
  - PR #25483: (alexandrsushko) Added `none' to the set of specialFSes | refs: #25516
• PR #25513: (garethgreenaway) fixes to schedule.add documentation in 2015.5 @ 2015-07-17T17:03:24Z
  - ISSUE #25479: (blackduckx) Issue with job_args on schedule.add command | refs: #25513
• PR #25465: (EvaSDK) 2015.5.3 LXC module fixes | refs: #25573 @ 2015-07-17T15:57:54Z
• PR #25506: (s0und3ch) [2015.5] Update bootstrap script to latest stable release, v2015.07.17 @ 2015-07-17T15:40:38Z
  - ISSUE #25456: (julienlavergne) [2015.8.0rc1] salt-bootstrap failstoinstallsalt master | refs: #25506
  - ISSUE #25270: (mschiff) Regression: salt2015.5notworkinginsecurechrootanymore. | refs: #25498
• PR #25469: (jfindlay) only read /proc/1/cmdline if it exists @ 2015-07-17T15:35:33Z
  - ISSUE #25454: (mschiff) Regression: salt 2015.5 not working in secure chroot anymore. | refs: #25498
• PR #25487: (rallytime) Back-port #25464 to 2015.5 @ 2015-07-16T16:58:36Z
  - PR #25464: (jquast) docfix: ```cache_jobs: False''=>grains_cache: False'' | refs: #25487
  - PR #25482: (oeuftete) Fix docker.running detection of running container @ 2015-07-16T16:58:29Z
  - PR #2015: (thekuffs) Esksy / bbfreeze support
• PR #25468: (joejulian) Add support for pyOpenSSL > 0.10 @ 2015-07-16T16:58:36Z
  - ISSUE #25384: (rickh563) pyopenssl 0.14 requirement in 2015.5.3 does not work in RHEL6 : ZD-364 | refs: #25487
• PR #25467: (rallytime) Add lxml dependency to opennebula docs @ 2015-07-16T16:58:29Z
• PR #25461: (jahamn) Update file, if force option and content not same @ 2015-07-15T20:15:07Z
  - ISSUE #25250: (wipfs) `force' option in copy state deletes target file | refs: #25461 #25710
  - ISSUE #24647: (nmadhok) salt.states.file.copy does not copy the file if it already exists with force=True | refs: #25461

35.2. Previous Releases 2111
• PR #25438: (rallytime) Reduce digital_ocean_v2 API call frequency @ 2015-07-15T19:40:18Z
  – ISSUE #25431: (namcois) Digital Ocean v2 reducing API calls by adding per_page | refs: #25438
• PR #25457: (jacksontj) Saltnado @ 2015-07-15T17:50:12Z
  – PR #25427: (tony-cocco) Saltnado runner client results in blocking call despite being set-up as Runner.async | refs: #25457
• PR #25459: (jahamn) Fixed `defulats' typo in verify.py @ 2015-07-15T16:53:06Z
• PR #25426: (jquast) bugfix: trailing "...done" in rabbitmq output (backport from 'develop' to 2015.5) @ 2015-07-15T14:48:05Z
• PR #25433: (jleroy) Support for IPv6 addresses scopes in network.interfaces (ifconfig) @ 2015-07-15T14:44:09Z
  – PR #25151: (jleroy) Support for IPv6 addresses scopes in network.interfaces | refs: #25274 #25433
• PR #25430: (twangboy) Disabled rbenv execution module for Windows @ 2015-07-15T14:41:18Z
  – ISSUE #21041: (deuscapturus) state module gem.installed not working on Windows. | refs: #25430 #25561 #25428
• c4b1584 Additional test case for question raised in #1846
  – ISSUE #1846: (seanchannel) development dependencies
• PR #25420: (techhat) Move S3 to use AWS Signature Version 4 @ 2015-07-14T22:03:09Z
• PR #25418: (twangboy) Fixed problem with file.managed test=True @ 2015-07-14T21:26:59Z
  – ISSUE #20441: (deuscapturus) State module file.managed returns an error on Windows and test=Test | refs: #25418
• PR #25417: (ahu1) extended documentation about dependencies for dig module @ 2015-07-14T20:49:51Z
• PR #25411: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-07-14T17:55:26Z
  – PR #25375: (cachedout) Fix error in config.py for master_type
  – PR #25324: (jacobhammons) Latest help theme updates
• PR #25406: (anlutro) Force arguments to aptpkg.version_cmp into strings @ 2015-07-14T16:15:41Z
• PR #25408: (rallytime) Back-port #25399 to 2015.5 @ 2015-07-14T16:09:06Z
  – PR #25399: (jarpy) Demonstrate per-minion client_acl. | refs: #25408
• PR #25240: (tankywoo) file make os.walk only be called one @ 2015-07-14T16:04:49Z
• PR #25395: (rallytime) Back-port #25389 to 2015.5 @ 2015-07-14T03:26:34Z
  – PR #25389: (l2ol33rt) Adding entropy note for gpg renderer | refs: #25395
• PR #25392: (rallytime) Back-port #25256 to 2015.5 @ 2015-07-14T03:25:13Z
  – PR #25256: (yanatan16) Dont assume source_hash exists | refs: #25392
• PR #25398: (twangboy) Fix date @ 2015-07-14T03:21:17Z
• PR #25397: (GideonRed) Introduce standard error output when cli exits with non-zero status @ 2015-07-14T03:20:24Z
• PR #25386: (cachedout) Lint #25383 @ 2015-07-13T21:01:10Z
  – ISSUE #24444: (michaelkrupp) file.managed does not handle dead symlinks | refs: #25383
  – PR #25383: (jahamn) Fix manage_file function in salt/modules/file.py to handle broken sym...
• PR #25383: (jahamn) Fix manage_file function in salt/modules/file.py to handle broken sym... @ 2015-07-13T20:58:23Z
  
  - ISSUE #24444: (michaelkrupp) file.managed does not handle dead symlinks | refs: #25383
• PR #25369: (anlutro) Fix aptpkg.version_cmp @ 2015-07-13T20:45Z
• PR #25379: (jfindlay) check for cwd before getting it @ 2015-07-13T19:50:27Z
  
  - ISSUE #25337: (eliasp) salt-call from non-existend cwd backtraces | refs: #25379
• PR #25334: (jfindlay) return all cmd info back to zypper fcn @ 2015-07-13T17:03:29Z
  
  - ISSUE #25320: (podloucky-init) zyppermodulelist_upgrades broken (2015.5.2) | refs: #25334
• PR #25339: (jfindlay) update orchestration docs @ 2015-07-13T16:04:26Z
• PR #25358: (dkiser) Deep merge of pillar lists | refs: #26016 @ 2015-07-13T15:51:01Z
  
  - ISSUE #22241: (masterkorp) Salt master not properly generating the map | refs: #25358
• PR #25346: (bechtoldt) set correct indentation in states/requisites.rst (docs), fixes #25281 @ 2015-07-13T15:34:45Z
  
  - ISSUE #25281: (shinshenjs) Unless usage in Official Doc syntax error?
• PR #25336: (terminalmage) Don't try to read init binary if it wasn't found @ 2015-07-13T09:45:30Z
• PR #25350: (davidjb) Fix documentation for file.blockreplace @ 2015-07-13T03:41:20Z
• PR #25326: (rallytime) Back-port #20972 to 2015.5 @ 2015-07-10T18:49:44Z
  
  - ISSUE #19288: (oba11) AssociatePublicIpAddress doesn't work with salt-cloud 2014.7.0 | refs: #20972
  - PR #20972: (JohannesEbke) Fix interface cleanup when using AssociatePublicIpAddress in #19288 | refs: #25326
• PR #25327: (rallytime) Back-port #25290 to 2015.5 @ 2015-07-10T18:49:37Z
  
  - ISSUE #24433: (chrimi) Salt locale state fails, if locale has not been generated | refs: #25290
  - PR #25290: (pcdummy) Simple fix for locale.present on Ubuntu. | refs: #25327
• PR #25328: (rallytime) Back-port #25309 to 2015.5 @ 2015-07-10T17:22:59Z
  
  - ISSUE #24827: (yermulnik) locale.present doesn't generate locales | refs: #25309
  - PR #25309: (davidjb) Format /etc/locale.gen correctly in salt.modules.localemod.gen_locale | refs: #25328
• PR #25322: (jacobhammons) version change to 2015.5.3 @ 2015-07-10T16:11:24Z
• PR #25308: (jacksontj) Make clear commands trace level logging @ 2015-07-10T14:20:06Z
  
  - PR #24737: (jacksontj) Move AES command logging to trace | refs: #25308
• PR #25269: (jfindlay) Extract tomcat war version @ 2015-07-10T01:28:21Z
  
  - ISSUE #24520: (nrex) Tomcat module fails to extract version number from snapshot builds (2015.5 regression) | refs: #24927
  - PR #24927: (egarbi) Tomcat module fails to extract version number from snapshot builds #2... | refs: #25269
• PR #25238: (DmitryKuzmenko) Pillarenv backport 2015.5 @ 2015-07-10T01:25:07Z
  
  - ISSUE #18808: (amendlik) Add command line argument to select pillar environment | refs: #25238
  - PR #23719: (DmitryKuzmenko) Support pillarenv cmdline in state.sls
• PR #25299: (twangboy) Added -NonInteractive so powershell doesn't hang waiting for input @ 2015-07-09T21:00:16Z
  - ISSUE #13943: (Supermathie) Powershell commands that expect input hang forever | refs: #25299
• PR #25301: (jacobhammons) bug fix for module function display in help @ 2015-07-09T20:46:34Z
• PR #25279: (jacobhammons) Additional docs on external and master job cache, assorted doc fixes @ 2015-07-09T16:46:26Z
  - ISSUE #25277: (jacobhammons) CherryPy recommended versions | refs: #25279
• PR #25274: (jleroy) Fix for issue #25268 @ 2015-07-09T13:36:26Z
  - ISSUE #25268: (lichtamberg) Salt not working anymore in 2015.8/develop: ValueError: `scope` is not in list | refs: #25274
• PR #25272: (twangboy) Fixed problem with service not starting @ 2015-07-08T23:29:48Z
• PR #25225: (nmadhok) Backporting fix for issue #25223 on 2015.5 branch @ 2015-07-08T15:16:18Z
  - ISSUE #25223: (nmadhok) Runner occasionally fails with a RuntimeError when fired by a reactor | refs: #25225
• PR #25214: (rallytime) A couple of doc fixes for the http tutorial @ 2015-07-07T22:23:07Z
• PR #25194: (rallytime) Update moto version check in boto_vpc_test and update min version @ 2015-07-07T18:27:32Z
  - ISSUE #24272: (rallytime) Fix boto_vpc_test moto version check | refs: #25194
• PR #25205: (basepi) Update release candidate docs @ 2015-07-07T15:25:24Z
• PR #25180: (rallytime) Back-port #25088 to 2015.5 @ 2015-07-06T19:35:24Z
  - ISSUE #25088: (supertom) Update | refs: #25180
• PR #25179: (rallytime) Back-port #25059 to 2015.5 @ 2015-07-07T00:58:00Z
  - ISSUE #23822: (sidcarter) Zip file extracted permissions are incorrect | refs: #25128
  - PR #25128: (stanislavb) Use cmd_unzip to preserve permissions | refs: #25185
• PR #25181: (rallytime) Back-port #25102 to 2015.5 @ 2015-07-07T00:57:13Z
  - PR #25102: (derBroBro) Update win_network.py | refs: #25181
• PR #25179: (rallytime) Back-port #25059 to 2015.5 @ 2015-07-07T00:56:44Z
  - ISSUE #24301: (iggy) influxdb_user and influxdb_database states need virtual functions | refs: #25059
  - PR #25059: (babilen) Add virtual functions to influxdb state modules | refs: #25179
• PR #25196: (twangboy) Fixed #18919 false-positive on pkg.refresh @ 2015-07-07T00:24:13Z
  - ISSUE #18919: (giner) Windows: pkg.refresh_db returns false-positive success | refs: #25196
• PR #25180: (rallytime) Back-port #25088 to 2015.5 @ 2015-07-06T20:33:45Z
  - PR #25088: (supertom) Update | refs: #25180
• PR #25191: (basepi) Add externdest back to fileclient.is_cached in 2015.5 @ 2015-07-06T19:35:24Z
  - PR #25117: (basepi) Fix fileclient.is_cached | refs: #25191
• PR #25175: (rallytime) Back-port #25020 to 2015.5 @ 2015-07-06T18:53:19Z
- ISSUE #25016: (martinhoefling) salt-run doc.execution fails with AttributeError
- PR #25020: (martinhoefling) Fix for issue #25016 | refs: #25175

- PR #25173: (rallytime) Partial back-port of #25019 @ 2015-07-06T18:52:59Z
  - ISSUE #21879: (bechtoldt) Reference pages in documentation are outdated again | refs: #25019
  - ISSUE #19262: (bechtoldt) salt.pillar.file_tree doesn't appear in the documentation | refs: #25019
  - PR #25019: (bechtoldt) add missing module documentation to references | refs: #25173
  - PR #24421: (bechtoldt) add missing module documentation | refs: #25019
  - PR #21880: (bechtoldt) update references, fixes #21879 | refs: #25019
  - PR #20039: (bechtoldt) completing some doc references | refs: #25019

- PR #25171: (rallytime) Back-port #25001 to 2015.5 @ 2015-07-06T18:51:53Z
  - PR #25001: (jasonkeene) Add docs for key arg in ssh_known_hosts.present | refs: #25171

- PR #25170: (rallytime) Back-port #24982 to 2015.5 @ 2015-07-06T16:34:43Z
  - PR #24982: (asyncsrc) ec2 network_interfaces fix | refs: #25170

- PR #25161: (aneeshusa) Allow checking for non-normalized systemd units. @ 2015-07-06T15:31Z
- PR #25151: (jeroy) Support for IPv6 addresses scopes in network.interfaces | refs: #25274 #25433 @ 2015-07-06T14:03Z

- PR #25166: (cachedout) Lint #25149 @ 2015-07-06T14:40:29Z
  - ISSUE #24979: (mavenAtHouzz) [Discussion] Support for more than 1 netapi.rest_tornado server process | refs: #25149
  - PR #25149: (jacksontj) Saltndao multiprocess support | refs: #25166

- PR #25149: (jacksontj) Saltndao multiprocess support | refs: #25166 @ 2015-07-06T14:38:43Z
  - ISSUE #24979: (mavenAtHouzz) [Discussion] Support for more than 1 netapi.rest_tornado server process | refs: #25149

- PR #25120: (d--j) add missing continue for exeption case @ 2015-07-02T19:38:45Z

- PR #25117: (basepi) Fix fileclient.is_cached | refs: #25191 @ 2015-07-02T19:38:26Z

- PR #25087: (0xf10e) Fix execution module for glance - now based on 2015.5! @ 2015-07-02T19:36:27Z

- PR #25129: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-07-02T17:37:40Z
  - ISSUE #18447: (ryan-lane) Can’t install salt with raet using pip -e git
  - PR #25093: (jaybocc2) quick fix for issue #18447
  - PR #25069: (puneetk) Add a helper module function called list_enabled

- PR #25114: (jfindlay) Revert ```Revert ```adding states/postgres_database unit test case.```' @ 2015-07-02T01:01:29Z
  - PR #24798: (itand) Revert ```adding states/postgres_database unit test case.``` | refs: #25114
  - PR #24329: (jayeshka) adding states/postgres_database unit test case. | refs: #24798

- PR #24362: (jayeshka) adding states/postgres_user unit test case. @ 2015-07-01T21:45:31Z
- PR #24361: (jayeshka) adding states/postgres_schema unit test case. @ 2015-07-01T21:44:56Z
- PR #24331: (jayeshka) adding states/postgres_extension unit test case. @ 2015-07-01T21:43:58Z
35.2.7 Salt 2015.5.5 Release Notes

Version 2015.5.5 is a bugfix release for 2015.5.0.

Changes:

- The `cron.present` state now correctly defaults to state ID as identifier.
- When querying for VMs in `digital_ocean_v2.py`, the number of VMs to include in a page was changed from 20 (default) to 200 to reduce the number of API calls to Digital Ocean.
- The `vmware` Salt-Cloud driver was back-ported from the develop branch in order for installations of Salt that are older than 2015.8.0 to be able to use the `vmware` driver without stack-tracing on various deprecation paths that were implemented in the 2015.8.0 release.

Changes for v2015.5.3..v2015.5.5

Extended changelog courtesy of Todd Stansell (https://github.com/tjstansell/salt-changelogs):

Generated at: 2015-08-20T17:02:37Z

Statistics:

- Total Merges: 280
- Total Issue references: 168
- Total PR references: 371

Changes:

- PR #26292: (jquast) Rabbitmq 3.2.4 on Ubuntu has "...done", not "...done" @ 2015-08-13T19:53:29Z
- PR #26296: (jquast) bugfix missing `runas=None` for rabbitmqctl cmds (backport to 2015.5) @ 2015-08-13T19:52:40Z
- PR #26293: (jfindlay) Fix #26268 @ 2015-08-13T19:48:06Z
  – ISSUE #25618: (twangboy) Fix reg.py to work with the registry properly | refs: #26268
  – PR #26268: (twangboy) Multiple improvements to reg executionmod and state mod | refs: #26293
- PR #26290: (rallytime) Only call convert_to_arn when action name is provided @ 2015-08-13T18:48:58Z
  – ISSUE #25192: (deuscapturus) salt.states.openstack_config.present and salt.states.openstack_config.absent make changes when test=True | refs: #26290
- PR #26288: (bbinet) allow to delete grains which value is False @ 2015-08-13T18:24:36Z
- PR #26265: (rallytime) Don't make changes when test=True for openstack present/absent funcs @ 2015-08-13T16:30:31Z
  – ISSUE #24882: (nmadhok) salt.states.openstack_config.present and salt.states.openstack_config.absent make changes when test=True | refs: #26263
- PR #26265: (rallytime) Don't stacktrace on query return in ec2.create_snapshot @ 2015-08-13T16:28:48Z
  – ISSUE #24484: (codehotter) clouds/ec2.py: create_snapshot throws exception | refs: #26265
- PR #26285: (stanislavb) Remove explicit version from instance identity URL @ 2015-08-13T16:25:32Z
- PR #26275: (cachedout) Re-init modules on multi-master reconnect @ 2015-08-13T15:52:50Z
- PR #26273: (garethgreenaway) Fixes to schedule module in 2015.5 @ 2015-08-13T15:34:43Z
- PR #26271: (rallytime) Fix del_root_vol_on_destroy and del_all_vols_on_destroy functionality on ec2 @ 2015-08-12T23:22:47Z
ISSUE #24483: (codehotter) clouds/ec2.py: del_root_vol_on_destroy and del_all_vols_on_destroy not working | refs: #26271

- PR #26219: (anlutro) cron: make identifier default to state ID @ 2015-08-10T18:42:33Z
  - ISSUE #25958: (anlutro) Cron identifier does not default to state ID as documented | refs: #26219

- PR #26257: (rallytime) Back-port #26237 to 2015.5 @ 2015-08-10T18:40:35Z
  - ISSUE #26207: (fullermd) group members setting fails with obscure error message on FreeBSD | refs: #26237
  - PR #26237: (silenus) fix issue #26207 | refs: #26257

- PR #26258: (nmadhok) Fix permission on tests/runtests.py on 2015.5 branch @ 2015-08-10T18:40:04Z

- PR #26261: (nmadhok) Correct spelling of integration in runtests.py @ 2015-08-10T18:14:48Z
  - PR #2015: (thekuffs) Esky / bbfreeze support

- PR #26247: (nmadhok) Initial commit of unit tests for vmware cloud driver @ 2015-08-10T18:58:24Z

- PR #26246: (nmadhok) Backport additions to VMware cloud driver from develop to 2015.5 branch @ 2015-08-10T18:11:26Z

- PR #26239: (opdude) Fixed documentation to match function name @ 2015-08-10T18:48:52Z

- PR #26232: (garethgreenaway) Fix to trust_key in gpg module for 2015.5 @ 2015-08-10T04:48:27Z

- PR #26084: (twangboy) Added python_shell=True, quoted user input @ 2015-08-10T21:29:35Z
  - ISSUE #25802: (jefftucker) Running module `"npm.list" fails on Windows for masterless minion | refs: #26084

- PR #26183: (cro) Fix LDAP configuration issue. @ 2015-08-10T19:09:41Z

- PR #26186: (jacobhammons) regenerated man pages @ 2015-08-10T19:07:44Z

- PR #26182: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-08-10T19:00:10Z
  - ISSUE #25961: (getabc) [2015.5.3-2] salt-winrepo.git/salt-minion.sls fails certificate '*.wpengine.com' or 'wpengine.com' | refs: #26047
  - ISSUE #25751: (basepi) Document master_finger more prominently | refs: #26088
  - PR #26116: (corux) file.replace fails if repl string is an invalid regex and append/prepend is used
  - PR #26088: (jacobhammons) Master finger
  - PR #26047: (jacobhammons) Updated windows download links in the docs to https://repo.saltstack.com

- PR #26167: (rallytime) Back-port #26153 to 2015.5 @ 2015-08-10T18:22:32Z
  - PR #26153: (loa) Fix dockerio state documentation typo | refs: #26175

- PR #26177: (rallytime) Back-port #26147 to 2015.5 @ 2015-08-10T18:22:01Z
  - ISSUE #26064: (clinta) Fix lxc_conf_unset in cloud.provision is ignored
  - PR #26147: (martinhoefling) Fixes #26064 | refs: #26177

- PR #26179: (rallytime) Back-port #25404 to 2015.5 @ 2015-08-10T18:21:50Z
  - ISSUE #21082: (clinta) master_type failover does not failover on DNS errors | refs: #25404
• PR #25404: (DmitryKuzmenko) Fixed minion failover to next master on DNS errors. | refs: #26179

• PR #26180: (jfindlay) fix processing of state.template @ 2015-08-10T18:21:38Z

• ISSUE #26112: (wt) state.template fails with unclear error with template with only an include | refs: #26180

• PR #26172: (nmadhok) [Backport] Make sure variable is a dictionary before popping something from it. @ 2015-08-10T18:21:38Z

• ISSUE #26162: (nmadhok) VMware cloud driver create function failing with traceback on latest develop | refs: #26163 #26172

• PR #26163: (nmadhok) Make sure variable is a dictionary before popping something from it.

• PR #26168: (cachedout) Fix slack docs @ 2015-08-10T14:57:18Z

• ISSUE #26098: (rdinoff) SALT.STATES.SLACK Doc update | refs: #26168

• PR #26127: (garethgreenaway) Fixes to salt.utils.http related to cp.get_file_str bug. @ 2015-08-10T14:57:18Z

• ISSUE #24106: (nvx) fileclient.py#get_urlignoresHTTPAuthagain(2015.5 regression) | refs: #26127

• PR #26140: (nmadhok) VMware cloud driver fixes @ 2015-08-10T13:15:58Z

• PR #26141: (nmadhok) salt-cloud VMware driver fails with error in parsing configuration file | refs: #26140

• ISSUE #25809: (o-sleep) vmware cloud module error message | refs: #26140

• ISSUE #25625: (steverweber) cloud vmware driver does not provide mac_address unless vmware tools is running | refs: #26137 #26140

• PR #26137: (steverweber) use device mac address if vmtools not active @ 2015-08-09T03:05:36Z

• ISSUE #25625: (steverweber) cloud vmware driver does not provide mac_address unless vmware tools is running | refs: #26137 #26140

• PR #26119: (jodv) Backport auth bug fix to 2015.5 @ 2015-08-09T02:19:52Z

• PR #26135: (cro) Fix proxy minions in 2015.5 and significantly update documentation. @ 2015-08-09T02:19:21Z

• PR #26132: (TheBigBear) minor edit @ 2015-08-08T21:05:34Z

• PR #26133: (amontalban) Fixed #25915 in salt/modules/pkgng.py and salt/states/pkg.py @ 2015-08-08T21:05:05Z

• ISSUE #25915: (ari) FreeBSD pkg install fails

• PR #26111: (anlutro) Better error messages when virtualenv creation fails @ 2015-08-07T21:42:09Z

• PR #26110: (jfindlay) check for sources before adding them to cmd str @ 2015-08-07T21:33:23Z

• ISSUE #26093: (freidba) archive.tar bug | refs: #26110

• PR #26106: (vr-jack) Update __init__.py @ 2015-08-07T21:15:55Z

• PR #26101: (rallytime) Back-port #25984 to 2015.5 @ 2015-08-07T18:56:26Z

• ISSUE #25983: (jmdcal) Trying to get md5 of local zip | refs: #25984

• PR #25984: (jmdcal) Support local files without md5sum | refs: #26101

• PR #26080: (techhat) Fix string checking in s3fs @ 2015-08-06T23:36:09Z

• PR #26079: (cachedout) Update docs to remove state.over @ 2015-08-06T23:35:26Z

• ISSUE #26039: (basepi) Update scheduler docs to use orchestrate instead of overstate | refs: #26079
• PR #26058: (opdude) Fix choco version on chocolatey versions below 0.9.9 @ 2015-08-06T18:50:10Z
• PR #26068: (jfindlay) fix autoruns.list looking in wrong directory @ 2015-08-06T18:49:48Z
• PR #26065: (stundt3ch) [2015.5] Update to latest bootstrap stable release v2015.06.08 @ 2015-08-06T17:09:35Z
  – ISSUE #634: (lopugarowlond) /srv/salt/_grains/ not documented | refs: #26065
  – ISSUE #631: (fatbox) Can't extend the same item multiple times | refs: #26065
  – ISSUE #625: (whiteinge) cmd.run state user flag is not working | refs: #25506 #632
  – PR #640: (terminalmage) fix syntax errors introduced in 0f776c13 | refs: #26065
  – PR #638: (blast-hardcheese) Tightened up configuration documentation | refs: #26065
  – PR #633: (epoelke) Bug fix to salt-key | refs: #26065
  – PR #632: (whiteinge) Change the cmd.run state to use the new runas arg | refs: #26065
• PR #26061: (gmcwhistler) Patch for issue #25994 @ 2015-08-06T17:07:34Z
  – ISSUE #25994: (gmcwhistler) module.ilo tempfile creation in __execute_cmd results in TypeError: cannot concatenate `str' and `int' objects
• PR #26064: (stundt3ch) Don't stacktrace when trying to get the default locale. @ 2015-08-06T16:11:05Z
  – ISSUE #26063: (saltstack-bot) not working with salt-cloud shows unknown locale error | refs: #26064
• PR #26048: (jacobhammons) Updated windows download links in the docs to https://repo.saltstack.com @ 2015-08-05T22:59:50Z
• PR #26044: (rallytime) Make sure the key we're comparing is also lowercase @ 2015-08-05T19:23:54Z
  – ISSUE #25616: (rallytime) [2015.5] Provisioning Linodes Stacktraces | refs: #26044
• PR #26042: (jfindlay) fix test mode logic in state docs @ 2015-08-05T19:23:07Z
• PR #26036: (nicholascapo) survey.hash: Remove manually printed text @ 2015-08-05T19:21:59Z
  – ISSUE #24460: (nicholascapo) Survey runner does not follow --out flag | refs: #26036
• PR #26030: (opdude) Fix a bug in choco version that returned odd data @ 2015-08-05T16:30:25Z
• PR #26032: (jfindlay) add test logic to state result doc @ 2015-08-05T16:28:32Z
• PR #26031: (alekti) Revert ``Add file as supported protocol for file source_hash. Fixes #23764'' @ 2015-08-05T15:32:01Z
  – ISSUE #23764: (es1o) source_hash from local file is not supported. | refs: #25750
• PR #26021: (anlutro) Documentation: Specify version added for git.present shared argument @ 2015-08-05T14:17:38Z
• PR #26020: (alekti) Correctly resolve conflict merging pull 25750 to 2015.5 @ 2015-08-05T14:16:58Z
  – ISSUE #23764: (es1o) source_hash from local file is not supported. | refs: #25750
• PR #26016: (basepi) Revert ```Deep merge of pillar lists'' @ 2015-08-05T04:59:52Z
  – ISSUE #22241: (masterkorp) Salt master not properly generating the map | refs: #25358
  – PR #25558: (dkiser) Deep merge of pillar lists | refs: #26016
• PR #25992: (twangboy) Refactor win_system.py @ 2015-08-05T04:54:18Z
  – ISSUE #12255: (eliasp) `system.set_computer_desc' fails with non-ASCII chars | refs: #25992
- ISSUE #3: (thatch45) libvirt module
  - PR #26002: (twangboy) Fixed regex to account for comment character followed by whitespace @ 2015-08-04T22:12:17Z
  - ISSUE #25948: (twangboy) Fix uncomment function to handle spaces | refs: #26002
- PR #25970: (jfindlay) accept addition of layman overlay @ 2015-08-04T42:28:42Z
  - ISSUE #25949: (godlike64) layman.add does not work with unofficial overlays | refs: #25970
- PR #25971: (basepi) [2015.5] salt.modules.reg Add spaces for strings split across multiple lines @ 2015-08-04T39:48:52Z
- PR #25990: (rallytime) Back-port #25976 to 2015.5 @ 2015-08-04T36:34:32Z
  - PR #25966: (rallytime) Back-port #25864 to 2015.5 @ 2015-08-03T18:48:26Z
  - ISSUE #25863: (peterdemin) pkg.installed fails on already installed package if it is in versionlock.list | refs: #25864
  - PR #25864: (peterdemin) state.pkg.installed fix | refs: #25966
- PR #25967: (rallytime) Back-port #25917 to 2015.5 @ 2015-08-03T18:48:02Z
  - PR #25917: (jfindlay) add timelib to dependency versions @ 2015-08-03T12:43:32Z
  - ISSUE #23764: (es1o) source_hash from local file is not supported. | refs: #25750
  - PR #25750: (alekti) Add file as supported protocol for file source_hash. Fixes #25701. | refs: #26020
  - PR #25704: (cachedout) Ensure prior alignment with master_type in 2014.7
  - PR #25657: (MrCitron) Add the ability to specify a base pattern for carbon returner
  - PR #25633: (AkhterAli) Update loader.py
- PR #25941: (jfindlay) add timelib to dependency versions @ 2015-08-03T12:43:42Z
  - ISSUE #25850: (ssgward) Need to add packages to --versions-report | refs: #25941
- PR #25951: (garethgreenaway) Log when event.fire and event.fire_master fail. @ 2015-08-03T00:45:45Z
- PR #25942: (jfindlay) typo in minion doc @ 2015-07-31T23:34:55Z
  - ISSUE #25838: (grep-linux) docs disable_modules documentation typo | refs: #25942
- PR #25938: (jacobhammons) Doc on using syndic with multimaster @ 2015-07-31T23:05:05Z
  - PR #14690: (jacksontj) Multi syndic | refs: #25938
- PR #25848: (twangboy) Added allusers="1" when installing msi @ 2015-07-31T20:33:17Z
  - ISSUE #25839: (twangboy) ALLUSERS="1" should be a default when installing MSI's | refs: #25848
- PR #25898: (jfindlay) clarify and expand syndic docs @ 2015-07-31T20:01:23Z
- PR #25927: (jacksontj) Pass actual renderers to the Reactor's Compiler @ 2015-07-31T20:00:17Z
  - ISSUE #25852: (UtahDave) Salt loader is not loading Salt vars in reactor python renderer | refs: #25927
- PR #25921: (cachedout) Handle non-ascii in state log @ 2015-07-31T7:41:30Z
- ISSUE #25810: (nvx) winpkg highstate fails when a new package name contains a unicode character | refs: #25921
- PR #25919: (TheBigBear) Minor update to msi un-installer info @ 2015-07-31T17:39:48Z
- PR #25905: (rallytime) Back-port #25982 to 2015.5 @ 2015-07-30T23:24:19Z
  - PR #25892: (TheBigBear) Update 7-zip msi un-installer instructions | refs: #25905
- PR #25890: (rallytime) Back-port #25698 to 2015.5 @ 2015-07-30T23:12:09Z
  - ISSUE #25677: (yellow1912) Wrong indentation in document | refs: #25696
  - PR #25698: (AkhterAli) Update schedule.py
  - PR #25696: (isbm) Bugfix: crash at getting non-existing repo | refs: #25698
- PR #25894: (jacobhammons) Minor doc bug fixes @ 2015-07-30T23:02:34Z
  - ISSUE #25650: (jacksontj) state.runningdocumentationisincorrect | refs: #25894
  - ISSUE #25652: (whiteinge) The state_events setting is not documented | refs: #25894
  - ISSUE #23788: (k5jj) functions in drac.py module do not match documentation | refs: #25894
  - ISSUE #21296: (Lothiraldan) Possible minion enumeration using saltutil.find_job and eauth | refs: #25894
- PR #25897: (rallytime) Protect against passing a map file in addition to VM names with --destroy @ 2015-07-30T21:55:45Z
  - ISSUE #24036: (arthurlogilab) [salt-cloud] Protect against passing command line arguments as names for the --destroy command in map files | refs: #25877
- PR #25870: (rallytime) Back-port #25824 to 2015.5 @ 2015-07-30T21:54:35Z
  - PR #25824: (klyr) Fix get_managed() in file.py module for local files | refs: #25870
- PR #25885: (t0rrant) Update Debian changelog @ 2015-07-30T20:05:59Z
- PR #25875: (rallytime) Back-port #25862 to 2015.5 @ 2015-07-30T17:34:02Z
  - ISSUE #25478: (zyio) salt-ssh - Unable to locate current thin version | refs: #25862
  - ISSUE #25026: (sylvia-wang) salt-ssh ```Failure deploying thin``` when using salt module functions | refs: #25862
  - PR #25862: (zyio) Adding SCP_NOT_FOUND exit code | refs: #25875
- PR #25873: (rallytime) Back-port #25855 to 2015.5 @ 2015-07-30T17:33:55Z
  - PR #25855: (puneetk) Patch 3 | refs: #25873
- PR #25871: (rallytime) Back-port #25829 to 2015.5 @ 2015-07-30T17:33:43Z
  - PR #25829: (peterdemin) Fixed typo in salt.states.saltnod.function doc string | refs: #25871
- PR #25869: (rallytime) Back-port #25788 to 2015.5 @ 2015-07-30T17:33:33Z
  - ISSUE #24002: (csakoda) File lock contention on windows minions causing highstate crash | refs: #25788
  - PR #25788: (opdude) Catch a hard crash when running highstate on windows | refs: #25869
- PR #25853: (davidjb) Make ssh-id-wrapper accessible to non-root users @ 2015-07-30T16:49:47Z
  - ISSUE #19533: (stolendog) salt-ssh running git clone with not root user | refs: #25853
- PR #25856: (jfindlay) expand minion reauth scalability documentation @ 2015-07-30T15:33:17Z
– ISSUE #25447: (spo0nman) SaltMaster is crippled with Minion Re-Authentication | refs: #25856

• PR #25840: (jfindlay) add note to winrepo state docs about required grain @ 2015-07-30T14:38:27Z

– ISSUE #25801: (themalkolm) Update docs that salt.states.winrepo requires roles:salt-master in grains. | refs: #25840

• PR #25846: (jfindlay) rework deprecation documentation for release names @ 2015-07-30T13:26:21Z

– ISSUE #25827: (0xf10e) ```DeprecatingCode'' doesn't mention Usage of warn_until() w/ Release Names | refs: #25846

• PR #25833: (jahamn) Allows cp.push to recreate empty files @ 2015-07-29T16:14:48Z

– ISSUE #23288: (UtahDave) cp.push fails to recreate empty files. | refs: #25833

• PR #25831: (rallytime) Add salt:// to key_url options to docs for pkgrepo.managed @ 2015-07-29T13:26:21Z

– ISSUE #11474: (JensRantil) pkgrepo.managed key_url: salt:// always use base env | refs: #25831

• PR #25807: (rallytime) Provide helpful error when using actions with a mapfile @ 2015-07-29T13:26:21Z

– ISSUE #22699: (arthurlogilab) salt-cloud fails on KeyError when given a nonexistent action | refs: #25807

• PR #25818: (jfindlay) fix autoruns list @ 2015-07-29T15:29:20Z

• PR #25826: (anlutro) Check that "onchanges" is a list @ 2015-07-29T15:00:28Z

• PR #25798: (twangboy) Fixed stacktrace on package name not found @ 2015-07-29T22:40:14Z

– ISSUE #25258: (nickw8) windows minion reponot updating | refs: #25798

• PR #25797: (twangboy) Changed repocache back to cached_repo @ 2015-07-29T22:39:32Z

– ISSUE #25437: (loregordon) Stacktrace on Windows when running pkg.list_pkgs | refs: #25598 #25763

– PR #25763: (twangboy) Fix 25437 | refs: #25797

• PR #25793: (rallytime) Back-port #25730 to 2015.5 @ 2015-07-28T19:37:34Z

– PR #25730: (sjorge) patchelf lives in pkgsrc | refs: #25793

• PR #25792: (rallytime) Back-port #25688 to 2015.5 @ 2015-07-28T19:37:17Z

– PR #25688: (bclermont) Don’t acquire lock if there is no formatter | refs: #25792

• PR #25796: (cachedout) Remove debug from docs @ 2015-07-28T17:35:59Z

• PR #25749: (jahamn) Allow zpool.create on character devices @ 2015-07-28T16:01:40Z

– ISSUE #24920: (voileux) module.zpool.create on character device is not possible by salt | refs: #25749

• PR #25685: (twangboy) Fixed regex issues with comment and uncomment @ 2015-07-28T15:29:49Z

• PR #25763: (twangboy) Fix 25437 | refs: #25797 @ 2015-07-28T15:29:27Z

– ISSUE #25437: (loregordon) Stacktrace on Windows when running pkg.list_pkgs | refs: #25598 #25763

• PR #25752: (thatch45) State top saltenv @ 2015-07-28T01:02:10Z

• PR #25755: (twangboy) Fixed problem with dunder functions not being passed @ 2015-07-27T19:31:22Z

– ISSUE #25717: (twangboy) Problem with chocolatey module not loading | refs: #25755

• PR #25648: (twangboy) Clarified functionality of reg module, fixed state to work with new module @ 2015-07-27T19:30:33Z

– ISSUE #25352: (m03) reg.absent reporting incorrect results | refs: #25648

– ISSUE #1: (thatch45) Enable regex on the salt cli
• PR #25740: (rallytime) Back-port #25722 to 2015.5 @ 2015-07-27T16:08:40Z
  
  – ISSUE #25154: (uvsmtid) All data mixed on STDOUT together should generate valid JSON output | refs: #25722
  
  – ISSUE #25153: (uvsmtid) Multiple results should generate valid JSON output | refs: #25722
  
  – PR #25722: (uvsmtid) Minor docs changes to emphasize JSON output problems without --static option | refs: #25740

• PR #25739: (rallytime) Back-port #25709 to 2015.5 @ 2015-07-27T16:08:27Z
  
  – PR #25709: (colekowalski) add direct-io-mode to mount_invisible_options | refs: #25739
  
  – PR #25699: (rallytime) Back-port #25660 to 2015.5 | refs: #25709
  
  – PR #25660: (colekowalski) add glusterfs’ direct-io-mode to mount_invisible_keys | refs: #25699 #25709

• PR #25738: (rallytime) Back-port #25671 to 2015.5 @ 2015-07-27T16:08:23Z
  
  – PR #25671: (niq000) added a parameter so verifying SSL is now optional instead of hard-coded | refs: #25738

• PR #25737: (rallytime) Back-port #25608 to 2015.5 @ 2015-07-27T16:08:18Z
  
  – ISSUE #25229: (rall0r) Module git.latest kills target directory when test=True | refs: #25608
  
  – PR #25608: (rall0r) Fix: prevent git.latest from removing target | refs: #25737

• PR #25733: (davidjb) Avoid IndexError when listing mounts if mount output ends in newline @ 2015-07-27T16:08:05Z

• PR #25705: (blackduckx) Support for setmaugeas command. @ 2015-07-27T16:07:10Z
  
  – ISSUE #22460: (onmeac) Command setm is not supported (yet) | refs: #25705

• PR #25703: (cachedout) Return to str for master_type for 2015.5 @ 2015-07-27T16:06:22Z

• PR #25702: (twangboy) Fixed win_user module for groups with spaces in the name @ 2015-07-27T15:06:33Z
  
  – ISSUE #25144: (johncefim) user.present on Windows fails to add user to groups if group name contains a space | refs: #25702

• PR #25711: (twangboy) Fixed problem with win_servermanager.list_installed @ 2015-07-27T15:05:48Z
  
  – ISSUE #25351: (m03) win_servermanager.list_installed failing with ” indexerror: list index out of range” | refs: #25711

• PR #25714: (cachedout) Display warning when progressbar can’t be loaded @ 2015-07-25T00:10:13Z
  
  – ISSUE #25435: (yee379) progressbar dependency missing | refs: #25714

• PR #25699: (rallytime) Back-port #25660 to 2015.5 | refs: #25709 @ 2015-07-24T22:11:40Z
  
  – PR #25660: (colekowalski) add glusterfs’ direct-io-mode to mount_invisible_keys | refs: #25699 #25709

• PR #25694: (stoundt3ch) Salt-SSH fix for #25689 @ 2015-07-24T21:41:57Z
  
  – ISSUE #25689: (anlutro) Minion log in salt-ssh | refs: #25694

• PR #25710: (jahamn) Integration Testcase for Issue 25250 @ 2015-07-24T20:57:33Z
  
  – ISSUE #25250: (wipfs) ‘force’ option in copy state deletes target file | refs: #25461 #25710

• PR #25680: (basepi) [2015.5] Move cmd.run jinja aliasing to a wrapper class to prevent side effects @ 2015-07-24T19:52:10Z
  
  – PR #25049: (terminalmage) Fix cmd.run when cross-called in a state/execution module | refs: #25680
· PR #25682: (basepi) [2015.5] Fix parsing args with just a hash(#) @ 2015-07-24T19:52:01Z

· PR #25695: (stanislavb) Configurable AWS region & region from IAM metadata @ 2015-07-24T19:36:40Z

· PR #25645: (kev009) Fix pkgng provider to work with a sources list and the underlying pkg... @ 2015-07-24T16:33:18Z

· PR #25677: (aneeshusa) Fix pacman.list_upgrades when refresh=True. @ 2015-07-24T16:30:06Z

· PR #25675: (UtahDave) Use OS line endings with contents on file.managed @ 2015-07-24T16:29:50Z

· ISSUE #25674: (UtahDave) file.managed with contents parameter uses wrong line endings on Windows | refs: #25675

· PR #25676: (basepi) Update release candidate docs to 2015.8.0rc2 @ 2015-07-23T20:29:37Z

· PR #25666: (nmadhok) Check if the properties exist before looping over them causing KeyError @ 2015-07-23T17:55:40Z

· ISSUE #25665: (nmadhok) salt-cloud VMware driver fails with KeyErrors if there's any existing machine in the VMware infrastructure in (invalid state) | refs: #25666

· PR #25656: (anlutro) Fix locale detection in debian/gentoo @ 2015-07-23T16:46:40Z

· PR #25661: (rallytime) Back-port #25624 to 2015.5 @ 2015-07-23T16:26:48Z
  · PR #25624: (bobrik) Fix typo in get_routes example for debian_ip | refs: #25661

· PR #25662: (rallytime) Back-port #25638 to 2015.5 @ 2015-07-23T16:26:40Z
  · ISSUE #15209: (hubez) file.manage: source_hash not working with s3:/// (2014.7.0rc1) | refs: #25638
  · PR #25638: (TronPaul) fix bad merge in 99fc7ec | refs: #25662

· PR #25644: (cachedout) pillar doc fix @ 2015-07-22T22:57:23Z
  · ISSUE #25413: (zizkebab) pillar_opts default behavior is not reflected in the docs | refs: #25644

· PR #25642: (cachedout) Warn on pillar schedule delete @ 2015-07-22T22:04:12Z
  · ISSUE #25540: (dennisjac) salt highstate schedule cannot be removed | refs: #25642

· PR #25598: (twangboy) Fixed problem trying to load file with name of boolean type @ 2015-07-22T17:07:49Z
  · ISSUE #25437: (lorensgordon) Stacktrace on Windows when running pkg.list_pkgs | refs: #25598 #25763
  · 7b79e433 Merge pull request #25598 from twangboy/fix_25437

· PR #25604: (terminalmage) Move patching of mock_open to within test @ 2015-07-22T16:53:55Z
  · ISSUE #25323: (terminalmage) unit.modules.tls_test fails with older mock | refs: #25604

· PR #25609: (stockdSch) [2015.5] Update the bootstrap script to latest release v2015.07.22 @ 2015-07-22T16:28:52Z
  · ISSUE #630: (syphernl) Allow for an include statement in config files | refs: #25609
  · PR #627: (chjohnst) add saltversion grain | refs: #25609

· PR #25603: (terminalmage) Add version_cmp function to yumpkg.py @ 2015-07-22T15:42:29Z
  · ISSUE #21912: (rvora) pkg.latest not updating the package on CentOS though yum reports an update available | refs: #25603

· PR #25590: (garethgreenaway) 2015.5 scheduled jobs return data @ 2015-07-21T21:57:42Z
  · ISSUE #25560: (dennisjac) scheduled highstate runs don't return results to the job cache | refs: #25590

· PR #25584: (rallytime) Back-port #24054 and #25576 to 2015.5 @ 2015-07-21T21:16:38Z
– PR #25576: (p cn) s3fs breaks when fetching files from s3 | refs: #25584
– PR #24054: (mgwilliams) s3.head: return useful data | refs: #25584

• PR #25589: (jahamm) Fixes ssh_known_host not taking port into account @ 2015-07-21T21:15:06Z
  – ISSUE #23626: (mirko) salt state `ssh_known_hosts` doesn't take `port` into account | refs: #25589

• PR #25573: (EvaSDK) Do not execute bootstrap script twice @ 2015-07-21T18:20:04Z
  – PR #25465: (EvaSDK) 2015.5.3 LXC module fixes | refs: #25573

• PR #25580: (attiasr) use explicit utf-8 decoding (#25532) @ 2015-07-21T15:40:49Z
  – ISSUE #25532: (attiasr) salt/modules/win_pkg.py list_pkgs is broken (encoding issues) | refs: #25556 #25580

• PR #25568: (twangboy) Fixed win_useradd module to add fullname @ 2015-07-21T14:30:25Z
  – ISSUE #25206: (jfindlay) fullname issues with user.add state on windows | refs: #25568

• PR #25561: (twangboy) Fixed the gem module to work on windows... without injection @ 2015-07-21T21:12:15Z
  – ISSUE #21041: (deuscapturus) state module gem.installed not working on Windows. | refs: #25430 #25561 #25428
  – PR #25428: (twangboy) Fixed the gem module to work on windows | refs: #25561

• PR #25521: (cachedout) Fix outputter for state.orch @ 2015-07-20T19:30:14Z

• PR #25563: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-07-20T19:27:36Z
  – PR #25416: (cachedout) Fix broken keyword

• PR #25559: (cachedout) List win_pkg @ 2015-07-20T17:46:29Z

• PR #25566: (attiasr) fix for #25532 @ 2015-07-20T17:45:11Z
  – ISSUE #25532: (attiasr) salt/modules/win_pkg.py list_pkgs is broken (encoding issues) | refs: #25556 #25580

• PR #25554: (jfindlay) verify_ssl=True for s3 ext pillar @ 2015-07-20T17:43:38Z
  – ISSUE #25538: (stanislavb) S3 ext_pillar configuration requires verify_ssl | refs: #25554

• PR #25551: (rallytime) Backport #25530 to 2015.5 @ 2015-07-20T17:43:00Z
  – PR #25530: (andre-luiz-dos-santos) The variable name must be last | refs: #25551

• PR #25533: (attiasr) port 445 for windows bootstraping @ 2015-07-20T15:13:06Z

• PR #25525: (gtmanfred) add make _prepare an alias for postinitio @ 2015-07-20T15:12:38Z
  – ISSUE #25432: (gtmanfred) [2015.5.3][raet] raet error with SaltRaetRoadStackJoiner | refs: #25525

• PR #25519: (rallytime) Backport vmware driver to 2015.5 branch @ 2015-07-20T15:11:26Z
  – ISSUE #25511: (rallytime) Make provider --> driver change backward compatible | refs: #25519 #25519
  – ISSUE #23574: (CedNantes) Failed to Deploy Salt-Minion on a Win 2012 R2 using vmware Cloud Driver from Develop branch | refs: #25519

• PR #25542: (Oro) Fix hipchat.send_message when using API v2 @ 2015-07-20T15:09:13Z

• PR #25531: (rallytime) Back-port #25529 to 2015.5 @ 2015-07-18T19:16:10Z
  – PR #25529: (davidjb) Fix minor typo in best practice example | refs: #25531

• PR #25528: (davidjb) Fix typo in extend declaration doco @ 2015-07-18T14:22:06Z
PR #25517: (rallytime) Back-port #25486 to 2015.5 @ 2015-07-17T21:49:26Z
- ISSUE #25486: (whiteinge) Highstate outputter not used for state.apply | refs: #25517
- PR #25485: (attiar) fix file downloads on windows

PR #25516: (rallytime) Back-port #25483 to 2015.5 @ 2015-07-17T21:49:05Z
- PR #25513: (garethgreenaway) fixes to schedule.add documentation in 2015.5 @ 2015-07-17T17:03:24Z
- ISSUE #25479: (alexandrsushko) multiple mount.mouted of one device | refs: #25516

PR #25506: (s0undt3ch) [2015.5] Update bootstrap script to latest stable release, v2015.07.17 @ 2015-07-17T15:40:38Z
- ISSUE #25493: (blackduckx) Issue with job_args on schedule.add command | refs: #25506

PR #25465: (EvaSDK) 2015.5.3 LXC module fixes | refs: #25573 @ 2015-07-17T15:57:54Z

PR #25506: (s0undt3ch) [2015.5] Update bootstrap script to latest stable release, v2015.07.17 @ 2015-07-17T15:40:38Z
- ISSUE #25456: (julienlavergne) [2015.8.0rc1] salt-bootstrap fails to install salt master | refs: #25506
- ISSUE #25270: (iggy) [2015.8.0rc1] salt-bootstrap fails to properly install a minion | refs: #25506
- ISSUE #625: (whiteinge) cmd.run state user flag is not working | refs: #25506 #632
- ISSUE #611: (fatbox) Peer interface fails to return data occasionally | refs: #25506
- ISSUE #607: (thatch45) next level -X support | refs: #25506
- ISSUE #598: (syphernl) Explanation on how to execute interactive installs | refs: #25506
- ISSUE #455: (whiteinge) Document common troubleshooting tips | refs: #25506
- PR #624: (chjohnst) Docs are not correct with network.ping as args are not supported | refs: #25506
- PR #621: (akoumjian) Adding ec2 cloud-init bootstrap docs | refs: #25506
- PR #606: (terminalmage) need empty line before code blocks. added ones that were missing. | refs: #25506
- PR #602: (terminalmage) State-related documentation changes | refs: #25506
- PR #25498: (jfindlay) only read /proc/1/cmdline if it exists @ 2015-07-17T15:35:33Z
- ISSUE #25454: (mschiff) Regression: salt 2015.5 not working in secure chroot anymore. | refs: #25498

PR #25487: (rallytime) Back-port #25464 to 2015.5 @ 2015-07-16T16:58:36Z
- PR #25464: (jquast) docfix: `cache_jobs: False'' => grains_cache: False'' | refs: #25487
- PR #25482: (oeuftete) Fix docker.running detection of running container @ 2015-07-16T16:58:29Z
- PR #2015: (thekuffs) Esky / bbfreeze support
- PR #25468: (joejulian) Add support for pyOpenSSL > 0.10 @ 2015-07-16T16:58:29Z
- ISSUE #25384: (rickh563) pyopenssl 0.14 requirement in 2015.5.3 does not work in RHEL6 : ZD-364 | refs: #25468

PR #25467: (rallytime) Add xml dependency to opennebula docs @ 2015-07-16T16:58:29Z

PR #25461: (jahamn) Update file, if force option and content not same @ 2015-07-15T20:15:07Z
- ISSUE #25250: (wipfs) `force` option in copy state deletes target file | refs: #25461 #25710
- ISSUE #24647: (nmadhok) salt.states.file.copy does not copy the file if it already exists with force=True | refs: #25461
- **PR #25438**: *(rallytime)* Reduce digital_ocean_v2 API call frequency @ 2015-07-15T19:40:18Z
  - ISSUE #25431: *(namcois)* Digital Ocean v2 reducing API calls by adding per_page |refs: #25438
- **PR #25457**: *(jacksonsj)* Saltndo @ 2015-07-15T17:50:12Z
  - PR #25427: *(tony-cocco)* Saltndo runner client results in blocking call despite being set-up as Runner.async |refs: #25457
- **PR #25459**: *(jahamn)* Fixed `default`s typo in verify.py @ 2015-07-15T16:53:06Z
- **PR #25426**: *(jquast)* bugfix: trailing ‘…done’ in rabbitmq output (backport from ‘develop' to 2015.5) @ 2015-07-15T14:48:05Z
- **PR #25433**: *(jleroy)* Support for IPv6 addresses scopes in network.interfaces (ifconfig) @ 2015-07-15T14:44:09Z
  - PR #25151: *(jleroy)* Support for IPv6 addresses scopes in network.interfaces |refs: #25433
- **PR #25375**: *(cachedout)* Fix error in config.py for master_type
- **PR #25240**: *(tankywoo)* filemakeos.walk only called one @ 2015-07-14T22:03:09Z
- **PR #25418**: *(twangboy)* Fixed problem with file.managed test=True @ 2015-07-14T21:26:59Z
  - ISSUE #20441: *(deuscapturus)* State module file.managed returns an error on Windows and test=Test |refs: #25418
- **PR #25417**: *(ahusl)* extended documentation about dependencies for dig module @ 2015-07-14T20:49:51Z
- **PR #25411**: *(basepi)* [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-07-14T17:55:26Z
  - PR #25375: *(cachedout)* Fix error in config.py for master_type
  - PR #25324: *(jacobhammons)* Latest help theme updates
- **PR #25406**: *(anlutro)* Force arguments to aptpkg.version_cmp into strings @ 2015-07-14T22:03:09Z
- **PR #25408**: *(rallytime)* Back-port #25399 to 2015.5 @ 2015-07-14T16:09:06Z
  - PR #25399: *(jarpy)* Demonstrate per-minion client_acl. |refs: #25408
- **PR #25240**: *(tankywoo)* file make os.walk only be called one @ 2015-07-14T16:04:49Z
- **PR #25395**: *(rallytime)* Back-port #25389 to 2015.5 @ 2015-07-14T03:26:34Z
  - PR #25389: *(l2ol33rt)* Adding entropy note for gpg renderer |refs: #25395
- **PR #25392**: *(rallytime)* Back-port #25256 to 2015.5 @ 2015-07-14T03:25:13Z
  - PR #25256: *(yanatan16)* Don't assume source_hash exists |refs: #25392
- **PR #25398**: *(twangboy)* Fix date @ 2015-07-14T03:21:17Z
- **PR #25397**: *(GideonRed)* Introduce standard error output when cli exits with non-zero status @ 2015-07-14T03:20:24Z
- **PR #25386**: *(cachedout)* Lint #25383 @ 2015-07-13T21:01:10Z
  - ISSUE #24444: *(michaelkrupp)* file.managed does not handle dead symlinks |refs: #25383
  - PR #25383: *(jahamn)* Fix manage_file function in salt/modules/file.py to handle broken sym...
- **PR #25383**: *(jahamn)* Fix manage_file function in salt/modules/file.py to handle broken sym... @ 2015-07-13T20:58:23Z

35.2. Previous Releases 2127
- ISSUE #24444: (michaelkrupp) file.managed does not handle dead symlinks | refs: #25383
- PR #25369: (anlutro) Fix aptpkg.version_cmp @ 2015-07-13T20:18:45Z
- PR #25379: (jfindlay) check for cwd before getting it @ 2015-07-13T19:50:27Z
  - ISSUE #25337: (eliasp) salt-call from non-existent cwd backtraces | refs: #25383
- PR #25334: (jfindlay) return all cmd info back to zypper fcn @ 2015-07-13T17:03:29Z
- ISSUE #25284: (jfindlay) update orchestration docs | refs: #25334
- PR #25338: (bechtoldt) set correct indentation in states/requisites.rst (docs), fixes #25284 @ 2015-07-13T15:34:45Z
- PR #25350: (davidjb) Fix documentation for file.blockreplace @ 2015-07-13T03:41:20Z
- PR #25326: (rallytime) Back-port #20972 to 2015.5 @ 2015-07-10T18:49:44Z
  - ISSUE #19288: (oba11) AssociatePublicIpAddress doesn't work with salt-cloud 2014.7.0 | refs: #20972 & #25326
  - PR #20972: (JohannesEbke) Fix interface cleanup when using AssociatePublicIpAddress in #19288 | refs: #25326
- PR #25327: (rallytime) Back-port #25290 to 2015.5 @ 2015-07-10T18:49:37Z
  - ISSUE #24433: (crimi) Salt locale state fails, if locale has not been generated | refs: #25290
  - PR #25290: (pcodev) Simple fix for locale.present on Ubuntu. | refs: #25327
- PR #25328: (rallytime) Back-port #25309 to 2015.5 @ 2015-07-10T17:22:59Z
  - ISSUE #24827: (yermulnik) locale.present doesn't generate locales | refs: #25309
  - PR #25309: (davidjb) Format /etc/locale.gen correctly in salt.modules.localemod.gen_locale | refs: #25328
- PR #25322: (jacobhammons) version change to 2015.5.3 @ 2015-07-10T16:11:24Z
- PR #25308: (jacksontj) Make clear commands trace level logging @ 2015-07-10T14:20:06Z
  - PR #24737: (jacksontj) Move AES command logging to trace | refs: #25308
- PR #25269: (jfindlay) Extract tomcat war version @ 2015-07-10T01:28:21Z
  - ISSUE #24520: (nax) Tomcat module fails to extract version number from snapshot builds (2015.5 regression) | refs: #24927
  - PR #24927: (egarbi) Tomcat module fails to extract version number from snapshot builds #2... | refs: #25269
- PR #25238: (DmitryKuzmenko) Pillarenv backport 2015.5 @ 2015-07-10T01:25:07Z
  - ISSUE #18808: ( amendlik) Add command line argument to select pillar environment | refs: #25388
  - PR #23719: (DmitryKuzmenko) Support pillarenv cmdline in state.sls
- PR #25299: (twangboy) Added -NonInteractive so powershell doesn't hang waiting for input @ 2015-07-09T21:00:16Z
  - ISSUE #13943: (Supermathie) Powershell commands that expect input hang forever | refs: #25299
- **PR #25301** (jacobhammons) bug fix for module function display in help @ 2015-07-09T20:46:34Z
- **PR #25279** (jacobhammons) Additional docs on external and master job cache, assorted doc fixes @ 2015-07-09T16:46:26Z
  - **ISSUE #25277** (jacobhammons) CherryPy recommended versions | refs: #25279
- **PR #25274** (jeroy) Fix for issue #25268 @ 2015-07-09T13:36:26Z
  - **ISSUE #25268** (lichtamberg) Salt not working anymore in 2015.8/develop: ValueError: `scope` is not in list | refs: #25274
- **PR #25272** (twangboy) Fixed problem with service not starting @ 2015-07-08T23:29:48Z
- **PR #25225** (nmadhok) Backporting fix for issue #25223 on 2015.5 branch @ 2015-07-08T15:16:18Z
  - **ISSUE #25223** (lichtamberg) Runner occasionally fails with a RuntimeException when fired by a reactor | refs: #25225
- **PR #25214** (rallytime) A couple of doc fixes for the http tutorial @ 2015-07-07T22:07Z
- **PR #25194** (rallytime) Update moto version check in boto_vpc_test and update min version @ 2015-07-07T22:37:32Z
  - **ISSUE #24272** (rallytime) Fix boto_vpc_test motoversioncheck | refs: #25194
- **PR #25205** (basepi) Update release candidate docs @ 2015-07-07T15:25:24Z
- **PR #25187** (UtahDave) Doc fixes: Fix misspelling and remove extraneous double spaces @ 2015-07-07T01:07:04Z
- **PR #25182** (cachedout) Try to re-pack long floats as strs @ 2015-07-07T01:06:43Z
- **PR #25181** (cachedout) Try to re-pack long floats as strs @ 2015-07-07T01:07:04Z
  - **PR #25180** (cachedout) Fix file client is cached | refs: #25181
- **PR #25179** (rallytime) Back-port #25059 to 2015.5 @ 2015-07-07T00:56:44Z
  - **ISSUE #24301** (iggy) influxdb_user and influxdb_database states need virtual functions | refs: #25059
    - **PR #25059** (babilen) Add virtual functions to influxdb state modules | refs: #25179
- **PR #25196** (twangboy) Fixed #18919 false-positive on pkg.refresh @ 2015-07-07T00:24:13Z
  - **ISSUE #18919** (giner) Windows: pkg.refresh_db returns false-positive success | refs: #25196
- **PR #25180** (rallytime) Back-port #25088 to 2015.5 @ 2015-07-06T20:33:45Z
  - **PR #25088** (supertom) Update win_network.py | refs: #25180
- **PR #25179** (rallytime) Back-port #25059 to 2015.5 @ 2015-07-07T00:56:44Z
  - **ISSUE #24301** (iggy) influxdb_user and influxdb_database states need virtual functions | refs: #25059
    - **PR #25059** (babilen) Add virtual functions to influxdb state modules | refs: #25179
- **PR #25175** (rallytime) Back-port #25020 to 2015.5 @ 2015-07-06T18:53:19Z
  - **ISSUE #25016** (martinhoefling) salt-run doc execution fails with AttributeError
    - **PR #25016** (martinhoefling) salt-run doc execution fails with AttributeError
    - **PR #25020** (martinhoefling) Fix for issue #25016 | refs: #25175
- **PR #25173** (rallytime) Partial back-port of #25019 @ 2015-07-06T18:52:59Z

35.2. Previous Releases
ISSUE #21879: (bechtoldt) Reference pages in documentation are outdated again | refs: #25019

ISSUE #19262: (bechtoldt) salt.pillar.file_tree doesn't appear in the documentation | refs: #25019

PR #25019: (bechtoldt) add missing module documentation to references | refs: #25173

PR #24421: (bechtoldt) add missing module documentation | refs: #25019

PR #21880: (bechtoldt) update references, fixes #21879 | refs: #25019

PR #20039: (bechtoldt) completing some doc references | refs: #25019

• PR #25171: (rallytime) Back-port #25001 to 2015.5 @ 2015-07-06T18:51:53Z

• PR #25001: (jasonkeene) Add docs for key arg in ssh_known_hosts.present | refs: #25171

• PR #25170: (rallytime) Back-port #24982 to 2015.5 @ 2015-07-06T16:34:43Z

• PR #24982: (asyncsrc) ec2_network_interfaces fix | refs: #25170

• PR #25161: (aneeshusa) Allow checking for non-normalized systemd units. @ 2015-07-06T15:15:31Z

• PR #25151: (jleroy) Support for IPv6 addresses scopes in network.interfaces | refs: #25274 #25433 @ 2015-07-06T14:43:03Z

• PR #25166: (cachedout) Lint #25149 @ 2015-07-06T14:40:29Z

• PR #25149: (jacksontj) Saltndomultiprocess support | refs: #25166 @ 2015-07-06T14:38:43Z

• PR #25129: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-07-02T19:37:40Z

• PR #25120: (d--) add missing continue for expection case @ 2015-07-02T19:38:45Z

• PR #25117: (basepi) Fix fileclient.is_cached | refs: #25191 @ 2015-07-02T19:38:26Z

• PR #25087: (0xf10e) Fix execution module for glance - now based on 2015.5! @ 2015-07-02T19:36:27Z

• PR #24798: (jtand) Revert `''Revert ``adding states/postgres_database unit test case.'''' | refs: #25114

• PR #24362: (jayeshka) adding states/postgres_user unit test case. @ 2015-07-01T21:45:31Z

• PR #24361: (jayeshka) adding states/postgres_schema unit test case. @ 2015-07-01T21:44:56Z

• PR #24331: (jayeshka) adding states/postgres_extension unit test case. @ 2015-07-01T21:43:58Z

• PR #26486: (thusoy) Git: Don’t leak https user/pw to log @ 2015-08-20T16:04:52Z

• ISSUE #24979: (mavenAtHouzz) [Discussion] Support for more than 1 netapi.rest_tornado server process | refs: #25149

• ISSUE #18447: (ryan-lane) Can’t install salt with raet using pip -e git

• ISSUE #18447: (ryan-lane) Can’t install salt with raet using pip -e git

• ISSUE #25093: (jaybocc2) quick fix for issue #18447

• ISSUE #25069: (puneetk) Add a helper module function called list_enabled

• ISSUE #26484: (thusoy) Git state leaks HTTPS user/pw to log | refs: #26486

• ISSUE #26482: (thusoy) Git states doesn't allow user-only auth | refs: #26483
- PR #26483: (thusoy) Handle user-only http auth in git module | refs: #26486
- PR #26476: (jacobhammons) Minor doc fixes @ 2015-08-19T22:52:35Z
  - ISSUE #26432: (centromere) Documentation incorrectly references salt-key on the minion | refs: #26476
  - ISSUE #26403: (adelcast) Grains documentation incorrectly states they are static | refs: #26476
  - ISSUE #26329: (cro) Add note to eauth docs indicating default PAM service. | refs: #26476
  - ISSUE #26264: (grep4linux) state trees cannot have `dots' in the name | refs: #26476
  - ISSUE #26233: (dove-young) pip install salt, then start master failed on Fedora 22 | refs: #26476
- PR #26443: (cachedout) Fix connect issue in event init @ 2015-08-19T22:50:22Z
  - ISSUE #26366: (GreatSnoopy) The development tree produces hanging, 100%cpu salt-master processes | refs: #26443
  - ISSUE #26301: (waynew) CPU pegged out running salt-master (after running command) | refs: #26443
  - ISSUE #25998: (driskell) Event subsystem discarding required events during --batch breaking it for slow running commands | refs: #26000
  - PR #26000: (driskell) Implement full event caching for subscribed tags | refs: #26443
- PR #26445: (cachedout) Raise clean error when no minions targeted in batch mode @ 2015-08-19T22:50:07Z
  - ISSUE #26343: (jfindlay) batch error when no minions match target | refs: #26445
- PR #26483: (thusoy) Handle user-only http auth in git module | refs: #26486 @ 2015-08-19T22:47:41Z
  - PR #26496: (jfindlay) add dateutil dependency reporting @ 2015-08-19T22:46:31Z
  - PR #26444: (cachedout) Remove unnecessary debug statements @ 2015-08-19T20:46:00Z
- PR #26465: (rallytime) Back-port #26457 to 2015.5 @ 2015-08-19T16:08:16Z
  - PR #26457: (arthurlogilab) docstring improvement for network.ping module execution | refs: #26465
- PR #26434: (s0undt3ch) Fix missed typo @ 2015-08-18T18:14:29Z
- PR #26430: (rallytime) List public and private ips under the correct label @ 2015-08-18T16:20:32Z
  - ISSUE #26426: (alxbse) Private/public IPs are interchanged when listing nova driver cloud nodes | refs: #26430
- PR #26431: (rallytime) Back-port #26417 to 2015.5 @ 2015-08-18T15:41:58Z
  - PR #26417: (scottipack) Changed t1 -> t2 micro | refs: #26431
- PR #26378: (stanislavb) Fix EC2 credentials from IAM roles for s3fs and s3 ext_pillar in 2015.5 @ 2015-08-18T14:53Z
- PR #26420: (terminalmage) Only use pygit2.errors if it exists (2015.5 branch) @ 2015-08-18T14:00:01Z
  - ISSUE #26245: (bradthurber) salt v2015.5.3 gitfs.py using newer pygit2 feature than required minimum | refs: #26420
- PR #26409: (basepi) [2015.5] Merge forward from 2014.7 to 2015.5 @ 2015-08-17T23:19:56Z
  - PR #26242: (cro) Remove dead code
  - PR #26216: (cro) Fix LDAP configuration issue.
- PR #26406: (jfindlay) fix syntax error in lvm exec module @ 2015-08-17T21:18:25Z
  - ISSUE #26404: (ssgward) Syntax error in lvm.vg_absent state causing failure | refs: #26406

35.2. Previous Releases
• PR #26405: (TheBigBear) dependency zip files moved to new site @ 2015-08-17T21:17:24Z
• PR #26298: (vr-jack) Keep $HOME from being interpreted by Master shell @ 2015-08-17T21:15:11Z
• PR #26324: (stundt3ch) Salt is now pip installable in windows @ 2015-08-17T20:41:34Z
• PR #26371: (bastaanb) fix issue #26161: on RedHat family systems touch /var/lock/subsys/$SE... @ 2015-08-17T20:39:28Z
  - ISSUE #26161: (bastaanb) salt initscripts do not set lock file in /var/lock/subsys as required on RedHat family OSes
• PR #26402: (twangboy) Removed documentation no longer required @ 2015-08-17T20:35:37Z
  - ISSUE #25801: (themalkolm) Update docs that salt.states.winrepo requires roles:salt-master in grains. | refs: #26328
  - ISSUE #25562: (jefftucker) winrepo state does not run on masterless minion | refs: #26328
  - PR #26328: (twangboy) Removed salt-master role requirement | refs: #26402
• PR #26392: (rallytime) Back-port #26376 to 2015.5 @ 2015-08-17T19:39:51Z
  - PR #26376: (TheBigBear) minor edit spelling | refs: #26392
• PR #26342: (rallytime) Don’t call boto_elb._attributes_present if no attributes were provided @ 2015-08-17T19:19:08Z
  - ISSUE #16049: (ryan-lane) boto_elb.present state requires attributes argument | refs: #26342
• PR #26389: (rallytime) Back-port #26160 to 2015.5 @ 2015-08-17T19:09:16Z
  - ISSUE #26155: (silenius) pip availability in states/pip_state | refs: #26160
  - PR #26160: (silenius) proposed fix for #26155 | refs: #26389
• PR #26300: (jfindlay) mock pwd function calls in pw_user exec module @ 2015-08-17T18:56:41Z
  - ISSUE #26266: (o-sleep) limit pw_user.getent() from returning entire corporate list | refs: #26300
• PR #26386: (jahamn) Fixes autosign_timeout usage in check_autosign_dir @ 2015-08-17T18:34:40Z
  - ISSUE #24334: (afletch) autosign_timeout not honoured | refs: #26386
• PR #26328: (twangboy) Removed salt-master role requirement | refs: #26402 @ 2015-08-17T18:30:17Z
  - ISSUE #25801: (themalkolm) Update docs that salt.states.winrepo requires roles:salt-master in grains. | refs: #26328
  - ISSUE #25562: (jefftucker) winrepo state does not run on masterless minion | refs: #26328
• PR #26362: (garethgreenaway) Fixes to mount state. @ 2015-08-17T17:44:55Z
  - ISSUE #26327: (bradthurber) mount.mounted opts incorrect "forced unmount and mount because options (tcp) changed" | refs: #26362
• PR #26379: (stundt3ch) [2015.5] Backport #26353 @ 2015-08-17T17:19:29Z
  - PR #26353: (sixninetynine) fixed a typo in setup.py | refs: #26379
• PR #26277: (rallytime) Handle exception when user is not found in keystone.user_get @ 2015-08-14T19:41:59Z
  - ISSUE #26240: (0xfe10e) keystone.user_get raises exception when user is not found | refs: #26277
• PR #26326: (rallytime) Make ec2.create_snapshot return less unwieldy and more relevant @ 2015-08-14T19:40:47Z
  - ISSUE #24484: (codehotter) clouds/ec2.py: create_snapshot throws exception | refs: #26326
• PR #26306: (rallytime) Move VM creation details dict to log.trace @ 2015-08-14T17:39:52Z
  - ISSUE #16179: (UtahDave) Salt Cloud -l debug includes the entire bootstrap script twice in its output | refs: #26306

35.2.8 Salt 2014.7.0 Release Notes - Codename Helium

This release is the largest Salt release ever, with more features and commits then any previous release of Salt. Everything from the new RAET transport to major updates in Salt Cloud and the merging of Salt API into the main project.

**Important:** The Fedora/RHEL/CentOS salt-master package has been modified for this release. The following components of Salt have been broken out and placed into their own packages:

- salt-syndic
- salt-cloud
- salt-ssh

When the salt-master package is upgraded, these components will be removed, and they will need to be manually installed.

**Important:** Compound/pillar matching have been temporarily disabled for the mine and publish modules for this release due to the possibility of inferring pillar data using pillar glob matching. A proper fix is now in the 2014.7 branch and scheduled for the 2014.7.1 release, and compound matching and non-globbing pillar matching will be re-enabled at that point.

Compound and pillar matching for normal salt commands are unaffected.

**New Transport!**

**RAET Transport Option**

This has been a HUGE amount of work, but the beta release of Salt with RAET is ready to go. RAET is a reliable queuing transport system that has been developed in partnership with a number of large enterprises to give Salt an alternative to ZeroMQ and a way to get Salt to scale well beyond tens of thousands of servers. Unlike ZeroMQ, RAET is completely asynchronous in every aspect of its operation and has been developed using the flow programming paradigm. This allows for many new capabilities to be added to Salt in the upcoming releases.

Please keep in mind that this is a beta release of RAET and we hope for bugs to be worked out, performance to be better realized and more in the 2015.5.0 release.

Simply stated, users running Salt with RAET should expect some hiccups as we hammer out the update. This is a BETA release of Salt RAET.

For information about how to use Salt with RAET please see the [tutorial](#).

**Salt SSH Enhancements**

Salt SSH has just entered a new league, with substantial updates and improvements to make salt-ssh more reliable and easier then ever! From new features like the ansible roster and fileserver backends to the new pypi salt-ssh installer to lowered deps and a swath of bugfixes, salt-ssh is basically reborn!
Install salt-ssh Using pip

Salt-ssh is now pip-installable!
https://pypi.python.org/pypi/salt-ssh/

Pip will bring in all of the required deps, and while some deps are compiled, they all include pure python implementations, meaning that any compile errors which may be seen can be safely ignored.

```bash
pip install salt-ssh
```

Fileserver Backends

Salt-ssh can now use the salt fileserver backend system. This allows for the gitfs, hgfs, s3, and many more ways to centrally store states to be easily used with salt-ssh. This also allows for a distributed team to easily use a centralized source.

Saltfile Support

The new saltfile system makes it easy to have a user specific custom extended configuration.

Ext Pillar

Salt-ssh can now use the external pillar system. Making it easier then ever to use salt-ssh with teams.

No More sshpass

Thanks to the enhancements in the salt vt system, salt-ssh no longer requires sshpass to send passwords to ssh. This also makes the manipulation of ssh calls substantially more flexible, allowing for intercepting ssh calls in a much more fluid way.

Pure Python Shim

The salt-ssh call originally used a shell script to discover what version of python to execute with and determine the state of the ssh code deployment. This shell script has been replaced with a pure python version making it easy to increase the capability of the code deployment without causing platform inconsistency issues with different shell interpreters.

Custom Module Delivery

Custom modules are now seamlessly delivered. This makes the deployment of custom grains, states, execution modules and returners a seamless process.

CP Module Support

Salt-ssh now makes simple file transfers easier then ever! The cp module allows for files to be conveniently sent from the salt fileserver system down to systems.
More Thin Directory Options

Salt ssh functions by copying a subset of the salt code, or salt thin down to the target system. In the past this was always transferred to /tmp/salt and cached there for subsequent commands.

Now, salt thin can be sent to a random directory and removed when the call is complete with the -W option. The new -W option still uses a static location but will clean up that location when finished.

The default salt thin location is now user defined, allowing multiple users to cleanly access the same systems.

State System Enhancements

New Imperative State Keyword `Listen`

The new listen and listen_in keywords allow for completely imperative states by calling the mod_watch() routine after all states have run instead of re-ordering the states.

Mod Aggregate Runtime Manipulator

The new mod_aggregate system allows for the state system to rewrite the state data during execution. This allows for state definitions to be aggregated dynamically at runtime.

The best example is found in the pkg state. If mod_aggregate is turned on, then when the first pkg state is reached, the state system will scan all of the other running states for pkg states and take all other packages set for install and install them all at once in the first pkg state.

These runtime modifications make it easy to run groups of states together. In future versions, we hope to fill out the mod_aggregate system to build in more and more optimizations.

For more documentation on mod_aggregate, see the documentation.

New Requisites: onchanges and onfail

The new onchanges and onchanges_in requisites make a state apply only if there are changes in the required state. This is useful to execute post hooks after changes occur on a system.

The other new requisites, onfail, and onfail_in, allow for a state to run in reaction to the failure of another state.

For more information about these new requisites, see the requisites documentation.

Global onlyif and unless

The onlyif and unless options can now be used for any state declaration.

Use names to expand and override values

The names declaration in Salt's state system can now override or add values to the expanded data structure. For example:
my_users:
  user.present:
    - names:
      - larry
      - curly
      - moe:
        - shell: /bin/zsh
        - groups:
          - wheel
        - shell: /bin/bash

Major Features

Scheduler Additions

The Salt scheduler system has received MAJOR enhancements, allowing for cron-like scheduling and much more granular timing routines. See here for more info.

Red Hat 7 Family Support

All the needed additions have been made to run Salt on RHEL 7 and derived OSes like CentOS and Scientific.

Fileserver Backends in salt-call

Fileserver backends like gitfs can now be used without a salt master! Just add the fileserver backend configuration to the minion config and execute salt-call. This has been a much-requested feature and we are happy to finally bring it to our users.

Amazon Execution Modules

An entire family of execution modules further enhancing Salt’s Amazon Cloud support. They include the following:

- **Autoscale Groups** (includes state support) -- related: Launch Control states
- **Cloud Watch** (includes state support)
- **Elastic Cache** (includes state support)
- **Elastic Load Balancer** (includes state support)
- **IAM Identity and Access Management** (includes state support)
- **Route53 DNS** (includes state support)
- **Security Groups** (includes state support)
- **Simple Queue Service** (includes state support)

LXC Runner Enhancements

BETA The Salt LXC management system has received a number of enhancements which make running an LXC cloud entirely from Salt an easy proposition.
Next Gen Docker Management

The Docker support in Salt has been increased at least ten fold. The Docker API is now completely exposed and Salt ships with Docker data tracking systems which make automating Docker deployments very easy.

Peer System Performance Improvements

The peer system communication routines have been refined to make the peer system substantially faster.

SDB

Encryption at rest for configs

GPG Renderer

Encrypted pillar at rest

OpenStack Expansion

Lots of new OpenStack stuff

Queues System

Ran change external queue systems into Salt events

Multi Master Failover Additions

Connecting to multiple masters is more dynamic then ever

Chef Execution Module

Managing Chef with Salt just got even easier!

salt-api Project Merge

The salt-api project has been merged into Salt core and is now available as part of the regular salt-master package install. No API changes were made, the salt-api script and init scripts remain intact.

salt-api has always provided Yet Another Pluggable Interface to Salt (TM) in the form of `netapi` modules. These are modules that bind to a port and start a service. Like many of Salt's other module types, netapi modules often have library and configuration dependencies. See the documentation for each module for instructions.

See also:

The full list of netapi modules.
Synchronous and Asynchronous Execution of Runner and Wheel Modules

`salt.runner.RunnerClient` and `salt.wheel.WheelClient` have both gained complimentary `cmd_sync` and `cmd_async` methods allowing for synchronous and asynchronous execution of any Runner or Wheel module function, all protected using Salt’s `external authentication` system. `salt-api` benefits from this addition as well.

**rest_cherrypy** Additions

The `rest_cherrypy` netapi module provides the main REST API for Salt.

**Web Hooks**

This release of course includes the Web Hook additions from the most recent `salt-api` release, which allows external services to signal actions within a Salt infrastructure. External services such as Amazon SNS, Travis-CI, or GitHub, as well as internal services that cannot or should not run a Salt minion daemon can be used as first-class components in Salt’s rich orchestration capabilities.

The raw HTTP request body is now available in the event data. This is sometimes required information for checking an HMAC signature in order to verify a HTTP request. As an example, Amazon or GitHub requests are signed this way.

**Generating and Accepting Minion Keys**

The `/key` convenience URL generates a public and private key for a minion, automatically pre-accepts the public key on the Salt Master, and returns both keys as a tarball for download.

This allows for easily bootstrapping the key on a new minion with a single HTTP call, such as with a Kickstart script, all using regular shell tools.

```
curl -sS http://salt-api.example.com:8000/keys \
  -d mid=jerry \
  -d username=kickstart \
  -d password=kickstart \
  -d eauth=pam \
  -o jerry-salt-keys.tar
```

**Fileserver Backend Enhancements**

All of the fileserver backends have been overhauled to be faster, lighter, and more reliable. The VCS backends (`gitfs`, `hgfs`, and `svnfs`) have also received a lot of new features.

Additionally, most config parameters for the VCS backends can now be configured on a per-remote basis, allowing for global config parameters to be overridden for a specific `gitfs/hgfs/svnfs` remote.

**New `gitfs` Features**

**Pygit2 and Dulwich**

In addition to supporting GitPython, support for `pygit2` (0.20.3 and newer) and `dulwich` have been added. Provided a compatible version of `pygit2` is installed, it will now be the default provider. The config parameter `gitfs_provider` has been added to allow one to choose a specific provider for `gitfs`.

**Mountpoints**

Prior to this release, to serve a file from `gitfs` at a salt fileserver URL of `salt://foo/bar/baz.txt`, it was necessary to ensure that the parent directories existed in the repository. A new config parameter `gitfs_mountpoint` allows `gitfs` remotes to be exposed starting at a user-defined `salt://` URL.
Environment Whitelisting/Blacklisting  By default, gitfs will expose all branches and tags as Salt fileserver environments. Two new config parameters, `gitfs_env_whitelist` and `gitfs_env_blacklist`, allow more control over which branches and tags are exposed. More detailed information on how these two options work can be found in the *Gitfs Walkthrough*.

Expanded Authentication Support  As of pygit2 0.20.3, both http(s) and SSH key authentication are supported, and Salt now also supports both authentication methods when using pygit2. Keep in mind that pygit2 0.20.3 is not yet available on many platforms, so those who had been using authenticated git repositories with a passphraseless key should stick to GitPython if a new enough pygit2 is not yet available for the platform on which the master is running. A full explanation of how to use authentication can be found in the *Gitfs Walkthrough*.

New **hgfs** Features

**Mountpoints**  This feature works exactly like its *gitfs counterpart*. The new config parameter is called `hgfs_mountpoint`.

**Environment Whitelisting/Blacklisting**  This feature works exactly like its *gitfs counterpart*. The new config parameters are called `hgfs_env_whitelist` and `hgfs_env_blacklist`.

New **svnfs** Features

**Mountpoints**  This feature works exactly like its *gitfs counterpart*. The new config parameter is called `svnfs_mountpoint`.

**Environment Whitelisting/Blacklisting**  This feature works exactly like its *gitfs counterpart*. The new config parameters are called `svnfs_env_whitelist` and `svnfs_env_blacklist`.

**Configurable Trunk/Branches/Tags Paths**  Prior to this release, the paths where trunk, branches, and tags were located could only be in directories named ```trunk```, ```branches```, and ```tags``` directly under the root of the repository. Three new config parameters (`svnfs_trunk`, `svnfs_branches`, and `svnfs_tags`) allow SVN repositories which are laid out differently to be used with svnfs.

New **minionfs** Features

**Mountpoint**  This feature works exactly like its *gitfs counterpart*. The new config parameter is called `minionfs_mountpoint`. The one major difference is that, as minionfs doesn’t use multiple remotes (it just serves up files pushed to the master using `cp.push`) there is no such thing as a per-remote configuration for `minionfs_mountpoint`.

**Changing the Saltenv from Which Files are Served**  A new config parameter (`minionfs_env`) allows minionfs files to be served from a Salt fileserver environment other than `base`.

**Minion Whitelisting/Blacklisting**  By default, minionfs will expose the pushed files from all minions. Two new config parameters, `minionfs_whitelist`, and `minionfs_blacklist`, allow minionfs to be restricted to serve files from only the desired minions.
Pyobjects Renderer

Salt now ships with the Pyobjects Renderer that allows for construction of States using pure Python with an idiomatic object interface.

New Modules

In addition to the Amazon modules mentioned above, there are also several other new execution modules:

- Oracle
- Random
- Redis
- Amazon Simple Queue Service
- Block Device Management
- CoreOS etcd
- Genesis
- InfluxDB
- Server Density
- Twilio Notifications
- Varnish
- ZNC IRC Bouncer
- SMTP

New Runners

- Map/Reduce Style
- Queue

New External Pillars

- CoreOS etcd

New Salt-Cloud Providers

- Aliyun ECS Cloud
- LXC Containers
- Proxmox (OpenVZ containers & KVM)

Salt Call Change

When used with a returner, salt-call now contacts a master if --local is not specified.
Deprecations

salt.modules.virtualenv_mod

- Removed deprecated memoize function from salt/utils/__init__.py (deprecated)
- Removed deprecated no_site_packages argument from create function (deprecated)
- Removed deprecated check_dns argument from minion_config and apply_minion_config functions (deprecated)
- Removed deprecated OutputOptionsWithTextMixIn class from salt/utils/parsers.py (deprecated)
- Removed the following deprecated functions from salt/modules/ps.py: - physical_memory_usage (deprecated) - virtual_memory_usage (deprecated) - cached_physical_memory (deprecated) - physical_memory_buffers (deprecated)
- Removed deprecated cloud arguments from cloud_config function in salt/config.py: - vm_config (deprecated) - vm_config_path (deprecated)
- Removed deprecated libcloud_version function from salt/cloud/libcloudfuncs.py (deprecated)
- Removed deprecated CloudConfigMixIn class from salt/utils/parsers.py (deprecated)

35.2.9 Salt 2014.7.1 Release Notes

release 2015-01-12

Version 2014.7.1 is a bugfix release for 2014.7.0. The changes include:

- Fixed gifs serving symlinks in file.recurse states (issue 17700)
- Fixed holding of multiple packages (YUM) when combined with version pinning (issue 18468)
- Fixed use of Jinja templates in masterless mode with non-roots fileserver backend (issue 17963)
- Re-enabled pillar and compound matching for mine and publish calls. Note that pillar globbing is still disabled for those modes, for security reasons. (issue 17194)
- Fix for tty: True in salt-ssh (issue 16847)
- Fix for supervisor states when supervisor not installed to system python (issue 18044)
- Fix for logging when log_level='quiet' for cmd.run (issue 19479)

35.2.10 Salt 2014.7.2 Release Notes

release 2015-02-09

Version 2014.7.2 is a bugfix release for 2014.7.0. The changes include:

- Fix erroneous warnings for systemd service enabled check (issue 19606)
- Fix FreeBSD kernel module loading, listing, and persistence kmod (issue 197151, issue 19682)
- Allow case-sensitive npm package names in the npm state. This may break behavior for people expecting the state to lowercase their npm package names for them. The npm module was never affected by mandatory lowercasing. (issue 20329)
• Deprecate the activate parameter for pip.install for both the module and the state. If bin_env is given and points to a virtualenv, there is no need to activate that virtualenv in a shell for pip to install to the virtualenv.

• Fix a file-locking bug in gifs (issue 18839)

• Deprecated archive_user in favor of standardized user parameter in state and added group parameter.

35.2.11 Salt 2014.7.3 Release Notes

release  TBA
Version 2014.7.3 is a bugfix release for 2014.7.0.

Changes:
• Multi-master minions mode no longer route fileclient operations asymetrically. This fixes the source of many multi-master bugs where the minion would become unresponsive from one or more masters.

• Fix bug wherein network.iface could produce stack traces.

• net.arp will no longer be made available unless arp is installed on the system.

• Major performance improvements to SaltNado

• Allow KVM module to operate under KVM itself or VMWare Fusion

• Various fixes to the Windows installation scripts

• Fix issue where the syndic would not correctly propagate loads to the master job cache.

• Improve error handling on invalid /etc/network/interfaces file in salt networking modules

• Fix bug where a reponse status was not checked for in fileclient.get_url

• Enable eauth when running salt in batch mode

• Increase timeout in Boto Route53 module

• Fix bugs with Salt's `tar` module option parsing

• Fix parsing of NTP servers on Windows

• Fix issue with blockdev tuning not reporting changes correctly

• Update to the latest Salt bootstrap script

• Update Linode salt-cloud driver to use either linode-python or apache-libcloud

• Fix for s3.query function to return correct headers

• Fix for s3.head returning None for files that exist

• Fix the disable function in win_service module so that the service is disabled correctly

• Fix race condition between master and minion when making a directory when both daemons are on the same host

• Fix an issue where file.recurse would fail at the root of an svn repo when the repo has a mountpoint

• Fix an issue where file.recurse would fail at the root of an hgfs repo when the repo has a mountpoint

• Fix an issue where file.recurse would fail at the root of an gifs repo when the repo has a mountpoint

• Add status.master capability for Windows.

• Various fixes to ssh_known_hosts
- Various fixes to states.network bonding for Debian
- The debian_ip.get_interfaces module no longer removes nameservers.
- Better integration between grains.virtual and systemd-detect-virt and virt-what
- Fix traceback in sysctl.present state output
- Fix for issue where mount.mounted would fail when superopts were not a part of mount.active (extended=True). Also mount.mounted various fixes for Solaris and FreeBSD.
- Fix error where datetimes were not correctly safeguarded before being passed into msgpack.
- Fix file.replace regressions. If the pattern is not found, and if dry run is False, and if backup is False, and if a pre-existing file exists with extension .bak, then that backup file will be overwritten. This backup behavior is a result of how fileinput works. Fixing it requires either passing through the file twice (the first time only to search for content and set a flag), or rewriting file.replace so it doesn’t use fileinput
- VCS files server fixes/optimizations
- Catch fileserver configuration errors on master start
- Raise errors on invalid gitfs configurations
- set locale when locale file does not exist (Redhat family)
- Fix to correctly count active devices when created mdadm array with spares
- Fix to correctly target minions in batch mode
- Support ssh:// urls using the gitfs dul which backend
- New fileserver runner
- Fix various bugs with argument parsing to the publish module.
- Fix disk.usage for Synology OS
- Fix issue with tags occurring twice with docker.pulled
- Fix incorrect key error in SMTP returner
- Fix condition which would remount loopback filesystems on every state run
- Remove requisites from listen after they are called in the state system
- Make system implementation of service.running aware of legacy service calls
- Fix issue where publish.publish would not handle duplicate responses gracefully.
- Accept Kali Linux for aptpkg salt execution module
- Fix bug where cmd.which could not handle a dirname as an argument
- Fix issue in ps.pgrep where exceptions were thrown on Windows.

Known issues:

- In multimaster mode, a minion may become temporarily unresponsive if modules or pillars are refreshed at the same time that one or more masters are down. This can be worked around by setting ‘auth_timeout’ and ‘auth_tries’ down to shorter periods.

35.2.12 Salt 2014.7.4 Release Notes

release 2015-03-30
Version 2014.7.4 is a bugfix release for 2014.7.0.

This is a security release. The security issues fixed have only been present since 2014.7.0, and only users of the two listed modules are vulnerable. The following CVEs have been resolved:

- CVE-2015-1838 SaltStack: insecure /tmp file handling in salt/modules/serverdensity_device.py
- CVE-2015-1839 SaltStack: insecure /tmp file handling in salt/modules/chef.py

Changes:

- Multi-master minions mode no longer route file client operations asymmetrically. This fixes the source of many multi-master bugs where the minion would become unresponsive from one or more masters.
- Fix bug wherein network.iface could produce stack traces.
- net.arp will no longer be made available unless arp is installed on the system.
- Major performance improvements to SaltNado
- Allow KVM module to operate under KVM itself or VMWare Fusion
- Various fixes to the Windows installation scripts
- Fix issue where the syndic would not correctly propagate loads to the master job cache.
- Improve error handling on invalid /etc/network/interfaces file in salt networking modules
- Fix bug where a reponse status was not checked for in fileclient.get_url
- Enable eauth when running salt in batch mode
- Increase timeout in Boto Route53 module
- Fix bugs with Salt’s `tar` module option parsing
- Fix parsing of NTP servers on Windows
- Fix issue with blockdev tuning not reporting changes correctly
- Update to the latest Salt bootstrap script
- Update Linode salt-cloud driver to use either linode-python or apache-libcloud
- Fix for s3.query function to return correct headers
- Fix for s3.head returning None for files that exist
- Fix the disable function in win_service module so that the service is disabled correctly
- Fix race condition between master and minion when making a directory when both daemons are on the same host
- Fix an issue where file.recurse would fail at the root of an svn repo when the repo has a mountpoint
- Fix an issue where file.recurse would fail at the root of an hgfs repo when the repo has a mountpoint
- Fix an issue where file.recurse would fail at the root of an gitfs repo when the repo has a mountpoint
- Add status.master capability for Windows.
- Various fixes to ssh_known_hosts
- Various fixes to states.network bonding for Debian
- The debian_ip.get_interfaces module no longer removes nameservers.
- Better integration between grains.virtual and systemd-detect-virt and virt-what
- Fix traceback in sysctl.present state output
• Fix for issue where mount.mounted would fail when superopts were not a part of mount.active (extended=True). Also mount.mounted various fixes for Solaris and FreeBSD.

• Fix error where datetimes were not correctly safeguarded before being passed into msgpack.

• Fix file.replace regressions. If the pattern is not found, and if dry run is False, and if backup is False, and if a pre-existing file exists with extension .bak, then that backup file will be overwritten. This backup behavior is a result of how fileinput works. Fixing it requires either passing through the file twice (the first time only to search for content and set a flag), or rewriting file.replace so it doesn’t use fileinput

• VCS filereserver fixes/optimizations

• Catch fileserver configuration errors on master start

• Raise errors on invalid gitfs configurations

• set_locale when locale file does not exist (Redhat family)

• Fix to correctly count active devices when created mdadm array with spares

• Fix to correctly target minions in batch mode

• Support ssh:// urls using the gitfs dul which backend

• New fileserver runner

• Fix various bugs with argument parsing to the publish module.

• Fix disk.usage for Synology OS

• Fix issue with tags occurring twice with docker.pulled

• Fix incorrect key error in SMTP returner

• Fix condition which would remount loopback filesystems on every state run

• Remove requisites from listens after they are called in the state system

• Make system implementation of service.running aware of legacy service calls

• Fix issue where publish.publish would not handle duplicate responses gracefully.

• Accept Kali Linux for aptpkg salt execution module

• Fix bug where cmd.which could not handle a dirname as an argument

• Fix issue in ps.pgrep where exceptions were thrown on Windows.

Known issues:

• In multimaster mode, a minion may become temporarily unresponsive if modules or pillars are refreshed at the same time that one or more masters are down. This can be worked around by setting `auth_timeout' and `auth_tries' down to shorter periods.

• There are known issues with batch mode operating on the incorrect number of minions. This bug can be patched with the change in Pull Request #22464.

• The fun, state, and unless keywords are missing from the state internals, which can cause problems running some states. This bug can be patched with the change in Pull Request #22365.

35.2.13 Salt 2014.7.5 Release Notes

release 2015-04-16

Version 2014.7.5 is a bugfix release for 2014.7.0.

Changes:
• Fixed a key error bug in salt-cloud
• Updated man pages to better match documentation
• Fixed bug concerning high CPU usage with salt-ssh
• Fixed bugs with remounting cvfs and fuse filesystems
• Fixed bug with allowing requisite tracking of entire sls files
• Fixed bug with aptpkg.mod_repo returning OK even if apt-add-repository fails
• Increased frequency of ssh terminal output checking
• Fixed malformed locale string in localmod module
• Fixed checking of available version of package when accept_keywords were changed
• Fixed bug to make git.latest work with empty repositories
• Added **kwargs to service.mod_watch which removes warnings about enable and __reqs__ not being supported by the function
• Improved state comments to not grow so quickly on failed requisites
• Added force argument to service to trigger force_reload
• Fixed bug to andle pkgrepo keyids that have been converted to int
• Fixed module.portage_config bug with appending accept_keywords
• Fixed bug to correctly report disk usage on windows minion
• Added the ability to specify key prefix for S3 ext_pillar
• Fixed issues with batch mode operating on the incorrect number of minions
• Fixed a bug with the proxmox cloud provider stacktracing on disk definition
• Fixed a bug with the changes dictionary in the file state
• Fixed the TCP keep alive settings to work better with SREQ caching
• Fixed many bugs within the iptables state and module
• Fixed bug with states by adding fun, state, and unless to the state runtime internal keywords listing
• Added ability to eAuth against Active Directory
• Fixed some salt-ssh issues when running on Fedora 21
• Fixed grains.get_or_set_hash to work with multiple entries under same key
• Added better explanations and more examples of how the Reactor calls functions to docs
• Fixed bug to not pass ex_config_drive to libcloud unless it's explicitly enabled
• Fixed bug with pip.install on windows
• Fixed bug where puppet.run always returns a 0 retcode
• Fixed race condition bug with minion scheduling via pillar
• Made efficiency improvements and bug fixes to the windows installer
• Updated environment variables to fix bug with pygit2 when running salt as non-root user
• Fixed cas behavior on data module -- data.cas was not saving changes
• Fixed GPG rendering error
• Fixed strace error in virt.query
• Fixed stacktrace when running chef-solo command
• Fixed possible bug wherein uncaught exceptions seem to make zmq3 tip over when threading is involved
• Fixed argument passing to the reactor
• Fixed glibc caching to prevent bug where salt-minion getaddrinfo in dns_check() never got updated nameservers

Known issues:
• In multimaster mode, a minion may become temporarily unresponsive if modules or pillars are refreshed at the same time that one or more masters are down. This can be worked around by setting `auth_timeout' and `auth_tries' down to shorter periods.

35.2.14 Salt 2014.7.6 Release Notes

release 2015-05-18

Version 2014.7.6 is a bugfix release for 2014.7.0.

This release is a security release. A minor issue was found, as cited below:
• CVE-2015-4017 -- Certificates are not verified when connecting to server in the Aliyun and Proxmox modules

Only users of the Aliyun or Proxmox cloud modules are at risk. The vulnerability does not exist in the latest 2015.5.0 release of Salt.

Changes:
• salt.runners.cloud.action() has changed the fun keyword argument to func. Please update any calls to this function in the cloud runner.

Extended Changelog Courtesy of Todd Stansell (https://github.com/tjstansell/salt-changelogs):
• PR #23810: (rallytime) Backport #23757 to 2014.7 @ 2015-05-18T15:30:21Z
  -- PR #23757: (clan) use abspath, do not eliminating symlinks | refs: #23810
  -- aee00c8 Merge pull request #23810 from rallytime/bp-23757
  -- fb32c32 use abspath, do not eliminating symlinks
• PR #23809: (rallytime) Fix virtualport section of virt.get_nics loop @ 2015-05-18T15:30:09Z
  -- ISSUE #20198: (jeftang) virt.get_graphics, virt.get_nics are broken, in turn breaking other things | refs: #23809
  -- PR #21487: (rallytime) Backport #21469 to 2014.7 | refs: #23809
  -- PR #21469: (vdesjardins) fixes #20198: virt.get_graphics and virt.get_nics calls in module virt | refs: #21487
  -- 6b3352b Merge pull request #23809 from rallytime/virt_get_nics_fix
  -- 0616fb7 Fix virtualport section of virt.get_nics loop
• PR #23823: (gtmanfred) add link local for ipv6 @ 2015-05-17T12:48:25Z
  -- 188f03f Merge pull request #23823 from gtmanfred/2014.7
  -- 5ef006d add link local for ipv6
• PR #23802: (gtmanfred) if it is ipv6 ip_to_int will fail @ 2015-05-16T04:06:59Z

35.2. Previous Releases
- PR #23573: (techhat) Scan all available networks for public and private IPs | refs: #23802
- f3ca682 Merge pull request #23802 from gtmanfred/2014.7
- 2da98b5 if it is ipv6 ip_to_int will fail

- PR #23488: (cellscape) LXC cloud fixes @ 2015-05-15T18:09:35Z
  - ISSUE #16424: (stanvit) salt-run cloud.create fails with saltify
  - d9a0c3 Merge pull request #23488 from cellscape/lxc-cloud-fixes
  - 64250a6 Remove profile from opts after creating LXC container
  - c4047d2 Set destroy=True in opts when destroying cloud instance
  - 9e1311a Store instance names in opts when performing cloud action
  - 934bc57 Correctly pass custom env to lxc-attach
  - 7fb85f7 Preserve test=True option in cloud states
  - 9771b5a Fix detection of absent LXC container in cloud state
  - fb24f0c Report failure when failed to create/clone LXC container
  - 2d9aa2b Avoid shadowing variables in lxc module
  - 792e102 Allow to override profile options in lxc.cloud_init_interface
  - 42bd64b Return changes on successful lxc.create from salt-cloud
  - 4409eab Return correct result when creating cloud LXC container
  - 377015c Issue #16424: List all providers when creating salt-cloud instance without profile

- PR #23748: (basepi) [2014.7] Log salt-ssh roster render errors more assertively and verbosely @ 2015-05-14T21:19:09:38:10Z
  - ISSUE #22332: (rallytime) [salt-ssh] Add a check for host in /etc/salt/roster | refs: #23748
  - 808bbe1 Merge pull request #23748 from basepi/salt-ssh.roster.host.check
  - bc53e04 Log entire exception for render errors in roster
  - 753de6a Log render errors in roster to error level
  - e01a7a9 Always let the real YAML error through

- PR #23731: (twangboy) Fixes #22959: Trying to add a directory to an unmapped drive in windows @ 2015-05-14T21:59:14Z
  - ISSUE #22959: (highlyunavailable) Windows Salt hangs if file.directory is trying to write to a drive that doesn't exist
  - 72cf360 Merge pull request #23731 from twangboy/fix_22959
  - 88e5495 Fixes #22959: Trying to add a directory to an unmapped drive in windows

- PR #23730: (rallytime) Backport #23729 to 2014.7 @ 2015-05-14T21:58:34Z
  - PR #23729: (rallytime) Partially merge #23437 (grains fix) | refs: #23730
  - PR #23437: (cedwards) Grains item patch | refs: #23729
  - 2610195 Merge pull request #23730 from rallytime/bp-23729
  - 1877cae adding support for nested grains to grains.item
• PR #23688: (twangboy) Added inet_pton to utils/validate/net.py for ip.set_static_ip in windows @ 2015-05-14T16:15:56Z
  - 3e9df88 Merge pull request #23688 from twangboy/fix_23415
  - 6a91169 Fixed unused-import pylint error
  - 5e25b3f fixed pylint errors
  - 1a96766 Added inet_pton to utils/validate/net.py for ip.set_static_ip in windows
• PR #23680: (cachedout) Rename kwarg in cloud runner @ 2015-05-13T19:44:02Z
  - ISSUE #23403: (iamfil) salt.runners.cloud.action fun parameter is replaced | refs: #23680
  - 1b86460 Merge pull request #23680 from cachedout/issue_23403
  - d5986c2 Rename kwarg in cloud runner
• PR #23674: (cachedout) Handle lists correctly in grains.list_present @ 2015-05-13T18:34:58Z
  - ISSUE #23548: (kkaig) grains.list_present produces incorrect (?) output | refs: #23674
  - cd64af0 Merge pull request #23674 from cachedout/issue_23548
  - da8a2f5 Handle lists correctly in grains.list_present
• PR #23672: (twangboy) Fix user present @ 2015-05-13T18:30:09Z
  - d322a19 Merge pull request #23672 from twangboy/fix_user_present
  - 731e7af Merge branch ’2014.7’ of https://github.com/saltstack/salt into fix_user_present
  - d6f70a4 Fixed user.present to create password in windows
• PR #23670: (rallytime) Backport #23607 to 2014.7 @ 2015-05-13T18:27:17Z
  - ISSUE #23604: (Azidburn) service.dead on systemd Minion create an Error Message | refs: #23670
  - PR #23607: (Azidburn) Fix for #23604. No error reporting. Exitcode !=0 are ok | refs: #23670
  - 43f7025 Merge pull request #23670 from rallytime/bp-23607
  - ed30dc4 Fix for #23604. No error reporting. Exitcode !=0 are ok
• PR #23661: (rallytime) Merge #23640 with whitespace fix @ 2015-05-13T15:47:30Z
  - ISSUE #22141: (Deshke) grains.get_or_set_hash render error if hash begins with ‘```’ | refs: #23640
  - PR #23640: (cachedout) Add warning to get_or_set_hash about reserved chars | refs: #23661
  - 0f006ac Merge pull request #23661 from rallytime/merge-23640
  - 4427f42 Whitespace fix
  - dd91154 Add warning to get_or_set_hash about reserved chars
• PR #23639: (cachedout) Handle exceptions raised by __virtual__ @ 2015-05-13T15:11:12Z
  - ISSUE #23452: (michaelforge) minion crashed with empty grain | refs: #23639
  - 84e2ef8 Merge pull request #23639 from cachedout/issue_23452
  - d418b49 Syntax error!
  - 45b4015 Handle exceptions raised by __virtual__
• PR #23637: (cachedout) Convert str master to list @ 2015-05-13T15:08:19Z
  - ISSUE #23611: (hubez) master_type set to 'failover' but 'master' is not of type list but of type <type `str'> | refs: #23637

35.2. Previous Releases
- bd9b94b Merge pull request #23637 from cachedout/issue_23611
- 56cb1f5 Fix typo
- 6fcff19 Convert str master to list

• PR #23595: (rallytime) Backport #23549 to 2014.7 @ 2015-05-12T21:19:40Z
  - PR #23549: (vr-jack) Update __init__.py | refs: #23595
  - f20c0e4 Merge pull request #23595 from rallytime/bp-23549
  - 6efcac0 Update __init__.py

• PR #23594: (rallytime) Backport #23496 to 2014.7 @ 2015-05-12T21:19:34Z
  - ISSUE #23110: (martinhoefling) Copying files from gifs in file.recurse state fails
  - PR #23496: (martinhoefling) Fix for issue #23110 | refs: #23594
  - 1acaf86 Merge pull request #23594 from rallytime/bp-23496
  - d5ae1d2 Fix for issue #23110 This resolves issues when the freshly created directory is removed by file-server.update.

• PR #23593: (rallytime) Backport #23442 to 2014.7 @ 2015-05-12T21:19:26Z
  - PR #23442: (clan) add directory itself to keep list | refs: #23593
  - 2c221c7 Merge pull request #23593 from rallytime/bp-23442
  - 304cc49 another fix for file defined w/ id, but require name
  - 8814d41 add directory itself to keep list

• PR #23606: (twangboy) Fixed checkbox for starting service and actually starting it @ 2015-05-12T21:18:50Z
  - fadd1ef Merge pull request #23606 from twangboy/fix_installer
  - 038331e Fixed checkbox for starting service and actually starting it

• PR #23592: (rallytime) Backport #23389 to 2014.7 @ 2015-05-12T16:44:42Z
  - ISSUE #22908: (karanjad) Add failhard option to salt orchestration | refs: #23389
  - PR #23389: (cachedout) Correct fail_hard typo | refs: #23592
  - 10b3f0f Merge pull request #23592 from rallytime/bp-23389
  - 734cc43 Correct fail_hard typo

• PR #23573: (techhat) Scan all available networks for public and private IPs | refs: #23802 @ 2015-05-12T15:22:22Z
  - cd34b9b Merge pull request #23573 from techhat/novaquery
  - f92db5e Linting
  - 26e00d3 Scan all available networks for public and private IPs

• PR #23558: (jfindlay) reorder emerge command line @ 2015-05-12T15:17:46Z
  - ISSUE #23479: (danielmorlock) Typo in pkg.removed for Gentoo? | refs: #23558
  - 2a72c07 Merge pull request #23558 from jfindlay/fixed_ebuild
  - 45404f4 reorder emerge command line

• PR #23530: (dr4Ke) salt-ssh state: fix including all salt:// references @ 2015-05-12T15:13:43Z
- **ISSUE #23355**: (dr4Ke) salt-ssh: `sources: salt://` files from `pkg` state are not included in salt_state.tgz | refs: #23530
  - a664a3c Merge pull request #23530 from dr4Ke/fix_salt-ssh_to_include_pkg_sources
  - 5d6a80 fix pylint warning
  - d0549e5 salt-ssh state: fix including all salt:// references

- **PR #23433**: (twangboy) Obtain all software from the registry @ 2015-05-11T22:47:52Z
  - **ISSUE #23004**: (b18) 2014.7.5 - Windows - pkg.list_pkgs - ```nxlog``` never shows up in output. | refs: #23433
  - 55c3869 Merge pull request #23433 from twangboy/list_pkgs-fix
  - 8ab5b1b Fix pylint error
  - 2d11d65 Obtain all software from the registry

- **PR #23554**: (jleroy) Debian: Hostname always updated @ 2015-05-11T21:57:00Z
  - 755bed0 Merge pull request #23554 from jleroy/debian-hostname-fix
  - 5ff749e Debian: Hostname always updated

- **PR #23551**: (dr4Ke) grains.append unit tests, related to #23474 @ 2015-05-11T21:54:25Z
  - 6ec87ce Merge pull request #23551 from dr4Ke/grains.append_unit_tests
  - ebf9df fix pylint errors
  - c495404 unit tests for grains.append module function
  - 0c9a323 use MagickMock
  - c838a22 unit tests for grains.append module function

- **PR #23474**: (dr4Ke) Fix grains.append in nested dictionary grains #23411 @ 2015-05-11T18:00:21Z
  - **ISSUE #23411**: (dr4Ke) grains.append should work at any level of a grain | refs: #23440
  - **PR #23440**: (dr4Ke) fix grains.append in nested dictionary grains #23411 | refs: #23474
  - e96c5c5 Merge pull request #23474 from dr4Ke/fix_grains.append_nested
  - a01a5bb grains.get, parameter delimititer, versionadded: 2014.7.6
  - b39f504 remove debugging output
  - b6e15e2 fix grains.append in nested dictionary grains #23411

- **PR #23537**: (t0rrant) Update changelog @ 2015-05-11T17:02:16Z
  - ab7e1ae Merge pull request #23537 from t0rrant/patch-1
  - 8e03c9 Update changelog

- **PR #23538**: (cro) Update date in LICENSE file @ 2015-05-11T15:19:25Z
  - b79fed3 Merge pull request #23538 from cro/licupdate
  - 345efe2 Update date in LICENSE file

- **PR #23505**: (aneeshusa) Remove unused ssh config validator. Fixes #23159. @ 2015-05-09T13:24:15Z
  - **ISSUE #23159**: (aneeshusa) Unused validator
  - a123a36 Merge pull request #23505 from aneeshusa/remove-unused-ssh-config-validator
  - 90a167 Remove unused ssh config validator. Fixes #23159.
• PR #23467: (*slinu3d*) Added AWS v4 signature support @ 2015-05-08T14:36:19Z
  – ISSUE #20518: (*ekle*) module s3.get does not support eu-central-1 | refs: #23467
  – ca2c21a Merge pull request #23467 from slinu3d/2014.7
  – 0b4081d Fixed pylint error at line 363
  – 5be5eb5 Fixed pylint errors
  – e643f74 Fixed lint errors
  – b9d1a4c Added AWS v4 signature support

• PR #23444: (*techhat*) Add create_attach_volume to nova driver @ 2015-05-07T19:51:32Z
  – e6f9ee5 Merge pull request #23444 from techhat/novacreateattach

• PR #23460: (*s0undt3ch*) [2014.7] Update to latest stable bootstrap script v2015.05.07 @ 2015-05-07T19:10:54Z
  – ISSUE #563: (*chutz*) pidfile support for minion and master daemons | refs: #23460
  – e331a6b Merge pull request #23460 from s0undt3ch/hotfix/bootstrap-script-2014.7
  – c390737 Update to latest stable bootstrap script v2015.05.07

• PR #23439: (*techhat*) Add wait_for_passwd_maxtries variable @ 2015-05-07T07:28:56Z
  – 7a8ce1a Merge pull request #23439 from techhat/maxtries
  – 0ad3ff2 Add wait_for_passwd_maxtries variable

• PR #23422: (*cro*) $HOME should not be used, some shells don’t set it. @ 2015-05-06T21:02:36Z
  – 644eb75 Merge pull request #23422 from cro/gce_sh_home
  – 4e9e6b Don’t use $HOME to find user’s directory, some shells don’t set it

• PR #23425: (*basepi*) [2014.7] Fix typo in FunctionWrapper @ 2015-05-06T20:38:03Z
  – ef17ab4 Merge pull request #23425 from basepi/functionwrapper_typo
  – c390737 Fix typo in FunctionWrapper

• PR #23385: (*rallytime*) Backport #23346 to 2014.7 @ 2015-05-06T20:12:29Z
  – PR #23346: (*ericfode*) Allow file_map in salt-cloud to handle folders. | refs: #23385
  – 1b1e300 Merge pull request #23385 from rallytime/bp-23346
  – 9efc13c more linting fixes
  – c01319c cleaned up some pylint errors
  – f981699 added logic to sftp_file and file_map to allow folder uploads using file_map

• PR #23414: (*jfindlay*) 2015.2 -> 2015.5 @ 2015-05-06T20:04:02Z
  – f8c7a62 Merge pull request #23414 from jfindlay/update_branch
  – 8074d16 2015.2 -> 2015.5

• PR #23404: (*hvnsweeting*) saltapi cherrypy: initialize var when POST body is empty @ 2015-05-06T17:35:56Z
  – 54b3bd4 Merge pull request #23404 from hvnsweeting/cherrypy-post-emptybody-fix
  – f85f8f9 initialize var when POST body is empty

• PR #23409: (*terminalmage*) Update Lithium docstrings in 2014.7 branch @ 2015-05-06T16:20:46Z
- 160f703 Merge pull request #23409 from terminalmage/update-lithium-docstrings-2014.7
- bc97d01 Fix sphinx typo
- 20006b0 Update Lithium docstrings in 2014.7 branch

- **PR #23397:** (jfindlay) add more flexible whitespace to locale_gen search @ 2015-05-06T03:44:11Z
  - ISSUE #17245: (tomashavlas) localemod does not generate locale for Arch | refs: #23307 #23397
  - aa5fb0a Merge pull request #23397 from jfindlay/fix_locale_gen
  - 0941fe6 add more flexible whitespace to locale_gen search

- **PR #23368:** (kaithar) Backport #23367 to 2014.7 @ 2015-05-05T21:42:26Z
  - **PR #23367:** (kaithar) Put the sed insert statement back in to the output. | refs: #23368
  - **PR #18368:** (basepi) Merge forward from 2014.7 to develop | refs: #23367 #23368
  - 0c76dd4 Merge pull request #23368 from kaithar/bp-23367
  - 577f419 Pylint fix
  - 8d9acd1 Put the sed insert statement back in to the output.

- **PR #23350:** (lorenjordon) Append/prepend: search for full line @ 2015-05-05T21:42:11Z
  - ISSUE #23294: (variia) file.replace fails to append if repl string partially available | refs: #23350
  - 3493ec1 Merge pull request #23350 from lorenjordon/file.replace_assume_line
  - b60e224 Append/prepend: search for full line

- **PR #23341:** (cachedout) Fix syndic pid and logfile path @ 2015-05-05T21:29:10Z
  - ISSUE #23026: (adelcast) Incorrect salt-syndic logfile and pidfile locations | refs: #23341
  - 7be5c48 Merge pull request #23341 from cachedout/issue_23026
  - e98e65e Fix tests
  - 601b43 Fix syndic pid and logfile path

- **PR #23272:** (basepi) [2014.7] Allow salt-ssh minion config overrides via master config and roster | refs: #23347 @ **
  - ISSUE #19114: (pykler) salt-ssh and gpg pillar renderer | refs: #23188 #23272 #23347
  - **PR #23188:** (basepi) [2014.7] Work around bug in salt-ssh in config.get for gpg renderer | refs: #23272
  - ea61abf Merge pull request #23272 from basepi/salt-ssh.minion.config.19114
  - c223309 Add versionadded
  - be7407f Lint
  - c2c3375 Missing comma
  - 8e3e8e0 Pass the minion_opts through the FunctionWrapper
  - cb69cd0 Match the master config template in the master config reference
  - 87fc316 Add Salt-SSH section to master config template
  - 91dd9dc Add ssh_minion_opts to master config ref
  - c273ea1 Add minion config to salt-ssh doc
  - a0b6b76 Add minion_opts to roster docs
- 5212c35 Accept minion_opts from the target information
- e209b6 Process ssh_minion_opts from master config
- 3b64214 Revert "Work around bug in salt-ssh in config.get for gpg renderer"
- 494953a Remove the strip (embracing multi-line YAML dump)
- fe87f0f Dump multi-line yaml into the SHIM
- b751a72 Inject local minion config into shim if available

• PR #23347: (basepi) [2014.7] Salt-SSH Backport FunctionWrapper.__contains__ @ 2015-05-05T14:13:21Z

  - ISSUE #19114: (pykler) salt-ssh and gpg pillar renderer | refs: #23188 #23272 #23347
  - PR #23272: (basepi) [2014.7] Allow salt-ssh minion config overrides via master config and roster | refs: #23347
  - PR #23188: (basepi) [2014.7] Work around bug in salt-ssh in config.get for gpg renderer | refs: #23272
  - 4f760dd Merge pull request #23347 from basepi/salt-ssh.functionwrapper.contains.19114
  - 30595e3 Backport FunctionWrapper.__contains__

• PR #23344: (cachedout) Explicitly set file_client on master @ 2015-05-04T23:21:48Z

  - ISSUE #22742: (hvnsweeting) salt-master says: "This master address: `salt' was previously resolvable but now fails to resolve!" | refs: #23344
  - 02658b1 Merge pull request #23344 from cachedout/issue_22742
  - 5ad96c Explicitly set file_client on master

• PR #23318: (cellscape) Honor seed argument in LXC container initialization @ 2015-05-04T20:58:12Z

  - PR #23311: (cellscape) Fix new container initialization in LXC runner | refs: #23318
  - ba7605d Merge pull request #23318 from cellscape/honor-seed-argument
  - 228b1be Honor seed argument in LXC container initialization

• PR #23307: (jfindlay) check for /etc/locale.gen @ 2015-05-04T20:56:32Z

  - ISSUE #17245: (tomashavlas) localemod does not generate locale for Arch | refs: #23307 #23397
  - 4ac4509 Merge pull request #23307 from jfindlay/fix_locale_gen
  - 101199a check for /etc/locale.gen

• PR #23324: (s0undt3ch) [2014.7] Update to the latest stable release of the bootstrap script v2015.05.04 @ 2015-05-04T16:28:30Z

  - ISSUE #580: (thatch45) recursive watch not being caught | refs: #23324
  - ISSUE #552: (jhutchins) Support require and watch under the same state dec | refs: #23324
  - PR #589: (epoelke) add --quiet and --outfile options to saltkey | refs: #23324
  - PR #567: (bastichelaar) Added upstart module | refs: #23324
  - PR #560: (UtahDave) The runs feature that was added in 93423aa2e5e4b7de6452090b0039560d2b13... | refs: #23324
  - PR #504: (SEJeff) File state goodies | refs: #23324
  - f790f42 Merge pull request #23324 from s0undt3ch/hotfix/bootstrap-script-2014.7
  - 6643e47 Update to the latest stable release of the bootstrap script v2015.05.04

Chapter 35. Release notes
- **PR #23329**: (cro) Require requests to verify cert when talking to aliyun and proxmox cloud providers @ 2015-05-04T16:18:17Z
  - 5487367 Merge pull request #23329 from cro/cloud_verify_cert
  - 860d4b7 Turn on ssl verify for requests.
- **PR #23311**: (cellscape) Fix new container initialization in LXC runner | refs: #23318 @ 2015-05-04T09:55:29Z
  - ea20176 Merge pull request #23311 from cellscape/fix-salt-cloud-lxc-init
  - 76fb34 Fix new container initialization in LXC runner
- **PR #23298**: (chris-prince) Fixed issue #18880 in 2014.7 branch @ 2015-05-04T09:55:29Z
  - ISSUE #18880: (johtso) npm installed breaks when a module is missing
  - c399b8f Merge pull request #23298 from chris-prince/2014.7
  - 0fa25db Fixed issue #18880 in 2014.7 branch
- **PR #23292**: (rallytime) Merge #23151 with pylint fixes @ 2015-05-02T03:54:12Z
  - ISSUE #23148: (cr1stIp) virt - error handling bogus if machine image location is wrong
  - PR #23151: (cr1stIp) Fixes #23148 | refs: #23292
  - 16ecefd Merge pull request #23292 from rallytime/merge-23151
  - 8ff852a Merge #23151 with pylint fixes
  - 8fa12e Fixes #23148
- **PR #23274**: (basepi) [2014.7] Reduce salt-ssh debug log verbosity @ 2015-05-01T20:19:23Z
  - ce24315 Merge pull request #23274 from basepi/salt-ssh.debug.verbosity
  - ece6c6 Log stdout and stderr to trace
  - 08f54d7 Log stdout and stderr to trace as well
  - 9b9c30f Reduce salt-ssh debug log verbosity
- **PR #23261**: (rallytime) Fix tornado websocket event handler registration @ 2015-05-01T18:20:31Z
  - ISSUE #22605: (mavenAtHouzz) Tornado websockets event Handlers registration are incorrect | refs: #23261
  - 7b55e43 Merge pull request #23261 from rallytime/fix-22605
  - 4950bf8 Fix tornado websocket event handler registration
- **PR #23258**: (teizz) TCP keepalives on the ret side, Revisited. @ 2015-05-01T16:13:49Z
  - 83ef7cb Merge pull request #23258 from teizz/i>ret_keepalive_2014_7_5
  - 0bf9b6f The fixes by i>cachedout which were backported into 2015_2 were missing a single parameter thus not setting up the TCP keepalive for the ZeroMQ Channel by default.
- **PR #23241**: (techhat) Move iptables log options after the jump @ 2015-05-01T01:34:59Z
  - ISSUE #23224: (twellspring) iptables.append --log parameters must be after --jump LOG | refs: #23241
  - 8de3c83 Merge pull request #23241 from techhat/issue23224
  - 87f7948 Move iptables log options after the jump
- **PR #23228**: (rallytime) Backport #23171 to 2014.7 @ 2015-04-30T21:09:45Z
  - PR #23171: (skizunov) Bugfix: `clean_proc_dir` is broken | refs: #23228

35.2. Previous Releases
Chapter 35. Release notes

- f20210e Merge pull request #23228 from rallytime/bp-23171
- e670e99 Bugfix: `clean_proc_dir` is broken

- **PR #23227**: (rallytime) Backport #22808 to 2014.7 @ 2015-04-30T21:09:14Z
  - ISSUE #22703: (Xiol) salt-ssh does not work with list matcher | refs: #22808
  - **PR #22808**: (basepi) [2015.2] Add list targeting to salt-ssh flat roster | refs: #23227
  - 721cc28 Merge pull request #23227 from rallytime/bp-22808
  - d208a0 Dict, not list
  - a3f529e It's already been converted to a list
  - dd57f2d Add list targeting to salt-ssh flat roster

- **PR #22823**: (hvnsweeting) 22822 file directory clean @ 2015-04-30T15:25:51Z
  - 82c22af Merge pull request #22823 from hvnsweeting/22822-file-directory-clean
  - c74c27 fix lint - remove unnecessary parenthesis
  - cb3dee refactor
  - 8924b5a refactor: use relpath instead of do it manually
  - d306a5 refactor
  - 5759a0e bugfix: file.directory clean=True when it require parent dir

- **PR #22977**: (bersace) Fix fileserver backends __opts__ overwritten by _pillar @ 2015-04-30T15:24:56Z
  - ISSUE #22941: (bersace) _pillar func breaks fileserver globals | refs: #22977 #22942
  - **PR #22942**: (bersace) Fix fileserver backends global overwritten by _pillar | refs: #22977
  - f6c0728 Merge pull request #22977 from bersace/fix-fileserver-backends-pillar-side-effect
  - 5f451f6 Fix fileserver backends __opts__ overwritten by _pillar

- **PR #23180**: (jfindlay) fix typos from 36841bdd in masterapi.py @ 2015-04-30T15:22:41Z
  - ISSUE #23166: (claudiupopescu) ```Error in function _minion_event`` resulting in modules not loaded | refs: #23180
  - 34206f7 Merge pull request #23180 from jfindlay/remote_event
  - 7206e1 fix typos from 36841bdd in masterapi.py

- **PR #23176**: (jfindlay) copy standard cmd.run* kwargs into cmd.run_chroot @ 2015-04-30T15:22:12Z
  - ISSUE #23153: (cr1st1p) cmdmod : run_chroot - broken in 2014.7.5 - missing kwargs | refs: #23176
  - b6b8216 Merge pull request #23176 from jfindlay/run_chroot
  - cc3417 copy standard cmd.run* kwargs into cmd.run_chroot

- **PR #23193**: (joejulian) supervisord.mod_watch should accept sfun @ 2015-04-30T04:34:21Z
  - ISSUE #23192: (joejulian) supervisord mod_watch does not accept sfuns | refs: #23193
  - ef8f99c Merge pull request #23193 from joejulian/2014.7_supervisord_accept_sfun
  - ebf59f9 supervisord.mod_watch should accept sfuns

- **PR #23188**: (basepi) [2014.7] Work around bug in salt-ssh in config.get for gpg renderer | refs: #23272 @ 2015-04-30T04:34:10Z
  - ISSUE #19114: (pykler) salt-ssh and gpg pillar renderer | refs: #23188 #23272 #23347
- 72fe88e Merge pull request #23188 from basepi/salt-ssh.function.wrapper.gpg.19114
- d73979e Work around bug in salt-ssh in config.get for gpg render

- **PR #23154**: (cachedout) Re-establish channel on interruption in fileclient @ 2015-04-29T16:59Z
  - ISSUE #21480: (msciciel) TypeError: string indices must be integers, not str | refs: #23154
  - 168508e Merge pull request #23154 from cachedout/refresh_channel
  - 9f8dd80 Re-establish channel on interruption in fileclient

- **PR #23146**: (rallytime) Backport #20779 to 2014.7 @ 2015-04-28T20:45:06Z
  - ISSUE #20647: (ryan-lane) file.serialize fails to serialize due to ordered dicts | refs: #20779
  - PR #20779: (cachedout) Use declared yaml options | refs: #23146
  - 3b53e04 Merge pull request #23146 from rallytime/bp-20779
  - ffd1849 compare OrderedDicts in serializer unit test
  - a221706 Just change serialize
  - a111798 Use declared yaml options

- **PR #23145**: (rallytime) Backport #23089 to 2014.7 @ 2015-04-28T20:45:06Z
  - PR #23089: (cachedout) Stringify version number before lstrip | refs: #23145
  - 88b4664 Merge pull request #23145 from rallytime/bp-23089
  - 93c41af Stringify version number before lstrip

- **PR #23144**: (rallytime) Backport #23124 to 2014.7 @ 2015-04-28T20:44:46Z
  - ISSUE #16188: (drawks) salt.modules.parted has various functions with bogus input validation. | refs: #23124
  - PR #23124: (ether42) fix parsing the output of parted in parted.list_() | refs: #23144
  - c85d36f Merge pull request #23144 from rallytime/bp-23124-2014-7
  - 6b64da7 fix parsing the output of parted

- **PR #23120**: (terminalmage) Don’t run os.path.relpath() if repo doesn’t have a `“root”` param set @ 2015-04-28T15:46:54Z
  - a27b158 Merge pull request #23120 from terminalmage/fix-gitfs-relpath
  - 1860ff Don’t run os.path.relpath() if repo doesn’t have a `“root”` param set

- **PR #23132**: (clinta) Backport b27c176 @ 2015-04-28T15:00:30Z
  - fcba607 Merge pull request #23132 from clinta/patch-2
  - a824d72 Backport b27c176

- **PR #23114**: (rallytime) Adjust ZeroMQ 4 docs to reflect changes to Ubuntu 12 packages @ 2015-04-28T03:59:24Z
  - ISSUE #18476: (Auha) Upgrading salt on my master caused dependency issues | refs: #23114 #18610
  - PR #18610: (rallytime) Make ZMQ 4 installation docs for ubuntu more clear | refs: #23114
  - b66f8b8 Merge pull request #23114 from rallytime/remove_ubuntu_zmq4_docs
  - f6cc7c8 Adjust ZeroMQ 4 docs to reflect changes to Ubuntu 12 packages

- **PR #23108**: (rallytime) Backport #23097 to 2014.7 @ 2015-04-28T03:58:05Z
  - ISSUE #23085: (xenophonf) Use `“s3fs”` (not `“s3”`) in fileserver_roots | refs: #23097
- PR #23097: (rallytime) Change s3 to s3fs in fileserver_roots docs example | refs: #23108
- 399857f Merge pull request #23108 from rallytime/bp-23097
- fa88984 Change s3 to s3fs in fileserver_roots docs example

- PR #23112: (basepi) [2014.7] Backport #22199 to fix mysql returner save_load errors @ 2015-04-28T03:55:44Z
- ISSUE #22171: (basepi) We should only call returner.save_load once per jid | refs: #22199
- PR #22199: (basepi) [2015.2] Put a bandaid on the save_load duplicate issue (mysql returner) | refs: #23112
- 5541537 Merge pull request #23112 from basepi/mysql_returner_save_load
- 0127012 Put a bandaid on the save_load duplicate issue

- PR #23113: (rallytime) Revert `Backport #22895 to 2014.7` @ 2015-04-28T03:27:29Z
- PR #22925: (rallytime) Backport #22895 to 2014.7 | refs: #23113
- PR #22895: (aletourneau) pam_tally counter was not reset to 0 after a succesfull login | refs: #22925
- dfe2066 Merge pull request #23113 from saltstack/revert-22925-bp-22895
- b957ea8 Revert `Backport #22895 to 2014.7`

- PR #23094: (terminalmage) pygit2: disable cleaning of stale refs for authenticated remotes @ 2015-04-27T20:51:28Z
- ISSUE #23013: (markusr815) gitfs regression with authenticated repos | refs: #23094
- 2151f3 Merge pull request #23094 from terminalmage/issue23013
- aaf7b04 pygit2: disable cleaning of stale refs for authenticated remotes

- PR #23048: (jfindlay) py-2.6 compat for utils/boto.py ElementTree exception @ 2015-04-25T16:56:45Z
- d45aa21 Merge pull request #23048 from jfindlay/ET_error
- 64e42cc py-2.6 compat for utils/boto.py ElementTree exception

- PR #23025: (jfindlay) catch exceptions on bad system locales/encodings @ 2015-04-25T16:56:30Z
- ISSUE #22981: (syphernl) Locale state throwing traceback when generating not (yet) existing locale | refs: #23025
- d25a5c1 Merge pull request #23025 from jfindlay/fix_sys_locale
- 9c4d62b catch exceptions on bad system locales/encodings

- PR #22932: (hvnsweeting) bugfix: also manipulate dir_mode when source not defined @ 2015-04-25T16:54:58Z
- 5e44b59 Merge pull request #22932 from hvnsweeting/file-append-bugfix
- 3f368de do not use assert in execution module
- 9d4d4a bugfix: also manipulate dir_mode when source not defined

- PR #23055: (jfindlay) prevent ps module errors on accessing dead procs @ 2015-04-24T22:39:49Z
- ISSUE #23021: (ether42) ps.pgrep raises NoSuchProcess | refs: #23055
- c2416a4 Merge pull request #23055 from jfindlay/fix_ps
- c2dc7ad prevent ps module errors on accessing dead procs

- PR #23031: (jfindlay) convert exception e.message to just e @ 2015-04-24T18:38:13Z
- bfd9158 Merge pull request #23031 from jfindlay/exception
- 856bad1 convert exception e.message to just e
• PR #23015: (hvnsweeting) if status of service is stop, there is not an error with it @ 2015-04-24T14:35:10Z
  - 7747f33 Merge pull request #23015 from hvnsweeting/set-non-error-lvl-for-service-status-log
  - 92ea163 if status of service is stop, there is not an error with it

• PR #23000: (jfindlay) set systemd service killMode to process for minion @ 2015-04-24T03:42:39Z
  - ISSUE #22993: (jetpak) salt-minion restart causes all spawned daemons to die on centos7 (systemd) | refs: #23000
  - 2e09789 Merge pull request #23000 from jfindlay/systemd_kill
  - 3d575e2 set systemd service killMode to process for minion

• PR #22999: (jtand) Added retry_dns to minion doc. @ 2015-04-24T17:48:07Z
  - ISSUE #22707: (arthurlogilab) retry_dns of master configuration is missing from the documentation | refs: #22999
  - b5c059a Merge pull request #22999 from jtand/fix_22707
  - 8486e17 Added retry_dns to minion doc.

• PR #22990: (techhat) Use the proper cloud conf variable @ 2015-04-24T03:42:39Z
  - 27dc877 Merge pull request #22990 from techhat/2014.7
  - d3bcbad Use the proper cloud conf variable

• PR #22976: (multani) Improve state_output documentation @ 2015-04-23T12:24:22Z
  - 13df65 Merge pull request #22976 from multani/fix/state-output-doc
  - 19efd41 Improve state_output documentation

• PR #22955: (terminalmage) Fix regression introduced yesterday in dockerio module @ 2015-04-22T18:56:39Z
  - 89fa185 Merge pull request #22955 from terminalmage/dockerio-run-fix
  - b4472ad Fix regression introduced yesterday in dockerio module

• PR #22954: (rallytime) Backport #22909 to 2014.7 @ 2015-04-22T18:56:20Z
  - PR #22909: (mguegan) Fix compatibility with pkgin > 0.7 | refs: #22954
  - 46e227 Merge pull request #22954 from rallytime/bp-22909
  - 70c1dc3 Fix compatibility with pkgin > 0.7

• PR #22856: (jfindlay) increase timeout and decrease tries for route53 records @ 2015-04-22T16:47:01Z
  - ISSUE #18720: (Reiner030) timeouts when setting Route53 records | refs: #22856
  - c9ae59a Merge pull request #22856 from jfindlay/route53_timeout
  - ba4a786 add route53 record sync wait, default=False
  - ea2fd50 increase timeout and tries for route53 records

• PR #22946: (s0undt3ch) Test with a more recent pip version to avoid a traceback @ 2015-04-22T16:25:17Z
  - a178d44 Merge pull request #22946 from s0undt3ch/2014.7
  - bc87749 Test with a more recent pip version to avoid a traceback

• PR #22945: (garethgreenaway) Fixes to scheduler @ 2015-04-22T16:25:00Z
  - ISSUE #22571: (BoomerB) same error message as on issue #18504 | refs: #22945
  - de39bde Merge pull request #22945 from garethgreenaway/22571_2014_7_schedule_pillar_refresh_seconds_exceptions
- bfa6d25 Fixing a reported issue when using a scheduled job from pillar with splay. _seconds element that acted as a backup of the actual seconds was being removed when pillar was refreshed and causing exceptions. This fix moves some splay related code out of the if else condition so it's checked whether the job is in the job queue or not.

**PR #22887:** (hvnsweeting) fix #18843 @ 2015-04-22T15:47:05Z
- ISSUE #18843: (calvinhp) State user.present will fail to create home if user exists and homedir doesn't
- 12d2b91 Merge pull request #22887 from hvnsweeting/18843-fix-user-present-home
- 7fe7b08 run user.chhome once to avoid any side-effect when run it twice
- 19de995 clarify the usage of home arg
- d6dc09a enhance doc, as usermod on ubuntu 12.04 will not CREATE home
- 0ce4d7f refactor: force to use boolean
- 849d19e log debug the creating dir process
- c4e95b9 fix #18843: usermod won't create a dir if old home does not exist

**PR #22930:** (jfindlay) localemod.gen_locale now always returns a boolean @ 2015-04-22T15:37:39Z
- ISSUE #21140: (holms) locale.present state executed successfully, although originally fails | refs: #22930 #22829
- ISSUE #2417: (ff) Module standards | refs: #22829
- PR #22829: (f30) Always return a boolean in gen_locale() | refs: #22930
- b7de7bd Merge pull request #22930 from jfindlay/localegen_bool
- 399399f localemod.gen_locale now always returns a boolean

**PR #22933:** (hvnsweeting) add test for #18843 @ 2015-04-22T15:27:18Z
- ISSUE #18843: (calvinhp) State user.present will fail to create home if user exists and homedir doesn’t
- 11bcf14 Merge pull request #22933 from hvnsweeting/18843-test
- b13db32 add test for #18843

**PR #22925:** (rallytime) Backport #22895 to 2014.7 | refs: #23113 @ 2015-04-22T02:30:26Z
- PR #22895: (alex) pam_tally counter was not reset to 0 after a succesfull login | refs: #22925
- 6890752 Merge pull request #22925 from rallytime/bp-22895
- 3852d96 Pylint fix
- 90f7829 Fixed pylint issues
- 5eb1f59 Cleaned up pull request
- a08ac47 pam_tally counter was not reset to 0 after a succesfull login

**PR #22914:** (cachedout) Call proper returner function in jobs.list_jobs @ 2015-04-22T00:49:01Z
- ISSUE #22790: (whiteinge) jobs.list_jobs runner tracebacks on ‘missing’ argument | refs: #22914
- eca37eb Merge pull request #22914 from cachedout/issue_22790
- d828d6f Call proper returner function in jobs.list_jobs

**PR #22918:** (JaseFace) Add a note to the git_pillar docs stating that GitPython is the only currently supported provider @ 2015-04-22T00:48:26Z
- 44f3409 Merge pull request #22918 from JaseFace/git-pillar-provider-doc-note
- 0aee5c2 Add a note to the git_pillar docs stating that GitPython is the only currently supported provider

- **PR #22907**: (techhat) Properly merge cloud configs to create profiles @ 2015-04-21T22:02:44Z
  - 31c461f Merge pull request #22907 from techhat/cloudconfig
  - 3bf4e66 Properly merge cloud configs to create profiles

- **PR #22894**: (0xf10e) Fix issue #22782 @ 2015-04-21T18:55:18Z
  - f09397f Merge pull request #22894 from 0xf10e/2014.7
  - 58fa24c Clarify doc on kwarg `roles` for user_present().
  - f0ae2eb Improve readability by renaming tenant_role

- **PR #22902**: (rallytime) Change state example to use proper kwarg @ 2015-04-21T18:50:47Z
  - ISSUE #12003: (MarkusMuellerAU) [state.dockerio] docker.run TypeError: run() argument after ** must be a mapping, not str | refs: #22902
  - c802ba7 Merge pull request #22902 from rallytime/docker_doc_fix
  - 8f70346 Change state example to use proper kwarg

- **PR #22898**: (terminalmage) dockerio: better error message for native exec driver @ 2015-04-21T18:02:58Z
  - b1771a7 Merge pull request #22898 from terminalmage/issue12003
  - c375309 dockerio: better error message for native exec driver

- **PR #22897**: (rallytime) Add param documentation for file.replace state @ 2015-04-21T17:31:04Z
  - ISSUE #22825: (paolodina) Issue using file.replace in state file | refs: #22897
  - e2ec4ec Merge pull request #22897 from rallytime/fix-22825
  - 9c51630 Add param documentation for file.replace state

- **PR #22850**: (bersace) Fix pillar and salt files server mixed @ 2015-04-21T17:04:33Z
  - ISSUE #22844: (bersace) LocalClient file cache confuse pillar and state files | refs: #22850
  - df53889 Merge pull request #22850 from bersace/fix-pillar-salt-mixed
  - 31b98e7 Initialize state file client after pillar loading
  - f6bebb7 Use saltenv

- **PR #22818**: (twangboy) Added documentation regarding pip in windows @ 2015-04-21T03:58:59Z
  - 1380fec Merge pull request #22818 from twangboy/upd_pip_docs
  - cb999c7 Update pip.py
  - 3cc5e97 Added documentation regarding pip in windows

- **PR #22872**: (rallytime) Prevent stacktrace on os.path.exists in hosts module @ 2015-04-21T02:54:40Z
  - b2bf17f Merge pull request #22872 from rallytime/fix_hosts_stacktrace
  - c88a1ea Prevent stacktrace on os.path.exists in hosts module

- **PR #22853**: (s0undt3ch) Don’t assume package installation order. @ 2015-04-21T02:42:41Z
  - 03af523 Merge pull request #22853 from s0undt3ch/2014.7
  - b62df62 Don’t assume package installation order.

- **PR #22877**: (s0undt3ch) Don’t fail on make clean just because the directory does not exist @ 2015-04-21T02:40:47Z
- 9211e36 Merge pull request #22877 from s0undt3ch/hotfix/clean-docs-fix
- 95d6887 Don’t fail on make clean just because the directory does not exist

• PR #22873: (thatch45) Type check the version since it will often be numeric @ 2015-04-21T02:38:11Z
  - 5bd2d08 Merge pull request #22873 from thatch45/type_check
  - 53b8376 Type check the version since it will often be numeric

• PR #22870: (twangboy) Added ability to send a version with a space in it @ 2015-04-20T23:18:28Z
  - c965b0a Merge pull request #22870 from twangboy/fix_installer_again
  - 3f180cf Added ability to send a version with a space in it

• PR #22863: (rallytime) Backport #20974 to 2014.7 @ 2015-04-20T19:29:37Z
  - PR #20974: (JohannesEbke) Fix expr_match usage in salt.utils.check_whitelist_blacklist | refs: #22863
  - 2973eb1 Merge pull request #22863 from rallytime/bp-20974
  - 14913a4 Fix expr_match usage in salt.utils.check_whitelist_blacklist

• PR #22578: (hvnsweeting) gracefully handle when salt-minion cannot decrypt key @ 2015-04-20T15:24:45Z
  - c45b92b Merge pull request #22578 from hvnsweeting/2014-7-fix-compile-pillar
  - f75b24a gracefully handle when salt-minion cannot decrypt key

• PR #22800: (terminalmage) Improve error logging for pygit2 SSH-based remotes @ 2015-04-18T17:18:55Z
  - ISSUE #21979: (yrdevops) gitfs: error message not descriptive enough when libgit2 was compiled without libssh2 | refs: #22800
  - 900c7a5 Merge pull request #22800 from terminalmage/issue21979
  - 8f1c008 Clarify that for pygit2, receiving 0 objects means repo is up-to-date
  - 98885f7 Add information about libssh2 requirement for pygit2 ssh auth
  - 09468d2 Fix incorrect log message
  - 2093bf8 Adjust loglevels for gitfs errors
  - 9d394df Improve error logging for pygit2 SSH-based remotes

• PR #22813: (twangboy) Updated instructions for building salt @ 2015-04-18T04:10:07Z
  - e99f2fd Merge pull request #22813 from twangboy/win_doc_fix
  - 8d9f2e3 Fixed some formatting issues
  - 9890b3b Updated instructions for building salt

• PR #22810: (basepi) [2014.7] More msgpack gating for salt-ssh @ 2015-04-17T22:28:24Z
  - ISSUE #22708: (Bilge) salt-ssh file.accumulated error: NameError: global name `msgpack` is not defined | refs: #22810
  - fe1de89 Merge pull request #22810 from basepi/salt-ssh.more.msgpack.gating
  - d4da8e6 Gate msgpack in salt/modules/saltutil.py
  - 02303b2 Gate msgpack in salt/modules/data.py
  - d7e8741 Gate salt.states.file.py msgpack

• PR #22803: (rallytime) Allow map file to work with softlayer @ 2015-04-17T20:34:42Z
  - ISSUE #17144: (xpender) salt-cloud -m fails with softlayer | refs: #22803
- 11df71e Merge pull request #22803 from rallytime/fix-17144
- ce88b6a Allow map file to work with softlayer

- **PR #22807**: *(rallytime)* Add 2014.7.5 links to windows installation docs @ 2015-04-17T20:32:13Z
  - cd43a95 Merge pull request #22807 from rallytime/windows_docs_update
  - 5931a58 Replace all 4s with 5s
  - eadaed Add 2014.7.5 links to windows installation docs

- **PR #22795**: *(rallytime)* Added release note for 2014.7.5 release @ 2015-04-17T18:05:36Z
  - 0b295e2 Merge pull request #22795 from rallytime/release_notes
  - fde1fee Remove extra line
  - b19b95d Added release note for 2014.7.5 release

- **PR #22759**: *(twangboy)* Final edits to the batch files for running salt @ 2015-04-17T04:31:15Z
  - ISSUE #22740: *(lorengordon)* New Windows installer assumes salt is installed to the current directory |
    refs: #22759
  - **PR #22754**: *(twangboy)* Removed redundant \ and " | refs: #22759
  - 3c91459 Merge pull request #22759 from twangboy/fix_bat_one_last_time
  - 075f82e Final edits to the batch files for running salt

- **PR #22760**: *(thatch45)* Fix issues with the syndic @ 2015-04-17T04:30:48Z
  - 20d3f2b Merge pull request #22760 from thatch45/syndic_fix
  - e2db624 Fix issues with the syndic not resolving the master when the interface is set

- **PR #22762**: *(twangboy)* Fixed version not showing in Add/Remove Programs @ 2015-04-17T04:29:46Z
  - 54c4584 Merge pull request #22762 from twangboy/fix_installer
  - 4d25af8 Fixed version not showing in Add/Remove Programs

## 35.2.15 Salt 2014.1.0 Release Notes - Codename Hydrogen

**Note**: Due to a change in master to minion communication, 2014.1.0 minions are not compatible with older-version masters. Please upgrade masters first. More info on backwards-compatibility policy [here](#), under the "Upgrading Salt" subheading.

**Note**: A change in the grammar in the state compiler makes `module.run` in requisites illegal syntax. Its use is replaced simply with the word `module`. In other words you will need to change requisites like this:

```
require:
    module.run: some_module_name
```

to:

```
require:
    module: some_module_name
```

This is a breaking change. We apologize for the inconvenience, we needed to do this to remove some ambiguity in parsing requisites.
The 2014.1.0 release of Salt is a major release which not only increases stability but also brings new capabilities in virtualization, cloud integration, and more. This release brings a great focus on the expansion of testing making roughly double the coverage in the Salt tests, and comes with many new features.

2014.1.0 is the first release to follow the new date-based release naming system. See the version numbers page for more details.

**Major Features**

**Salt Cloud Merged into Salt**

Salt Cloud is a tool for provisioning salted minions across various cloud providers. Prior to this release, Salt Cloud was a separate project but this marks its full integration with the Salt distribution. A Getting Started guide and additional documentation for Salt Cloud can be found [here](#).

**Google Compute Engine**

Alongside Salt Cloud comes new support for the Google Compute Engine. Salt Stack can now deploy and control GCE virtual machines and the application stacks that they run.

For more information on Salt Stack and GCE, please see [this blog post](#).

Documentation for Salt and GCE can be found [here](#).

**Salt Virt**

Salt Virt is a cloud controller that supports virtual machine deployment, inspection, migration, and integration with many aspects of Salt.

Salt Virt has undergone a major overhaul with this release and now supports many more features and includes a number of critical improvements.

**Docker Integration**

Salt now ships with `states` and an `execution module` to manage Docker containers.

**Substantial Testing Expansion**

Salt continues to increase its unit/regression test coverage. This release includes over 300 new tests.

**BSD Package Management**

BSD package management has been entirely rewritten. FreeBSD 9 and older now default to using `pkg_add`, while FreeBSD 10 and newer will use `pkgng`. FreeBSD 9 can be forced to use `pkgng`, however, by specifying the following option in the minion config file:

```
providers:
  pkg: pkgng
```
In addition, support for installing software from the ports tree has been added. See the documentation for the ports state and execution module for more information.

Network Management for Debian/Ubuntu

Initial support for management of network interfaces on Debian-based distros has been added. See the documentation for the network state and the debian_ip for more information.

IPv6 Support for iptables State/Module

The iptables state and module now have IPv6 support. A new parameter family has been added to the states and execution functions, to distinguish between IPv4 and IPv6. The default value for this parameter is ipv4, specifying ipv6 will use ip6tables to manage firewall rules.

GitFS Improvements

Several performance improvements have been made to the Git fileserver backend. Additionally, file states can now use any any SHA1 commit hash as a fileserver environment:

```bash
/etc/httpd/httpd.conf:
file.managed:
  - source: salt://webserver/files/httpd.conf
  - saltenv: 45af879
```

This applies to the functions in the cp module as well:

```bash
salt '*' cp.get_file salt://readme.txt /tmp/readme.txt saltenv=45af879
```

MinionFS

This new fileserver backend allows files which have been pushed from the minion to the master (using cp.push) to be served up from the salt fileserver. The path for these files takes the following format:

```
salt://minion-id/path/to/file
```

minion-id is the id of the "source" minion, the one from which the files were pushed to the master. /path/to/file is the full path of the file.

The MinionFS Walkthrough contains a more thorough example of how to use this backend.

saltenv

To distinguish between fileserver environments and execution functions which deal with environment variables, fileserver environments are now specified using the saltenv parameter. env will continue to work, but is deprecated and will be removed in a future release.
Grains Caching

A caching layer has been added to the Grains system, which can help speed up minion startup. Disabled by default, it can be enabled by setting the minion config option `grains_cache`:

```
grains_cache: True
# Seconds before grains cache is considered to be stale.
grains_cache_expiration: 300
```

If set to `True`, the grains loader will read from/write to a msgpack-serialized file containing the grains data.

Additional command-line parameters have been added to salt-call, mainly for testing purposes:

- `--skip-grains` will completely bypass the grains loader when salt-call is invoked.
- `--refresh-grains-cache` will force the grains loader to bypass the grains cache and refresh the grains, writing a new grains cache file.

Improved Command Logging Control

When using the `cmd` module, either on the CLI or when developing Salt execution modules, a new keyword argument `output_loglevel` allows for greater control over how (or even if) the command and its output are logged. For example:

```
salt '*' cmd.run 'tail /var/log/messages' output_loglevel=debug
```

The package management modules (apt, yumpkg, etc.) have been updated to log the copious output generated from these commands at loglevel `debug`.

**Note:** To keep a command from being logged, `output_loglevel=quiet` can be used. Prior to this release, this could be done using `quiet=True`. This argument is still supported, but will be removed in a future Salt release.

PagerDuty Support

Initial support for firing events via PagerDuty has been added. See the documentation for the `pagerduty` module.

Virtual Terminal

Sometimes the subprocess module is not good enough, and, in fact, not even `askpass` is. This virtual terminal is still in its infant childhood, needs quite some love, and was originally created to replace `askpass`, but, while developing it, it immediately proved that it could do so much more. It’s currently used by salt-cloud when bootstrapping salt on clouds which require the use of a password.

Proxy Minions

Initial basic support for Proxy Minions is in this release. Documentation can be found here.
Proxy minions are a developing feature in Salt that enables control of devices that cannot run a minion. Examples include network gear like switches and routers that run a proprietary OS but offer an API, or "dumb" devices that just don't have the horsepower or ability to handle a Python VM.

Proxy minions can be difficult to write, so a simple REST-based example proxy is included. A Python bottle-based webserver can be found at https://github.com/cro/salt-proxy-rest as an endpoint for this proxy.

This is an ALPHA-quality feature. There are a number of issues with it currently, mostly centering around process control, logging, and inability to work in a masterless configuration.

Additional Bugfixes (Release Candidate Period)

Below are many of the fixes that were implemented in salt during the release candidate phase.

- Fix mount.mounted leaving conflicting entries in fstab (issue 7079)
- Fix mysql returner serialization to use json (issue 9590)
- Fix ZMQError: Operation cannot be accomplished in current state errors (issue 6306)
- Rbenv and ruby improvements
- Fix quoting issues with mysql port (issue 9568)
- Update mount module/state to support multiple swap partitions (issue 9520)
- Fix archive state to work with bsd.tar
- Clarify logs for minion ID caching
- Add numeric revision support to git state (issue 9718)
- Update master_uri with master_ip (issue 9694)
- Add comment to Debian mod_repo (issue 9923)
- Fix potential undefined loop variable in rabbitmq state (issue 8703)
- Fix for salt-virt runner to delete key on VM deletion
- Fix for salt-run -d to limit results to specific runner or function (issue 9975)
- Add tracebacks to jinja renderer when applicable (issue 10010)
- Fix parsing in monit module (issue 10041)
- Fix highstate output from syndic minions (issue 9732)
- Quiet logging when dealing with passwords/hashe (issue 10000)
- Fix for multiple remotes in git_pillar (issue 9932)
- Fix npm installed command (issue 10109)
- Add safeguards for utf8 errors in zcbuildout module
- Fix compound commands (issue 9746)
- Add systemd notification when master is started
- Many doc improvements
35.2.16 Salt 2014.1.1 Release Notes

release 2014-03-18

Version 2014.1.1 is a bugfix release for 2014.1.0. The changes include:

- Various doc fixes, including up-to-date Salt Cloud installation documentation.
- Renamed state.sls runner to state.orchestrate, to reduce confusion with the state.sls execution function
- Fix various bugs in the dig module (issue 10367)
- Add retry for query on certain EC2 status codes (issue 10154)
- Fix various bugs in mongodb_user state module (issue 10430)
- Fix permissions on ~/.salt_token (issue 10422)
- Add PyObjects support
- Fix launchctl module crash with missing files
- Fix saltutil.find_job for Windows (issue 10581)
- Fix OS detection for OpenSolaris (issue 10601)
- Fix broken salt-ssh key_deploy
- Add support for multiline cron comments (issue 10721)
- Fix timezone module for Arch (issue 10789)
- Fix symlink support for file.recurse (issue 10809)
- Fix multi-master bugs (issue 10732 and issue 10969)
- Fix file.patch to error when source file is unavailable (issue 10380)
- Fix pkg to handle packages set as purge in pkg.installed (issue 10719)
- Add zmqversion grain
- Fix highstate summary for masterless minions (issue 10945)
- Fix saltutil.find_job for 2014.1 masters talking to 0.17 minions (issue 11020)
- Fix file.recurse states with trailing slashes in source (issue 11002)
- Fix pkg states to allow pkgname.x86_64 (issue 7306)
- Make iptables states set a default table for flush (issue 11037)
- Added iptables --reject-with after final iptables call in iptables states (issue: 10757)
- Fix improper passing of “family” in iptables states (issue 10774)
- Fix traceback in iptables.insert states (issue 10988)
- Fix zombie processes (issue 10867 and others)
- Fix batch mode to obey --return settings (issue 9146)
- Fix localclient issue that was causing batch mode breakage (issue 11094, issue 10470, and others)
- Multiple salt-ssh fixes
- FreeBSD: look in /usr/local/etc/salt for configuration by default, if installed using pip --editable.
- Add a skip_suggestions parameter to pkg.installed states which allows pre-flight check to be skipped (issue 11106)
- Fixed tag-based gitfs fileserver environments regression ([issue 10956])
- Yum: fix cache of available pkgs not cleared when repos are changed ([issue 11001])
- Yum: fix for plugin-provided repositories (i.e. RHN/Spacewalk) ([issue 11145])
- Fix regression in `chocolatey.bootstrap` ([issue 10541])
- Fix fail on unknown target in `jobs runner` ([issue 11151])
- Don’t log errors for commands which are expected to sometimes exit with non-zero exit status ([issue 11154, issue 11090])
- Fix `test=True` CLI override of config option ([issue 10877])
- Log sysctl key listing at loglevel TRACE ([issue 10931])

### 35.2.17 Salt 2014.1.10 Release Notes

**release** 2014-08-01

**Note:** Version 2014.1.9 contained a regression which caused inaccurate Salt version detection, and thus was never packaged for general release. This version contains the version detection fix, but is otherwise identical to 2014.1.9.

Version 2014.1.10 is another bugfix release for 2014.1.0. Changes include:
- Ensure salt-ssh will not continue if permissions on a temporary directory are not correct.
- Use the bootstrap script distributed with Salt instead of relying on an external resource
- Remove unused testing code
- Ensure salt states are placed into the `.salt` directory in salt-ssh
- Use a randomized path for temporary files in a salt-cloud deployment
- Clean any stale directories to ensure a fresh copy of salt-ssh during a deployment

Salt 2014.1.10 fixes security issues documented by CVE-2014-3563: "Insecure tmp-file creation in seed.py, salt-ssh, and salt-cloud.” Upgrading is recommended.

### 35.2.18 Salt 2014.1.11 Release Notes

**release** 2014-08-29

Version 2014.1.11 is another bugfix release for 2014.1.0. Changes include:
- Fix for minion_id with byte-order mark (BOM) ([issue 12296])
- Fix `runas` deprecation in `at` module
- Fix trailing slash behavoir for `file.makedirs_` ([issue 14019])
- Fix chocolatey path ([issue 13870])
- Fix git_pillar infinite loop issues ([issue 14671])
- Fix json outputter `null` case
- Fix for minion error if one of multiple masters are down ([issue 14099])

---

**35.2. Previous Releases**
35.2.19 Salt 2014.1.12 Release Notes

release 2014-10-08

Version 2014.1.12 is another bugfix release for 2014.1.0. Changes include:

- Fix `scp_file` always failing (which broke salt-cloud) (issue 16437)
- Fix regression in pillar in masterless (issue 16210, issue 16416, issue 16428)

35.2.20 Salt 2014.1.13 Release Notes

release 2014-10-14

Version 2014.1.13 is another bugfix release for 2014.1.0. Changes include:

- Fix `sftp_file` by checking the exit status code of scp (which broke salt-cloud) (issue 16599)

35.2.21 Salt 2014.1.2 Release Notes

release 2014-04-15

Version 2014.1.2 is another bugfix release for 2014.1.0. The changes include:

- Fix username detection when su’ed to root on FreeBSD (issue 11628)
- Fix minionfs backend for file.recurse states
- Fix 32-bit packages of different arches than the CPU arch, on 32-bit RHEL/CentOS (issue 11822)
- Fix bug with specifying alternate home dir on user creation (FreeBSD) (issue 11790)
- Don’t reload site module on module refresh for MacOS
- Fix regression with running execution functions in Pillar SLS (issue 11453)
- Fix some modules missing from Windows installer
- Don’t log an error for yum commands that return nonzero exit status on non-failure (issue 11645)
- Fix bug in rabbitmq state (issue 8703)
- Fix missing ssh config options (issue 10604)
- Fix top.sls ordering (issue 10810 and issue 11691)
- Fix `salt-key --list all` (issue 10982)
- Fix `win_servermanager install/remove function` (issue 11038)
- Fix interaction with tokens when running commands as root (issue 11223)
- Fix overstate bug with `find_job` and `**kwargs` (issue 10503)
- Fix `saltenv` for `apt pkg.mod_repo` from `pkgrepo` state
- Fix environment issue causing file caching problems (issue 11189)
- Fix bug in `__parse_key` in registry state (issue 11408)
- Add minion auth retry on rejection (issue 10763)
- Fix `publish_session` updating the encryption key (issue 11493)
- Fix for bad `AssertionError` raised by GitPython (issue 11473)
• Fix debian_ip to allow disabling and enabling networking on Ubuntu (issue 11164)
• Fix potential memory leak caused by saved (and unused) events (issue 11582)
• Fix exception handling in the MySQL module (issue 11616)
• Fix environment-related error (issue 11534)
• Include psutil on Windows
• Add file.replace and file.search to Windows (issue 11471)
• Add additional file module helpers to Windows (issue 11235)
• Add pid to netstat output on Windows (issue 10782)
• Fix Windows not caching new versions of installers in winrepo (issue 10597)
• Fix hardcoded md5 hashing
• Fix kwargs in salt-ssh (issue 11609)
• Fix file backup timestamps (issue 11745)
• Fix stacktrace on sys.doc with invalid eauth (issue 11293)
• Fix git.latest with test=True (issue 11595)
• Fix file.check_perms hardcoded follow_symlinks (issue 11387)
• Fix certain pkg states for RHEL5/Cent5 machines (issue 11719)

35.2.22 Salt 2014.1.3 Release Notes

release 2014-04-15

Version 2014.1.3 is another bugfix release for 2014.1.0. It was created as a hotfix for a regression found in 2014.1.2, which was not distributed. The only change made was as follows:

• Fix regression that caused saltutil.find_job to fail, causing premature terminations of salt CLI commands.

Changes in the not-distributed 2014.1.2, also included in 2014.1.3:

• Fix username detection when su'ed to root on FreeBSD (issue 11628)
• Fix minionfs backend for file.recurse states
• Fix 32-bit packages of different arches than the CPU arch, on 32-bit RHEL/CentOS (issue 11822)
• Fix bug with specifying alternate home dir on user creation (FreeBSD) (issue 11790)
• Don’t reload site module on module refresh for MacOS
• Fix regression with running execution functions in Pillar SLS (issue 11453)
• Fix some modules missing from Windows installer
• Don’t log an error for yum commands that return nonzero exit status on non-failure (issue 11645)
• Fix bug in rabbitmq state (issue 8703)
• Fix missing ssh config options (issue 10604)
• Fix top.sls ordering (issue 10810 and issue 11691)
• Fix salt-key --list all (issue 10982)
• Fix win_servermanager install/remove function (issue 11038)
• Fix interaction with tokens when running commands as root (issue 11223)
• Fix overstate bug with **kwargs (issue 10503)
• Fix saltenv for aptpkg.mod_repo from pkgrepo state
• Fix environment issue causing file caching problems (issue 11189)
• Fix bug in __parse_key in registry state (issue 11408)
• Add minion auth retry on rejection (issue 10763)
• Fix publish_session updating the encryption key (issue 11493)
• Fix for bad AssertionError raised by GitPython (issue 11473)
• Fix debian_ip to allow disabling and enabling networking on Ubuntu (issue 11164)
• Fix potential memory leak caused by saved (and unused) events (issue 11582)
• Fix exception handling in the MySQL module (issue 11616)
• Fix environment-related error (issue 11534)
• Include psutil on Windows
• Add file.replace and file.search to Windows (issue 11471)
• Add additional file module helpers to Windows (issue 11235)
• Add pid to netstat output on Windows (issue 10782)
• Fix Windows not caching new versions of installers in winrepo (issue 10597)
• Fix hardcoded md5 hashing
• Fix kwargs in salt-ssh (issue 11609)
• Fix file backup timestamps (issue 11745)
• Fix stacktrace on sys.doc with invalid eauth (issue 11293)
• Fix git.latest with test=True (issue 11595)
• Fix file.check_perms hardcoded follow_symlinks (issue 11387)
• Fix certain pkg states for RHEL5/Cent5 machines (issue 11719)

35.2.23 Salt 2014.1.4 Release Notes

release 2014-05-05

Version 2014.1.4 is another bugfix release for 2014.1.0. Changes include:
• Fix setup.py dependency issue (issue 12031)
• Fix handling for IOErrors under certain circumstances (issue 11783 and issue 11853)
• Fix fatal exception when /proc/1/cgroup is not readable (issue 11619)
• Fix os grains for OpenSolaris (issue 11907)
• Fix lvs.zero module argument pass-through (issue 9001)
• Fix bug in debian_ip interaction with network.system state (issue 11164)
• Remove bad binary package verification code (issue 12177)
• Fix traceback in solaris package installation (issue 12237)
- Fix `file.directory` state symlink handling (issue 12209)
- Remove `external_ip` grain
- Fix `file.managed` makedirs issues (issue 10446)
- Fix hang on non-existent Windows drive letter for `file` module (issue 9880)
- Fix salt minion caching all users on the server (issue 9743)
- Add strftime formatting for `ps.boot_time` (issue 12428)

### 35.2.24 Salt 2014.1.5 Release Notes

**release** 2014-06-11

Version 2014.1.5 is another bugfix release for 2014.1.0. Changes include:

- Add function for finding cached job on the minion
- Fix iptables save file location for Debian (issue 11730)
- Fix for minion caching jobs when master is down
- Bump default `syndic_wait` to 5 to fix syndic-related problems (issue 12262)
- Add OpenBSD, FreeBSD, and NetBSD support for `network.netstat` (issue 12121)
- Fix false positive error in logs for `makeconf` state (issue 9762)
- Fix for `yum fromrepo` package installs when repo is disabled by default (issue 12466)
- Fix for extra blank lines in `file.blockreplace` (issue 12422)
- Fix grain detection for OpenVZ guests (issue 11877)
- Fix `get_dns_servers` function for Windows `win_dns_client`
- Use system locale for ports package installations
- Use correct stop/restart procedure for Debian networking in `debian_ip` (issue 12614)
- Fix for `cmd_iter/cmd_iter_no_block` blocking issues (issue 12617)
- Fix traceback when syncing custom types (issue 12883)
- Fix cleaning directory symlinks in `file.directory`
- Add performance optimizations for `saltutil.sync_all` and `state.highstate`
- Fix possible error in `saltutil.running`
- Fix for kmod modules with dashes (issue 13239)
- Fix possible race condition for Windows minions in state module reloading (issue 12370)
- Fix bug with roster for `passwd` option that is loaded as a non-string object (issue 13249)
- Keep duplicate version numbers from showing up in `pkg.list_pkgs` output
- Fixes for Jinja renderer, timezone `module/state` (issue 12724)
- Fix `timedatectl` parsing for systemd>=210 (issue 12728)
- Fix `saltenv` being written to YUM repo config files (issue 12887)
- Removed the deprecated external nodes classifier (originally accessible by setting a value for `external_nodes` in the master configuration file). Note that this functionality has been marked deprecated for some time and was replaced by the more general `master tops` system.
• More robust escaping of ldap filter strings.
• Fix trailing slash in gitfs_root causing files not to be available (issue 13185)

35.2.25 Salt 2014.1.6 Release Notes

release 2014-07-08

Version 2014.1.6 is another bugfix release for 2014.1.0. Changes include:

• Fix extra iptables --help output (Sorry!) (issue 13648, issue 13507, issue 13527, issue 13607)
• Fix mount.active for Solaris
• Fix support for allow-hotplug statement in debian_ip network module
• Add sqlite3 to esky builds
• Fix jobs.active output (issue 9526)
• Fix the virtual grain for Xen (issue 13534)
• Fix eauth for batch mode (issue 9605)
• Fix force-related issues with tomcat support (issue 12889)
• Fix KeyError when cloud mapping
• Fix salt-minion restart loop in Windows (issue 12086)
• Fix detection of service virtual module on Fedora minions
• Fix traceback with missing ipv4 grain (issue 13838)
• Fix issue in roots backend with invalid data in mtime_map (issue 13836)
• Fix traceback in jobs.active (issue 11151)
• Fix master_tops and _ext_nodes issue (issue 13535, issue 13673)

35.2.26 Salt 2014.1.7 Release Notes

release 2014-07-09

Version 2014.1.7 is another bugfix release for 2014.1.0. Changes include:

• Fix batch mode regression (issue 14046)

This release was a hotfix release for the regression listed above which was present in the 2014.1.6 release. The changes included in 2014.1.6 are listed below:

• Fix extra iptables --help output (Sorry!) (issue 13648, issue 13507, issue 13527, issue 13607)
• Fix mount.active for Solaris
• Fix support for allow-hotplug statement in debian_ip network module
• Add sqlite3 to esky builds
• Fix jobs.active output (issue 9526)
• Fix the virtual grain for Xen (issue 13534)
• Fix eauth for batch mode (issue 9605)
• Fix force-related issues with tomcat support (issue 12889)
• Fix KeyError when cloud mapping
• Fix salt-minion restart loop in Windows (issue 12086)
• Fix detection of service virtual module on Fedora minions
• Fix traceback with missing ipv4 grain (issue 13838)
• Fix issue in roots backend with invalid data in mtime_map (issue 13836)
• Fix traceback in jobs.active (issue 11151)
• Fix master_tops and _ext_nodes issue (issue 13535, issue 13673)

35.2.27 Salt 2014.1.8 Release Notes

release  2014-07-30

Note:  This release contained a regression which caused inaccurate Salt version detection, and thus was never packaged for general release. Please use version 2014.1.10 instead.

Version 2014.1.8 is another bugfix release for 2014.1. Changes include:
• Ensure salt-ssh will not continue if permissions on a temporary directory are not correct.
• Use the bootstrap script distributed with Salt instead of relying on an external resource
• Remove unused testing code
• Ensure salt states are placed into the .salt directory in salt-ssh
• Use a randomized path for temporary files in a salt-cloud deployment
• Clean any stale directories to ensure a fresh copy of salt-sshd during a deployment

35.2.28 Salt 2014.1.9 Release Notes

release  2014-07-31

Note:  This release contained a regression which caused inaccurate Salt version detection, and thus was never packaged for general release. Please use version 2014.1.10 instead.

Note:  Version 2014.1.8 contained a regression which caused inaccurate Salt version detection, and thus was never packaged for general release. This version contains the version detection fix, but is otherwise identical to 2014.1.8.

Version 2014.1.9 is another bugfix release for 2014.1. Changes include:
• Ensure salt-ssh will not continue if permissions on a temporary directory are not correct.
• Use the bootstrap script distributed with Salt instead of relying on an external resource
• Remove unused testing code
• Ensure salt states are placed into the .salt directory in salt-ssh
• Use a randomized path for temporary files in a salt-cloud deployment
• Clean any stale directories to ensure a fresh copy of salt-sshd during a deployment

35.2. Previous Releases  2175
35.2.29 Salt 0.10.0 Release Notes

release 2012-06-16

0.10.0 has arrived! This release comes with MANY bug fixes, and new capabilities which greatly enhance performance and reliability. This release is primarily a bug fix release with many new tests and many repaired bugs. This release also introduces a few new key features which were brought in primarily to repair bugs and some limitations found in some of the components of the original architecture.

Major Features

Event System

The Salt Master now comes equipped with a new event system. This event system has replaced some of the back end of the Salt client and offers the beginning of a system which will make plugging external applications into Salt. The event system relies on a local ZeroMQ publish socket and other processes can connect to this socket and listen for events. The new events can be easily managed via Salt’s event library.

Unprivileged User Updates

Some enhancements have been added to Salt for running as a user other than root. These new additions should make switching the user that the Salt Master is running as very painless, simply change the user option in the master configuration and restart the master, Salt will take care of all of the particulars for you.

Peer Runner Execution

Salt has long had the peer communication system used to allow minions to send commands via the salt master. 0.10.0 adds a new capability here, now the master can be configured to allow for minions to execute Salt runners via the peer_run option in the salt master configuration.

YAML Parsing Updates

In the past the YAML parser for sls files would return the incorrect numbers when the file mode was set with a preceding 0. The YAML parser used in Salt has been modified to no longer convert these number into octal but to keep them as the correct value so that sls files can be a little cleaner to write.

State Call Data Files

It was requested that the minion keep a local cache of the most recent executed state run. This has been added and now with state runs the data is stored in a msgpack file in the minion’s cachedir.

Turning Off the Job Cache

A new option has been added to the master configuration file. In previous releases the Salt client would look over the Salt job cache to read in the minion return data. With the addition of the event system the Salt client can now watch for events directly from the master worker processes.

This means that the job cache is no longer a hard requirement. Keep in mind though, that turning off the job cache means that historic job execution data cannot be retrieved.
Test Updates

Minion Swarms Are Faster

To continue our efforts with testing Salt’s ability to scale the minionswarm script has been updated. The minion-swarm can now start up minions much faster than it could before and comes with a new feature allowing modules to be disabled, thus lowering the minion’s footprint when making a swarm. These new updates have allows us to test

```bash
# python minionswarm.py -m 20 --master salt-master
```

Many Fixes

To get a good idea for the number of bugfixes this release offers take a look at the closed tickets for 0.10.0, this is a very substantial update:

https://github.com/saltstack/salt/issues?milestone=12&state=closed

Master and Minion Stability Fixes

As Salt deployments grow new ways to break Salt are discovered. 0.10.0 comes with a number of fixes for the minions and master greatly improving Salt stability.

35.2.30 Salt 0.10.1 Release Notes

release 2012-06-19

35.2.31 Salt 0.10.2 Release Notes

release 2012-07-30

0.10.2 is out! This release comes with enhancements to the pillar interface, cleaner ways to access the salt-call capabilities in the API, minion data caching and the event system has been added to salt minions.

There have also been updates to the ZeroMQ functions, many more tests (thanks to sponsors, the code sprint and many contributors) and a swath of bug fixes.

Major Features

Ext Pillar Modules

The ranks of available Salt modules directories sees a new member in 0.10.2. With the popularity of pillar a higher demand has arisen for ext_pillar interfaces to be more like regular Salt module additions. Now ext_pillar interfaces can be added in the same way as other modules, just drop it into the pillar directory in the salt source.
Minion Events

In 0.10.0 an event system was added to the Salt master. 0.10.2 adds the event system to the minions as well. Now event can be published on a local minion as well.

The minions can also send events back up to the master. This means that Salt is able to communicate individual events from the minions back up to the Master which are not associated with command.

Minion Data Caching

When pillar was introduced the landscape for available data was greatly enhanced. The minion's began sending grain data back to the master on a regular basis.

The new config option on the master called minion_data_cache instructs the Salt master to maintain a cache of the minion's grains and pillar data in the cachedir. This option is turned off by default to avoid hitting the disk more, but when enabled the cache is used to make grain matching from the salt command more powerful, since the minions that will match can be predetermined.

Backup Files

By default all files replaced by the file.managed and file.recurse states we simply deleted. 0.10.2 adds a new option. By setting the backup option to minion the files are backed up before they are replaced.

The backed up files are located in the cachedir under the file_backup directory. On a default system this will be at: /var/cache/salt/file_backup

Configuration files

salt-master and salt-minion automatically load additional configuration files from master.d/*.conf respective minion.d/*.conf where master.d/minion.d is a directory in the same directory as the main configuration file.

Salt Key Verification

A number of users complained that they had inadvertently deleted the wrong salt authentication keys. 0.10.2 now displays what keys are going to be deleted and verifies that they are the keys that are intended for deletion.

Key auto-signing

If autosign_file is specified in the configuration file incoming keys will be compared to the list of keynames in autosign_file. Regular expressions as well as globbing is supported.

The file must only be writable by the user otherwise the file will be ignored. To relax the permission and allow group write access set the permissive_pki_access option.

Module changes

Improved OpenBSD support    New modules for managing services and packages were provided by Joshua Elsasser to further improve the support for OpenBSD.

Existing modules like the disk module were also improved to support OpenBSD.
SQL Modules  The MySQL and PostgreSQL modules have both received a number of additions thanks to the work of Avi Marcus and Roman Imankulov.

ZFS Support on FreeBSD  A new ZFS module has been added by Kurtis Velarde for FreeBSD supporting various ZFS operations like creating, extending or removing zpools.

Augeas  A new Augeas module by Ulrich Dangel for editing and verifying config files.

Native Debian Service module  The support for the Debian was further improved with an new service module for Debian by Ahmad Khayyat supporting disable and enable.

Cassandra  Cassandra support has been added by Adam Garside. Currently only status and diagnostic information are supported.

Networking  The networking support for RHEL has been improved and supports bonding support as well as zero-conf configuration.

Monit  Basic monit support by Kurtis Velarde to control services via monit.

nzbget  Basic support for controlling nzbget by Joseph Hall

Bluetooth  Basic bluez support for managing and controlling Bluetooth devices. Supports scanning as well as pairing/unpairing by Joseph Hall.

Test Updates

Consistency Testing

Another testing script has been added. A bug was found in pillar when many minions generated pillar data at the same time. The new consist.py script is the tests directory was created to reproduce bugs where data should always be consistent.

Many Fixes

To get a good idea for the number of bugfixes this release offers take a look at the closed tickets for 0.10.2, this is a very substantial update:
https://github.com/saltstack/salt/issues?milestone=24&page=1&state=closed

Master and Minion Stability Fixes

As Salt deployments grow new ways to break Salt are discovered. 0.10.2 comes with a number of fixes for the minions and master greatly improving Salt stability.
35.2.32 Salt 0.10.3 Release Notes

release 2012-09-30

The latest taste of Salt has come, this release has many fixes and feature additions. Modifications have been made to make ZeroMQ connections more reliable, the beginning of the ACL system is in place, a new command line parsing system has been added, dynamic module distribution has become more environment aware, the new master_finger option and many more!

Major Features

ACL System

The new ACL system has been introduced. The ACL system allows for system users other than root to execute salt commands. Users can be allowed to execute specific commands in the same way that minions are opened up to the peer system.

The configuration value to open up the ACL system is called client_acl and is configured like so:

```yaml
client_acl:
    fred:
    - test..*
    - pkg.list_pkgs
```

Where fred is allowed access to functions in the test module and to the pkg.list_pkgs function.

Master Finger Option

The master_finger option has been added to improve the security of minion provisioning. The master_finger option allows for the fingerprint of the master public key to be set in the configuration file to double verify that the master is valid. This option was added in response to a motivation to pre-authenticate the master when provisioning new minions to help prevent man in the middle attacks in some situations.

Salt Key Fingerprint Generation

The ability to generate fingerprints of keys used by Salt has been added to salt-key. The new option finger accepts the name of the key to generate and display a fingerprint for.

```
salt-key -F master
```

Will display the fingerprints for the master public and private keys.

Parsing System

Pedro Algavio, aka s0undt3ch, has added a substantial update to the command line parsing system that makes the help message output much cleaner and easier to search through. Salt parsers now have --versions-report besides usual --version info which you can provide when reporting any issues found.
Key Generation

We have reduced the requirements needed for `salt-key` to generate minion keys. You’re no longer required to have salt configured and it’s common directories created just to generate keys. This might prove useful if you’re batch creating keys to pre-load on minions.

Startup States

A few configuration options have been added which allow for states to be run when the minion daemon starts. This can be a great advantage when deploying with Salt because the minion can apply states right when it first runs. To use startup states set the `startup_states` configuration option on the minion to `highstate`.

New Exclude Declaration

Some users have asked about adding the ability to ensure that other sls files or ids are excluded from a state run. The exclude statement will delete all of the data loaded from the specified sls file or will delete the specified id:

```yaml
exclude:
  - sls: http
  - id: /etc/vimrc
```

Max Open Files

While we’re currently unable to properly handle ZeroMQ’s abort signals when the max open files is reached, due to the way that’s handled on ZeroMQ’s, we have minimized the chances of this happening without at least warning the user.

More State Output Options

Some major changes have been made to the state output system. In the past state return data was printed in a very verbose fashion and only states that failed or made changes were printed by default. Now two options can be passed to the master and minion configuration files to change the behavior of the state output. State output can be set to verbose (default) or non-verbose with the `state_verbose` option:

```yaml
state_verbose: False
```

It is noteworthy that the state_verbose option used to be set to `False` by default but has been changed to `True` by default in 0.10.3 due to many requests for the change.

The next option to be aware of new and called `state_output`. This option allows for the state output to be set to `full` (default) or `terse`.

The `full` output is the standard state output, but the new `terse` output will print only one line per state making the output much easier to follow when executing a large state system.

```yaml
state_output: terse
```
**state.file.append Improvements**

The salt state `file.append()` tries not to append existing text. Previously the matching check was being made line by line. While this kind of check might be enough for most cases, if the text being appended was multi-line, the check would not work properly. This issue is now properly handled, the match is done as a whole ignoring any white space addition or removal except inside commas. For those thinking that, in order to properly match over multiple lines, salt will load the whole file into memory, that's not true. For most cases this is not important but an erroneous order to read a 4GB file, if not properly handled, like salt does, could make salt chew that amount of memory. Salt has a buffered file reader which will keep in memory a maximum of 256KB and iterates over the file in chunks of 32KB to test for the match, more than enough, if not, explain your usage on a ticket. With this change, also `salt.modules.file.contains()`, `salt.modules.file.contains_regex()`, `salt.modules.file.contains_glob()` and `salt.utils.find` now do the searching and/or matching using the buffered chunks approach explained above.

Two new keyword arguments were also added, `makedirs` and `source`. The first, `makedirs` will create the necessary directories in order to append to the specified file, of course, it only applies if we’re trying to append to a non-existing file on a non-existing directory:

```
/tmp/salttest/file-append-makedirs:
    file.append:
        text: foo
        makedirs: True
```

The second, `source`, allows one to append the contents of a file instead of specifying the text.

```
/tmp/salttest/file-append-source:
    file.append:
        - source: salt://testfile
```

**Security Fix**

A timing vulnerability was uncovered in the code which decrypts the AES messages sent over the network. This has been fixed and upgrading is strongly recommended.

### 35.2.33 Salt 0.10.4 Release Notes

**release** 2012-10-23

Salt 0.10.4 is a monumental release for the Salt team, with two new module systems, many additions to allow granular access to Salt, improved platform support and much more.

This release is also exciting because we have been able to shorten the release cycle back to under a month. We are working hard to keep up the aggressive pace and look forward to having releases happen more frequently!

This release also includes a serious security fix and all users are very strongly recommended to upgrade. As usual, upgrade the master first, and then the minion to ensure that the process is smooth.

**Major Features**

**External Authentication System**

The new external authentication system allows for Salt to pass through authentication to any authentication system to determine if a user has permission to execute a Salt command. The Unix PAM system is the first supported system
The external authentication system allows for specific users to be granted access to execute specific functions on specific minions. Access is configured in the master configuration file, and uses the new access control system:

```yaml
external_auth:
pam:
  thatch:
    - 'web*':
    - test.*
    - network.*
```

The configuration above allows the user `thatch` to execute functions in the test and network modules on minions that match the `web*` target.

**Access Control System**

All Salt systems can now be configured to grant access to non-administrative users in a granular way. The old configuration continues to work. Specific functions can be opened up to specific minions from specific users in the case of external auth and client ACLs, and for specific minions in the case of the peer system.

Access controls are configured like this:

```yaml
client_acl:
  fred:
    - web\*:
      - pkg.list_pkgs
      - test.*
      - apache.*
```

**Target by Network**

A new matcher has been added to the system which allows for minions to be targeted by network. This new matcher can be called with the `-S` flag on the command line and is available in all places that the matcher system is available. Using it is simple:

```bash
$ salt -S '192.168.1.0/24' test.ping
$ salt -S '192.168.1.100' test.ping
```

**Nodegroup Nesting**

Previously a nodegroup was limited by not being able to include another nodegroup, this restraint has been lifted and now nodegroups will be expanded within other nodegroups with the `N@` classifier.

**Salt Key Delete by Glob**

The ability to delete minion keys by glob has been added to `salt-key`. To delete all minion keys whose minion name starts with `web`:

```bash
$ salt-key -d 'web*'`
Master Tops System

The `external_nodes` system has been upgraded to allow for modular subsystems to be used to generate the top file data for a highstate run.

The `external_nodes` option still works but will be deprecated in the future in favor of the new `master_tops` option.

Example of using `master_tops`:

```yaml
master_tops:
  ext_nodes: cobbler-external-nodes
```

Next Level Solaris Support

A lot of work has been put into improved Solaris support by Romeo Theriault. Packaging modules (pkgadd/pkgrm and pkgutil) and states, cron support and user and group management have all been added and improved upon. These additions along with SMF (Service Management Facility) service support and improved Solaris grain detection in 0.10.3 add up to Salt becoming a great tool to manage Solaris servers with.

Security

A vulnerability in the security handshake was found and has been repaired, old minions should be able to connect to a new master, so as usual, the master should be updated first and then the minions.

Pillar Updates

The pillar communication has been updated to add some extra levels of verification so that the intended minion is the only one allowed to gather the data. Once all minions and the master are updated to salt 0.10.4 please activate pillar 2 by changing the `pillar_version` in the master config to 2. This will be set to 2 by default in a future release.

35.2.34 Salt 0.10.5 Release Notes

Salt 0.10.5 is ready, and comes with some great new features. A few more interfaces have been modularized, like the outputter system. The job cache system has been made more powerful and can now store and retrieve jobs archived in external databases. The returner system has been extended to allow minions to easily retrieve data from a returner interface.

As usual, this is an exciting release, with many noteworthy additions!

Major Features

External Job Cache

The external job cache is a system which allows for a returner interface to also act as a job cache. This system is intended to allow users to store job information in a central location for longer periods of time and to make the act of looking up information from jobs executed on other minions easier.

Currently the external job cache is supported via the mongo and redis returners:
ext_job_cache: redis
redis.host: salt

Once the external job cache is turned on the new ret module can be used on the minions to retrieve return information from the job cache. This can be a great way for minions to respond and react to other minions.

OpenStack Additions

OpenStack integration with Salt has been moving forward at a blistering pace. The new nova, glance, and keystone modules represent the beginning of ongoing OpenStack integration.

The Salt team has had many conversations with core OpenStack developers and is working on linking to OpenStack in powerful new ways.

Wheel System

A new API was added to the Salt Master which allows the master to be managed via an external API. This new system allows Salt API to easily hook into the Salt Master and manage configs, modify the state tree, manage the pillar and more. The main motivation for the wheel system is to enable features needed in the upcoming web UI so users can manage the master just as easily as they manage minions.

The wheel system has also been hooked into the external auth system. This allows specific users to have granular access to manage components of the Salt Master.

Render Pipes

Jack Kuan has added a substantial new feature. The render pipes system allows Salt to treat the render system like unix pipes. This new system enables sls files to be passed through specific render engines. While the default renderer is still recommended, different engines can now be more easily merged. So to pipe the output of Mako used in YAML use this shebang line:

#!/mako|yaml

Salt Key Overhaul

The Salt Key system was originally developed as only a CLI interface, but as time went on it was pressed into becoming a clumsy API. This release marks a complete overhaul of Salt Key. Salt Key has been rewritten to function purely from an API and to use the outputter system. The benefit here is that the outputter system works much more cleanly with Salt Key now, and the internals of Salt Key can be used much more cleanly.

Modular Outputters

The outputter system is now loaded in a modular way. This means that output systems can be more easily added by dropping a python file down on the master that contains the function output.

Gzip from Fileserver

Gzip compression has been added as an option to the cp.get_file and cp.get_dir commands. This will make file transfers more efficient and faster, especially over slower network links.
Unified Module Configuration

In past releases of Salt, the minions needed to be configured for certain modules to function. This was difficult because it required pre-configuring the minions. 0.10.5 changes this by making all module configs on minions search the master config file for values.

Now if a single database server is needed, then it can be defined in the master config and all minions will become aware of the configuration value.

Salt Call Enhancements

The `salt-call` command has been updated in a few ways. Now, `salt-call` can take the `--return` option to send the data to a returner. Also, `salt-call` now reports executions in the minion proc system, this allows the master to be aware of the operation salt-call is running.

Death to `pub_refresh` and `sub_timeout`

The old configuration values `pub_refresh` and `sub_timeout` have been removed. These options were in place to alleviate problems found in earlier versions of ZeroMQ which have since been fixed. The continued use of these options has proven to cause problems with message passing and have been completely removed.

Git Revision Versions

When running Salt directly from git (for testing or development, of course) it has been difficult to know exactly what code is being executed. The new versioning system will detect the git revision when building and how many commits have been made since the last release. A release from git will look like this:

0.10.4-736-gec74d69

Svn Module Addition

Anthony Cornehl (twinshadow) contributed a module that adds Subversion support to Salt. This great addition helps round out Salt’s VCS support.

Noteworthy Changes

Arch Linux Defaults to Systemd

Arch Linux recently changed to use systemd by default and discontinued support for init scripts. Salt has followed suit and defaults to systemd now for managing services in Arch.

Salt, Salt Cloud and Openstack

With the releases of Salt 0.10.5 and Salt Cloud 0.8.2, OpenStack becomes the first (non-OS) piece of software to include support both on the user level (with Salt Cloud) and the admin level (with Salt). We are excited to continue to extend support of other platforms at this level.
35.2.35 Salt 0.11.0 Release Notes

```
release  2012-12-14
```

Salt 0.11.0 is here, with some highly sought after and exciting features. These features include the new overstate system, the reactor system, a new state run scope component called __context__, the beginning of the search system (still needs a great deal of work), multiple package states, the MySQL returner and a better system to arbitrarily reference outputters.

It is also noteworthy that we are changing how we mark release numbers. For the life of the project we have been pushing every release with features and fixes as point releases. We will now be releasing point releases for only bug fixes on a more regular basis and major feature releases on a slightly less regular basis. This means that the next release will be a bugfix only release with a version number of 0.11.1. The next feature release will be named 0.12.0 and will mark the end of life for the 0.11 series.

**Major Features**

**OverState**

The overstate system is a simple way to manage rolling state executions across many minions. The overstate allows for a state to depend on the successful completion of another state.

**Reactor System**

The new reactor system allows for a reactive logic engine to be created which can respond to events within a salted environment. The reactor system uses sls files to match events fired on the master with actions, enabling Salt to react to problems in an infrastructure.

Your load-balanced group of webservers is under extra load? Spin up a new VM and add it to the group. Your fileserver is filling up? Send a notification to your sysadmin on call. The possibilities are endless!

**Module Context**

A new component has been added to the module loader system. The module context is a data structure that can hold objects for a given scope within the module.

This allows for components that are initialized to be stored in a persistent context which can greatly speed up ongoing connections. Right now the best example can be found in the cp execution module.

**Multiple Package Management**

A long desired feature has been added to package management. By definition Salt States have always installed packages one at a time. On most platforms this is not the fastest way to install packages. Erik Johnson, aka terminalmage, has modified the package modules for many providers and added new capabilities to install groups of packages. These package groups can be defined as a list of packages available in repository servers:

```
python_pkgs:
  pkg.installed:
    - pkgs:
      - python-mako
      - whoosh
      - python-git
```
or specify based on the location of specific packages:

```
python_pkgs:
  pkg.installed:
  - sources:
    - python-mako: http://some-rpms.org/python-mako.rpm
    - whoosh: salt://whoosh/whoosh.rpm
    - python-git: ftp://companyserver.net/python-git.rpm
```

**Search System**

The bones to the search system have been added. This is a very basic interface that allows for search backends to be added as search modules. The first supported search module is the whoosh search backend. Right now only the basic paths for the search system are in place, making this very experimental. Further development will involve improving the search routines and index routines for whoosh and other search backends.

The search system has been made to allow for searching through all of the state and pillar files, configuration files and all return data from minion executions.

**Notable Changes**

All previous versions of Salt have shared many directories between the master and minion. The default locations for keys, cached data and sockets has been shared by master and minion. This has created serious problems with running a master and a minion on the same systems. 0.11.0 changes the defaults to be separate directories. Salt will also attempt to migrate all of the old key data into the correct new directories, but if it is not successful it may need to be done manually. If your keys exhibit issues after updating make sure that they have been moved from `/etc/salt/pki` to `/etc/salt/pki/{master, minion}`.

The old setup will look like this:

```
/etc/salt/pki
|-- master.pem
|-- master.pub
|-- minions
   |-- ragnarok.saltstack.net
   |-- minions_pre
   |-- minion.pem
   |-- minion.pub
   `-- minion_master.pub
      `-- minions_pre
         `-- minions_rejected
```

With the accepted minion keys in `/etc/salt/pki/minions`, the new setup places the accepted minion keys in `/etc/salt/pki/master/minions`.

```
/etc/salt/pki
|-- master
   |-- master.pem
   |-- master.pub
   |-- minions
      |-- ragnarok.saltstack.net
```

2188 Chapter 35. Release notes
35.2.36 Salt 0.11.1 Release Notes

release 2012-12-19

35.2.37 Salt 0.12.0 Release Notes

release 2013-01-15

Another feature release of Salt is here! Some exciting additions are included with more ways to make salt modular and even easier management of the salt file server.

Major Features

Modular Fileserver Backend

The new modular fileserver backend allows for any external system to be used as a salt file server. The main benefit here is that it is now possible to tell the master to directly use a git remote location, or many git remote locations, automatically mapping git branches and tags to salt environments.

Windows is First Class!

A new Salt Windows installer is now available! Much work has been put in to improve Windows support. With this much easier method of getting Salt on your Windows machines, we hope even more development and progress will occur. Please file bug reports on the Salt GitHub repo issue tracker so we can continue improving.

One thing that is missing on Windows that Salt uses extensively is a software package manager and a software package repository. The Salt pkg state allows sys admins to install software across their infrastructure and across operating systems. Software on Windows can now be managed in the same way. The SaltStack team built a package manager that interfaces with the standard Salt pkg module to allow for installing and removing software on Windows. In addition, a software package repository has been built on top of the Salt fileserver. A small YAML file provides the information necessary for the package manager to install and remove software.

An interesting feature of the new Salt Windows software package repository is that one or more remote git repositories can supplement the master’s local repository. The repository can point to software on the master’s fileserver or on an HTTP, HTTPS, or ftp server.

New Default Outputer

Salt displays data to the terminal via the outputer system. For a long time the default outputer for Salt has been the python pretty print library. While this has been a generally reasonable outputer, it did have many failings. The new default outputer is called `nested`, it recursively scans return data structures and prints them out cleanly.
If the result of the new nested outputter is not desired any other outputter can be used via the --out option, or the output option can be set in the master and minion configs to change the default outputter.

**Internal Scheduler**

The internal Salt scheduler is a new capability which allows for functions to be executed at given intervals on the minion, and for runners to be executed at given intervals on the master. The scheduler allows for sequences such as executing state runs (locally on the minion or remotely via an overstate) or continually gathering system data to be run at given intervals.

The configuration is simple, add the schedule option to the master or minion config and specify jobs to run, this in the master config will execute the state.over runner every 60 minutes:

```
schedule:
  overstate:
    function: state.over
    minutes: 60
```

This example for the minion configuration will execute a highstate every 30 minutes:

```
schedule:
  highstate:
    function: state.highstate
    minutes: 30
```

**Optional DSL for SLS Formulas**

Jack Kuan, our renderer expert, has created something that is astonishing. Salt, now comes with an optional Python based DSL, this is a very powerful interface that makes writing SLS files in pure python easier than it was with the raw py renderer. As usual this can be used with the renderer shebang line, so a single sls can be written with the DSL if pure python power is needed while keeping other sls files simple with YAML.

**Set Grains Remotely**

A new execution function and state module have been added that allows for grains to be set on the minion. Now grains can be set via a remote execution or via states. Use the `grains.present` state or the `grains.setval` execution functions.

**Gentoo Additions**

Major additions to Gentoo specific components have been made. The encompasses executions modules and states ranging from supporting the make.conf file to tools like layman.

**35.2.38 Salt 0.12.1 Release Notes**

```
release 2013-01-21
```
Salt Documentation, Release 2015.8.0

35.2.39 Salt 0.13.0 Release Notes
release 2013-02-12
The lucky number 13 has turned the corner! From CLI notifications when quitting a salt command, to substantial
improvements on Windows, Salt 0.13.0 has arrived!
Major Features
Improved file.recurse Performance

The file.recurse system has been deployed and used in a vast array of situations. Fixes to the file state and module
have led towards opening up new ways of running file.recurse to make it faster. Now the file.recurse state will
download fewer files and will run substantially faster.
Windows Improvements

Minion stability on Windows has improved. Many file operations, including file.recurse, have been fixed and improved. The network module works better, to include network.interfaces. Both 32bit and 64bit installers are now
available.
Nodegroup Targeting in Peer System

In the past, nodegroups were not available for targeting via the peer system. This has been fixed, allowing the new
nodegroup expr_form argument for the publish.publish function:
salt-call publish.publish group1 test.ping expr_form=nodegroup
Blacklist Additions

Additions allowing more granular blacklisting are available in 0.13.0. The ability to blacklist users and functions in
client_acl have been added, as well as the ability to exclude state formulas from the command line.
Command Line Pillar Embedding

Pillar data can now be embedded on the command line when calling state.sls and state.highstate. This
allows for on the fly changes or settings to pillar and makes parameterizing state formulas even easier. This is done
via the keyword argument:
salt '*' state.highstate pillar='{"cheese": "spam"}'

The above example will extend the existing pillar to hold the cheese key with a value of spam. If the cheese key
is already specified in the minion's pillar then it will be overwritten.
CLI Notifications

In the past hitting ctrl-C and quitting from the salt command would just drop to a shell prompt, this caused
confusion with users who expected the remote executions to also quit. Now a message is displayed showing what
command can be used to track the execution and what the job id is for the execution.

35.2. Previous Releases

2191


Version Specification in Multiple-Package States

Versions can now be specified within multiple-package `pkg.installed` states. An example can be found below:

```
mypkgs:
    pkg.installed:
        - pkgs:
            - foo
            - bar: 1.2.3-4
            - baz
```

Noteworthy Changes

The configuration subsystem in Salt has been overhauled to make the `opts` dict used by Salt applications more portable, the problem is that this is an incompatible change with salt-cloud, and salt-cloud will need to be updated to the latest git to work with Salt 0.13.0. Salt Cloud 0.8.5 will also require Salt 0.13.0 or later to function.

The SaltStack team is sorry for the inconvenience here, we work hard to make sure these sorts of things do not happen, but sometimes hard changes get in.

35.2.40 Salt 0.13.1 Release Notes

    release 2013-02-15

35.2.41 Salt 0.13.2 Release Notes

    release 2013-03-13

35.2.42 Salt 0.13.3 Release Notes

    release 2013-03-18

35.2.43 Salt 0.14.0 Release Notes

    release 2013-03-23

Salt 0.14.0 is here! This release was held up primarily by PyCon, Scale, and illness, but has arrived! 0.14.0 comes with many new features and is breaking ground for Salt in the area of cloud management with the introduction of Salt providing basic cloud controller functionality.

Major Features

Salt - As a Cloud Controller

This is the first primitive inroad to using Salt as a cloud controller is available in 0.14.0. Be advised that this is alpha, only tested in a few very small environments.

The cloud controller is built using kvm and libvirt for the hypervisors. Hypervisors are autodetected as minions and only need to have libvirt running and kvm installed to function. The features of the Salt cloud controller are as follows:
• Basic vm discovery and reporting
• Creation of new virtual machines
• Seeding virtual machines with Salt via qemu-nbd or libguestfs
• Live migration (shared and non shared storage)
• Delete existing VMs

It is noteworthy that this feature is still Alpha, meaning that all rights are reserved to change the interface if needs be in future releases!

Libvirt State

One of the problems with libvirt is management of certificates needed for live migration and cross communication between hypervisors. The new libvirt state makes the Salt Master hold a CA and manage the signing and distribution of keys onto hypervisors, just add a call to the libvirt state in the sls formulas used to set up a hypervisor:

```
libvirt_keys:
  libvirt.keys
```

New get Functions

An easier way to manage data has been introduced. The pillar, grains, and config execution modules have been extended with the new get function. This function works much in the same way as the get method in a python dict, but with an enhancement, nested dict components can be extracted using a : delimiter.

If a structure like this is in pillar:

```
foo:
  bar:
    baz: quo
```

Extracting it from the raw pillar in an sls formula or file template is done this way:

```
{{ pillar['foo']['bar']['baz'] }}
```

Now with the new get function the data can be safely gathered and a default can be set allowing the template to fall back if the value is not available:

```
{{ salt['pillar.get']('foo:bar:baz', 'qux') }}
```

This makes handling nested structures much easier, and defaults can be cleanly set. This new function is being used extensively in the new formulae repository of salt sls formulas.

35.2.44 Salt 0.14.1 Release Notes

release  2013-04-13
The many new features of Salt 0.15.0 have arrived! Salt 0.15.0 comes with many smaller features and a few larger ones.

These features range from better debugging tools to the new Salt Mine system.

**Major Features**

**The Salt Mine**

First there was the peer system, allowing for commands to be executed from a minion to other minions to gather data live. Then there was the external job cache for storing and accessing long term data. Now the middle ground is being filled in with the Salt Mine. The Salt Mine is a system used to execute functions on a regular basis on minions and then store only the most recent data from the functions on the master, then the data is looked up via targets.

The mine caches data that is public to all minions, so when a minion posts data to the mine all other minions can see it.

**IPV6 Support**

0.13.0 saw the addition of initial IPV6 support but errors were encountered and it needed to be stripped out. This time the code covers more cases and must be explicitly enabled. But the support is much more extensive than before.

**Copy Files From Minions to the Master**

Minions have long been able to copy files down from the master file server, but until now files could not be easily copied from the minion up to the master.

A new function called `cp.push` can push files from the minions up to the master server. The uploaded files are then cached on the master in the master cachedir for each minion.

**Better Template Debugging**

Template errors have long been a burden when writing states and pillar. 0.15.0 will now send the compiled template data to the debug log, this makes tracking down the intermittent stage templates much easier. So running `state.sls` or `state.highstate` with `-l debug` will now print out the rendered templates in the debug information.

**State Event Firing**

The state system is now more closely tied to the master's event bus. Now when a state fails the failure will be fired on the master event bus so that the reactor can respond to it.

**Major Syndic Updates**

The Syndic system has been basically re-written. Now it runs in a completely asynchronous way and functions primarily as an event broker. This means that the events fired on the syndic are now pushed up to the higher level master instead of the old method used which waited for the client libraries to return.
This makes the syndic much more accurate and powerful, it also means that all events fired on the syndic master make it up the pipe as well making a reactor on the higher level master able to react to minions further downstream.

Peer System Updates

The Peer System has been updated to run using the client libraries instead of firing directly over the publish bus. This makes the peer system much more consistent and reliable.

Minion Key Revocation

In the past when a minion was decommissioned the key needed to be manually deleted on the master, but now a function on the minion can be used to revoke the calling minion's key:

```
$ salt-call saltutil.revoke_auth
```

Function Return Codes

Functions can now be assigned numeric return codes to determine if the function executed successfully. While not all functions have been given return codes, many have and it is an ongoing effort to fill out all functions that might return a non-zero return code.

Functions in Overstate

The overstate system was originally created to just manage the execution of states, but with the addition of return codes to functions, requisite logic can now be used with respect to the overstate. This means that an overstate stage can now run single functions instead of just state executions.

Pillar Error Reporting

Previously if errors surfaced in pillar, then the pillar would consist of only an empty dict. Now all data that was successfully rendered stays in pillar and the render error is also made available. If errors are found in the pillar, states will refuse to run.

Using Cached State Data

Sometimes states are executed purely to maintain a specific state rather than to update states with new configs. This is grounds for the new cached state system. By adding `cache=True` to a state call the state will not be generated fresh from the master but the last state data to be generated will be used. If no previous state data is available then fresh data will be generated.

Monitoring States

The new monitoring states system has been started. This is very young but allows for states to be used to configure monitoring routines. So far only one monitoring state is available, the `disk.status` state. As more capabilities are added to Salt UI the monitoring capabilities of Salt will continue to be expanded.
35.2.46 Salt 0.15.1 Release Notes

release 2013-05-08

The 0.15.1 release has been posted, this release includes fixes to a number of bugs in 0.15.1 and a three security patches.

Security Updates

A number of security issues have been resolved via the 0.15.1 release.

Path Injection in Minion IDs

Salt masters did not properly validate the id of a connecting minion. This can lead to an attacker uploading files to the master in arbitrary locations. In particular this can be used to bypass the manual validation of new unknown minions.Exploiting this vulnerability does not require authentication.

This issue affects all known versions of Salt.

This issue was reported by Ronald Volgers.

Patch The issue is fixed in Salt 0.15.1. Updated packages are available in the usual locations.

Specific commits:
https://github.com/saltstack/salt/commit/5427b9438e452a5a8910d9128c6aafb45d8fd5d3
https://github.com/saltstack/salt/commit/7560908ee62351769c3cd43b03d74c1ca772cc52
https://github.com/saltstack/salt/commit/e200b8a7ff53780124e08d2bdefde7587e52bfca

RSA Key Generation Fault

RSA key generation was done incorrectly, leading to very insecure keys. It is recommended to regenerate all RSA keys.

This issue can be used to impersonate Salt masters or minions, or decrypt any transferred data.

This issue can only be exploited by attackers who are able to observe or modify traffic between Salt minions and the legitimate Salt master.

A tool was included in 0.15.1 to assist in mass key regeneration, the manage.regen_keys runner.

This issue affects all known versions of Salt.

This issue was reported by Ronald Volgers.

Patch The issue is fixed in Salt 0.15.1. Updated packages are available in the usual locations.

Specific commits:
https://github.com/saltstack/salt/commit/5dd304276ba5745ec21fc1e6686a0b28da29e6fc
Command Injection Via ext_pillar

Arbitrary shell commands could be executed on the master by an authenticated minion through options passed when requesting a pillar.

Ext pillar options have been restricted to only allow safe external pillars to be called when prompted by the minion.

This issue affects Salt versions from 0.14.0 to 0.15.0.

This issue was reported by Ronald Volgers.

Patch   The issue is fixed in Salt 0.15.1. Updated packages are available in the usual locations.

Specific commits:
https://github.com/saltstack/salt/commit/43d8c16bd26159d827d1a945c83ac28159ec5865

35.2.47 Salt 0.15.2 Release Notes

release 2013-05-29

35.2.48 Salt 0.15.3 Release Notes

release 2013-06-01

35.2.49 Salt 0.16.0 Release Notes

release 2013-07-01

The 0.16.0 release is an exciting one, with new features in master redundancy, and a new, powerful requisite.

Major Features

Multi-Master

This new capability allows for a minion to be actively connected to multiple salt masters at the same time. This allows for multiple masters to send out commands to minions and for minions to automatically reconnect to masters that have gone down. A tutorial is available to help get started here:

Multi Master Tutorial

Prereq, the New Requisite

The new prereq requisite is very powerful! It allows for states to execute based on a state that is expected to make changes in the future. This allows for a change on the system to be preempted by another execution. A good example is needing to shut down a service before modifying files associated with it, allowing, for instance, a webserver to be shut down allowing a load balancer to stop sending requests while server side code is updated. In this case, the prereq will only run if changes are expected to happen in the prerequired state, and the prerequired state will always run after the prereq state and only if the prereq state succeeds.
Peer System Improvements

The peer system has been revamped to make it more reliable, faster, and like the rest of Salt, async. The peer calls when an updated minion and master are used together will be much faster!

Relative Includes

The ability to include an sls relative to the defined sls has been added, the new syntax id documented here:

Includes

More State Output Options

The state_output option in the past only supported full and terse, 0.16.0 add the mixed and changes modes further refining how states are sent to users’ eyes.

Improved Windows Support

Support for Salt on Windows continues to improve. Software management on Windows has become more seamless with Linux/UNIX/BSD software management. Installed software is now recognized by the short names defined in the repository SLS. This makes it possible to run salt '*' pkg.version firefox and get back results from Windows and non-Windows minions alike.

When templating files on Windows, Salt will now correctly use Windows appropriate line endings. This makes it much easier to edit and consume files on Windows.

When using the cmd state the shell option now allows for specifying Windows Powershell as an alternate shell to execute cmd.run and cmd.script. This opens up Salt to all the power of Windows Powershell and its advanced Windows management capabilities.

Several fixes and optimizations were added for the Windows networking modules, especially when working with IPv6.

A system module was added that makes it easy to restart and shutdown Windows minions.

The Salt Minion will now look for its config file in c:\salt\conf by default. This means that it’s no longer necessary to specify the -c option to specify the location of the config file when starting the Salt Minion on Windows in a terminal.

Multiple Targets for pkg.removed, pkg.purged States

Both pkg.removed and pkg.purged now support the pkgs argument, which allow for multiple packages to be targeted in a single state. This, as in pkg.installed, helps speed up these states by reducing the number of times that the package management tools (apt, yum, etc.) need to be run.

Random Times in Cron States

The temporal parameters in cron.present states (minute, hour, etc.) can now be randomized by using random instead of a specific value. For example, by using the random keyword in the minute parameter of a cron state, the same cron job can be pushed to hundreds or thousands of hosts, and they would each use a randomly-generated minute. This can be helpful when the cron job accesses a network resource, and it is not desirable for all hosts to run the job concurrently.
/path/to/cron/script:
cron.present:
  - user: root
  - minute: random
  - hour: 2

Since Salt assumes a value of * for unspecified temporal parameters, adding a parameter to the state and setting it to random will change that value from * to a randomized numeric value. However, if that field in the cron entry on the minion already contains a numeric value, then using the random keyword will not modify it.

Confirmation Prompt on Key Acceptance

When accepting new keys with salt-key -a minion-id or salt-key -A, there is now a prompt that will show the affected keys and ask for confirmation before proceeding. This prompt can be bypassed using the -y or --yes command line argument, as with other salt-key commands.

Support for Setting Password Hashes on BSD Minions

FreeBSD, NetBSD, and OpenBSD all now support setting passwords in user.present states.

35.2.50 Salt 0.16.1 Release Notes

release 2013-07-29

35.2.51 Salt 0.16.2 Release Notes

release 2013-08-01

Version 0.16.2 is a bugfix release for 0.16.0, and contains a number of fixes.

Windows

- Only allow Administrator’s group and SYSTEM user access to C:salt. This eliminates a race condition where a non-admin user could modify a template or managed file before it is executed by the minion (which is running as an elevated user), thus avoiding a potential escalation of privileges. (issue 6361)

Grains

- Fixed detection of virtual grain on OpenVZ hardware nodes
- Gracefully handle lsb_release data when it is enclosed in quotes
- LSB grains are now prefixed with lsb_distrib_ instead of simply lsb_. The old naming is not preserved, so SLS may be affected.
- Improved grains detection on MacOS
Pillar

- Don’t try to load `git_pillar` if not enabled in master config (issue 6052)
- Functions `pillar.item` and `pillar.items` added for parity with `grains.item/grains.items`. The old function `pillar.data` is preserved for backwards compatibility.
- Fixed minion traceback when Pillar SLS is malformed (issue 5910)

Peer Publishing

- More gracefully handle improperly quoted publish commands (issue 5958)
- Fixed traceback when timeout specified via the CLI for `publish.publish, publish.full_data` (issue 5959)
- Fixed unintended change in output of `publish.publish` (issue 5928)

Minion

- Fixed salt-key usage in minionswarm script
- Quieted warning about `SALT_MINION_CONFIG` environment variable on minion startup and for CLI commands run via `salt-call` (issue 5956)
- Added minion config parameter `random_reauth_delay` to stagger re-auth attempts when the minion is waiting for the master to approve its public key. This helps prevent SYN flooding in larger environments.

User/Group Management

- Implement previously-ignored `unique` option for `user.present` states in FreeBSD
- Report in state output when a `group.present` state attempts to use a gid in use by another group
- Fixed regression that prevents a `user.present` state to set the password hash to the system default (i.e. an unset password)
- Fixed multiple `group.present` states with the same group (issue 6439)

File Management

- Fixed file.mkdir setting incorrect permissions (issue 6033)
- Fixed cleanup of source files for templates when `/tmp` is in file_roots (issue 6118)
- Fixed caching of zero-byte files when a non-empty file was previously cached at the same path
- Added HTTP authentication support to the `cp` module (issue 5641)
- Diffs are now suppressed when binary files are changed

Package/Repository Management

- Fixed traceback when there is only one target for `pkg.latest` states
- Fixed regression in detection of virtual packages (apt)
- Limit number of pkg database refreshes to once per `state.sls/state.highstate`
• YUM: Allow 32-bit packages with arches other than x86 to be managed on 64-bit systems (issue 6299)
• Fixed incorrect reporting in pkgrepo.managed states (issue 5517)
• Fixed 32-bit binary package installs on 64-bit RHEL-based distros, and added proper support for 32-bit packages on 64-bit Debian-based distros (issue 6303)
• Fixed issue where requisites were inadvertently being put into YUM repo files (issue 6471)

Service Management

• Fixed inaccurate reporting of results in service.running states when the service fails to start (issue 5894)
• Fixed handling of custom initscripts in RHEL-based distros so that they are immediately available, negating the need for a second state run to manage the service that the initscript controls

Networking

• Function network.hwaddr renamed to network.hw_addr to match network.ip_addrs and network.ip_addrs6. All three functions also now work without the underscore in the name, as well.
• Fixed traceback in bridge.show when interface is not present (issue 6326)

SSH

• Fixed incorrect result reporting for some ssh_known_hosts.present states
• Fixed inaccurate reporting when ssh_auth.present states are run with test=True, when rsa/dss is used for the enc param instead of ssh-rsa/ssh-dss (issue 5374)

pip

• Properly handle -f lines in pip freeze output
• Fixed regression in pip.installed states with specifying a requirements file (issue 6003)
• Fixed use of editable argument in pip.installed states (issue 6025)
• Deprecated runas parameter in execution function calls, in favor of user

MySQL

• Allow specification of MySQL connection arguments via the CLI, overriding/bypassing minion config params
• Allow mysql_user.present states to set a passwordless login (issue 5550)
• Fixed endless loop when mysql.processlist is run (issue 6297)

PostgreSQL

• Fixed traceback in postgres.user_list (issue 6352)
Miscellaneous

- Don't allow `npm states` to be used if `npm module` is not available
- Fixed `alternatives.install` states for which the target is a symlink (issue 6162)
- Fixed traceback in `sysbench module` (issue 6175)
- Fixed traceback in job cache
- Fixed tempfile cleanup for windows
- Fixed issue where SLS files using the `pydsl renderer` were not being run
- Fixed issue where returners were being passed incorrect information (issue 5518)
- Fixed traceback when numeric args are passed to `cmd.script` states
- Fixed bug causing `cp.get_dir` to return more directories than expected (issue 6048)
- Fixed traceback when `supervisord.running` states are run with `test=True` (issue 6053)
- Fixed tracebacks when Salt encounters problems running rbenv (issue 5888)
- Only make the `monit module` available if monit binary is present (issue 5871)
- Fixed incorrect behavior of `img.mount_image`
- Fixed traceback in `tomcat.deploy_war` in Windows
- Don't re-write `/etc/fstab` if mount fails
- Fixed tracebacks when Salt encounters problems running gem (issue 5886)
- Fixed incorrect behavior of `selinux.boolean` states (issue 5912)
- *RabbitMQ*: Quote passwords to avoid symbols being interpolated by the shell (issue 6338)
- Fixed tracebacks in `extfs.mkfs` and `extfs.tune` (issue 6462)
- Fixed a regression with the `module.run` state where the `m_name` and `m_fun` arguments were being ignored (issue 6464)

35.2.52 Salt 0.16.3 Release Notes

release 2013-08-09

Version 0.16.3 is another bugfix release for 0.16.0. The changes include:

- Various documentation fixes
- Fix proc directory regression (issue 6502)
- Properly detect Linaro Linux (issue 6496)
- Fix regressions in `mount.mounted` (issue 6522, issue 6545)
- Skip malformed state requisites (issue 6521)
- Fix regression in gitsfs from bad import
- Fix for watching prereq states (including recursive requisite error) (issue 6057)
- Fix `mod_watch` not overriding prereq (issue 6520)
- Don't allow functions which compile states to be called within states (issue 5623)
- Return error for malformed `top.sls` (issue 6544)
• Fix traceback in `mysql.query`
• Fix regression in binary package installation for 64-bit packages on Debian-based Linux distros (issue 6563)
• Fix traceback caused by running `cp.push` without having set `file_recv` in the master config file
• Fix scheduler configuration in pillar (issue 6201)

35.2.53 Salt 0.16.4 Release Notes

release 2013-09-07

Version 0.16.4 is another bugfix release for 0.16.0, likely to be the last before 0.17.0 is released. The changes include:

• Multiple documentation improvements/additions
• Added the osfinger and osarch grains
• Properly handle 32-bit packages for debian32 on x86_64 (issue 6607)
• Fix regression in yum package installation in CentOS 5 (issue 6677)
• Fix bug in `hg.latest` state that would erroneously delete directories (issue 6661)
• Fix bug related to pid not existing for `ps.top` (issue 6679)
• Fix regression in MySQL returner (issue 6695)
• Fix IP addresses grains (ipv4 and ipv6) to include all addresses (issue 6656)
• Fix regression preventing authenticated FTP (issue 6733)
• Fix setting password for windows users (issue 6824)
• Fix `file.contains` on values YAML parses as non-string (issue 6817)
• Fix `file.get_gid`, `file.get_uid`, and `file.chown` for broken symlinks (issue 6826)
• Fix comment for service reloads in service state (issue 6851)

35.2.54 Salt 0.17.0 Release Notes

release 2013-09-26

The 0.17.0 release is a very exciting release of Salt, this brings to Salt some very powerful new features and advances. The advances range from the state system to the test suite, covering new transport capabilities and making states easier and more powerful, to extending Salt Virt and much more!

The 0.17.0 release will also be the last release of Salt to follow the old 0.XX.X numbering system, the next release of Salt will change the numbering to be date based following this format:

<Year>-<Month>-<Minor>

So if the release happens in November of 2013 the number will be 13.11.0, the first bugfix release will be 13.11.1 and so forth.
Major Features

Halite

The new Halite web GUI is now available on PyPI. A great deal of work has been put into Halite to make it fully event driven and amazingly fast. The Halite UI can be started from within the Salt Master (after being installed from PyPI), or standalone, and does not require an external database to run. It is very lightweight!

This initial release of Halite is primarily the framework for the UI and the communication systems, making it easy to extend and build the UI up. It presently supports watching the event bus and firing commands over Salt.

At this time, Halite is not available as a package, but installation documentation is available at: http://docs.saltstack.com/topics/tutorials/halite.html

Halite is, like the rest of Salt, Open Source!

Much more will be coming in the future of Halite!

Salt SSH

The new salt-ssh command has been added to Salt. This system allows for remote execution and states to be run over ssh. The benefit here being, that salt can run relying only on the ssh agent, rather than requiring a minion to be deployed.

The salt-ssh system runs states in a compatible way as Salt and states created and run with salt-ssh can be moved over to a standard salt deployment without modification.

Since this is the initial release of salt-ssh, there is plenty of room for improvement, but it is fully operational, not just a bootstrap tool.

Rosters

Salt is designed to have the minions be aware of the master and the master does not need to be aware of the location of the minions. The new salt roster system was created and designed to facilitate listing the targets for salt-ssh.

The roster system, like most of Salt, is a plugin system, allowing for the list of systems to target to be derived from any pluggable backend. The rosters shipping with 0.17.0 are flat and scan. Flat is a file which is read in via the salt render system and the scan roster does simple network scanning to discover ssh servers.

State Auto Order

This is a major change in how states are evaluated in Salt. State Auto Order is a new feature that makes states get evaluated and executed in the order in which they are defined in the sls file. This feature makes it very easy to see the finite order in which things will be executed, making Salt now, fully imperative AND fully declarative.

The requisite system still takes precedence over the order in which states are defined, so no existing states should break with this change. But this new feature can be turned off by setting state_auto_order: False in the master config, thus reverting to the old lexicographical order.

state.sls Runner

The state.sls runner has been created to allow for a more powerful system for orchestrating state runs and function calls across the salt minions. This new system uses the state system for organizing executions.
This allows for states to be defined that are executed on the master to call states on minions via `salt-run state.sls`.

**Salt Thin**

Salt Thin is an exciting new component of Salt, this is the ability to execute Salt routines without any transport mechanisms installed, it is a pure python subset of Salt.

Salt Thin does not have any networking capability, but can be dropped into any system with Python installed and then `salt-call` can be called directly. The Salt Thin system, is used by the `salt-ssh` command, but can still be used to just drop salt somewhere for easy use.

**Event Namespacing**

Events have been updated to be much more flexible. The tags in events have all been namespaced allowing easier tracking of event names.

**Mercurial Fileserver Backend**

The popular git fileserver backend has been joined by the mercurial fileserver backend, allowing the state tree to be managed entirely via mercurial.

**External Logging Handlers**

The external logging handler system allows for Salt to directly hook into any external logging system. Currently supported are sentry and logstash.

**Jenkins Testing**

The testing systems in Salt have been greatly enhanced, tests for salt are now executed, via jenkins.saltstack.com, across many supported platforms. Jenkins calls out to salt-cloud to create virtual machines on Rackspace, then the minion on the virtual machine checks into the master running on Jenkins where a state run is executed that sets up the minion to run tests and executes the test suite.

This now automates the sequence of running platform tests and allows for continuous destructive tests to be run.

**Salt Testing Project**

The testing libraries for salt have been moved out of the main salt code base and into a standalone codebase. This has been done to ease the use of the testing systems being used in salt based projects other than Salt itself.

**StormPath External Authentication**

The external auth system now supports the fantastic Stormpath cloud based authentication system.
LXC Support

Extensive additions have been added to Salt for LXC support. This included the backend libs for managing LXC containers. Addition into the salt-virt system is still in the works.

Mac OS X User/Group Support

Salt is now able to manage users and groups on Minions running Mac OS X. However, at this time user passwords cannot be managed.

Django ORM External Pillar

Pillar data can now be derived from Django managed databases.

Fixes from RC to release

- Multiple documentation fixes
- Add multiple source files + templating for file.append (issue 6905)
- Support sysctl configuration files in systemd>=207 (issue 7351)
- Add file.search and file.replace
- Fix cross-calling execution functions in provider overrides
- Fix locale override for postgres (issue 4543)
- Fix Raspbian identification for service/pkg support (issue 7371)
- Fix cp.push file corruption (issue 6495)
- Fix ALT Linux password hash specification (issue 3474)
- Multiple salt-ssh-related fixes and improvements

35.2.55 Salt 0.17.1 Release Notes

release 2013-10-17

Note: THIS RELEASE IS NOT COMPATIBLE WITH PREVIOUS VERSIONS. If you update your master to 0.17.1, you must update your minions as well. Sorry for the inconvenience -- this is a result of one of the security fixes listed below.

The 0.17.1 release comes with a number of improvements to salt-ssh, many bugfixes, and a number of security updates.

Salt SSH has been improved to be faster, more featureful and more secure. Since the original release of Salt SSH was primarily a proof of concept, it has been very exciting to see its rapid adoption. We appreciate the willingness of security experts to review Salt SSH and help discover oversights and ensure that security issues only exist for such a tiny window of time.
SSH Enhancements

Shell Improvements

Improvements to Salt SSH’s communication have been added that improve routine execution regardless of the target system’s login shell.

Performance

Deployment of routines is now faster and takes fewer commands to execute.

Security Updates

Be advised that these security issues all apply to a small subset of Salt users and mostly apply to Salt SSH.

Insufficient Argument Validation

This issue allowed for a user with limited privileges to embed executions inside of routines to execute routines that should be restricted. This applies to users using external auth or client ACL and opening up specific routines.

Be advised that these patches address the direct issue. Additional commits have been applied to help mitigate this issue from resurfacing.

CVE  CVE-2013-4435

Affected Versions

0.15.0 - 0.17.0

Patches  https://github.com/saltstack/salt/commit/6d8ef68b605fd63e36bb8ed96122a75ad2e80269
https://github.com/saltstack/salt/commit/ebdef37b7e5d2b95a01d34b211c61c61da67e46a
https://github.com/saltstack/salt/commit/7f190ff890e47cd591d9d7cefa5126574660824
https://github.com/saltstack/salt/commit/8e5afe59cef6743fe5dbd510dfc463dbfca1ced
https://github.com/saltstack/salt/commit/aca78f314481082862e96d4f0c1b75f382bb885
https://github.com/saltstack/salt/commit/6a9752c0b1be8df2c9505ea910434c79d132eb1e2
https://github.com/saltstack/salt/commit/b73677435ba54ecfc93c1c2d840a7f9ba6f53410
https://github.com/saltstack/salt/commit/07972eb0a6f985749a55d8d4a2e471596591c80d
https://github.com/saltstack/salt/commit/1e3f197726aa13ac5c3f2416000089f477f489b5

Found By  Feth Arezki, of Majerti

MITM SSH attack in salt-ssh

SSH host keys were being accepted by default and not enforced on future SSH connections. These patches set SSH host key checking by default and can be overridden by passing the -i flag to salt-ssh.

CVE  CVE-2013-4436
Affected Versions 0.17.0

Found By Michael Scherer, Red Hat

Insecure Usage of /tmp in salt-ssh

The initial release of salt-ssh used the /tmp directory in an insecure way. These patches not only secure usage of files under /tmp in salt-ssh, but also add checksum validation for all packages sent into the now secure locations on target systems.

CVE CVE-2013-4438

Affected Versions 0.17.0

Patches https://github.com/saltstack/salt/commit/aa4bb77ef230758cad84381ddee0ec660d2dc340a
https://github.com/saltstack/salt/commit/8f92b6b2cb2e4ec3af8783eb6bf4ff06f5a352cf
https://github.com/saltstack/salt/commit/c58e56811d5a50e908df0597a0ba0b643b45ebfd
https://github.com/saltstack/salt/commit/0359db9b46e47614cff35a66ea6a7684685d2
https://github.com/saltstack/salt/commit/4348392860e0fd43701c331ac3e681cf1a8c17b0
https://github.com/saltstack/salt/commit/664d1a1acae05602fad2693f6f97092d98a72bf61
https://github.com/saltstack/salt/commit/bab92775a576e28ff9db262f32db9ecf2375bba87
https://github.com/saltstack/salt/commit/c6d34f1ac6f4900a3c87a2d37618ff414e5a704e

Found By Michael Scherer, Red Hat

YAML Calling Unsafe Loading Routine

It has been argued that this is not a valid security issue, as the YAML loading that was happening was only being called after an initial gateway filter in Salt has already safely loaded the YAML and would fail if non-safe routines were embedded. Nonetheless, the CVE was filed and patches applied.

CVE CVE-2013-4438

Patches

https://github.com/saltstack/salt/commit/339b0a51befae6b6b218ebcb55daa9cd3329a1c5

Found By Michael Scherer, Red Hat

Failure to Drop Supplementary Group on Salt Master

If a salt master was started as a non-root user by the root user, root's groups would still be applied to the running process. This fix changes the process to have only the groups of the running user.

CVE CVE not considered necessary by submitter.
Affected Versions  0.11.0 - 0.17.0

Patches  https://github.com/saltstack/salt/commit/b89fa9135822d029795ab1eecd68cce2d1ced715

Found By  Michael Scherer, Red Hat

Failure to Validate Minions Posting Data

This issue allowed a minion to pose as another authorized minion when posting data such as the mine data. All minions now pass through the id challenge before posting such data.

CVE  CVE-2013-4439

Affected Versions  0.15.0 - 0.17.0

Patches

https://github.com/saltstack/salt/commit/7b850ff3d07ef6782888914ac4556c01e8a1c482
https://github.com/saltstack/salt/commit/151759b2a1e1c6ce29277aa81b054219147f80fd

Found By  David Anderson

Fix Reference

Version 0.17.1 is the first bugfix release for 0.17.0. The changes include:

- Fix symbolic links in thin.tgz (issue 7482)
- Pass env through to file.patch state (issue 7452)
- Service provider fixes and reporting improvements (issue 7361)
- Add --priv option for specifying salt-ssh private key
- Fix salt-thin’s salt-call on setuptools installations (issue 7516)
- Fix salt-ssh to support passwords with spaces (issue 7480)
- Fix regression in wildcard includes (issue 7455)
- Fix salt-call outputter regression (issue 7456)
- Fix custom returner support for startup states (issue 7540)
- Fix value handling in augeas (issue 7605)
- Fix regression in apt (issue 7624)
- Fix minions ID guessing to use socket.getfqdn() first (issue 7558)
- Add minion ID caching (issue 7558)
- Fix salt-key race condition (issue 7304)
- Add --include-all flag to salt-key (issue 7399)

35.2. Previous Releases
- Fix custom grains in pillar (part of issue 5716, issue 6083)
- Fix race condition in salt-key (issue 7304)
- Fix regression in minion ID guessing, prioritize socket.getfqdn() (issue 7558)
- Cache minion ID on first guess (issue 7558)
- Allow trailing slash in file.directory state
- Fix reporting of file.roots in pillar return (issue 5449 and issue 5951)
- Remove pillar matching for mine.get (issue 7197)
- Sanitize args for multiple execution modules
- Fix yumpkg mod_repo functions to filter hidden args (issue 7656)
- Fix conflicting IDs in state includes (issue 7526)
- Fix mysql_grants.absent string formatting issue (issue 7827)
- Fix postgres.version so it won't return None (issue 7695)
- Fix for trailing slashes in mount.mounted state
- Fix rogue AttributeError in the outputter system (issue 7845)
- Fix for incorrect ssh key encodings resulting in incorrect key added (issue 7718)
- Fix for pillar/grains naming regression in python renderer (issue 7693)
- Fix args/kwargshandling in the scheduler (issue 7422)
- Fix logfile handling for file://, tcp://, and udp:// (issue 7754)
- Fix error handling in config file parsing (issue 6714)
- Fix RVM using sudo when running as non-root user (issue 2193)
- Fix client ACL and underlying logging bugs (issue 7706)
- Fix scheduler bug with returner (issue 7367)
- Fix user management bug related to default groups (issue 7690)
- Fix various salt-ssh bugs (issue 7528)
- Many various documentation fixes

**35.2.56 Salt 0.17.2 Release Notes**

release 2013-11-14

Version 0.17.2 is another bugfix release for 0.17.0. The changes include:

- Add ability to delete key with grains.delval (issue 7872)
- Fix possible state compiler stack trace (issue 5767)
- Fix architecture regression in yumpkg (issue 7813)
- Use correct ps on Debian to prevent truncating (issue 5646)
- Fix grains targeting for new grains (issue 5737)
- Fix bug with merging in git_pillar (issue 6992)
- Fix print_jobs duplicate results
• Fix apt version specification for pkg.install
• Fix possible KeyError from ext_job_cache missing option
• Fix auto_order for - names states (issue 7649)
• Fix regression in new gitfs installs (directory not found error)
• Fix escape pipe issue on Windows for file.recurse (issue 7967)
• Fix fileclient in case of master restart (issue 7987)
• Try to output warning if CLI command malformed (issue 6538)
• Fix --out=quiet to actually be quiet (issue 8000)
• Fix for state.sls in salt-ssh (issue 7991)
• Fix for MySQL grants ordering issue (issue 5817)
• Fix traceback for certain missing CLI args (issue 8016)
• Add ability to disable lspci queries on master (issue 4906)
• Fail if sls defined in topline does not exist (issue 5998)
• Add ability to downgrade MySQL grants (issue 6606)
• Fix ssh_auth.absent traceback (issue 8043)
• Add upstart detection for Debian/Raspbian (issue 8039)
• Fix ID-related issues (issue 8052, issue 8050, and others)
• Fix for jinja rendering issues (issue 8066 and issue 8079)
• Fix argument parsing in salt-ssh (issue 7928)
• Fix some GPU detection instances (issue 6945)
• Fix bug preventing includes from other environments in SLS files
• Fix for kwargs with dashes (issue 8102)
• Fix salt.utils.which for windows `.exe` (issue 7904)
• Fix apache.adduser without apachectl (issue 8123)
• Fix issue with evaluating test kwarg in states (issue 7788)
• Fix regression in salt.client.Caller() (issue 8078)
• Fix apt-key silent failure
• Fix bug where cmd.script would try to run even if caching failed (issue 7601)
• Fix apt pkg.latest regression (issue 8067)
• Fix for mine data not being updated (issue 8144)
• Fix for noarch packages in yum
• Fix a Xen detection edge case (issue 7839)
• Fix windows __opts__ dictionary persistence (issue 7714)
• Fix version generation for when it’s part of another git repo (issue 8090)
• Fix _handle_iorder stacktrace so that the real syntax error is shown (issue 8114 and issue 7905)
• Fix git.latest state when a commit SHA is used (issue 8163)
• Fix various small bugs in yumpkg.py (issue 8201)
• Fix for specifying identify file in git.latest (issue 8094)
• Fix for --output-file CLI arg (issue 8205)
• Add ability to specify shutdown time for system.shutdown (issue 7833)
• Fix for salt version using non-salt git repo info (issue 8266)
• Add additional hints at impact of pkgrepo states when test=True (issue 8247)
• Fix for salt-ssh files not being owned by root (issue 8216)
• Fix retry logic and error handling in fileserver (related to issue 7755)
• Fix file.replace with test=True (issue 8279)
• Add flag for limiting file traversal in fileserver (issue 6928)
• Fix for extra mine processes (issue 5729)
• Fix for unloading custom modules (issue 7691)
• Fix for salt-ssh opts (issue 8005 and issue 8271)
• Fix compound matcher for grains (issue 7944)
• Improve error reporting in ebuild module (related to issue 5393)
• Add dir_mode to file.managed (issue 7860)
• Improve traceroute support for FreeBSD and OS X (issue 4927)
• Fix for matching minions under syndics (issue 7671)
• Improve exception handling for missing ID (issue 8259)
• Fix grain mismatch for ScientificLinux (issue 8338)
• Add configuration option for minion_id_caching
• Fix open mode auth errors (issue 8402)

### 35.2.57 Salt 0.17.3 Release Notes

release 2013-12-08

Note: 0.17.3 had some regressions which were promptly fixed in the 0.17.4 release. Please use 0.17.4 instead.

Version 0.17.3 is another bugfix release for 0.17.0. The changes include:

• Fix some jinja render errors (issue 8418)
• Fix file.replace state changing file ownership (issue 8399)
• Fix state ordering with the PyDSL renderer (issue 8446)
• Fix for new npm version (issue 8517)
• Fix for pip state requiring name even with requirements file (issue 8519)
• Fix yum logging to open terminals (issue 3855)
• Add sane maxrunning defaults for scheduler (issue 8563)
• Fix states duplicate key detection (issue 8053)
• Fix SUSE patch level reporting (issue 8428)
• Fix managed file creation umask (issue 8590)
• Fix logstash exception (issue 8635)
• Improve argument exception handling for salt command (issue 8016)
• Fix pecl success reporting (issue 8750)
• Fix launchctl module exceptions (issue 8759)
• Fix argument order in pw_user module
• Add warnings for failing grains (issue 8690)
• Fix hgfs problems caused by connections left open (issue 8811 and issue 8810)
• Add Debian iptables default for iptables-persistent package (issue 8889)
• Fix installation of packages with dots in pkg name (issue 8614)
• Fix noarch package installation on CentOS 6 (issue 8945)
• Fix portage_config.enforce_nice_config (issue 8252)
• Fix salt.util.copyfile umask usage (issue 8590)
• Fix rescheduling of failed jobs (issue 8941)
• Fix pkg on Amazon Linux (uses yumpkg5 now) (issue 8226)
• Fix conflicting options in postgres module (issue 8717)
• Fix ps modules for psutil >= 0.3.0 (issue 7432)
• Fix postgres module to return False on failure (issue 8778)
• Fix argument passing for args with pound signs (issue 8585)
• Fix pid of salt CLI command showing in status.pid output (issue 8720)
• Fix rvm to run gem as the correct user (issue 8951)
• Fix namespace issue in win_file module (issue 9060)
• Fix masterless state paths on windows (issue 9021)
• Fix timeout option in master config (issue 9040)

35.2.58 Salt 0.17.4 Release Notes

release 2013-12-10

Version 0.17.4 is another bugfix release for 0.17.0. The changes include:
• Fix file.replace bug when replacement str is numeric (issue 9101)
• Fix regression in file.managed (issue 9131)
• Prevent traceback when job is None. (issue 9145)
35.2.59 Salt 0.17.5 Release Notes

release 2014-01-27

Version 0.17.5 is another bugfix release for 0.17.0. The changes include:

- Fix user.present states with non-string fullname (issue 9085)
- Fix virt.init return value on failure (issue 6870)
- Fix reporting of file.blockreplace state when test=True
- Fix network.interfaces when used in cron (issue 7990)
- Fix bug in pkgrepo when switching to/from mirrorlist-based repo def (issue 9121)
- Fix infinite recursion when cache file is corrupted
- Add checking for rev and mirror/bare args in git.latest (issue 9107)
- Add cmd.watch alias (points to cmd.wait) (issue 8612)
- Fix stacktrace when prereq is not formed as a list (issue 8235)
- Fix stdin issue with lvdisplay command (issue 9128)
- Add pre-check function for range matcher (issue 9236)
- Add exception handling for psutil for processes that go missing (issue 9274)
- Allow _in requisites to match both on ID and name (issue 9061)
- Fix multiple client timeout issues (issue 7157 and issue 9302, probably others)
- Fix ZMQError: Operation cannot be accomplished in current state errors (issue 6306)
- Multiple optimization in minion auth routines
- Clarify logs for minion ID caching

35.2.60 Salt 0.6.0 release notes

The Salt remote execution manager has reached initial functionality! Salt is a management application which can be used to execute commands on remote sets of servers.

The whole idea behind Salt is to create a system where a group of servers can be remotely controlled from a single master, not only can commands be executed on remote systems, but salt can also be used to gather information about your server environment.

Unlike similar systems, like Func and MCollective, Salt is extremely simple to setup and use, the entire application is contained in a single package, and the master and minion daemons require no running dependencies in the way that Func requires Certmaster and MCollective requires activeMQ.

Salt also manages authentication and encryption. Rather than using SSL for encryption, salt manages encryption on a payload level, so the data sent across the network is encrypted with fast AES encryption, and authentication uses RSA keys. This means that Salt is fast, secure, and very efficient.

Messaging in Salt is executed with ZeroMQ, so the message passing interface is built into salt and does not require an external ZeroMQ server. This also adds speed to Salt since there is no additional bloat on the networking layer, and ZeroMQ has already proven itself as a very fast networking system.

The remote execution in Salt is `Lazy Execution`; in that once the command is sent the requesting network connection is closed. This makes it easier to detach the execution from the calling process on the master, it also means that replies are cached, so that information gathered from historic commands can be queried in the future.
Salt also allows users to make execution modules in Python. Writers of these modules should also be pleased to know that they have access to the impressive information gathered from PuppetLabs’ Facter application, making Salt module more flexible. In the future I hope to also allow Salt to group servers based on Facter information as well.

All in all Salt is fast, efficient, and clean, can be used from a simple command line client or through an API, uses message queue technology to make network execution extremely fast, and encryption is handled in a very fast and efficient manner. Salt is also VERY easy to use and VERY easy to extend.

You can find the source code for Salt on my GitHub page, I have also set up a few wiki pages explaining how to use and set up Salt. If you are using Arch Linux there is a package available in the Arch Linux AUR.

Salt 0.6.0 Source: https://cloud.github.com/downloads/saltstack/salt/salt-0.6.0.tar.gz
GitHub page: https://github.com/saltstack/salt
Wiki: https://github.com/saltstack/salt/wiki
Arch Linux Package: https://aur.archlinux.org/packages/salt-git/

I am very open to contributions, for instance I need packages for more Linux distributions as well as BSD packages and testers.

Give Salt a try, this is the initial release and is not a 1.0 quality release, but it has been working well for me! I am eager to get your feedback!

35.2.61 Salt 0.7.0 release notes

I am pleased to announce the release of Salt 0.7.0!

This release marks what is the first stable release of salt, 0.7.0 should be suitable for general use.

0.7.0 brings the following new features to Salt:

- Integration with Facter data from puppet labs
- Allow for matching minions from the salt client via Facter information
- Minion job threading, many jobs can be executed from the master at once
- Preview of master clustering support - Still experimental
- Introduce new minion modules for stats, virtualization, service management and more
- Add extensive logging to the master and minion daemons
- Add sys.reload_functions for dynamic function reloading
- Greatly improve authentication
- Introduce the saltkey command for managing public keys
- Begin backend development preparatory to introducing butter
- Addition of man pages for the core commands
- Extended and cleaned configuration

0.7.0 fixes the following major bugs:

- Fix crash in minions when matching failed
- Fix configuration file lookups for the local client
- Repair communication bugs in encryption
- Numerous fixes in the minion modules

35.2. Previous Releases
The next release of Salt should see the following features:

- Stabilize the cluster support
- Introduce a remote client for salt command tiers
- salt-ftp system for distributed file copies
- Initial support for `butter`

Coming up next is a higher level management framework for salt called Butter. I want salt to stay as a simple and effective communication framework, and allow for more complicated executions to be managed via Butter.

Right now Butter is being developed to act as a cloud controller using salt as the communication layer, but features like system monitoring and advanced configuration control (a puppet manager) are also in the pipe.

Special thanks to Joseph Hall for the status and network modules, and thanks to Matthias Teege for tracking down some configuration bugs!

Salt can be downloaded from the following locations:

Source Tarball:
https://cloud.github.com/downloads/saltstack/salt/salt-0.7.0.tar.gz

Arch Linux Package:
https://aur.archlinux.org/packages/salt-git/

Please enjoy the latest Salt release!

### 35.2.62 Salt 0.8.0 release notes

Salt 0.8.0 is ready for general consumption! The source tarball is available on GitHub for download:
https://cloud.github.com/downloads/saltstack/salt/salt-0.8.0.tar.gz

A lot of work has gone into salt since the last release just 2 weeks ago, and salt has improved a great deal. A swath of new features are here along with performance and threading improvements!

The main new features of salt 0.8.0 are:

- **Salt-cp**
- Cython minion modules
- Dynamic returners
- Faster return handling
- Lowered required Python version to 2.6
- Advanced minion threading
- Configurable minion modules

**Salt-cp**

The salt-cp command introduces the ability to copy simple files via salt to targeted servers. Using salt-cp is very simple, just call salt-cp with a target specification, the source file(s) and where to copy the file(s) on the minions. For instance:

```
# salt-cp "/" /etc/hosts /etc/hosts
```

Will copy the local /etc/hosts file to all of the minions.
Salt-cp is very young, in the future more advanced features will be added, and the functionality will much more closely resemble the cp command.

Cython minion modules

Cython is an amazing tool used to compile Python modules down to c. This is arguably the fastest way to run Python code, and since pyzmq requires cython, adding support to salt for cython adds no new dependencies.

Cython minion modules allow minion modules to be written in cython and therefore executed in compiled c. Simply write the salt module in cython and use the file extension “.pyx” and the minion module will be compiled when the minion is started. An example cython module is included in the main distribution called cytest.pyx:
https://github.com/saltstack/salt/blob/develop/salt/modules/cytest.pyx

Dynamic Returners

By default salt returns command data back to the salt master, but now salt can return command data to any system. This is enabled via the new returners modules feature for salt. The returners modules take the return data and sends it to a specific module. The returner modules work like minion modules, so any returner can be added to the minions.

This means that a custom data returner can be added to communicate the return data so anything from MySQL, Redis, MongoDB, and more!

There are 2 simple stock returners in the returners directory:
https://github.com/saltstack/salt/blob/develop/salt/returners

The documentation on writing returners will be added to the wiki shortly, and returners can be written in pure Python, or in cython.

Configurable Minion Modules

Minion modules may need to be configured, now the options passed to the minion configuration file can be accessed inside of the minion modules via the __opt__ dict.

Information on how to use this simple addition has been added to the wiki: Writing modules

The test module has an example of using the __opts__ dict, and how to set default options:
https://github.com/saltstack/salt/blob/develop/salt/modules/test.py

Advanced Minion Threading

In 0.7.0 the minion would block after receiving a command from the master, now the minion will spawn a thread or multiprocess. By default Python threads are used because for general use they have proved to be faster, but the minion can now be configured to use the Python multiprocessing module instead. Using multiprocessing will cause executions that are CPU bound or would otherwise exploit the negative aspects of the Python GIL to run faster and more reliably, but simple calls will still be faster with Python threading. The configuration option can be found in the minion configuration file:
https://github.com/saltstack/salt/blob/develop/conf/minion
Lowered Supported Python to 2.6

The requirement for Python 2.7 has been removed to support Python 2.6. I have received requests to take the minimum Python version back to 2.4, but unfortunately this will not be possible, since the ZeroMQ Python bindings do not support Python 2.4.

Salt 0.8.0 is a very major update, it also changes the network protocol slightly which makes communication with older salt daemons impossible, your master and minions need to be upgraded together!

I could use some help bringing salt to the people! Right now I only have packages for Arch Linux, Fedora 14 and Gentoo. We need packages for Debian and people willing to help test on more platforms. We also need help writing more minion modules and returner modules. If you want to contribute to salt please hop on the mailing list and send in patches, make a fork on GitHub and send in pull requests! If you want to help but are not sure where you can, please email me directly or post to the mailing list!

I hope you enjoy salt, while it is not yet 1.0 salt is completely viable and usable!

-Thomas S. Hatch

35.2.63 Salt 0.8.7 release notes

It has been a month since salt 0.8.0, and it has been a long month! But Salt is still coming along strong. 0.8.7 has a lot of changes and a lot of updates. This update makes Salt’s ZeroMQ back end better, strips Facter from the dependencies, and introduces interfaces to handle more capabilities.

Many of the major updates are in the background, but the changes should shine through to the surface. A number of the new features are still a little thin, but the back end to support expansion is in place.

I also recently gave a presentation to the Utah Python users group in Salt Lake City, the slides from this presentation are available here: https://cloud.github.com/downloads/saltstack/salt/Salt.pdf

The video from this presentation will be available shortly.

The major new features and changes in Salt 0.8.7 are:

- Revamp ZeroMQ topology on the master for better scalability
- State enforcement
- Dynamic state enforcement managers
- Extract the module loader into salt.loader
- Make Job ids more granular
- Replace Facter functionality with the new salt grains interface
- Support for “virtual” salt modules
- Introduce the salt-call command
- Better debugging for minion modules

The new ZeroMQ topology allows for better scalability, this will be required by the need to execute massive file transfers to multiple machines in parallel and state management. The new ZeroMQ topology is available in the aforementioned presentation.

0.8.7 introduces the capability to declare states, this is similar to the capabilities of Puppet. States in salt are declared via state data structures. This system is very young, but the core feature set is available. Salt states work around rendering files which represent Salt high data. More on the Salt state system will be documented in the near future.

The system for loading salt modules has been pulled out of the minion class to be a standalone module, this has enabled more dynamic loading of Salt modules and enables many of the updates in 0.8.7 –
Salt Job ids are now microsecond precise, this was needed to repair a race condition unveiled by the speed improvements in the new ZeroMQ topology.

The new grains interface replaces the functionality of Facter, the idea behind grains differs from Facter in that the grains are only used for static system data, dynamic data needs to be derived from a call to a salt module. This makes grains much faster to use, since the grains data is generated when the minion starts.

Virtual salt modules allows for a salt module to be presented as something other than its module name. The idea here is that based on information from the minion decisions about which module should be presented can be made. The best example is the pacman module. The pacman module will only load on Arch Linux minions, and will be called pkg. Similarly the yum module will be presented as pkg when the minion starts on a Fedora/RedHat system.

The new salt-call command allows for minion modules to be executed from the minion. This means that on the minion a salt module can be executed, this is a great tool for testing Salt modules. The salt-call command can also be used to view the grains data.

In previous releases when a minion module threw an exception very little data was returned to the master. Now the stack trace from the failure is returned making debugging of minion modules MUCH easier.

Salt is nearing the goal of 1.0, where the core feature set and capability is complete!

Salt 0.8.7 can be downloaded from GitHub here: https://cloud.github.com/downloads/saltstack/salt/salt-0.8.7.tar.gz

-Thomas S Hatch

35.2.64 Salt 0.8.8 release notes

Salt 0.8.8 is here! This release adds a great deal of code and some serious new features. The latest release can be downloaded here: https://cloud.github.com/downloads/saltstack/salt/salt-0.8.8.tar.gz

Improved Documentation has been set up for salt using sphinx thanks to the efforts of Seth House. This new documentation system will act as the back end to the salt website which is still under heavy development. The new sphinx documentation system has also been used to greatly clean up the salt manpages. The salt 7 manpage in particular now contains extensive information which was previously only in the wiki. The new documentation can be found at: http://docs.saltstack.com/ We still have a lot to add, and when the domain is set up I will post another announcement.

More additions have been made to the ZeroMQ setup, particularly in the realm of file transfers. Salt 0.8.8 introduces a built in, stateless, encrypted file server which allows salt minions to download files from the salt master using the same encryption system used for all other salt communications. The main motivation for the salt file server has been to facilitate the new salt state system.

Much of the salt code has been cleaned up and a new cleaner logging system has been introduced thanks to the efforts of Pedro Algarvio. These additions will allow for much more flexible logging to be executed by salt, and fixed a great deal of my poor spelling in the salt docstrings! Pedro Algarvio has also cleaned up the API, making it easier to embed salt into another application.

The biggest addition to salt found in 0.8.8 is the new state system. The salt module system has received a new front end which allows salt to be used as a configuration management system. The configuration management system allows for system configuration to be defined in data structures. The configuration management system, or as it is called in salt, the "salt state system" supports many of the features found in other configuration managers, but allows for system states to be written in a far simpler format, executes at blazing speeds, and operates via the salt minion matching system. The state system also operates within the normal scope of salt, and requires no additional configuration to use.

The state system can enforce the following states with many more to come: Packages Files Services Executing commands Hosts
The system used to define the salt states is based on a data structure, the data structure used to define the salt states has been made to be as easy to use as possible. The data structure is defined by default using a YAML file rendered via a Jinja template. This means that the state definition language supports all of the data structures that YAML supports, and all of the programming constructs and logic that Jinja supports. If the user does not like YAML or Jinja the states can be defined in yaml-mako, json-jinja, or json-mako. The system used to render the states is completely dynamic, and any rendering system can be added to the capabilities of Salt, this means that a rendering system that renders XML data in a cheetah template, or whatever you can imagine, can be easily added to the capabilities of salt.

The salt state system also supports isolated environments, as well as matching code from several environments to a single salt minion.

The feature base for Salt has grown quite a bit since my last serious documentation push. As we approach 0.9.0 the goals are becoming very clear, and the documentation needs a lot of work. The main goals for 0.9.0 are to further refine the state system, fix any bugs we find, get Salt running on as many platforms as we can, and get the documentation filled out. There is a lot more to come as Salt moves forward to encapsulate a much larger scope, while maintaining supreme usability and simplicity.

If you would like a more complete overview of Salt please watch the Salt presentation: Slides: https://cloud.github.com/downloads/saltstack/salt/Salt.pdf

-Thomas S Hatch

35.2.65 Salt 0.8.9 Release Notes

Salt 0.8.9 has finally arrived! Unfortunately this is much later than I had hoped to release 0.8.9, life has been very crazy over the last month. But despite challenges, Salt has moved forward!

This release, as expected, adds few new features and many refinements. One of the most exciting aspect of this release is that the development community for salt has grown a great deal and much of the code is from contributors.

Also, I have filled out the documentation a great deal. So information on States is properly documented, and much of the documentation that was out of date has been filled in.

Download!

The Salt source can be downloaded from the salt GitHub site:

https://cloud.github.com/downloads/saltstack/salt/salt-0.8.9.tar.gz

Or from PyPI:

https://pypi.python.org/packages/source/s/salt/salt-0.8.9.tar.gz

Here s the md5sum:

7d5aca4633bc22f59045f9e82f43b56

For instructions on how to set up Salt please see the Installation instructions.

New Features

Salt Run

A big feature is the addition of Salt run, the salt-run command allows for master side execution modules to be made that gather specific information or execute custom routines from the master.

Documentation for salt-run can be found here
Refined Outputters

One problem often complained about in salt was the fact that the output was so messy. Thanks to help from Jeff Schroeder a cleaner interface for the command output for the Salt CLI has been made. This new interface makes adding new printout formats easy and additions to the capabilities of minion modules makes it possible to set the printout mode or `outputter` for functions in minion modules.

Cross Calling Salt Modules

Salt modules can now call each other, the `__salt__` dict has been added to the predefined references in minion modules. This new feature is documented in the *modules documentation*.

Watch Option Added to Salt State System

Now in Salt states you can set the watch option, this will allow watch enabled states to change based on a change in the other defined states. This is similar to subscribe and notify statements in puppet.

Root Dir Option

Travis Cline has added the ability to define the option `root_dir` which allows the salt minion to operate in a subdir. This is a strong move in supporting the minion running as an unprivileged user.

Config Files Defined in Variables

Thanks again to Travis Cline, the master and minion configuration file locations can be defined in environment variables now.

New Modules

Quite a few new modules, states, returners, and runners have been made.

New Minion Modules

- **apt** Support for apt-get has been added, this adds greatly improved Debian and Ubuntu support to Salt!
- **useradd** and **groupadd** Support for manipulating users and groups on Unix-like systems.
- **moosefs** Initial support for reporting on aspects of the distributed file system, MooseFS. For more information on MooseFS please see: [http://www.moosefs.org](http://www.moosefs.org)
  Thanks to Joseph Hall for his work on MooseFS support.
- **mount** Manage mounts and the fstab.
- **puppet** Execute puppet on remote systems.
shadow    Manipulate and manage the user password file.

ssh        Interact with ssh keys.

New States

user and group    Support for managing users and groups in Salt States.

mount        Enforce mounts and the fstab.

New Returners

mongo_return    Send the return information to a MongoDB server.

New Runners

manage        Display minions that are up or down.

35.2.66 Salt 0.9.0 Release Notes

release 2011-08-27
Salt 0.9.0 is here. This is an exciting release, 0.9.0 includes the new network topology features allowing peer salt commands and masters of masters via the syndic interface.
0.9.0 also introduces many more modules, improvements to the API and improvements to the ZeroMQ systems.

Download!

The Salt source can be downloaded from the salt GitHub site:
https://cloud.github.com/downloads/saltstack/salt/salt-0.9.0.tar.gz
Or from PyPI:
https://pypi.python.org/packages/source/s/salt/salt-0.9.0.tar.gz
Here is the md5sum:
9a925da04981e65a0f237f2e77ddab37
For instructions on how to set up Salt please see the Installation instructions.

New Features

Salt Syndic

The new Syndic interface allows a master to be commanded via another higher level salt master. This is a powerful solution allowing a master control structure to exist, allowing salt to scale to much larger levels then before.
Peer Communication

0.9.0 introduces the capability for a minion to call a publication on the master and receive the return from another set of minions. This allows salt to act as a communication channel between minions and as a general infrastructure message bus.

Peer communication is turned off by default but can be enabled via the peer option in the master configuration file. Documentation on the new Peer interface.

Easily Extensible API

The minion and master classes have been redesigned to allow for specialized minion and master servers to be easily created. An example on how this is done for the master can be found in the master.py salt module:
https://github.com/saltstack/salt/blob/develop/salt/master.py

The Master class extends the SMaster class and set up the main master server.

The minion functions can now also be easily added to another application via the SMinion class, this class can be found in the minion.py module:
https://github.com/saltstack/salt/blob/develop/salt/minion.py

Cleaner Key Management

This release changes some of the key naming to allow for multiple master keys to be held based on the type of minion gathering the master key.

The -d option has also been added to the salt-key command allowing for easy removal of accepted public keys.

The --gen-keys option is now available as well for salt-key, this allows for a salt specific RSA key pair to be easily generated from the command line.

Improved 0MQ Master Workers

The 0MQ worker system has been further refined to be faster and more robust. This new system has been able to handle a much larger load than the previous setup. The new system uses the IPC protocol in 0MQ instead of TCP.

New Modules

Quite a few new modules have been made.

New Minion Modules

apache Work directly with apache servers, great for managing balanced web servers

cron Read out the contents of a systems crontabs

mdadm Module to manage raid devices in Linux, appears as the raid module

mysql Gather simple data from MySQL databases
ps  Extensive utilities for managing processes

publish  Used by the peer interface to allow minions to make publications

35.2.67  Salt 0.9.1 Release Notes

release  2011-08-29

35.2.68  Salt 0.9.2 Release Notes

release  2011-09-17

Salt 0.9.2 has arrived! 0.9.2 is primarily a bugfix release, the exciting component in 0.9.2 is greatly improved support for salt states. All of the salt states interfaces have been more thoroughly tested and the new salt-states git repo is growing with example of how to use states.

This release introduces salt states for early developers and testers to start helping us clean up the states interface and make it ready for the world!

0.9.2 also fixes a number of bugs found on Python 2.6.

Download!

The Salt source can be downloaded from the salt GitHub site:
https://cloud.github.com/downloads/saltstack/salt/salt-0.9.2.tar.gz

Or from PyPI:
https://pypi.python.org/packages/source/s/salt/salt-0.9.2.tar.gz

For instructions on how to set up Salt please see the Installation instructions.

New Features

Salt-Call Additions

The salt-call command has received an overhaul, it now hooks into the outputter system so command output looks clean, and the logging system has been hooked into salt-call, so the -l option allows the logging output from salt minion functions to be displayed.

The end result is that the salt-call command can execute the state system and return clean output:

# salt-call state.highstate

State System Fixes

The state system has been tested and better refined. As of this release the state system is ready for early testers to start playing with. If you are interested in working with the state system please check out the (still very small) salt-states GitHub repo:
https://github.com/saltstack/salt-states
This git repo is the active development branch for determining how a clean salt-state database should look and act. Since the salt state system is still very young a lot of help is still needed here. Please fork the salt-states repo and help us develop a truly large and scalable system for configuration management!

**Notable Bug Fixes**

**Python 2.6 String Formatting**

Python 2.6 does not support format strings without an index identifier, all of them have been repaired.

**Cython Loading Disabled by Default**

Cython loading requires a development tool chain to be installed on the minion, requiring this by default can cause problems for most Salt deployments. If Cython auto loading is desired it will need to be turned on in the minion config.

### 35.2.69 Salt 0.9.3 Release Notes

**release** 2011-11-05

Salt 0.9.3 is finally arrived. This is another big step forward for Salt, new features range from proper FreeBSD support to fixing issues seen when attaching a minion to a master over the Internet.

The biggest improvements in 0.9.3 though can be found in the state system, it has progressed from something ready for early testers to a system ready to compete with platforms such as Puppet and Chef. The backbone of the state system has been greatly refined and many new features are available.

**Download!**

The Salt source can be downloaded from the salt GitHub site:

https://cloud.github.com/downloads/saltstack/salt/salt-0.9.3.tar.gz

Or from PyPI:

https://pypi.python.org/packages/source/s/salt/salt-0.9.3.tar.gz

For instructions on how to set up Salt please see the *Installation* instructions.

**New Features**

**WAN Support**

Recently more people have been testing Salt minions connecting to Salt Masters over the Internet. It was found that Minions would commonly lose their connection to the master when working over the internet. The minions can now detect if the connection has been lost and reconnect to the master, making WAN connections much more reliable.
State System Fixes

Substantial testing has gone into the state system and it is ready for real world usage. A great deal has been added to the documentation for states and the modules and functions available to states have been cleanly documented.

A number of State System bugs have also been found and repaired, the output from the state system has also been refined to be extremely clear and concise.

Error reporting has also been introduced, issues found in sls files will now be clearly reported when executing Salt States.

Extend Declaration

The Salt States have also gained the `extend` declaration. This declaration allows for states to be cleanly modified in a post environment. Simply said, if there is an apache.sls file that declares the apache service, then another sls can include apache and then extend it:

```yaml
include:
  - apache

extend:
  apache:
    service:
      - require:
        - pkg: mod_python

mod_python:
  pkg:
    - installed
```

The notable behavior with the extend functionality is that it literally extends or overwrites a declaration set up in another sls module. This means that Salt will behave as though the modifications were made directly to the apache sls. This ensures that the apache service in this example is directly tied to all requirements.

Highstate Structure Specification

This release comes with a clear specification of the Highstate data structure that is used to declare Salt States. This specification explains everything that can be declared in the Salt SLS modules.

The specification is extremely simple, and illustrates how Salt has been able to fulfill the requirements of a central configuration manager within a simple and easy to understand format and specification.

SheBang Renderer Switch

It came to our attention that having many renderers means that there may be a situation where more than one State Renderer should be available within a single State Tree.

The method chosen to accomplish this was something already familiar to developers and systems administrators, a SheBang. The Python State Renderer displays this new capability.
Python State Renderer

Until now Salt States could only be declared in yaml or json using Jinja or Mako. A new, very powerful, renderer has been added, making it possible to write Salt States in pure Python:

```python
#!py

def run():
    '''
    Install the python-mako package
    '''
    return {
        'include': ['python'],
        'python-mako': {'pkg': ['installed']}}
```

This renderer is used by making a run function that returns the Highstate data structure. Any capabilities of Python can be used in pure Python sls modules.

This example of a pure Python sls module is the same as this example in yaml:

```yaml
include:
    - python

python-mako:
    pkg:
        - installed
```

FreeBSD Support

Additional support has been added for FreeBSD, this is Salt’s first branch out of the Linux world and proves the viability of Salt on non-Linux platforms.

Salt remote execution already worked on FreeBSD, and should work without issue on any Unix-like platform. But this support comes in the form of package management and user support, so Salt States also work on FreeBSD now.

The new freebsdpkg module provides package management support for FreeBSD and the new pw_user and pw_group provide user and group management.

Module and State Additions

Cron Support

Support for managing the system crontab has been added, declaring a cron state can be done easily:

```bash
date > /tmp/datemstamp:
    cron:
        - present
        - user: fred
        - minute: 5
        - hour: 3
```
File State Additions

The file state has been given a number of new features, primarily the directory, recurse, symlink, and absent functions.

file.directory Make sure that a directory exists and has the right permissions.

```
/srv/foo:
  file:
    - directory
    - user: root
    - group: root
    - mode: 1755
```

file.symlink Make a symlink.

```
/var/lib/www:
  file:
    - symlink
    - target: /srv/www
    - force: True
```

file.recurse The recurse state function will recursively download a directory on the master file server and place it on the minion. Any change in the files on the master will be pushed to the minion. The recurse function is very powerful and has been tested by pushing out the full Linux kernel source.

```
/opt/code:
  file:
    - recurse
    - source: salt://linux
```

file.absent Make sure that the file is not on the system, recursively deletes directories, files, and symlinks.

```
/etc/httpd/conf.d/somebogusfile.conf:
  file:
    - absent
```

Sysctl Module and State

The sysctl module and state allows for sysctl components in the kernel to be managed easily. The sysctl module contains the following functions:

- **sysctl.show** Return a list of sysctl parameters for this minion
- **sysctl.get** Return a single sysctl parameter for this minion
- **sysctl.assign** Assign a single sysctl parameter for this minion
- **sysctl.persist** Assign and persist a simple sysctl parameter for this minion

The sysctl state allows for sysctl parameters to be assigned:

```
vm.swappiness:
  sysctl:
    - present
    - value: 20
```
Kernel Module Management

A module for managing Linux kernel modules has been added. The new functions are as follows:

- **kmod.available** Return a list of all available kernel modules
- **kmod.check_available** Check to see if the specified kernel module is available
- **kmod.lsmod** Return a dict containing information about currently loaded modules
- **kmod.load** Load the specified kernel module
- **kmod.remove** Unload the specified kernel module

The kmod state can enforce modules be either present or absent:

```yaml
kvm_intel:
  kmod:
    - present
```

Ssh Authorized Keys

The ssh_auth state can distribute ssh authorized keys out to minions. Ssh authorized keys can be present or absent.

```plaintext
AAAAAB3NzaC1kc3MAACBAL0sQ9fJ5bYTEyYvlRBsJdD0o49CNfhlWhWXQRqul6rwL4KIUprhY7hBw0tv7Unc7J9iZRN04iGod9C+0
ssh_auth:
  - present
  - user: frank
  - enc: dsa
  - comment: 'Frank's key'
```

35.2.70 Salt 0.9.4 Release Notes

**release** 2011-11-27

Salt 0.9.4 has arrived. This is a critical update that repairs a number of key bugs found in 0.9.3. But this update is not without feature additions as well! 0.9.4 adds support for Gentoo portage to the pkg module and state system. Also there are 2 major new state additions, the failhard option and the ability to set up finite state ordering with the **order** option.

This release also sees our largest increase in community contributions. These contributors have and continue to be the life blood of the Salt project, and the team continues to grow. I want to put out a big thanks to our new and existing contributors.

Download!

The Salt source can be downloaded from the salt GitHub site:

https://cloud.github.com/downloads/saltstack/salt/salt-0.9.4.tar.gz

Or from PyPI:

https://pypi.python.org/packages/source/s/salt/salt-0.9.4.tar.gz

For instructions on how to set up Salt please see the Installation instructions.
New Features

Failhard State Option

Normally, when a state fails Salt continues to execute the remainder of the defined states and will only refuse to execute states that require the failed state.

But the situation may exist, where you would want all state execution to stop if a single state execution fails. The capability to do this is called failing hard.

State Level Failhard  A single state can have a failhard set, this means that if this individual state fails that all state execution will immediately stop. This is a great thing to do if there is a state that sets up a critical config file and setting a require for each state that reads the config would be cumbersome. A good example of this would be setting up a package manager early on:

```
/etc/yum.repos.d/company.repo:
    file:
        - managed
        - source: salt://company/yumrepo.conf
        - user: root
        - group: root
        - mode: 644
        - order: 1
        - failhard: True
```

In this situation, the yum repo is going to be configured before other states, and if it fails to lay down the config file, than no other states will be executed.

Global Failhard  It may be desired to have failhard be applied to every state that is executed, if this is the case, then failhard can be set in the master configuration file. Setting failhard in the master configuration file will result in failing hard when any minion gathering states from the master have a state fail.

This is NOT the default behavior, normally Salt will only fail states that require a failed state.

Using the global failhard is generally not recommended, since it can result in states not being executed or even checked. It can also be confusing to see states failhard if an admin is not actively aware that the failhard has been set.

To use the global failhard set failhard: True in the master configuration

Finite Ordering of State Execution

When creating salt sls files, it is often important to ensure that they run in a specific order. While states will always execute in the same order, that order is not necessarily defined the way you want it.

A few tools exist in Salt to set up the correct state ordering, these tools consist of requisite declarations and order options.

The Order Option  Before using the order option, remember that the majority of state ordering should be done with requisite statements, and that a requisite statement will override an order option.

The order option is used by adding an order number to a state declaration with the option order:
vim:
pkg:
  - installed
  - order: 1

By adding the order option to 1 this ensures that the vim package will be installed in tandem with any other state declaration set to the order 1.

Any state declared without an order option will be executed after all states with order options are executed.

But this construct can only handle ordering states from the beginning. Sometimes you may want to send a state to the end of the line, to do this set the order to last:

vim:
pkg:
  - installed
  - order: last

Substantial testing has gone into the state system and it is ready for real world usage. A great deal has been added to the documentation for states and the modules and functions available to states have been cleanly documented.

A number of State System bugs have also been founds and repaired, the output from the state system has also been refined to be extremely clear and concise.

Error reporting has also been introduced, issues found in sls files will now be clearly reported when executing Salt States.

**Gentoo Support**

Additional experimental support has been added for Gentoo. This is found in the contribution from Doug Renn, aka nestegg.

### 35.2.71 Salt 0.9.5 Release Notes

**release** 2012-01-15

Salt 0.9.5 is one of the largest steps forward in the development of Salt.

0.9.5 comes with many milestones, this release has seen the community of developers grow out to an international team of 46 code contributors and has many feature additions, feature enhancements, bug fixes and speed improvements.

**Warning:** Be sure to read the upgrade instructions about the switch to msgpack before upgrading!

**Community**

Nothing has proven to have more value to the development of Salt that the outstanding community that has been growing at such a great pace around Salt. This has proven not only that Salt has great value, but also the expandability of Salt is as exponential as I originally intended.

0.9.5 has received over 600 additional commits since 0.9.4 with a swath of new committers. The following individuals have contributed to the development of 0.9.5:

- Aaron Bull Schaefer
- Antti Kaihola
This makes 21 new developers since 0.9.4 was released!

To keep up with the growing community follow Salt on Ohloh (http://www.ohloh.net/p/salt), to join the Salt development community, fork Salt on GitHub, and get coding (https://github.com/saltstack/salt)!

**Major Features**

**SPEED! Pickle to msgpack**

For a few months now we have been talking about moving away from Python pickles for network serialization, but a preferred serialization format had not yet been found. After an extensive performance testing period involving everything from JSON to protocol buffers, a clear winner emerged. Message Pack (http://msgpack.org/) proved to
not only be the fastest and most compact, but also the most "salt like". Message Pack is simple, and the code involved is very small. The msgpack library for Python has been added directly to Salt.

This move introduces a few changes to Salt. First off, Salt is no longer a "noarch" package, since the msgpack lib is written in C. Salt 0.9.5 will also have compatibility issues with 0.9.4 with the default configuration.

We have gone through great lengths to avoid backwards compatibility issues with Salt, but changing the serialization medium was going to create issues regardless. Salt 0.9.5 is somewhat backwards compatible with earlier minions. A 0.9.5 master can command older minions, but only if the `serial` config value in the master is set to `pickle`. This will tell the master to publish messages in pickle format and will allow the master to receive messages in both msgpack and pickle formats.

Therefore the **suggested methods for upgrading** are either to just upgrade everything at once, or:

1. Upgrade the master to 0.9.5
2. Set `serial` to `pickle` in the master config
3. Upgrade the minions
4. Remove the `serial` option from the master config

Since pickles can be used as a security exploit the ability for a master to accept pickles from minions at all will be removed in a future release.

**C Bindings for YAML**

All of the YAML rendering is now done with the YAML C bindings. This speeds up all of the sls files when running states.

**Experimental Windows Support**

David Boucha has worked tirelessly to bring initial support to Salt for Microsoft Windows operating systems. Right now the Salt Minion can run as a native Windows service and accept commands.

In the weeks and months to come Windows will receive the full treatment and will have support for Salt States and more robust support for managing Windows systems. This is a big step forward for Salt to move entirely outside of the Unix world, and proves Salt is a viable cross platform solution. Big Thanks to Dave for his contribution here!

**Dynamic Module Distribution**

Many Salt users have expressed the desire to have Salt distribute in-house modules, states, renderers, returners, and grains. This support has been added in a number of ways:

**Modules via States**  Now when salt modules are deployed to a minion via the state system as a file, then the modules will be automatically loaded into the active running minion - no restart required - and into the active running state. So custom state modules can be deployed and used in the same state run.

**Modules via Module Environment Directories**  Under the file_roots each environment can now have directories that are used to deploy large groups of modules. These directories sync modules at the beginning of a state run on the minion, or can be manually synced via the Salt module `salt.modules.saltutil.sync_all`.

The directories are named:

- _modules
Module Reloading

Modules can now be reloaded without restarting the minion, this is done by calling the `salt.modules.sys.reload_modules` function.

But wait, there's more! Now when a salt module of any type is added via states the modules will be automatically reloaded, allowing for modules to be laid down with states and then immediately used.

Finally, all modules are reloaded when modules are dynamically distributed from the salt master.

Enable / Disable Added to Service

A great deal of demand has existed for adding the capability to set services to be started at boot in the service module. This feature also comes with an overhaul of the service modules and initial systemd support.

This means that the `service state` can now accept `- enable: True` to make sure a service is enabled at boot, and `- enable: False` to make sure it is disabled.

Compound Target

A new target type has been added to the lineup, the compound target. In previous versions the desired minions could only be targeted via a single specific target type, but now many target specifications can be declared.

These targets can also be separated by and/or operators, so certain properties can be used to omit a node:

```
salt -C 'webserv* and G@os:Debian or E@db.*' test.ping
```

will match all minions with ids starting with webserv via a glob and minions matching the `os:Debian` grain. Or minions that match the `db.*` regular expression.

Node Groups

Often the convenience of having a predefined group of minions to execute targets on is desired. This can be accomplished with the new nodegroups feature. Nodegroups allow for predefined compound targets to be declared in the master configuration file:

```
nodegroups:
  group1: 'L@foo.domain.com,bar.domain.com,baz.domain.com and bl*.domain.com'
  group2: 'G@os:Debian and foo.domain.com'
```

And then used via the `-N` option:

```
salt -N group1 test.ping
```
Minion Side Data Store

The data module introduces the initial approach into storing persistent data on the minions, specific to the minions. This allows for data to be stored on minions that can be accessed from the master or from the minion.

The Minion datastore is young, and will eventually provide an interface similar to a more mature key/value pair server.

Major Grains Improvement

The Salt grains have been overhauled to include a massive amount of extra data. This includes hardware data, os data and salt specific data.

Salt -Q is Useful Now

In the past the salt query system, which would display the data from recent executions would be displayed in pure Python, and it was unreadable.

0.9.5 has added the outputter system to the –Q option, thus enabling the salt query system to return readable output.

Packaging Updates

Huge strides have been made in packaging Salt for distributions. These additions are thanks to our wonderful community where the work to set up packages has proceeded tirelessly.

FreeBSD

Salt on FreeBSD? There a port for that:
http://svnweb.freebsd.org/ports/head/sysutils/py-salt/

This port was developed and added by Christer Edwards. This also marks the first time Salt has been included in an upstream packaging system!

Fedora and Red Hat Enterprise

Salt packages have been prepared for inclusion in the Fedora Project and in EPEL for Red Hat Enterprise 5 and 6. These packages are the result of the efforts made by Clint Savage (herlo).

Debian/Ubuntu

A team of many contributors have assisted in developing packages for Debian and Ubuntu. Salt is still actively seeking inclusion in upstream Debian and Ubuntu and the package data that has been prepared is being pushed through the needed channels for inclusion.

These packages have been prepared with the help of:

- Corey
- Aaron Toponce
- and another person.
More to Come

We are actively seeking inclusion in more distributions. Primarily getting Salt into Gentoo, SUSE, OpenBSD, and preparing Solaris support are all turning into higher priorities.

Refinement

Salt continues to be refined into a faster, more stable and more usable application. 0.9.5 comes with more debug logging, more bug fixes and more complete support.

More Testing, More BugFixes

0.9.5 comes with more bug fixes due to more testing than any previous release. The growing community and the introduction a dedicated QA environment have unearthed many issues that were hiding under the covers. This has further refined and cleaned the state interface, taking care of things from minor visual issues to repairing misleading data.

Custom Exceptions

A custom exception module has been added to throw salt specific exceptions. This allows Salt to give much more granular error information.

New Modules

data The new data module manages a persistent datastore on the minion. Big thanks to bastichelaar for his help refining this module.

freebsdkmod FreeBSD kernel modules can now be managed in the same way Salt handles Linux kernel modules. This module was contributed thanks to the efforts of Christer Edwards.

gentoo_service Support has been added for managing services in Gentoo. Now Gentoo services can be started, stopped, restarted, enabled, disabled, and viewed.

pip The pip module introduces management for pip installed applications. Thanks goes to whitinge for the addition of the pip module.

rh_service The rh_service module enables Red Hat and Fedora specific service management. Now Red Hat like systems come with extensive management of the classic init system used by Red Hat.

saltutil The saltutil module has been added as a place to hold functions used in the maintenance and management of salt itself. Saltutil is used to salt the salt minion. The saltutil module is presently used only to sync extension modules from the master server.

systemd Systemd support has been added to Salt, now systems using this next generation init system are supported on systems running systemd.
**virtualenv**  The virtualenv module has been added to allow Salt to create virtual Python environments. Thanks goes to Whitinge for the addition of the virtualenv module.

**win_disk**  Support for gathering disk information on Microsoft Windows minions The windows modules come courtesy of Utah_Dave

**win_service**  The win_service module adds service support to Salt for Microsoft Windows services

**win_useradd**  Salt can now manage local users on Microsoft Windows Systems

**yumpkg5**  The yumpkg module introduces in 0.9.4 uses the yum API to interact with the yum package manager. Unfortunately, on Red Hat 5 systems salt does not have access to the yum API because the yum API is running under Python 2.4 and Salt needs to run under Python 2.6.

The yumpkg5 module bypasses this issue by shelling out to yum on systems where the yum API is not available.

**New States**

**mysql_database**  The new mysql_database state adds the ability to systems running a mysql server to manage the existence of mysql databases.

The mysql states are thanks to syphernl

**mysql_user**  The mysql_user state enables mysql user management.

**virtualenv**  The virtualenv state can manage the state of Python virtual environments. Thanks to Whitinge for the virtualenv state

**New Returners**

**cassandra_returner**  A returner allowing Salt to send data to a cassandra server. Thanks to Byron Clark for contributing this returner

### 35.2.72 Salt 0.9.6 Release Notes

**release**  2012-01-21

Salt 0.9.6 is a release targeting a few bugs and changes. This is primarily targeting an issue found in the names declaration in the state system. But a few other bugs were also repaired, like missing support for grains in extmods.

Due to a conflict in distribution packaging msgpack will no longer be bundled with Salt, and is required as a dependency.

**New Features**

**HTTP and ftp support in files.managed**

Now under the source option in the file.managed state a HTTP or ftp address can be used instead of a file located on the salt master.
Allow Multiple Returners

Now the returner interface can define multiple returners, and will also return data back to the master, making the process less ambiguous.

Minion Memory Improvements

A number of modules have been taken out of the minion if the underlying systems required by said modules are not present on the minion system. A number of other modules need to be stripped out in this same way which should continue to make the minion more efficient.

Minions Can Locally Cache Return Data

A new option, cache_jobs, has been added to the minion to allow for all of the historically run jobs to cache on the minion, allowing for looking up historic returns. By default cache_jobs is set to False.

Pure Python Template Support For file.managed

Templates in the file.managed state can now be defined in a Python script. This script needs to have a run function that returns the string that needs to be in the named file.

35.2.73 Salt 0.9.7 Release Notes

release  2012-02-15

Salt 0.9.7 is here! The latest iteration of Salt brings more features and many fixes. This release is a great refinement over 0.9.6, adding many conveniences under the hood, as well as some features that make working with Salt much better.

A few highlights include the new Job system, refinements to the requisite system in states, the mod_inits interface for states, external node classification, search path to managed files in the file state, and refinements and additions to dynamic module loading.

0.9.7 also introduces the long developed (and oft changed) unit test framework and the initial unit tests.

Major Features

Salt Jobs Interface

The new jobs interface makes the management of running executions much cleaner and more transparent. Building on the existing execution framework the jobs system allows clear introspection into the active running state of the running Salt interface.

The Jobs interface is centered in the new minion side proc system. The minions now store msgpack serialized files under /var/cache/salt/proc. These files keep track of the active state of processes on the minion.
Functions in the saltutil Module  A number of functions have been added to the saltutil module to manage and view the jobs:

**running** - Returns the data of all running jobs that are found in the proc directory.

**find_job** - Returns specific data about a certain job based on job id.

**signal_job** - Allows for a given jid to be sent a signal.

**term_job** - Sends a termination signal (**SIGTERM**, **15**) to the process controlling the specified job.

**kill_job** Sends a kill signal (**SIGKILL**, **9**) to the process controlling the specified job.

The jobs Runner

A convenience runner front end and reporting system has been added as well. The jobs runner contains functions to make viewing data easier and cleaner.

The jobs runner contains a number of functions...

**active**  The active function runs **saltutil.running** on all minions and formats the return data about all running jobs in a much more usable and compact format. The active function will also compare jobs that have returned and jobs that are still running, making it easier to see what systems have completed a job and what systems are still being waited on.

**lookup_jid**  When jobs are executed the return data is sent back to the master and cached. By default is is cached for 24 hours, but this can be configured via the **keep_jobs** option in the master configuration.

Using the **lookup_jid** runner will display the same return data that the initial job invocation with the salt command would display.

**list_jobs**  Before finding a historic job, it may be required to find the job id. **list_jobs** will parse the cached execution data and display all of the job data for jobs that have already, or partially returned.

External Node Classification

Salt can now use external node classifiers like Cobbler's **cobbler-ext-nodes**.

Salt uses specific data from the external node classifier. In particular the classes value denotes which sls modules to run, and the environment value sets to another environment.

An external node classification can be set in the master configuration file via the **external_nodes** option:

http://salt.readthedocs.org/en/latest/ref/configuration/master.html#external-nodes

External nodes are loaded in addition to the top files. If it is intended to only use external nodes, do not deploy any top files.

State Mod Init System

An issue arose with the pkg state. Every time a package was run Salt would need to refresh the package database. This made systems with slower package metadata refresh speeds much slower to work with. To alleviate this issue the **mod_init** interface has been added to salt states.
The **mod_init** interface is a function that can be added to a state file. This function is called with the first state called. In the case of the pkg state, the **mod_init** function sets up a tag which makes the package database only refresh on the first attempt to install a package.

In a nutshell, the **mod_init** interface allows a state to run any command that only needs to be run once, or can be used to set up an environment for working with the state.

**Source File Search Path**

The file state continues to be refined, adding speed and capabilities. This release adds the ability to pass a list to the source option. This list is then iterated over until the source file is found, and the first found file is used.

The new syntax looks like this:

```
/etc/httpd/conf/httpd.conf:
    file:
    - managed
    - source:
      - salt://httpd/httpd.conf
      - http://myserver/httpd.conf: md5=8c1fe119e6f1fd96bc06614473509bf1
```

The source option can take sources in the list from the salt file server as well as an arbitrary web source. If using an arbitrary web source the checksum needs to be passed as well for file verification.

**Refinements to the Requisite System**

A few discrepancies were still lingering in the requisite system, in particular, it was not possible to have a `require` and a `watch` requisite declared in the same state declaration.

This issue has been alleviated, as well as making the requisite system run more quickly.

**Initial Unit Testing Framework**

Because of the module system, and the need to test real scenarios, the development of a viable unit testing system has been difficult, but unit testing has finally arrived. Only a small amount of unit testing coverage has been developed, much more coverage will be in place soon.

A huge thanks goes out to those who have helped with unit testing, and the contributions that have been made to get us where we are. Without these contributions unit tests would still be in the dark.

**Compound Targets Expanded**

Originally only support for `and` and `or` were available in the compound target. 0.9.7 adds the capability to negate compound targets with `not`.

**Nodegroups in the Top File**

Previously the nodegroups defined in the master configuration file could not be used to match nodes for states. The nodegroups support has been expanded and the nodegroups defined in the master configuration can now be used to match minions in the top file.
35.2.74 Salt 0.9.8 Release Notes

**release** 2012-03-21

Salt 0.9.8 is a big step forward, with many additions and enhancements, as well as a number of precursors to advanced future developments.

This version of Salt adds much more power to the command line, making the old hard timeout issues a thing of the past and adds keyword argument support. These additions are also available in the salt client API, making the available API tools much more powerful.

The new pillar system allows for data to be stored on the master and assigned to minions in a granular way similar to the state system. It also allows flexibility for users who want to keep data out of their state tree similar to 'external lookup' functionality in other tools.

A new way to extend requisites was added, the `requisite in` statement. This makes adding requires or watch statements to external state decs much easier.

Additions to requisites making them much more powerful have been added as well as improved error checking for sls files in the state system. A new provider system has been added to allow for redirecting what modules run in the background for individual states.

Support for OpenSUSE has been added and support for Solaris has begun serious development. Windows support has been significantly enhanced as well.

The matcher and target systems have received a great deal of attention. The default behavior of grain matching has changed slightly to reflect the rest of salt and the compound matcher system has been refined.

A number of impressive features with keyword arguments have been added to both the CLI and to the state system. This makes states much more powerful and flexible while maintaining the simple configuration everyone loves.

The new batch size capability allows for executions to be rolled through a group of targeted minions a percentage or specific number at a time. This was added to prevent the `thundering herd` problem when targeting large numbers of minions for things like service restarts or file downloads.

**Upgrade Considerations**

**Upgrade Issues**

There was a previously missed oversight which could cause a newer minion to crash an older master. That oversight has been resolved so the version incompatibility issue will no longer occur. When upgrading to 0.9.8 make sure to upgrade the master first, followed by the minions.

**Debian/Ubuntu Packages**

The original Debian/Ubuntu packages were called salt and included all salt applications. New packages in the ppa are split by function. If an old salt package is installed then it should be manually removed and the new split packages need to be freshly installed.

On the master:

```
# apt-get purge salt
# apt-get install salt-{master,minion}
```

On the minions:

---

35.2. Previous Releases
# apt-get purge salt
# apt-get install salt-minion

And on any Syndics:

# apt-get install salt-syndic

The official Salt PPA for Ubuntu is located at: https://launchpad.net/~saltstack/+archive/salt

## Major Features

### Pillar

*Pillar* offers an interface to declare variable data on the master that is then assigned to the minions. The pillar data is made available to all modules, states, sls files etc. It is compiled on the master and is declared using the existing renderer system. This means that learning pillar should be fairly trivial to those already familiar with salt states.

### CLI Additions

The `salt` command has received a serious overhaul and is more powerful than ever. Data is returned to the terminal as it is received, and the salt command will now wait for all running minions to return data before stopping. This makes adding very large `--timeout` arguments completely unnecessary and gets rid of long running operations returning empty `{}` when the timeout is exceeded.

When calling salt via sudo, the user originally running salt is saved to the log for auditing purposes. This makes it easy to see who ran what by just looking through the minion logs.

The `salt-key` command gained the `-D` and `--delete-all` arguments for removing all keys. Be careful with this one!

### Running States Without a Master

The addition of running states without a salt-master has been added to 0.9.8. This feature allows for the unmodified salt state tree to be read locally from a minion. The result is that the UNMODIFIED state tree has just become portable, allowing minions to have a local copy of states or to manage states without a master entirely.

This is accomplished via the new file client interface in Salt that allows for the salt:// URI to be redirected to custom interfaces. This means that there are now two interfaces for the salt file server, calling the master or looking in a local, minion defined file_roots.

This new feature can be used by modifying the minion config to point to a local file_roots and setting the file_client option to local.

### Keyword Arguments and States

State modules now accept the `**kwargs` argument. This results in all data in a sls file assigned to a state being made available to the state function.

This passes data in a transparent way back to the modules executing the logic. In particular, this allows adding arguments to the pkg.install module that enable more advanced and granular controls with respect to what the state is capable of.

An example of this along with the new debconf module for installing ldap client packages on Debian:
ldap-client-packages:
  pkg:
    - debconf: salt://debconf/ldap-client.ans
    - installed
    - names:
      - nslcd
      - libpam-ldapd
      - libnss-ldapd

Keyword Arguments and the CLI

In the past it was required that all arguments be passed in the proper order to the `salt` and `salt-call` commands. As of 0.9.8, keyword arguments can be passed in the form of `kwaeg=argument`.

```
# salt -G 'type:dev' git.clone \\n    repository=https://github.com/saltstack/salt.git cwd=/tmp/salt user=jeff
```

Matcher Refinements and Changes

A number of fixes and changes have been applied to the Matcher system. The most noteworthy is the change in the grain matcher. The grain matcher used to use a regular expression to match the passed data to a grain, but now defaults to a shell glob like the majority of match interfaces in Salt. A new option is available that still uses the old style regex matching to grain data called `grain-pcre`. To use regex matching in compound matches use the letter `P`.

For example, this would match any ArchLinux or Fedora minions:

```
# salt --grain-pcre 'os:(Arch:Fed).*' test.ping
```

And the associated compound matcher suitable for `top.sls` is `P`:

```
P@os:(Arch|Fed).*
```

**NOTE:** Changing the grains matcher from pcre to glob is backwards incompatible.

Support has been added for matching minions with Yahoo's range library. This is handled by passing range syntax with `-R` or `--range` arguments to `salt`.

More information at: https://github.com/ytoolshed/range/wiki/%22yamlfile%22-module-file-spec

Requisite ``in``

A new means to updating requisite statements has been added to make adding watchers and requires to external states easier. Before 0.9.8 the only way to extend the states that were watched by a state outside of the sls was to use an extend statement:

```
include:
  - http
extend:
  apache:
    service:
      watch:
```

35.2. Previous Releases
- pkg: tomcat

tomcat:
  pkg:
    - installed

But the new Requisite in statement allows for easier extends for requisites:

include:
  - http
tomcat:
  pkg:
    - installed
    - watch_in:
      - service: apache

Requisite in is part of the extend system, so still remember to always include the sls that is being extended!

Providers

Salt predetermines what modules should be mapped to what uses based on the properties of a system. These determinations are generally made for modules that provide things like package and service management. The apt module maps to pkg on Debian and the yum module maps to pkg on Fedora for instance.

Sometimes in states, it may be necessary for a non-default module to be used for the desired functionality. For instance, an Arch Linux system may have been set up with systemd support. Instead of using the default service module detected for Arch Linux, the systemd module can be used:

http:
  service:
    - running
    - enable: True
    - provider: systemd

Default providers can also be defined in the minion config file:

providers:
  service: systemd

When default providers are passed in the minion config, then those providers will be applied to all functionality in Salt, this means that the functions called by the minion will use these modules, as well as states.

Requisite Glob Matching

Requisites can now be defined with glob expansion. This means that if there are many requisites, they can be defined on a single line.

To watch all files in a directory:

http:
  service:
    - running
    - enable: True
This example will watch all defined files that match the glob `/etc/http/conf.d/*`

**Batch Size**

The new batch size option allows commands to be executed while maintaining that only so many hosts are executing the command at one time. This option can take a percentage or a finite number:

```
salt '*' -b 10 test.ping
salt -G 'os:RedHat' --batch-size 25% apache.signal restart
```

This will only run test.ping on 10 of the targeted minions at a time and then restart apache on 25% of the minions matching `os:RedHat` at a time and work through them all until the task is complete. This makes jobs like rolling web server restarts behind a load balancer or doing maintenance on BSD firewalls using carp much easier with salt.

**Module Updates**

This is a list of notable, but non-exhaustive updates with new and existing modules.

Windows support has seen a flurry of support this release cycle. We've gained all new `file`, `network`, and `shadow` modules. Please note that these are still a work in progress.

For our ruby users, new `rvm` and `gem` modules have been added along with the `associated states`.

The `virt` module gained basic Xen support.

The `yum` module gained Scientific Linux support.

The `pkg` module on Debian, Ubuntu, and derivatives force apt to run in a non-interactive mode. This prevents issues when package installation waits for confirmation.

A `pkg` module for OpenSUSE's zypper was added.

The `service` module on Ubuntu natively supports `upstart`.

A new `debconf` module was contributed by our community for more advanced control over deb package deployments on Debian based distributions.

The `mysql.user` state and `mysql` module gained a `password_hash` argument.

The `cmd` module and state gained a `shell` keyword argument for specifying a shell other than `/bin/sh` on Linux / Unix systems.

New `git` and `mercurial` modules have been added for fans of distributed version control.

**In Progress Development**

**Master Side State Compiling**

While we feel strongly that the advantages gained with minion side state compiling are very critical, it does prevent certain features that may be desired. 0.9.8 has support for initial master side state compiling, but many more components still need to be developed, it is hoped that these can be finished for 0.9.9.
The goal is that states can be compiled on both the master and the minions allowing for compilation to be split between master and minion. Why will this be great? It will allow storing sensitive data on the master and sending it to some minions without all minions having access to it. This will be good for handling ssl certificates on front-end web servers for instance.

**Solaris Support**

Salt 0.9.8 sees the introduction of basic Solaris support. The daemon runs well, but grains and more of the modules need updating and testing.

**Windows Support**

Salt states on windows are now much more viable thanks to contributions from our community! States for file, service, local user, and local group management are more fully fleshed out along with network and disk modules. Windows users can also now manage registry entries using the new `reg` module.

### 35.2.75 Salt 0.9.9 Release Notes

**Release** 2012-04-27

0.9.9 is out and comes with some serious bug fixes and even more serious features. This release is the last major feature release before 1.0.0 and could be considered the 1.0.0 release candidate.

A few updates include more advanced kwarg support, the ability for salt states to more safely configure a running salt minion, better job directory management and the new state test interface.

Many new tests have been added as well, including the new minion swarm test that allows for easier testing of Salt working with large groups of minions. This means that if you have experienced stability issues with Salt before, particularly in larger deployments, that these bugs have been tested for, found, and killed.

**Major Features**

**State Test Interface**

Until 0.9.9 the only option when running states to see what was going to be changed was to print out the highstate with `state.show_highstate` and manually look it over. But now states can be run to discover what is going to be changed.

Passing the option `test=True` to many of the state functions will now cause the salt state system to only check for what is going to be changed and report on those changes.

```bash
salt '*' state.highstate test=True
```

Now states that would have made changes report them back in yellow.

**State Syntax Update**

A shorthand syntax has been added to sls files, and it will be the default syntax in documentation going forward. The old syntax is still fully supported and will not be deprecated, but it is recommended to move to the new syntax in the future. This change moves the state function up into the state name using a dot notation. This is in-line with how state functions are generally referred to as well:
The new way:

```
/etc/sudoers:
   file.present:
       - source: salt://sudo/sudoers
       - user: root
       - mode: 400
```

**Use and Use_in Requisites**

Two new requisite statements are available in 0.9.9. The use and use_in requisite and requisite-in allow for the transparent duplication of data between states. When a state `"uses"` another state it copies the other state's arguments as defaults. This was created in direct response to the new network state, and allows for many network interfaces to be configured in the same way easily. A simple example:

```
root_file:
   file.absent:
       - name: /tmp/nothing
       - user: root
       - mode: 644
       - group: root
       - use_in:
           - file: /etc/vimrc

fred_file:
   file.absent:
       - name: /tmp/nothing
       - user: fred
       - group: marketing
       - mode: 660

/files/marketing/district7.rst:
   file.present:
       - source: salt://marketing/district7.rst
       - template: jinja
       - use:
           - file: fred_file

/etc/vimrc:
   file.present:
       - source: salt://edit/vimrc
```

This makes the 2 lower state decs inherit the options from their respectively `"used"` state decs.

**Network State**

The new network state allows for the configuration of network devices via salt states and the ip salt module. This addition has been given to the project by Jeff Hutchins and Bret Palsson from Jive Communications. Currently the only network configuration backend available is for Red Hat based systems, like Red Hat Enterprise, CentOS, and Fedora.
Exponential Jobs

Originally the jobs executed were stored on the master in the format: `<cachedir>/jobs/jid/{minion ids}` But this format restricted the number of jobs in the cache to the number of subdirectories allowed on the filesystem. Ext3 for instance limits subdirectories to 32000. To combat this the new format for 0.9.9 is: `<cachedir>/jobs/jid_hash[:2]/jid_hash[2:]/{minion ids}` So that now the number of maximum jobs that can be run before the cleanup cycle hits the job directory is substantially higher.

ssh_auth Additions

The original ssh_auth state was limited to accepting only arguments to apply to a public key, and the key itself. This was restrictive due to the way the we learned that many people were using the state, so the key section has been expanded to accept options and arguments to the key that over ride arguments passed in the state. This gives substantial power to using ssh_auth with names:

```
sshkeys:
  ssh_auth:
    - present
    - user: backup
    - enc: ssh-dss
    - options:
      - option1="value1"
      - option2="value2 flag2"
    - comment: backup
    - names:
      - AAAAB3NzaC1yc2EAAABIwAAAAQAEAlEyE26SMFFVY5YJvnL7AF5CRTPtAigSW1U887ASfBt6FDa7Qr1Yd0SochiLoz8aSiM62
      - AAAAB3NzaC1yc2EAAABIwAAAAQAEAlEyE26SMFFVY5YJvnL7AF5CRTPtAigSW1U887ASfBt6FDa7Qr1Yd0SochiLoz8aSiM62
      - ssh-rsa AAAAB3NzaC1yc2EAAABIwAAAAQAEAlEyE26SMFFVY5YJvnL7AF5CRTPtAigSW1U887ASfBt6FDa7Qr1Yd0SochiLoz8aSiM62
      - ssh-rsa AAAAB3NzaC1yc2EAAABIwAAAAQAEAlEyE26SMFFVY5YJvnL7AF5CRTPtAigSW1U887ASfBt6FDa7Qr1Yd0SochiLoz8aSiM62
      - option3="value3",option4="value4 flag4" ssh-rsa AAAAB3NzaC1yc2EAAABIwAAAAQAEAlEyE26SMFFVY5YJvnL7AF5CRTPtAigSW1U887ASfBt6FDa7Qr1Yd0SochiLoz8aSiM62
      - option3="value3" ssh-rsa AAAAB3NzaC1yc2EAAABIwAAAAQAEAlEyE26SMFFVY5YJvnL7AF5CRTPtAigSW1U887ASfBt6FDa7Qr1Yd0SochiLoz8aSiM62
```

LocalClient Additions

To follow up the recent additions in 0.9.8 of additional kwargs support, 0.9.9 also adds the capability to send kwargs into commands via a dict. This addition to the LocalClient api can be used like so:

```
import salt.client

client = salt.client.LocalClient('/etc/salt/master')
ret = client.cmd('*', 'cmd.run', ['ls -l'], kwarg={'cwd': '/etc'})
```

This update has been added to all cmd methods in the LocalClient class.

Better Self Salting

One problem faced with running Salt states, is that it has been difficult to manage the Salt minion via states, this is due to the fact that if the minion is called to restart while a state run is happening then the state run would be killed. 0.9.9 slightly changes the process scope of the state runs, so now when salt is executing states it can safely restart the salt-minion daemon.
In addition to daemonizing the state run, the apt module also daemonizes. This update makes it possible to cleanly update the salt-minion package on Debian/Ubuntu systems without leaving apt in an inconsistent state or killing the active minion process mid-execution.

**Wildcards for SLS Modules**

Now, when including sls modules in include statements or in the top file, shell globs can be used. This can greatly simplify listing matched sls modules in the top file and include statements:

```python
base:
  '*':
    - files*
    - core*

include:
  - users.dev.*
  - apache.ser*
```

**External Pillar**

Since the pillar data is just, data, it does not need to come expressly from the pillar interface. The external pillar system allows for hooks to be added making it possible to extract pillar data from any arbitrary external interface. The external pillar interface is configured via the `ext_pillar` option. Currently interfaces exist to gather external pillar data via hiera or via a shell command that sends yaml data to the terminal:

```python
ext_pillar:
  - cmd_yaml: cat /etc/salt/ext.yaml
  - hiera: /etc/hirea.yaml
```

The initial external pillar interfaces and extra interfaces can be added to the file salt/pillar.py, it is planned to add more external pillar interfaces. If the need arises a new module loader interface will be created in the future to manage external pillar interfaces.

**Single State Executions**

The new `state.single` function allows for single states to be cleanly executed. This is a great tool for setting up a small group of states on a system or for testing out the behavior of single states:

```bash
salt '*' state.single user.present name=wade uid=2000
```

The test interface functions here as well, so changes can also be tested against as:

```bash
salt '*' state.single user.present name=wade uid=2000 test=True
```

**New Tests**

A few exciting new test interfaces have been added, the minion swarm allows not only testing of larger loads, but also allows users to see how Salt behaves with large groups of minions without having to create a large deployment.
Minion Swarm

The minion swarm test system allows for large groups of minions to be tested against easily without requiring large numbers of servers or virtual machines. The minion swarm creates as many minions as a system can handle and roots them in the /tmp directory and connects them to a master.

The benefit here is that we were able to replicate issues that happen only when there are large numbers of minions. A number of elusive bugs which were causing stability issues in masters and minions have since been hunted down. Bugs that used to take careful watch by users over several days can now be reliably replicated in minutes, and fixed in minutes.

Using the swarm is easy, make sure a master is up for the swarm to connect to, and then use the minionswarm.py script in the tests directory to spin up as many minions as you want. Remember, this is a fork bomb, don't spin up more than your hardware can handle!

```bash
python minionswarm.py -m 20 --master salt-master
```

Shell Tests

The new Shell testing system allows us to test the behavior of commands executed from a high level. This allows for the high level testing of salt runners and commands like salt-key.

Client Tests

Tests have been added to test the aspects of the client APIs and ensure that the client calls work, and that they manage passed data, in a desirable way.

See also:

Legacy salt-cloud release docs

See also:

Legacy salt-api release docs
A number of unofficial open source projects, based on Salt, or written to enhance Salt have been created.

### 36.1 Salt Sandbox

Created by Aaron Bull Schaefer, aka `elasticdog`.

[https://github.com/elasticdog/salt-sandbox](https://github.com/elasticdog/salt-sandbox)

Salt Sandbox is a multi-VM Vagrant-based Salt development environment used for creating and testing new Salt state modules outside of your production environment. It’s also a great way to learn firsthand about Salt and its remote execution capabilities.

Salt Sandbox will set up three separate virtual machines:

- `salt.example.com` - the Salt master server
- `minion1.example.com` - the first Salt minion machine
- `minion2.example.com` - the second Salt minion machine

These VMs can be used in conjunction to segregate and test your modules based on node groups, top file environments, grain values, etc. You can even test modules on different Linux distributions or release versions to better match your production infrastructure.
Security disclosure policy

email  security@saltstack.com

gpg key ID  4EA0793D

gpg key fingerprint  8ABE 4EFC B24A FF2A AF90 D570 F2D3 4EA0 793D

gpg public key:

-----BEGIN PGP PUBLIC KEY BLOCK-----
Version: GnuPG/MacGPG2 v2.0.22 (Darwin)
mQINBF015mMBEADa3CfQwkJ5ED9wAQ8fFDbu277Ceg3G3u1hVGdcqxKNvucblwokCk
hRK6u91ha0G9v9dvU2glwqjytIBZ/6lyWyqdaD3X7YG/gTl+9hd+qdsDeoaA/Seg
7y+gP+Fv9HUALuRvLofUn5Dj/I3ZguywxbwEybultzvVFTzn+DFWvTH34Qoh
Q1uN2QCEZ3Lh98q9LqkyN1ZQO1ZIUrypaof6HGBHhEC8emsBFyINbNvCufH
u0r4j1rav+621EtD5GZs0t65+NJ18pkaC/dDK1Ruriv6bymeSpNzLAxUhxw6f29
Vhag5jyVGGNQxLrTxNEM86HEfP+4zQjQwm/wRDrG5X1AhbDedH+P+jDv1AAAX/tp
/Uc12fgpTnDVH0A09E515Q87ZHv6awj3GL1veq18zfssl4ag7rw1uHuHYL0PKdD
5TPaj5s9R3K1ITpghn6iw16b70159oisudguzhZChWUXUXVSti1i2jCv0yOOLMG5OS
AEYxWYP7KgjuzZCmDArTNqRddg939M9J180UkzxXDuj1jiDZpJyGFAwtyK8Isc
Fizeq3/Yz9R9VCX/LmRbeEhql/zSxwLBqd17PkaL+Ts5QFXcm9zccyAxFb2jr2
QHP5A9BEu9yiFme2j2u3jwM9V9qo3jF5dmmUk31IyupZeAOGZkrIswAC3hWARAQAB
tDBT3WxU3R3Hy2sU2VjdX3phKg6Vgvb9A8c2VjX3phLhac2FsdHN8YVnrLmNv
bT6AlA4k4EeEeC4AcGfAI015mCGwMFCQeGgH4ACgwIKwMCBhUIAgkKCuQWQhWMBAh4B
AheAAaAOJEnVw8tN0okHxZ/MPW0127y2f7mVX58joiturjlgEqw41IEmWv1BW
4WXYXCHf+1/YUuv0mdSBlI51b2ooy7w7iB0mNorgupTs55b7jabEhekCv
h/H4ZVTihqwpPthrV/2npXjIM7SLSS/kuaOoXyQ23pszwDVFw+XCRVL0T9H9K3xZ
HuNBeVq7awBD5fzIwmkg99h1cG/R20RIRlo1q0V9Kny8k1G+pOFOW886KwvkSPc7
JU6ypo1UHsLhTmkLE5Gm4cyvZrTP/XuZuyMTdyt3mfga0adneA6LAMRTc5UB/h
q+v9dqf4i3Dw6cytu8KE8Vo5MUEsNNOE42adUrR88LwFZ3ZnnXdQkizgR/Aa515
dm17VnKSo9nYoC84eN7GT0FtxwCq+iyXSYWcKWT4X+h/r+LmNndqWQBRebVUTbKE
ZDwKmizQ/5LY5EHlwcuU14vmMSFwXts5F/PrTzgTdZao9QKkbcvjv97LyBxsVpI6
EL1BlAG+m+1UpEl7zT1i1L6PqvyEFANBWxw46WYXCkGssFsZcz2yR6p0Dx8A6u4yq
rTkt9uYht1is61jOJZD/kq3+6k8q3wIkDOW+2NMrmf+/quCYM5YmrtOpq/wf27W
GMNKabdyzgEX/MubU6CgCMdhehRvUv015bu4vT5s3KdshG+yhV45bapKRD5VN+1
mZRqquQINBF015mMBEACS5ui8i91ZL6qHfIjp3sIOW9U80S7FQfHzXR7N3dMjs3d
f6Nb/habQFHIj9imK9wbpj+Fvaw2oWRLVvdzqU96C2GUJU1ldnqgUVfmdmM835
1n0YQ2TonmYAa882RvsRz65uvy7 SQxouXaAYOdqwLSpXeBOyOnMPskjtvW2U
IWYxPNSp3ADchWQGq9p5D3Y/lo9m1Ssdj+TjoQZOKsJ7Cu9T98+8yhaGAYY8BEXu
9r3196dKduPAlljMc8r9im6ez2eTkt/szk4tHy1bpSSBZU4w/XR7XwQnyWmb
wxjyMT60d3MwjoJtzc3qO1H8hEcY3+BO+NMMymsFVv0LZiwmEcmw62S57wYKUVn
HD2nLmsQa8veo6AABBMEY7zGEGStva59rfghe0jUMJjiccGUDTM0sOIdC6enkYb
uf/dRqNYF0NuDcSeLew4DCp0912W4y+F1K6hAcL5amJzc+yYo9eaqM7nRAT
The SaltStack Security Team is available at security@saltstack.com for security-related bug reports or questions.

We request the disclosure of any security-related bugs or issues be reported non-publicly until such time as the issue can be resolved and a security-fix release can be prepared. At that time we will release the fix and make a public announcement with upgrade instructions and download locations.

### 37.1 Security response procedure

SaltStack takes security and the trust of our customers and users very seriously. Our disclosure policy is intended to resolve security issues as quickly and safely as is possible.

1. A security report sent to security@saltstack.com is assigned to a team member. This person is the primary contact for questions and will coordinate the fix, release, and announcement.
2. The reported issue is reproduced and confirmed. A list of affected projects and releases is made.
3. Fixes are implemented for all affected projects and releases that are actively supported. Back-ports of the fix are made to any old releases that are actively supported.
4. Packagers are notified via the salt-packagers mailing list that an issue was reported and resolved, and that an announcement is incoming.
5. A new release is created and pushed to all affected repositories. The release documentation provides a full description of the issue, plus any upgrade instructions or other relevant details.
6. An announcement is made to the salt-users and salt-announce mailing lists. The announcement contains a description of the issue and a link to the full release documentation and download locations.

### 37.2 Receiving security announcements

The fastest place to receive security announcements is via the salt-announce mailing list. This list is low-traffic.
Frequently Asked Questions

FAQ

- Is Salt open-core?
- I think I found a bug! What should I do?
- What ports should I open on my firewall?
- I’m seeing weird behavior (including but not limited to packages not installing their users properly)
- My script runs every time I run a `state.highstate`. Why?
- When I run `test.ping`, why don’t the Minions that aren’t responding return anything? Returning `False` would be helpful.
- How does Salt determine the Minion’s id?
- I’m trying to manage packages/services but I get an error saying that the state is not available. Why?
- I’m using gitfs and my custom modules/states/etc are not syncing. Why?
- Why aren’t my custom modules/states/etc. available on my Minions?
- Module X isn’t available, even though the shell command it uses is installed. Why?
- Can I run different versions of Salt on my Master and Minion?
- Does Salt support backing up managed files?
- What is the best way to restart a Salt daemon using Salt?
  - * Linux/Unix
  - * Windows
- Salting the Salt Master

38.1 Is Salt open-core?

No. Salt is 100% committed to being open-source, including all of our APIs. It is developed under the Apache 2.0 license, allowing it to be used in both open and proprietary projects.

38.2 I think I found a bug! What should I do?

The salt-users mailing list as well as the salt IRC channel can both be helpful resources to confirm if others are seeing the issue and to assist with immediate debugging.

To report a bug to the Salt project, please follow the instructions in reporting a bug.
38.3 What ports should I open on my firewall?

Minions need to be able to connect to the Master on TCP ports 4505 and 4506. Minions do not need any inbound ports open. More detailed information on firewall settings can be found here.

38.4 I'm seeing weird behavior (including but not limited to packages not installing their users properly)

This is often caused by SELinux. Try disabling SELinux or putting it in permissive mode and see if the weird behavior goes away.

38.5 My script runs every time I run a state.highstate. Why?

You are probably using cmd.run rather than cmd.wait. A cmd.wait state will only run when there has been a change in a state that it is watching.

A cmd.run state will run the corresponding command every time (unless it is prevented from running by the unless or onlyif arguments).

More details can be found in the documentation for the cmd states.

38.6 When I run test.ping, why don't the Minions that aren't responding return anything? Returning False would be helpful.

When you run test.ping the Master tells Minions to run commands/functions, and listens for the return data, printing it to the screen when it is received. If it doesn't receive anything back, it doesn't have anything to display for that Minion.

There are a couple options for getting information on Minions that are not responding. One is to use the verbose (-v) option when you run salt commands, as it will display ``Minion did not return” for any Minions which time out.

    salt -v '*/' pkg.install zsh

Another option is to use the manage.down runner:

    salt-run manage.down

Also, if the Master is under heavy load, it is possible that the CLI will exit without displaying return data for all targeted Minions. However, this doesn't mean that the Minions did not return; this only means that the Salt CLI timed out waiting for a response. Minions will still send their return data back to the Master once the job completes. If any expected Minions are missing from the CLI output, the jobs.list_jobs runner can be used to show the job IDs of the jobs that have been run, and the jobs.lookup_jid runner can be used to get the return data for that job.

    salt-run jobs.list_jobs
    salt-run jobs.lookup_jid 20130916125524463507
If you find that you are often missing Minion return data on the CLI, only to find it with the jobs runners, then this may be a sign that the `worker_threads` value may need to be increased in the master config file. Additionally, running your Salt CLI commands with the `-t` option will make Salt wait longer for the return data before the CLI command exits. For instance, the below command will wait up to 60 seconds for the Minions to return:

```
salt -t 60 '*' test.ping
```

### 38.7 How does Salt determine the Minion's id?

If the Minion id is not configured explicitly (using the `id` parameter), Salt will determine the id based on the hostname. Exactly how this is determined varies a little between operating systems and is described in detail [here](#).

### 38.8 I'm trying to manage packages/services but I get an error saying that the state is not available. Why?

Salt detects the Minion’s operating system and assigns the correct package or service management module based on what is detected. However, for certain custom spins and OS derivatives this detection fails. In cases like this, an issue should be opened on our [tracker](#), with the following information:

1. The output of the following command:
   
   ```
salt <minion_id> grains.items | grep os
   ```

2. The contents of `/etc/lsb-release`, if present on the Minion.

### 38.9 I'm using gitfs and my custom modules/states/etc are not syncing. Why?

In versions of Salt 0.16.3 or older, there is a bug in [gitfs](#) which can affect the syncing of custom types. Upgrading to 0.16.4 or newer will fix this.

### 38.10 Why aren't my custom modules/states/etc. available on my Minions?

Custom modules are only synced to Minions when `state.highstate`, `saltutil.sync_modules`, or `saltutil.sync_all` is run. Similarly, custom states are only synced to Minions when `state.highstate`, `saltutil.sync_states`, or `saltutil.sync_all` is run.

Other custom types (renderers, outputters, etc.) have similar behavior, see the documentation for the `saltutil` module for more information.
38.11 Module X isn't available, even though the shell command it uses is installed. Why?

This is most likely a PATH issue. Did you custom-compile the software which the module requires? RHEL/CentOS/etc. in particular override the root user's path in /etc/init.d/functions, setting it to /sbin:/usr/sbin:/bin:/usr/bin, making software installed into /usr/local/bin unavailable to Salt when the Minion is started using the init script. In version 2014.1.0, Salt will have a better solution for these sort of PATH-related issues, but recompiling the software to install it into a location within the PATH should resolve the issue in the meantime. Alternatively, you can create a symbolic link within the PATH using a file.symlink state.

```
/usr/bin/foo:
  file.symlink:
    - target: /usr/local/bin/foo
```

38.12 Can I run different versions of Salt on my Master and Minion?

This depends on the versions. In general, it is recommended that Master and Minion versions match.

When upgrading Salt, the master(s) should always be upgraded first. Backwards compatibility for minions running newer versions of salt than their masters is not guaranteed.

Whenever possible, backwards compatibility between new masters and old minions will be preserved. Generally, the only exception to this policy is in case of a security vulnerability.

Recent examples of backwards compatibility breakage include the 0.17.1 release (where all backwards compatibility was broken due to a security fix), and the 2014.1.0 release (which retained compatibility between 2014.1.0 masters and 0.17 minions, but broke compatibility for 2014.1.0 minions and older masters).

38.13 Does Salt support backing up managed files?

Yes. Salt provides an easy to use addition to your file.managed states that allow you to back up files via backup_mode, backup_mode can be configured on a per state basis, or in the minion config (note that if set in the minion config this would simply be the default method to use, you still need to specify that the file should be backed up!).

38.14 What is the best way to restart a Salt daemon using Salt?

Updating the salt-minion package requires a restart of the salt-minion service. But restarting the service while in the middle of a state run interrupts the process of the minion running states and sending results back to the master. It's a tricky problem to solve, and we're working on it, but in the meantime one way of handling this (on Linux and UNIX-based operating systems) is to use at (a job scheduler which predates cron) to schedule a restart of the service. at is not installed by default on most distros, and requires a service to be running (usually called atd) in order to schedule jobs. Here's an example of how to upgrade the salt-minion package at the end of a Salt run, and schedule a service restart for one minute after the package update completes.
### 38.14.1 Linux/Unix

```yaml
salt-minion:
  pkg.installed:
    - name: salt-minion
    - version: 2014.1.7-3.el6
    - order: last
  service.running:
    - name: salt-minion
    - require:
      - pkg: salt-minion
  cmd.wait:
    - name: echo service salt-minion restart | at now + 1 minute
    - watch:
      - pkg: salt-minion
```

To ensure that `at` is installed and `atd` is running, the following states can be used (be sure to double-check the package name and service name for the distro the minion is running, in case they differ from the example below.

```yaml
at:
  pkg.installed:
    - name: at
  service.running:
    - name: atd
      - enable: True
```

An alternative to using the `atd` daemon is to fork and disown the process.

```yaml
restart_minion:
  cmd.run:
    - name: |
      exec 0<&- # close stdin
      exec 1<&- # close stdout
      exec 2<&- # close stderr
      nohup /bin/sh -c 'sleep 10 && salt-call --local service.restart salt-minion' &
    - python_shell: True
    - order: last
```

### 38.14.2 Windows

For Windows machines, restarting the minion at can be accomplished by adding the following state:

```yaml
schedule-start:
  cmd.run:
    - name: 'start powershell "Restart-Service -Name salt-minion"'
    - order: last
```

or running immediately from the command line:

```bash
salt -G kernel:Windows cmd.run 'start powershell "Restart-Service -Name salt-minion"'
```
38.15 Salting the Salt Master

In order to configure a master server via states, the Salt master can also be ``salted'' in order to enforce state on the Salt master as well as the Salt minions. Salting the Salt master requires a Salt minion to be installed on the same machine as the Salt master. Once the Salt minion is installed, the minion configuration file must be pointed to the local Salt master:

```
master: 127.0.0.1
```

Once the Salt master has been ``salted'' with a Salt minion, it can be targeted just like any other minion. If the minion on the salted master is running, the minion can be targeted via any usual `salt` command. Additionally, the `salt-call` command can execute operations to enforce state on the salted master without requiring the minion to be running.

More information about salting the Salt master can be found in the salt-formula for salt itself:

https://github.com/saltstack-formulas/salt-formula
Auto-Order  The evaluation of states in the order that they are defined in a SLS file. See also: ordering.

Bootstrap  A stand-alone Salt project which can download and install a Salt master and/or a Salt minion onto a host. See also: salt-bootstrap.

Compound Matcher  A combination of many target definitions that can be combined with boolean operators. See also: targeting.

EAuth  Shorthand for `external authentication'. A system for calling to a system outside of Salt in order to authenticate users and determine if they are allowed to issue particular commands to Salt. See also: external auth.

Environment  A directory tree containing state files which can be applied to minions. See also: top file.

Execution Function  A Python function inside an Execution Module that may take arguments and performs specific system-management tasks. See also: the list of execution modules.

External Job Cache  An external data-store that can archive information about jobs that have been run. A default returner. See also: ext_job_cache, the list of returners.

Execution Module  A Python module that contains execution functions which directly perform various system-management tasks on a server. Salt ships with a number of execution modules but users can also write their own execution modules to perform specialized tasks. See also: the list of execution modules.

External Pillar  A module that accepts arbitrary arguments and returns a dictionary. The dictionary is automatically added to a pillar for a minion.

Event  A notice emitted onto an event bus. Events are often driven by requests for actions to occur on a minion or master and the results of those actions. See also: Salt Reactor.

File Server  A local or remote location for storing both Salt-specific files such as top files or SLS files as well as files that can be distributed to minions, such as system configuration files. See also: Salt's file server.

Grain  A key-value pair which contains a fact about a system, such as its hostname, network addresses. See also: targeting with grains.

Highdata  The data structure in a SLS file the represents a set of state declarations. See also: state layers.

Highstate  The collection of states to be applied to a system. See also: state layers.

Jinja  A templating language which allows variables and simple logic to be dynamically inserted into static text files when they are rendered. See also: Salt's Jinja documentation.

Job  The complete set of tasks to be performed by the execution of a Salt command are a single job. See also: jobs runner.

Job ID  A unique identifier to represent a given job.
Low State  The collection of processed states after requisites and order are evaluated. See also: state layers.

Master  A central Salt daemon which from which commands can be issued to listening minions.

Masterless  A minion which does not require a Salt master to operate. All configuration is local. See also: file_client.

Master Tops  A system for the master that allows hooks into external systems to generate top file data.

Mine  A facility to collect arbitrary data from minions and store that data on the master. This data is then available to all other minions. [Sometimes referred to as Salt Mine.] See also: Salt Mine.

Minion  A server running a Salt minion daemon which can listen to commands from a master and perform the requested tasks. Generally, minions are servers which are to be controlled using Salt.

Minion ID  A globally unique identifier for a minion. See also: id.

Multi-Master  The ability for a minion to be actively connected to multiple Salt masters at the same time in high-availability environments.

Node Group  A pre-defined group of minions declared in the master configuration file. See also: targeting.

OUTPUTTER  A formatter for defining the characteristics of output data from a Salt command. See also: list of outputters.

Peer Communication  The ability for minions to communicate directly with other minions instead of brokering commands through the Salt master. See also: peer communication.

Pillar  A simple key-value store for user-defined data to be made available to a minion. Often used to store and distribute sensitive data to minions. See also: Pillar, list of Pillar modules.

Proxy Minion  A minion which can control devices that are unable to run a Salt minion locally, such as routers and switches.

PyDSL  A Pythonic domain-specific-language used as a Salt renderer. PyDSL can be used in cases where adding pure Python into SLS files is beneficial. See also: PyDSL.

Reactor  An interface for listening to events and defining actions that Salt should taken upon receipt of given events. See also: Reactor.

Render Pipe  Allows SLS files to be rendered by multiple renderers, with each renderer receiving the output of the previous. See also: composing renderers.

Renderer  Responsible for translating a given data serialization format such as YAML or JSON into a Python data structure that can be consumed by Salt. See also: list of renderers.

Returner  Allows for the results of a Salt command to be sent to a given data-store such as a database or log file for archival. See also: list of returners.

Roster  A flat-file list of target hosts. (Currently only used by salt-ssh.)

Runner Module  A module containing a set of runner functions. See also: list of runner modules.

Runner Function  A function which is is called by the salt-run command and executes on the master instead of on a minion. See also: Runner Module.

Salt Cloud  A suite of tools used to create and deploy systems on many hosted cloud providers. See also: salt-cloud.

Salt SSH  A configuration management and remote orchestration system that does not require that any software besides SSH be installed on systems to be controlled.

Salt Thin  A subset of the normal Salt distribution that does not include any transport routines. A Salt Thin bundle can be dropped onto a host and used directly without any requirement that the host be connected to a network. Used by Salt SSH. See also: thin runner.

Salt Virt  Used to manage the creation and deployment of virtual machines onto a set of host machines. Often used to create and deploy private clouds. See also: virt runner.
SLS Module  Contains a set of state declarations.

State Compiler  Translates highdata into lowdata.

State Declaration  A data structure which contains a unique ID and describes one or more states of a system such as ensuring that a package is installed or a user is defined. See also: highstate structure.

State Function  A function contained inside a state module which can manages the application of a particular state to a system. State functions frequently call out to one or more execution modules to perform a given task.

State Module  A module which contains a set of state functions. See also: list of state modules.

State Run  The application of a set of states on a set of systems.

Syndic  A forwarder which can relay messages between tiered masters. See also: Syndic.

Target  Minion(s) to which a given salt command will apply. See also: targeting.

Top File  Determines which SLS files should be applied to various systems and organizes those groups of systems into environments. See also: top file, list of master top modules.

__virtual__  A function in a module that is called on module load to determine whether or not the module should be available to a minion. This function commonly contains logic to determine if all requirements for a module are available, such as external libraries.

Worker  A master process which can send notices and receive replies from minions. See also: worker_threads.
Salt Module Index

a
salt.auth.auto, 391
salt.auth.django, 391
salt.auth.keystone, 392
salt.auth.ldap, 393
salt.auth.mysql, 393
salt.auth.pam, 394
salt.auth.pki, 395
salt.auth.stormpath, 395
salt.auth.yubico, 396

b
salt.beacons.btmp, 1786
salt.beacons.diskusage, 1787
salt.beacons.inotify, 1787
salt.beacons.journald, 1788
salt.beacons.load, 1788
salt.beacons.network_info, 1789
salt.beacons.service, 1789
salt.beacons.sh, 1790
salt.beacons.twilio_txt_msg, 1790
salt.beacons.wtmp, 1791

c
salt.cloud.clouds.aliyun, 433
salt.cloud.clouds.botocore_aws, 435
salt.cloud.clouds.cloudstack, 436
salt.cloud.clouds.digital_ocean, 437
salt.cloud.clouds.ec2, 439
salt.cloud.clouds.gce, 446
salt.cloud.clouds.gogrid, 451
salt.cloud.clouds.joyent, 453
salt.cloud.clouds.libcloud_aws, 456
salt.cloud.clouds.linode, 458
salt.cloud.clouds.lxc, 462
salt.cloud.clouds.msazure, 463
salt.cloud.clouds.nova, 477
salt.cloud.clouds.opennebula, 480
salt.cloud.clouds.openstack, 481
salt.cloud.clouds.parallels, 484
salt.cloud.clouds.proxmox, 485
salt.cloud.clouds.pyrax, 487
salt.cloud.clouds.rackspace, 488
salt.cloud.clouds.saltify, 489
salt.cloud.clouds.softlayer, 489
salt.cloud.clouds.softlayer_hw, 491
salt.cloud.clouds.vmware, 492
salt.cloud.clouds.vsphere, 500
e
salt.engines.logstash, 1791
salt.engines.sqs_events, 1791
salt.engines.test, 1792
salt.exceptions, 600

f
salt.fileserver.azurefs, 589
salt.fileserver.gitfs, 590
salt.fileserver.hgfs, 591
salt.fileserver.minionfs, 592
salt.fileserver.roots, 593
salt.fileserver.s3fs, 593
salt.fileserver.svnfs, 594
l
salt.log.handlers.logstash_mod, 581
salt.log.handlers.sentry_mod, 583

m
salt.modules.aliases, 609
salt.modules.alternatives, 609
salt.modules.apache, 610
salt.modules.aptpkg, 612
salt.modules.archive, 619
salt.modules.artifactory, 622
salt.modules.at, 624
salt.modules.augias_config, 624
salt.modules.aws_sqs, 626
salt.modules.bamboohr, 627
salt.modules.beacons, 629
<table>
<thead>
<tr>
<th>Salt Module Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>salt.modules.bigip</td>
<td>630</td>
</tr>
<tr>
<td>salt.modules.blockdev</td>
<td>638</td>
</tr>
<tr>
<td>salt.modules.bluez</td>
<td>639</td>
</tr>
<tr>
<td>salt.modules.boto_asg</td>
<td>640</td>
</tr>
<tr>
<td>salt.modules.boto_cfn</td>
<td>642</td>
</tr>
<tr>
<td>salt.modules.boto_cloudwatch</td>
<td>644</td>
</tr>
<tr>
<td>salt.modules.boto_dynamodb</td>
<td>645</td>
</tr>
<tr>
<td>salt.modules.boto_ec2</td>
<td>646</td>
</tr>
<tr>
<td>salt.modules.boto_elasticsearch</td>
<td>649</td>
</tr>
<tr>
<td>salt.modules.boto_elasticache</td>
<td>649</td>
</tr>
<tr>
<td>salt.modules.boto_elb</td>
<td>652</td>
</tr>
<tr>
<td>salt.modules.boto_iam</td>
<td>654</td>
</tr>
<tr>
<td>salt.modules.boto_kms</td>
<td>660</td>
</tr>
<tr>
<td>salt.modules.boto_rds</td>
<td>663</td>
</tr>
<tr>
<td>salt.modules.boto_route53</td>
<td>666</td>
</tr>
<tr>
<td>salt.modules.boto_secgroup</td>
<td>667</td>
</tr>
<tr>
<td>salt.modules.boto_sns</td>
<td>668</td>
</tr>
<tr>
<td>salt.modules.boto_sqx</td>
<td>670</td>
</tr>
<tr>
<td>salt.modules.boto_vpc</td>
<td>671</td>
</tr>
<tr>
<td>salt.modulesbower</td>
<td>679</td>
</tr>
<tr>
<td>salt.modules.brew</td>
<td>679</td>
</tr>
<tr>
<td>salt.modules.bridge</td>
<td>681</td>
</tr>
<tr>
<td>salt.modules.bsd_shadow</td>
<td>683</td>
</tr>
<tr>
<td>salt.modules.btrfs</td>
<td>683</td>
</tr>
<tr>
<td>salt.modules.cabal</td>
<td>686</td>
</tr>
<tr>
<td>salt.modules.cassandra</td>
<td>687</td>
</tr>
<tr>
<td>salt.modules.cassandra_cql</td>
<td>688</td>
</tr>
<tr>
<td>salt.modules.chef</td>
<td>693</td>
</tr>
<tr>
<td>salt.modules.chocolatey</td>
<td>694</td>
</tr>
<tr>
<td>salt.modules.cloud</td>
<td>698</td>
</tr>
<tr>
<td>salt.modules.cmdmod</td>
<td>700</td>
</tr>
<tr>
<td>salt.modules.composer</td>
<td>713</td>
</tr>
<tr>
<td>salt.modules.config</td>
<td>715</td>
</tr>
<tr>
<td>salt.modules.consul</td>
<td>717</td>
</tr>
<tr>
<td>salt.modules.container_resource</td>
<td>729</td>
</tr>
<tr>
<td>salt.modules.cp</td>
<td>730</td>
</tr>
<tr>
<td>salt.modules.cpan</td>
<td>733</td>
</tr>
<tr>
<td>salt.modules.cron</td>
<td>734</td>
</tr>
<tr>
<td>salt.modules.cyg</td>
<td>735</td>
</tr>
<tr>
<td>salt.modules.daemontools</td>
<td>736</td>
</tr>
<tr>
<td>salt.modules.darwin_pkgutil</td>
<td>737</td>
</tr>
<tr>
<td>salt.modules.darwin_sysctl</td>
<td>737</td>
</tr>
<tr>
<td>salt.modules.data</td>
<td>738</td>
</tr>
<tr>
<td>salt.modules.ddns</td>
<td>740</td>
</tr>
<tr>
<td>salt.modules.deb_apache</td>
<td>741</td>
</tr>
<tr>
<td>salt.modules.deb_postgres</td>
<td>742</td>
</tr>
<tr>
<td>salt.modules.debconfmod</td>
<td>742</td>
</tr>
<tr>
<td>salt.modules.debian_ip</td>
<td>743</td>
</tr>
<tr>
<td>salt.modules.debian_service</td>
<td>744</td>
</tr>
<tr>
<td>salt.modules.defaults</td>
<td>746</td>
</tr>
<tr>
<td>salt.modules.devmap</td>
<td>746</td>
</tr>
<tr>
<td>salt.modules.dig</td>
<td>747</td>
</tr>
<tr>
<td>salt.modules.disk</td>
<td>748</td>
</tr>
<tr>
<td>salt.modules.djangomod</td>
<td>748</td>
</tr>
<tr>
<td>salt.modules.dnsmasq</td>
<td>749</td>
</tr>
<tr>
<td>salt.modules.dnsutil</td>
<td>750</td>
</tr>
<tr>
<td>salt.modules.dockerio</td>
<td>751</td>
</tr>
<tr>
<td>salt.modules.dockereng</td>
<td>762</td>
</tr>
<tr>
<td>salt.modules.dpkg</td>
<td>786</td>
</tr>
<tr>
<td>salt.modules.drac</td>
<td>787</td>
</tr>
<tr>
<td>salt.modules.drbd</td>
<td>790</td>
</tr>
<tr>
<td>salt.modules.elasticsearch</td>
<td>794</td>
</tr>
<tr>
<td>salt.modules.environ</td>
<td>797</td>
</tr>
<tr>
<td>salt.modules.eselect</td>
<td>798</td>
</tr>
<tr>
<td>salt.modules.etcd_mod</td>
<td>799</td>
</tr>
<tr>
<td>salt.modules.event</td>
<td>800</td>
</tr>
<tr>
<td>salt.modules.extfs</td>
<td>802</td>
</tr>
<tr>
<td>salt.modules.file</td>
<td>804</td>
</tr>
<tr>
<td>salt.modules.firewalld</td>
<td>824</td>
</tr>
<tr>
<td>salt.modules.freebsd_sysctl</td>
<td>828</td>
</tr>
<tr>
<td>salt.modules.freebsdjail</td>
<td>829</td>
</tr>
<tr>
<td>salt.modules.freebsdmod</td>
<td>830</td>
</tr>
<tr>
<td>salt.modules.freebsdpkgs</td>
<td>831</td>
</tr>
<tr>
<td>salt.modules.freebsdports</td>
<td>833</td>
</tr>
<tr>
<td>salt.modules.freebsdservice</td>
<td>835</td>
</tr>
<tr>
<td>salt.modules.gem</td>
<td>837</td>
</tr>
<tr>
<td>salt.modules.genesis</td>
<td>839</td>
</tr>
<tr>
<td>salt.modules.gentoo_service</td>
<td>840</td>
</tr>
<tr>
<td>salt.modules.gentoolkitmod</td>
<td>842</td>
</tr>
<tr>
<td>salt.modules.git</td>
<td>843</td>
</tr>
<tr>
<td>salt.modules.glance</td>
<td>863</td>
</tr>
<tr>
<td>salt.modules.glusterfs</td>
<td>865</td>
</tr>
<tr>
<td>salt.modules.gnomedesktop</td>
<td>867</td>
</tr>
<tr>
<td>salt.modules.gpg</td>
<td>868</td>
</tr>
<tr>
<td>salt.modules.grains</td>
<td>873</td>
</tr>
<tr>
<td>salt.modules.groupadd</td>
<td>877</td>
</tr>
<tr>
<td>salt.modules.grub_legacy</td>
<td>878</td>
</tr>
<tr>
<td>salt.modules.guestfs</td>
<td>878</td>
</tr>
<tr>
<td>salt.modules.hadoop</td>
<td>879</td>
</tr>
<tr>
<td>salt.modules.haproxyconn</td>
<td>879</td>
</tr>
<tr>
<td>salt.modules.hashutil</td>
<td>880</td>
</tr>
<tr>
<td>salt.modules.hg</td>
<td>881</td>
</tr>
<tr>
<td>salt.modules.hipchat</td>
<td>883</td>
</tr>
<tr>
<td>salt.modules.hosts</td>
<td>884</td>
</tr>
<tr>
<td>salt.modules.htpasswd</td>
<td>885</td>
</tr>
<tr>
<td>salt.modules.http</td>
<td>886</td>
</tr>
<tr>
<td>salt.modules.ifttt</td>
<td>887</td>
</tr>
<tr>
<td>salt.modules.iolo</td>
<td>887</td>
</tr>
<tr>
<td>salt.modules.img</td>
<td>889</td>
</tr>
<tr>
<td>salt.modules.incron</td>
<td>890</td>
</tr>
<tr>
<td>salt.modules.influx</td>
<td>891</td>
</tr>
<tr>
<td>salt.modules.ini_manage</td>
<td>895</td>
</tr>
<tr>
<td>salt.modules.introspect</td>
<td>896</td>
</tr>
<tr>
<td>salt.modules.ipmi</td>
<td>897</td>
</tr>
<tr>
<td>salt.modules.ipset</td>
<td>908</td>
</tr>
<tr>
<td>salt.modules.iptables</td>
<td>910</td>
</tr>
<tr>
<td>salt.modules.jboss7</td>
<td>914</td>
</tr>
</tbody>
</table>
Salt Module Index
salt.modules.saltcloudmod, 1134
salt.modules.saltutil, 1135
salt.modules.schedule, 1139
salt.modules.scsi, 1141
salt.modules.sdb, 1141
salt.modules.seed, 1142
salt.modules.selinux, 1142
salt.modules.sensors, 1143
salt.modules.serverdensity_device, 1144
salt.modules.service, 1144
salt.modules.shadow, 1145
salt.modules.slack_notify, 1147
salt.modules.smartos_imgadm, 1148
salt.modules.smartos_vmadm, 1149
salt.modules.smbios, 1153
salt.modules.smtp, 1156
salt.modules.ssh, 1157
salt.modules.softwareupdate, 1158
salt.modules.solaris_group, 1160
salt.modules.solaris_shadow, 1160
salt.modules.solaris_user, 1161
salt.modules.solarisips, 1163
salt.modules.solarispkg, 1166
salt.modules.solaris/pkg, 1169
salt.modules.splay, 1174
salt.modules.splunk_search, 1175
salt.modules.sqlite3, 1176
salt.modules.ssh, 1177
salt.modules.state, 1179
salt.modules.status, 1183
salt.modules.stormpath, 1185
salt.modules.sudo, 1186
salt.modules.supervisord, 1187
salt.modules.svn, 1189
salt.modules.swift, 1192
salt.modules.sysbench, 1193
salt.modules.syslog_ng, 1194
salt.modules.sysmod, 1199
salt.modules.sysrc, 1203
salt.modules.system, 1204
salt.modules.system_profiler, 1204
salt.modules.systemd, 1205
salt.modules.temp, 1207
salt.modules.test, 1207
salt.modules.test_virtual, 1211
salt.modules.timezone, 1212
salt.modules.tls, 1212
salt.modules.tomcat, 1220
salt.modules.trafficserver, 1224
salt.modules.tuned, 1226
salt.modules.twilio_notify, 1226
salt.modules.udev, 1227
salt.modules.upstart, 1228
salt.modules.uptime, 1230
salt.modules.useradd, 1230
salt.modules.uwsgi, 1232
salt.modules.vbox_guest, 1234
salt.modules.victorops, 1235
salt.modules.virt, 1236
salt.modules.virtualenv_mod, 1243
salt.modules.win_autoruns, 1244
salt.modules.win_dacl, 1244
salt.modules.win_disk, 1245
salt.modules.win_dns_client, 1246
salt.modules.win_file, 1246
salt.modules.win_firewall, 1251
salt.modules.win_groupadd, 1252
salt.modules.win_ip, 1253
salt.modules.win_network, 1254
salt.modules.win_ntp, 1256
salt.modules.win_path, 1256
salt.modules.win_pkg, 1257
salt.modules.win_powercfg, 1261
salt.modules.win_repo, 1262
salt.modules.win_servermanager, 1263
salt.modules.win_service, 1263
salt.modules.win_shadow, 1267
salt.modules.win_status, 1267
salt.modules.win_system, 1268
salt.modules.win_timezone, 1273
salt.modules.win_update, 1274
salt.modules.win_useradd, 1276
salt.modules.win_wua, 1281
salt.modules.x509, 1287
salt.modules.xapi, 1292
salt.modules.xfs, 1296
salt.modules.xmpp, 1298
salt.modules.yumpkg, 1299
salt.modules.zcbuildout, 1308
salt.modules.zfs, 1310
salt.modules.zk_concurrency, 1311
salt.modules.znc, 1313
salt.modules.zpool, 1313
salt.modules.zypper, 1315

N
salt.netapi.rest_cherrypy.app, 1321
salt.netapi.rest_cherrypy.wsgi, 1324
salt.netapi.rest_tornado, 1338
salt.netapi.rest_tornado.saltnado, 1340
salt.netapi.rest_wsgi, 1345

O
salt.output.compact, 1347
salt.output.highstate, 1348
salt.output.json_out, 1349
salt.output.key, 1349
salt.output.nested, 1349
salt.output.newline_values_only, 1350
salt.output.no_out, 1351
salt.output.no_return, 1351
salt.output.overstatestage, 1352
salt.output.pprint_out, 1352
salt.output.progress, 1352
salt.output.raw, 1352
salt.output.txt, 1353
salt.output.virt_query, 1353
salt.output.yaml_out, 1353
salt.pillar.cmd_json, 1355
salt.pillar.cmd_yaml, 1356
salt.pillar.cmd_yamlex, 1356
salt.pillar.cobbler, 1356
salt.pillar.django_orm, 1356
salt.pillar.ec2_pillar, 1358
salt.pillar.etcd_pillar, 1358
salt.pillar.file_tree, 1359
salt.pillar.foreman, 1361
salt.pillar.git_pillar, 1361
salt.pillar.git, 1363
salt.pillar.hiera, 1364
salt.pillar.libvirt, 1364
salt.pillar.mysql, 1364
salt.pillar.mongo, 1364
salt.pillar.mysq1, 1365
salt.pillar.pepa, 1366
salt.pillar.pillar_ldap, 1371
salt.pillar.puppet, 1372
salt.pillar.reclass_adapter, 1372
salt.pillar.redismod, 1373
salt.pillar.s3, 1374
salt.pillar.svn_pillar, 1375
salt.pillar.varstack_pillar, 1375
salt.pillar.virtkey, 1376
salt.renderers.cheetah, 1378
salt.renderers.genshi, 1378
salt.renderers.gpg, 1379
salt.renderers.hjson, 1380
salt.renderers.jinja, 1380
salt.renderers.json, 1385
salt.renderers.mako, 1385
salt.renderers.msgpack, 1385
salt.renderers.py, 1385
salt.renderers.pydsl, 1386
salt.renderers.pyobjects, 1391
salt.renderers.stateconf, 1394
salt.renderers.wempy, 1397
salt.renderers.yaml, 1398
salt.renderers.ymlex, 1399
salt.returners.carbon_return, 1405
salt.returners.cassandra_cql_return, 1406
salt.returners.cassandra_return, 1408
salt.returners.couchbase_return, 1408
salt.returners.couchdb_return, 1409
salt.returners.django_return, 1410
salt.returners.elasticsearch_return, 1410
salt.returners.etcd_return, 1411
salt.returners.hipchat_return, 1412
salt.returners.influxdb_return, 1413
salt.returners.kafka_return, 1414
salt.returners.local, 1414
salt.returners.local_cache, 1414
salt.returners.memcache_return, 1415
salt.returners.mongo_future_return, 1416
salt.returners.mongo_return, 1417
salt.returners.multi_returner, 1417
salt.returners.mysql, 1418
salt.returners.nagios_return, 1420
salt.returners.odbc, 1421
salt.returners.pgjsonb, 1423
salt.returners.postgres, 1425
salt.returners.postgres_local_cache, 1427
salt.returners.pushover_returner, 1428
salt.returners.redis_return, 1430
salt.returners.sentry_return, 1430
salt.returners.sentry, 1431
salt.returners.sentry, 1431
salt.returners.smtp_return, 1432
salt.returners.smtp_return, 1432
salt.returners.sqlite3_return, 1434
salt.returners.syslog_return, 1435
salt.returners.xmpp_return, 1435
salt.roster.ansible, 1437
salt.roster.cache, 1438
salt.roster.cloud, 1439
salt.roster.clustershell, 1439
salt.roster.flat, 1439
salt.roster.scan, 1439
salt.runners.cache, 1441
salt.runners.cache, 1441
salt.runners.cloud, 1442
salt.runners.doc, 1442
salt.runners.drac, 1443
salt.runners.error, 1443
salt.runners.f5, 1444
salt.runners.fileserver, 1445
salt.runners.git_pillar, 1448
salt.runners.http, 1448
salt.runners.jobs, 1449
salt.runners.launchd, 1450
salt.runners.lxc, 1450

Salt Module Index 2269
Salt Module Index

salt.runners.manage, 1453
salt.runners.mine, 1457
salt.runners.nacl, 1457
salt.runners.network, 1458
salt.runners.pagerduty, 1458
salt.runners.pillar, 1460
salt.runners.pkg, 1460
salt.runners.queue, 1462
salt.runners.sdb, 1462
salt.runners.search, 1462
salt.runners.ssh, 1462
salt.runners.state, 1463
salt.runners.survey, 1464
salt.runners.test, 1465
salt.runners.thin, 1465
salt.runners.virt, 1466
salt.runners.winrepo, 1467
salt.sdb.couchdb, 1792
salt.sdb.etcd_db, 1793
salt.sdb.keyring_db, 1794
salt.sdb.memcached, 1794
salt.sdb.sqlite3, 1795
salt.states.alias, 1520
salt.states.alternatives, 1520
salt.states.apache, 1521
salt.states.apache_module, 1522
salt.states.aptpkg, 1523
salt.states.archive, 1523
salt.states.artifactory, 1524
salt.states.at, 1525
salt.states.augeas, 1526
salt.states.aws_sqs, 1527
salt.states.beacon, 1528
salt.states.bigip, 1529
salt.states.blockdev, 1535
salt.states.boto_asg, 1536
salt.states.boto_cfn, 1540
salt.states.boto_cloudwatch_alarm, 1542
salt.states.boto_dynamodb, 1543
salt.states.boto_ec2, 1545
salt.states.boto_elasticache, 1546
salt.states.boto_elb, 1549
salt.states.boto_iam, 1553
salt.states.boto_iam_role, 1557
salt.states.boto_kms, 1559
salt.states.boto_lc, 1560
salt.states.boto_rds, 1562
salt.states.boto_route53, 1565
salt.states.boto_secgroup, 1567
salt.states.boto_sns, 1568
salt.states.boto_sqs, 1570
salt.states.boto_vpc, 1571
salt.states.bower, 1575
salt.states.cabal, 1576
salt.states.cchef, 1576
salt.states.cloud, 1577
salt.states.cmd, 1579
salt.states.composer, 1586
salt.states.cron, 1588
salt.states.cyg, 1590
salt.states.ddns, 1592
salt.states.debcfg, 1592
salt.states.disk, 1594
salt.states.dockerio, 1594
salt.states.doctor, 1600
salt.states.drac, 1610
salt.states.elasticsearch_index, 1610
salt.states.elasticsearch_index_template, 1610
salt.states.environ, 1611
salt.states.esrestyle, 1611
salt.states.etcd_mod, 1612
salt.states.event, 1613
salt.states.file, 1614
salt.states.firewalld, 1634
salt.states.gem, 1634
salt.states.git, 1635
salt.states.glusterfs, 1640
salt.states.gnomedesktop, 1641
salt.states.grafana, 1641
salt.states.grains, 1645
salt.states.group, 1646
salt.states.hg, 1647
salt.states.hipchat, 1647
salt.states.host, 1648
salt.states.htpasswd, 1649
salt.states.http, 1649
salt.states.ifttt, 1650
salt.states.incrone, 1650
salt.states.influxdb_database, 1651
salt.states.influxdb_user, 1652
salt.states.ini_manager, 1653
salt.states.ipmi, 1654
salt.states.ipset, 1656
salt.states.iptables, 1658
salt.states.jboss7, 1662
salt.states.keyboard, 1667
salt.states.keystone, 1668
salt.states.kmod, 1670
salt.states.layman, 1670
salt.states.libvirt, 1671
salt.states.linux_acl, 1671
salt.states.locale, 1672
salt.states.lvm, 1672
salt.states.lvs_server, 1673
salt.states.lvs_service, 1674
salt.states.lxc, 1674
salt.states.makeconf, 1678
salt.states.madm, 1678
salt.states.memcached, 1679
salt.states.modjk, 1679
salt.states.modjk_worker, 1680
salt.states.module, 1681
salt.states.mongodb_database, 1683
salt.states.mongodb_user, 1683
salt.states.monit, 1684
salt.states.mount, 1684
salt.states.mysql_database, 1686
salt.states.mysql_grants, 1686
salt.states.mysql_query, 1688
salt.states.network, 1689
salt.states.nftables, 1693
salt.states.ntp, 1697
salt.states.openstack_config, 1697
salt.states.pagerduty, 1698
salt.states.pagerduty escalation_policy, 1698
salt.states.pagerduty_schedule, 1699
salt.states.pagerduty_service, 1700
salt.states.pagerduty_user, 1701
salt.states.pip_state, 1702
salt.states.pkg, 1705
salt.states.pkgbuild, 1712
salt.states.pkgng, 1713
salt.states.pkgrepo, 1713
salt.states.portage_config, 1716
salt.states.ports, 1716
salt.states.postgres_database, 1717
salt.states.postgres_extension, 1718
salt.states.postgres_group, 1718
salt.states.postgres_schema, 1719
salt.states.postgres_tablespace, 1720
salt.states.postgres_user, 1721
salt.states.powerpath, 1722
salt.states.process, 1722
salt.states.pushover, 1722
salt.states.pyenv, 1723
salt.states.pyrax_queues, 1724
salt.states.quota, 1725
salt.states.rabbitmq_cluster, 1725
salt.states.rabbitmq_plugin, 1726
salt.states.rabbitmq_policy, 1726
salt.states.rabbitmq_user, 1727
salt.states.rabbitmq_vhost, 1727
salt.states.rbenv, 1728
salt.states.rdp, 1729
salt.states.redismod, 1729
salt.states.reg, 1730
salt.states.rvm, 1732
salt.states.selinux, 1739
salt.states.serverdensity_device, 1739
salt.states.service, 1740
salt.states.slack, 1741
salt.states.smtp, 1742
salt.states.splunk_search, 1742
salt.states.ssh_auth, 1743
salt.states.ssh_known_hosts, 1744
salt.states.stateconf, 1745
salt.states.status, 1745
salt.states.stormpath_account, 1746
salt.states.supervisor, 1746
salt.states.svn, 1747
salt.states.sysctl, 1747
salt.states.syslog_ng, 1748
salt.states.sysrc, 1749
salt.states.test, 1749
salt.states.timezone, 1751
salt.states.tls, 1751
salt.states.tomcat, 1752
salt.states.tops.cobbler, 1781
salt.states.tops.ext_nodes, 1781
salt.states.tops.mongo, 1782
salt.states.tops.reclass_adapter, 1783
salt.states.tops.cobbler, 1781
salt.states.tops.ext_nodes, 1781
salt.states.tops.mongo, 1782
salt.states.tops.reclass_adapter, 1783
salt.tops.cobbler, 1781
salt.tops.ext_nodes, 1781
salt.tops.mongo, 1782
salt.tops.reclass_adapter, 1783
salt.utils.aggregation, 596
W
salt.wheel.config, 1784
salt.wheel.error, 1784
salt.wheel.file_roots, 1785
salt.wheel.key, 1785
salt.wheel.minions, 1786
salt.wheel.pillar_roots, 1786
Symbols

--args-separator=ARGS_SEPARATOR
  salt command line option, 403
--async
  salt command line option, 402
--auto-create
  salt-key command line option, 412
--file-root=FILE_ROOT
  salt-call command line option, 400
--force-color
  salt command line option, 404, 419
  salt-call command line option, 401
  salt-cloud command line option, 245, 407
  salt-key command line option, 411
--gen-keys-dir=GEN_KEYS_DIR
  salt-key command line option, 412
--gen-keys=GEN_KEYS
  salt-key command line option, 412
--gen-signature
  salt-key command line option, 412
--grain-pcre
  salt command line option, 403, 418
  salt-cp command line option, 409
--hard-crash
  salt-call command line option, 399
  salt-key command line option, 410
  salt-run command line option, 416
--hide-timeout
  salt command line option, 402
--id=ID
  salt-call command line option, 400
--include-all
  salt-key command line option, 411
--key-deploy
  command line option, 417
--keysize=KEYSIZE
  salt-key command line option, 412
--list-images=LIST_IMAGES
  salt-cloud command line option, 245, 406
--list-locations=LIST_LOCATIONS
  salt-cloud command line option, 245, 406
--list-profiles
  salt-cloud command line option, 244, 406
--list-providers
  salt-cloud command line option, 244, 406
--list-sizes=LIST_SIZES
  salt-cloud command line option, 245, 406
--local
  salt-call command line option, 400
--log-file-level=LOG_LEVEL_LOGFILE
  salt command line option, 403, 418
  salt-api command line option, 421
  salt-call command line option, 400
  salt-cp command line option, 409
  salt-key command line option, 410
  salt-master command line option, 413
  salt-minion command line option, 414
  salt-proxy command line option, 415
  salt-run command line option, 416
  salt-syndic command line option, 420
  spm command line option, 422
--log-file=LOG_FILE
  salt command line option, 403, 418
  salt-api command line option, 421
  salt-call command line option, 400
  salt-cp command line option, 409
  salt-key command line option, 410
  salt-master command line option, 413
  salt-minion command line option, 414
  salt-proxy command line option, 415
  salt-run command line option, 416
  salt-syndic command line option, 420
  spm command line option, 422
--master=MASTER
  salt-call command line option, 400
--max-procs
  command line option, 417
--metadata
  salt-call command line option, 400
--no-color
  salt command line option, 404, 419
salt-call command line option, 401
salt-cloud command line option, 245, 407
salt-key command line option, 411

--out
salt command line option, 404, 418
salt-call command line option, 400
salt-cloud command line option, 245, 407
salt-key command line option, 411

--out-file=OUTPUT_FILE, --output-file=OUTPUT_FILE
salt command line option, 404, 419
salt-call command line option, 401
salt-cloud command line option, 245, 407
salt-key command line option, 411

--out-indent OUTPUT_INDENT, --output-indent OUTPUT_INDENT
salt command line option, 404, 419
salt-call command line option, 401
salt-cloud command line option, 245, 407
salt-key command line option, 411

--passwd
command line option, 417

--pid-file PIDFILE
salt-master command line option, 413
salt-minion command line option, 414
salt-proxy command line option, 415
salt-syndic command line option, 420

--pid-file=PIDFILE
salt-api command line option, 421

--pillar-root=PILLAR_ROOT
salt-call command line option, 400

--priv
command line option, 417
--priv=PRIV
salt-key command line option, 412
--proxyid
salt-proxy command line option, 415
--pub=PUBLIC
salt-key command line option, 412

--refresh, --refresh-cache
command line option, 417
--refresh-grains-cache
salt-call command line option, 400

--retcode-passthrough
salt-call command line option, 400

--return RETURNER
salt-call command line option, 400

--return=RETURNER
salt-call command line option, 400

--revert
salt command line option, 402

--roster
command line option, 417
--roster-file
command line option, 417

--rotate-aes-key=ROTATE_AES_KEY
salt-key command line option, 410

--script-args=SCRIPT_ARGS
salt-cloud command line option, 244, 406

--set-password=USER_NAME PROVIDER
salt-cloud command line option, 245, 406

--show-deploy-args
salt-cloud command line option, 244, 406

--signature-path=SIGNATURE_PATH
salt-key command line option, 412

--skip-grains
salt-call command line option, 400

--state-output=STATE_OUTPUT
salt command line option, 402

--subset=SUBSET
salt command line option, 402

--version
salt command line option, 402, 417
salt-api command line option, 420
salt-call command line option, 399
salt-cloud command line option, 243, 405
salt-cp command line option, 408
salt-key command line option, 410
salt-master command line option, 413
salt-minion command line option, 414
salt-proxy command line option, 415
salt-run command line option, 416
salt-syndic command line option, 419

--versions-report
salt command line option, 402, 417
salt-api command line option, 420
salt-call command line option, 399
salt-cloud command line option, 243, 405
salt-cp command line option, 408
salt-key command line option, 410
salt-master command line option, 413
salt-minion command line option, 414
salt-proxy command line option, 415
salt-run command line option, 416
salt-syndic command line option, 419

-A, --accept-all
salt-key command line option, 411

-C, --compound
salt command line option, 403

-D, --delete-all
salt-key command line option, 412

-E, --pcre
salt command line option, 403, 418
salt-cp command line option, 409

-F, --finger-all
salt-key command line option, 412

-F, --full-query
salt-cloud command line option, 244, 406

-G, --grain
salt command line option, 403, 418
salt-cp command line option, 409
-H, --hard
  salt-cloud command line option, 244, 405
-I, --pillar
  salt command line option, 403
-L LOCATION, --location=LOCATION
  salt-cloud command line option, 243, 405
-L, --list
  salt command line option, 403, 418
salt-cp command line option, 243, 405
-L, --list-all
  salt-key command line option, 411
-N, --nodegroup
  salt command line option, 403, 418
salt-cp command line option, 409
-P, --parallel
  salt-cloud command line option, 244, 405
-P, --print-all
  salt-key command line option, 412
-Q, --query
  salt-cloud command line option, 244, 406
-R, --range
  salt command line option, 403, 418
salt-cp command line option, 409
-R, --reject-all
  salt-key command line option, 411
-S, --ipcidr
  salt command line option, 403
-S, --select-query
  salt-cloud command line option, 244, 406
-T, --make-token
  salt command line option, 402
-a ACCEPT, --accept=ACCEPT
  salt-key command line option, 411
-a ACTION, --action=ACTION
  salt-cloud command line option, 243, 405
-a EAUTH, --auth=EAUTH
  salt command line option, 402
-b BATCH, --batch-size=BATCH
  salt command line option, 402
-c CONFIG_DIR, --config-dir=CONFIG_DIR
  salt command line option, 402, 418
salt-api command line option, 421
salt-master command line option, 413
salt-minion command line option, 414
salt-proxy command line option, 415
salt-syndic command line option, 420
-d, --destroy
  salt-cloud command line option, 244, 405
-d, --doc, --documentation
  salt command line option, 403
salt-call command line option, 400
salt-run command line option, 416
-f FINGER, --finger=FINGER
  salt-key command line option, 412
-f <FUNC-NAME> <PROVIDER>, --function=<FUNC-NAME> <PROVIDER>
  salt-cloud command line option, 243, 405
-f, --force
  spm command line option, 421
-g, --grains
  salt-call command line option, 399
-h, --help
  salt command line option, 402, 418
salt-api command line option, 421
salt-call command line option, 399
salt-cloud command line option, 243, 405
salt-cp command line option, 408
salt-key command line option, 410
salt-master command line option, 413
salt-minion command line option, 414
salt-proxy command line option, 415
salt-run command line option, 416
salt-syndic command line option, 420
-i, --ignore-host-keys
  command line option, 417
-k, --keep-tmp
  salt-cloud command line option, 244, 406
-l ARG, --list=ARG
  salt-key command line option, 411
-l LOG_LEVEL, --log-level=LOG_LEVEL
  salt command line option, 403, 418
salt-api command line option, 421
salt-call command line option, 400
salt-cloud command line option, 409
salt-master command line option, 413
salt-minion command line option, 414
salt-proxy command line option, 415
salt-run command line option, 416
spm command line option, 422
-m MAP, --map=MAP
  salt-cloud command line option, 243, 405
-m MODULE_DIRS, --module-dirs=MODULE_DIRS
  salt-call command line option, 400
-p PRINT, --print=PRINT
-p PROFILE, --profile=PROFILE
  salt-cloud command line option, 243, 405
-q, --quiet
  salt-key command line option, 410
-r REJECT, --reject=REJECT
  salt-key command line option, 411
-r, --raw, --raw-shell
  command line option, 417
-s, --static
  salt command line option, 402
-t TIMEOUT, --timeout=TIMEOUT
  salt-cp command line option, 408
  salt-run command line option, 416
-u USER, --user=USER
  salt-key command line option, 410
  salt-master command line option, 413
  salt-minion command line option, 414
  salt-proxy command line option, 415
  salt-syndic command line option, 420
-u, --update-bootstrap
  salt-cloud command line option, 244, 406
-v VERBOSE, --verbose
  salt command line option, 402
-ym, --assume-yes
  salt-cloud command line option, 244, 406
  spm command line option, 421
-y, --yes
  salt-key command line option, 410
__virtual__, 2147

A
A() (in module salt.modules.dig), 747
A() (in module salt.modules.dnsutil), 750
a2dismod() (in module salt.modules.deb_apache), 741
a2dissite() (in module salt.modules.deb_apache), 741
a2enmod() (in module salt.modules.deb_apache), 741
a2ensite() (in module salt.modules.deb_apache), 741
AAAA() (in module salt.modules.dig), 747
AAAAA() (in module salt.modules.dnsutil), 750
abort_import() (in module salt.modules.solr), 1169
absent() (in module salt.states.alias), 1520
absent() (in module salt.states.at), 1525
absent() (in module salt.states.aws_sqs), 1528
absent() (in module salt.states.beacon), 1528
absent() (in module salt.states.boto_asg), 1539
absent() (in module salt.states.boto_cfn), 1541
absent() (in module salt.states.boto_cloudwatch_alarm), 1543
absent() (in module salt.states.boto_dynamodb), 1544
absent() (in module salt.states.boto_elastachel), 1547
absent() (in module salt.states.boto_elb), 1552
absent() (in module salt.states.boto_iam_role), 1558
absent() (in module salt.states.boto_iam_role), 1558
absent() (in module salt.states.boto_rds), 1563
absent() (in module salt.states.boto_route53), 1566
absent() (in module salt.states.boto_s3), 1569
absent() (in module salt.states.boto_sqs), 1570
absent() (in module salt.states.boto_vpc), 1572
absent() (in module salt.states.cloud), 1578
absent() (in module salt.states.cron), 1589
absent() (in module salt.states.ddns), 1592
absent() (in module salt.states.dockerio), 1596
absent() (in module salt.states.dockereng), 1600
absent() (in module salt.states.drac), 1610
absent() (in module salt.states.elasticsearch_index), 1610
absent() (in module salt.states.elasticsearch_index_template), 1610
absent() (in module salt.states.file), 1617
absent() (in module salt.states.grains), 1645
absent() (in module salt.states.group), 1646
absent() (in module salt.states.host), 1649
absent() (in module salt.states.incr), 1651
absent() (in module salt.states.influxdb_database), 1651
absent() (in module salt.states.influxdb_user), 1652
absent() (in module salt.states.ipset), 1657
absent() (in module salt.states.kmod), 1670
absent() (in module salt.states.layman), 1670
absent() (in module salt.states.linux_acl), 1671
absent() (in module salt.states.lvs_server), 1673
absent() (in module salt.states.lvs_service), 1674
absent() (in module salt.states.lxc), 1674
absent() (in module salt.states.makeconf), 1678
absent() (in module salt.states.mdadm), 1678
absent() (in module salt.states.memcached), 1679
absent() (in module salt.states.mongodb_database), 1683
absent() (in module salt.states.mongodb_user), 1683
absent() (in module salt.states.mysql_database), 1686
absent() (in module salt.states.mysql_grants), 1687
absent() (in module salt.states.mysql_user), 1689
absent() (in module salt.states.openstack_config), 1697
absent() (in module salt.states.pagerduty_escalation_policy), 1699
absent() (in module salt.states.pagerduty_schedule), 1700
absent() (in module salt.states.pagerduty_service), 1700
absent() (in module salt.states.pagerduty_user), 1701
absent() (in module salt.states.pkgrepo), 1714
absent() (in module salt.states.postgres_database), 1717
absent() (in module salt.states.postgres_extension), 1718
absent() (in module salt.states.postgres_group), 1718
absent() (in module salt.states.postgres_schema), 1720
absent() (in module salt.states.postgres_tablespace), 1720
absent() (in module salt.states.postgres_user), 1721
absent() (in module salt.states.pyserv), 1722
absent() (in module salt.states.pyenv), 1724
absent() (in module salt.states.pyrax_queues), 1724

2276 Index
add() (in module salt.modules.supervisord), 1187
add() (in module salt.modules.svn), 1189
add() (in module salt.modules.useradd), 1230
add() (in module salt.modules.win_groupadd), 1252
add() (in module salt.modules.win_path), 1256
add() (in module salt.modules.win_useradd), 1276
add() (in module salt.modules.zpool), 1313
add_vhost() (in module salt.modules.rabbitmq), 1244
add_argument() (salt.modules.syslog_ng.TypedParameterValue method), 1196
add_child() (salt.modules.syslog_ng.Statement method), 1196
add_dns() (in module salt.modules.win_dns_client), 1246
add_gateway_router() (in module salt.modules.neutron), 1003
add_host() (in module salt.cloud.clouds.vmware), 493
add_host() (in module salt.modules.ddns), 740
add_host() (in module salt.modules.hosts), 884
add_host() (in module salt.modules.omapi), 1036
add_input_endpoint() (in module salt.cloud.clouds.msazure), 463
add_interface_router() (in module salt.modules.neutron), 1003
add_license() (in module salt.modules.powerpath), 1093
add_lock() (in module salt.modules.zypper), 1315
add_management_certificate() (in module salt.cloud.clouds.msazure), 464
add_masquerade() (in module salt.modules.firewalld), 824
add_parameter() (salt.modules.syslog_ng.Option method), 1195
add_pkg() (in module salt.modules.pkg_resource), 1068
add_pool_member() (in module salt.modules.bigip), 1529
add_pool_member() (salt.runners.f5.F5Mgmt method), 1444
add_port() (in module salt.modules.firewalld), 825
add_port_fwd() (in module salt.modules.firewalld), 825
add_record() (in module salt.modules.boto_route53), 666
add_rule() (in module salt.modules.win_firewall), 1251
add_rule() (in module salt.modules.svn), 1187
add_rule() (in module salt.modules.win_firewall), 1251
add_server() (in module salt.modules.lvs), 934
add_service() (in module salt.modules.firewalld), 825
add_service() (in module salt.modules.lvs), 934
add_service_certificate() (in module salt.cloud.clouds.msazure), 464
add_user() (in module salt.modules.rabbitmq), 1102
add_user_to_group() (in module salt.modules.boto_iam), 655
add_value() (salt.modules.syslog_ng.TypedParameterValue method), 1196
add_vhost() (in module salt.modules.rabbitmq), 1102
add_volume_bricks() (in module salt.modules.glusterfs), 865
add_volume_bricks() (in module salt.states.glusterfs), 1640
added()(salt.states.cyg.DictDiffer method), 1591
addgroup() (in module salt.modules.win_useradd), 1277
addif() (in module salt.modules.bridge), 682
additions_install() (in module salt.modules.vbox_guest), 1234
additions_installed() (in module salt.states.vbox_guest), 1758
additions mount() (in module salt.modules.vbox_guest), 1234
additions_remove() (in module salt.modules.vbox_guest), 1234
additions_removed() (in module salt.states.vbox_guest), 1758
additions_umount() (in module salt.modules.vbox_guest), 1234
additions_version() (in module salt.modules.vbox_guest), 1235
address() (in module salt.modules.bluez), 639
adduser() (in module salt.modules.groupadd), 877
adduser() (in module salt.modules.win_groupadd), 1252
agent_check_deregister() (in module salt.modules.consul), 719
agent_check_fail() (in module salt.modules.consul), 719
agent_check_pass() (in module salt.modules.consul), 719
agent_check_register() (in module salt.modules.consul), 719
agent_check_warn() (in module salt.modules.consul), 720
agent_checks() (in module salt.modules.consul), 720
agent_join() (in module salt.modules.consul), 720
agent_leave() (in module salt.modules.consul), 721
agent_maintenance() (in module salt.modules.consul), 721
agent_members() (in module salt.modules.consul), 721
agent_self() (in module salt.modules.consul), 721
agent_service_deregister() (in module salt.modules.consul), 721
agent_service_maintenance() (in module salt.modules.consul), 721
agent_service_register() (in module salt.modules.consul), 721
agent_services() (in module salt.modules.consul), 722
Aggregate (class in salt.utils.aggregation), 597
alarms() (in module salt.modules.trafficserver), 1224
align_check() (in module salt.modules.parted), 1057
allow_icmp() (in module salt.modules.firewalld), 825
allowed() (in module salt.runners.manage), 1453
always_verify_signature
conf/minion, 575
appdata_ptr (salt.auth.pam.PamConv attribute), 394
append() (in module salt.modules.file), 804
append() (in module salt.modules.grains), 873
append() (in module salt.modules.iptables), 910
append() (in module salt.modules.nftables), 1019
append() (in module salt.modules.file), 1618
append() (in module salt.modules.grains), 1645
append() (in module salt.modules.iptables), 1661
append() (in module salt.modules.nftables), 1695
append_cflags() (in module salt.modules.makeconf), 959
append_cxxflags() (in module salt.modules.makeconf), 959
append_domain
conf/minion, 567
append_emerge_default_opts() (in module salt.modules.makeconf), 959
append_features() (in module salt.modules.makeconf), 959
append_gentoo_mirrors() (in module salt.modules.makeconf), 959
append_makeopts() (in module salt.modules.makeconf), 960
append_to_package_conf() (in module salt.modules.portage_config), 1083
append_use_flags() (in module salt.modules.portage_config), 1083
append_var() (in module salt.modules.makeconf), 960
applications() (in module salt.modules.system_profiler), 1204
apply() (in module salt.modules.seed), 1142
apply() (in module salt.modules.state), 1179
apply() (in module salt.wheel.config), 1784
apply_network_profile() (in module salt.modules.lxc), 936
apply_network_settings() (in module salt.modules.debian_ip), 743
apply_network_settings() (in module salt.modules.rh_ip), 1121
apply_security_groups() (in module salt.modules.boto_elb), 652
apps() (in module salt.modules.osquery), 1044
apt_sources() (in module salt.modules.osquery), 1044
archive() (in module salt.modules.git), 843
archive() (in module salt.modules.hg), 881
arg() (in module salt.modules.test), 1207
arg() (in module salt.runners.test), 1465
arg_type() (in module salt.modules.test), 1208
argspec() (in module salt.modules.sysmod), 1199
Argument (class in module salt.modules.syslog_ng), 1194
arp() (in module salt.modules.network), 998
arp_cache() (in module salt.modules.osquery), 1044
ArtifactoryError, 622
assemble() (in module salt.modules.mdadm), 968
assertion() (in module salt.modules.test), 1208
assign() (in module salt.modules.darwin_sysctl), 737
assign() (in module salt.modules.freebsd_sysctl), 828
assign() (in module salt.modules.linux_sysctl), 931
assign() (in module salt.modules.netbsd_sysctl), 992
assign() (in module salt.modules.openbsd_sysctl), 1037
associate_dhcp_options_to_vpc() (in module salt.modules.boto_vpc), 671
associate_network_acl_to_subnet() (in module salt.modules.boto_vpc), 672
associate_new_dhcp_options_to_vpc() (in module salt.modules.boto_vpc), 672
associate_new_network_acl_to_subnet() (in module salt.modules.boto_vpc), 672
associate_profile_to_role() (in module salt.modules.boto_iam), 655
associate_route_table() (in module salt.modules.boto_vpc), 672
async() (method in class salt.runner.RunnerClient), 429
async() (method in class salt.wheel.WheelClient), 430
at() (in module salt.modules.at), 624
atc() (in module salt.modules.at), 624
atq() (in module salt.modules.at), 624
atrm() (in module salt.modules.at), 624
attach_disk() (in module salt.cloud.clouds.gce), 447
attach_lb() (in module salt.cloud.clouds.gce), 447
attach_subnets() (in module salt.cloud.clouds.boto_elb), 652
attach_volume() (in module salt.cloud.clouds.ec2), 440
attach_volume() (in module salt.cloud.clouds.nova), 478
attachable() (in module salt.modules.lxc), 936
attr_call() (in module salt.modules.test), 1208
attributes() (in module salt.modules.extfs), 802
audit() (in module salt.modules.pkgng), 1071
auth() (in module salt.auth.auto), 391
auth() (in module salt.auth.django), 392
auth() (in module salt.auth.keystone), 392
auth() (in module salt.auth.idap), 393
auth() (in module salt.auth.mysql), 394
auth() (in module salt.auth.pam), 394
auth() (in module salt.auth.pki), 395
auth() (in module salt.auth.stormpath), 395
auth() (in module salt.auth.yubico), 396
auth() (in module salt.modules.keystone), 921
auth_keys() (in module salt.modules.ssh), 1177
authenticate() (in module salt.auth.pam), 394
AuthenticationError, 597, 600
AuthorizationError, 597, 600
authorize() (in module salt.modules.boto_security_group), 667
authorize_cache_security_group_ingress() (in module salt.modules.boto_elasticache), 650
auto() (in module salt.modules.alternatives), 609
Auto-Order, 2145
auto_accept
conf/master, 537
autoload_dynamic_modules
conf/minion, 572
automaster() (in module salt.modules.mount), 978
autoreject_file
conf/master, 537
autoremove() (in module salt.modules.aptpkg), 612
autoremove() (in module salt.modules.pkgng), 1072
AutoSearch() (method in class salt.modules.update.PyWinUpdater), 1274
AutoSearch() (method in class salt.states.update.PyWinUpdater), 1766
autosign_file
conf/master, 537
autosign_timeout
conf/master, 537
avail() (in module salt.modules.localemod), 932
avail() (in module salt.modules.smartos_imgadm), 1148
avail_images() (in module salt.cloud.clouds.aliyun), 433
avail_images() (in module salt.cloud.clouds.cloudstack), 436
avail_images() (in module salt.cloud.clouds.digitalOcean), 438
avail_images() (in module salt.cloud.clouds.ec2), 440
avail_images() (in module salt.cloud.clouds.gce), 447
avail_images() (in module salt.cloud.clouds.gogrid), 451
avail_images() (in module salt.cloud.clouds.joyent), 453
avail_images() (in module salt.cloud.clouds.linode), 458
avail_images() (in module salt.cloud.clouds.lxc), 462
avail_images() (in module salt.cloud.clouds.msazure), 464
avail_images() (in module salt.cloud.clouds.nova), 478
avail_images() (in module salt.cloud.clouds.opennebula), 480
avail_images() (in module salt.cloud.clouds.openstack), 483
avail_images() (in module salt.cloud.clouds.parallels), 484
avail_images() (in module salt.cloud.clouds.proxmox), 486
avail_images() (in module salt.cloud.clouds.rackspace), 488
avail_images() (in module salt.cloud.clouds.softlayer), 490
avail_images()
  (in module salt.cloud.clouds.softlayer_hw), 491
avail_images()
  (in module salt.cloud.clouds.vmware), 493
avail_images()
  (in module salt.cloud.clouds.vsphere), 502
avail_locations()
  (in module salt.cloud.clouds.aliyun), 433
avail_locations()
  (in module salt.cloud.clouds.cloudstack), 436
avail_locations()
  (in module salt.cloud.clouds.digital_ocean), 438
avail_locations()
  (in module salt.cloud.clouds.ec2), 440
avail_locations()
  (in module salt.cloud.clouds.gce), 447
avail_locations()
  (in module salt.cloud.clouds.gogrid), 451
avail_locations()
  (in module salt.cloud.clouds.joyent), 453
avail_locations()
  (in module salt.cloud.clouds.linode), 458
avail_locations()
  (in module salt.cloud.clouds.msazure), 464
avail_locations()
  (in module salt.cloud.clouds.opennebula), 481
avail_locations()
  (in module salt.cloud.clouds.openstack), 483
avail_locations()
  (in module salt.cloud.clouds.proxmox), 486
avail_locations()
  (in module salt.cloud.clouds.rackspace), 488
avail_locations()
  (in module salt.cloud.clouds.softlayer), 490
avail_locations()
  (in module salt.cloud.clouds.softlayer_hw), 491
avail_locations()
  (in module salt.cloud.clouds.vmware), 493
avail_locations()
  (in module salt.cloud.clouds.aliyun), 433
avail_locations()
  (in module salt.cloud.clouds.cloudstack), 436
avail_locations()
  (in module salt.cloud.clouds.digital_ocean), 438
avail_locations()
  (in module salt.cloud.clouds.ec2), 440
avail_locations()
  (in module salt.cloud.clouds.gce), 447
avail_locations()
  (in module salt.cloud.clouds.gogrid), 451
avail_locations()
  (in module salt.cloud.clouds.joyent), 453
avail_locations()
  (in module salt.cloud.clouds.linode), 458
avail_locations()
  (in module salt.cloud.clouds.msazure), 464
avail_locations()
  (in module salt.cloud.clouds.opennebula), 481
avail_locations()
  (in module salt.cloud.clouds.openstack), 483
avail_locations()
  (in module salt.cloud.clouds.proxmox), 486
avail_locations()
  (in module salt.cloud.clouds.rackspace), 488
avail_locations()
  (in module salt.cloud.clouds.softlayer), 490
avail_locations()
  (in module salt.cloud.clouds.softlayer_hw), 491
avail_locations()
  (in module salt.cloud.clouds.vmware), 493
avail_locations()
  (in module salt.cloud.clouds.vsphere), 502
avail_platforms()
  (in module salt.modules.genesis), 839
avail_sizes()
  (in module salt.cloud.clouds.aliyun), 433
avail_sizes()
  (in module salt.cloud.clouds.cloudstack), 436
avail_sizes()
  (in module salt.cloud.clouds.digital_ocean), 438
avail_sizes()
  (in module salt.cloud.clouds.ec2), 440
avail_sizes()
  (in module salt.cloud.clouds.gce), 447
avail_sizes()
  (in module salt.cloud.clouds.gogrid), 451
avail_sizes()
  (in module salt.cloud.clouds.joyent), 453
avail_sizes()
  (in module salt.cloud.clouds.linode), 458
avail_sizes()
  (in module salt.cloud.clouds.msazure), 464
avail_sizes()
  (in module salt.cloud.clouds.opennebula), 481
avail_sizes()
  (in module salt.cloud.clouds.openstack), 483
avail_sizes()
  (in module salt.cloud.clouds.rackspace), 488
avail_sizes()
  (in module salt.cloud.clouds.softlayer), 490
avail_sizes()
  (in module salt.cloud.clouds.softlayer_hw), 491
avail_sizes()
  (in module salt.cloud.clouds.vmware), 494
available()
  (in module salt.modules.daemontools), 736
available()
  (in module salt.modules.debian_service), 744
available()
  (in module salt.modules.freebsdmod), 830
available()
  (in module salt.modules.freebsdservice), 835
available()
  (in module salt.modules.gentoo_service), 840
available()
  (in module salt.modules.kmod), 925
available()
  (in module salt.modules.launchctl), 926
available()
  (in module salt.modules.netbsdservice), 993
available()
  (in module salt.modules.openbsdrcctl), 1038
available()
  (in module salt.modules.openstack), 1040
available()
  (in module salt.modules.rh_service), 1123
available()
  (in module salt.modules.runit), 1129
available()
  (in module salt.modules.service), 1144
available()
  (in module salt.modules.snf), 1156
available()
  (in module salt.modules.systemd), 1205
available()
  (in module salt.modules.upstart), 1228
available()
  (in module salt.modules.win_service), 1263
available_extensions()
  (in module salt.modules.postgres), 1086
available_version()
  (in module salt.modules.macports), 957
available_version()
  (in module salt.modules.pkgin), 1069
available_version()
  (in module salt.modules.solarisips), 1163
B_backup()
  (in module salt.modules.pkgng), 1072
backup()
  (in module salt.modules.solr), 1170
backup_mode
  conf/minion, 568
backup_mode()
  (in module salt.modules.config), 715
ban()
  (in module salt.modules.varnish), 1233
ban_list()
  (in module salt.modules.varnish), 1233
base64_decodestring()
  (in module salt.modules.hashutil), 880
base64_encodestring()
  (in module salt.modules.hashutil), 881
basename()
  (in module salt.modules.file), 804
beacon()
  (in module salt.beacons.btmp), 1786
beacon()
  (in module salt.beacons.diskusage), 1787
beacon()
  (in module salt.beacons.inotify), 1787
beacon()
  (in module salt.beacons.journald), 1788
beacon()
  (in module salt.beacons.load), 1788
beacon()
  (in module salt.beacons.network_info), 1789
beacon()
  (in module salt.beacons.service), 1789
beacon()
  (in module salt.beacons.sh), 1790
beacon()
  (in module salt.beacons.twilio_txt_msg), 1790
beacon()
  (in module salt.beacons.wtmp), 1791
Best Practices, 1797
bgrewriteaof()
  (in module salt.modules.redismod), 1113
bgsave()
  (in module salt.modules.redismod), 1113
bin_pkg_info()
  (in module salt.modules.rpm), 1126
Salt Documentation, Release 2015.8.0

Index 2281
cachedir
conf/master, 533
conf/minion, 567
calc_net() (in module salt.modules.network), 998
call() (in module salt.states.cmd), 1581
call_rpc() (in module salt.modules.junos), 918
Caller (class in salt.client), 428
cas() (in module salt.modules.data), 738
catalog_datacenters() (in module salt.modules.consul), 722
catalog_deregister() (in module salt.modules.consul), 723
catalog_node() (in module salt.modules.consul), 723
catalog_nodes() (in module salt.modules.consul), 723
catalog_register() (in module salt.modules.consul), 723
catalog_service() (in module salt.modules.consul), 724
catalog_services() (in module salt.modules.consul), 724
cert_base_path() (in module salt.modules.tls), 1214
cert_info() (in module salt.modules.tls), 1214
certificate_managed() (in module salt.states.x509), 1103
certificates() (in module salt.modules.osquery), 1044
cflags_contains() (in module salt.modules.makeconf), 960
chain_absent() (in module salt.states.iptables), 1661
chain_absent() (in module salt.states.nftables), 1695
chain_present() (in module salt.states.iptables), 1661
chain_present() (in module salt.states.nftables), 1695
change() (in module salt.states.augeas), 1526
change_password() (in module salt.modules.drac), 787
change_password() (in module salt.modules.iptables), 887
change_password() (in module salt.modules.rabbitmq), 1103
change_username() (in module salt.states.iptables), 887
change() (salt.states.cyg.DictDiffer method), 1591
check() (in module salt.states.ipset), 908
check() (in module salt.modules.ipset), 911
check() (in module salt.modules.nftables), 1020
check() (in module salt.states.pam), 1058
check() (in module salt.modules.pkg), 1072
check_ace() (in module salt.modules.win_dacl), 1244
check_available() (in module salt.modules.freebsdmod), 830
check_available() (in module salt.modules.kmod), 925
check_chain() (in module salt.states.iptables), 911
check_chain() (in module salt.modules.nftables), 1020
check_db() (in module salt.modules.ebuild), 790
check_db() (in module salt.states.yumpkg), 1299
check_exists() (in module salt.states.uptime), 1230
check_extra_requirements() (in module salt.modules.iptables), 790
check_extra_requirements() (in module salt.modules.ebuild), 790
check_extra_requirements() (in module salt.modules.pkg_resource), 1068
check_file_meta() (in module salt.modules.file), 805
check_hash() (in module salt.modules.file), 805
check_inheritance() (in module salt.modules.win_dacl), 1244
check_installed() (in module salt.modules.alternatives), 609
check_ip() (in module salt.modules.dig), 748
check_ip() (in module salt.modules.dnsutil), 751
check_key() (in module salt.modules.ssh), 1177
check_key_file() (in module salt.modules.ssh), 1177
check_known_host() (in module salt.modules.ssh), 1177
check_managed() (in module salt.modules.file), 806
check_manager() (in module salt.modules.file), 806
check_member_pool() (in module salt.runners.f5), 1444
check_member_pool() (salt.runners.f5.F5Mgmt method), 1444
check_mod_enabled() (in module salt.modules.deb_apache), 741
check_perms() (in module salt.modules.file), 806
check_pillar() (in module salt.states.test), 1750
check_pool() (in module salt.runners.f5), 1444
check_pool() (salt.runners.f5.F5Mgmt method), 1444
check_request() (in module salt.modules.state), 1179
check_server() (in module salt.modules.lvs), 934
check_service() (in module salt.modules.lvs), 935
check_set() (in module salt.modules.ipset), 908
check_site_enabled() (in module salt.modules.deb_apache), 741
check_table() (in module salt.modules.nftables), 1020
check_valid_package() (in module salt.modules.cyg), 735
check_virtualserver() (in module salt.runners.f5), 1445
check_virtualserver() (salt.runners.f5.F5Mgmt method), 1444
checkout() (in module salt.modules.git), 845
checkout() (in module salt.modules.svn), 1189
checks_list() (in module salt.states.uptime), 1230
chfullname() (in module salt.modules.mac_user), 955
chfullname() (in module salt.modules.pw_user), 955
chfullname() (in module salt.modules.pw_group), 955
chfullname() (in module salt.modules.solaris_user), 1161
chfullname() (in module salt.modules.solaris_group), 1161
chfullname() (in module salt.modules.useradd), 1161
chfullname() (in module salt.modules.win_useradd), 1277
chgid() (in module salt.modules.group), 877
chgid() (in module salt.modules.mac_group), 877
chgid() (in module salt.modules.mac_user), 877
chgid() (in module salt.modules.pw_group), 877
chgid() (in module salt.modules.pw_user), 877
chgid() (in module salt.modules.solaris_group), 877
chgid() (in module salt.modules.solaris_user), 877
chgid() (in module salt.modules.useradd), 877
chgrp() (in module salt.modules.deb_apache), 1098
chgrp() (in module salt.modules.deb_apache), 1098
chgrp() (module salt.modules.solaris_user), 1098
chgrp() (module salt.modules.solaris_group), 1098
chgrp() (module salt.modules.solaris_user), 1098
chgrp() (module salt.modules.useradd), 1098
chgrp() (module salt.modules.useradd), 1098
chgrp() (module salt.modules.win_useradd), 1277
chgrp() (module salt.modules.win_useradd), 1277
chgrp() (module salt.modules.win_useradd), 1277
chgrp() (module salt.modules.win_useradd), 1277
chhome() (in module salt.modules.mac_user), 955
chhome() (in module salt.modules.mac_user), 955
chhome() (in module salt.modules.mac_user), 955
chhome() (in module salt.modules.mac_user), 955
chhome() (in module salt.modules.mac_user), 955
chhome() (in module salt.modules.mac_user), 955
chome() (in module salt.modules.pw_user), 1098
chome() (in module salt.modules.solaris_user), 1162
chhome() (in module salt.modules.useradd), 1231
chhome() (in module salt.modules.win_useradd), 1278
chhomephone() (in module salt.modules.pw_user), 1098
chhomephone() (in module salt.modules.solaris_user), 1162
chhomephone() (in module salt.modules.useradd), 1231
chloginclass() (in module salt.modules.useradd), 1231
chocolatey_version() (in module salt.modules.chocolatey), 694
chost_contains() (in module salt.modules.makeconf), 960
chown() (in module salt.modules.file), 806
chown() (in module salt.modules.win_file), 1247
chpgrp() (in module salt.modules.win_file), 1247
chprofile() (in module salt.modules.win_useradd), 1278
chrome_extensions() (in module salt.modules.osquery), 1045
chroomnumber() (in module salt.modules.pw_user), 1098
chroomnumber() (in module salt.modules.solaris_user), 1162
chroomnumber() (in module salt.modules.useradd), 1231
chshell() (in module salt.modules.mac_user), 955
chshell() (in module salt.modules.pw_user), 1098
chshell() (in module salt.modules.solaris_user), 1162
chshell() (in module salt.modules.useradd), 1231
chuid() (in module salt.modules.mac_user), 956
chuid() (in module salt.modules.pw_user), 1098
chuid() (in module salt.modules.solaris_user), 1162
chuid() (in module salt.modules.useradd), 1231
chworkphone() (in module salt.modules.pw_user), 1098
chworkphone() (in module salt.modules.solaris_user), 1162
chworkphone() (in module salt.modules.useradd), 1232
clean() (in module salt.modules.pkgng), 1073
clean_dynamic_modules
conf/minion, 572
clean_locks() (in module salt.modules.zypper), 1316
clean_metadata() (in module salt.modules.yumpkg), 1299
clean_old_jobs() (in module salt.runners.local_cache), 1414

clean_old_jobs() (in module salt.runners.multi_returner), 1417
clean_old_jobs() (in module salt.runners.postgres_local_cache), 1428
cleanup_unattached_disks() (in module salt.cloud.clouds.msaure), 464
clear() (in module salt.modules.data), 738
clear() (in module salt.modules.lvs), 935
clear() (in module salt.modules.qemu_nbd), 1101
clear_alarms() (in module salt.modules.trafficserver), 1224

clear_all() (in module salt.runners.cache), 1441
clear_cache() (in module salt.fileserver.gifs), 590
clear_cache() (in module salt.fileserver.svnfs), 595
clear_cache() (in module salt.modules.saltutil), 1135
clear_cache() (in module salt.modules.state), 1179
clear_cache() (in module salt.runners.fileserver), 1445
clear_cluster() (in module salt.modules.trafficserver), 1224
clear_cluster() (in module salt.states.trafficserver), 1754
clear_grains() (in module salt.runners.cache), 1441
clear_lock() (in module salt.fileserver.gifs), 590
clear_lock() (in module salt.fileserver.svnfs), 595
clear_lock() (in module salt.runners.fileserver), 1445
clear_node() (in module salt.modules.trafficserver), 1225
clear_node() (in module salt.states.trafficserver), 1754
clear_password() (in module salt.modules.rabbitmq), 1103
clear_pillar() (in module salt.runners.fileserver), 1441
clear_request() (in module salt.modules.state), 1179
client() (in module salt.modules.chef), 693
client() (in module salt.modules.state), 1576
client_acl
conf/master, 537
client_acl_blacklist
conf/master, 538
client_config() (in module salt.config), 423
client_version() (in module salt.modules.oracle), 1043
cloned() (in module salt.cloud.clouds.linode), 459
cloned() (in module salt.modules.git), 845
cloned() (in module salt.modules.hg), 882
cloned() (in module salt.modules.lxc), 937
close() (in module salt.states.lxc), 1674
close() (salt.pillar.hg_pillar.Repomethod), 1363
cloud_init() (in module salt.modules.lxc), 938
cloud_init() (in module salt.runners.lxc), 1450
cloud_init_interface() (in module salt.modules.lxc), 938

CloudClient (class in salt.cloud), 431
cloudnetwork() (in module salt.cloud.clouds.nova), 479
cloudstack_displayname() (in module salt.cloud.clouds.cloudstack), 436

clear_request() (in module salt.modules.trafficserver), 1224

clear_cluster() (in module salt.states.trafficserver), 1754

clear_grains() (in module salt.runners.cache), 1441
clear_lock() (in module salt.fileserver.gifs), 590
clear_lock() (in module salt.fileserver.svnfs), 595
clear_lock() (in module salt.modules.saltutil), 1135
clear_cache() (in module salt.modules.state), 1179
clear_cache() (in module salt.runners.fileserver), 1445

clear_cluster() (in module salt.states.trafficserver), 1754

clear_grains() (in module salt.runners.cache), 1441
clear_lock() (in module salt.fileserver.gifs), 590
clear_lock() (in module salt.fileserver.svnfs), 595
clear_lock() (in module salt.runners.fileserver), 1445
clear_node() (in module salt.modules.trafficserver), 1225
clear_node() (in module salt.states.trafficserver), 1754

clear_password() (in module salt.modules.rabbitmq), 1103

clear_pillar() (in module salt.runners.fileserver), 1441

clear_request() (in module salt.modules.state), 1179

client() (in module salt.modules.chef), 693
client() (in module salt.modules.state), 1576
client_acl
conf/master, 537
client_acl_blacklist
conf/master, 538
client_config() (in module salt.config), 423
client_version() (in module salt.modules.oracle), 1043
cloned() (in module salt.cloud.clouds.linode), 459
cloned() (in module salt.modules.git), 845
cloned() (in module salt.modules.hg), 882
cloned() (in module salt.modules.lxc), 937
closed() (in module salt.states.lxc), 1674

clear_request() (in module salt.modules.trafficserver), 1224

clear_cluster() (in module salt.states.trafficserver), 1754

clear_grains() (in module salt.runners.cache), 1441
clear_lock() (in module salt.fileserver.gifs), 590
clear_lock() (in module salt.fileserver.svnfs), 595
clear_lock() (in module salt.modules.saltutil), 1135
clear_cache() (in module salt.modules.state), 1179
clear_cache() (in module salt.runners.fileserver), 1445

Index 2283
cmd() (in module salt.modules.saltutil), 1135

CommandExecutionError, 597, 600
CommandNotFoundError, 597, 600

comment() (in module salt.modules.file), 806

comment_line() (in module salt.modules.file), 807

commit() (in module salt.modules.dockerio), 754

commit() (in module salt.modules.dockerng), 766

commit() (in module salt.modules.git), 846

commit() (in module salt.modules.junos), 918

commit() (in module salt.modules.svn), 1190

commit_transaction() (in module salt.modules.bigip), 631

compare_versions() (in module salt.modules.win_pkg), 1257

Compound Matcher, 2145

compound() (in module salt.modules.match), 965

computer_desc() (in module salt.states.win_system), 1765

computer_name() (in module salt.states.win_system), 1765

conf() (in module salt.modules.grub_legacy), 878

conf/logging
    external-logging-handlers, 581
    log_datefmt, 580
    log_datefmt_logfile, 580
    log_file, 579
    log_fmt_console, 580
    log_fmt_logfile, 581
    log_granular_levels, 581
    log_level, 580
    log_level_logfile, 580

collectstatic() (in module salt.modules.djangomod), 748

color
    conf/master, 534

column_families() (in module salt.modules.cassandra), 687

column_family_definition() (in module salt.modules.cassandra), 687

command line option
    --key-deploy, 417
    --max-procs, 417
    --passwd, 417
    --priv, 417
    --refresh, --refresh-cache, 417
    --roster, 417
    --roster-file, 417
    -i, --ignore-host-keys, 417
    -r, --raw, --raw-shell, 417

command() (in module salt.modules.djangomod), 748

failhard, 540

file_buffer_size, 542

file_ignore_glob, 542

file_ignore_regex, 542

file_roots, 543

fileservers_backend, 542

fileserver_backend, 542

gen_volumes, 542

get_pillar, 552

get_pillar_first, 552

get_pillar_base, 553

git_pillar_base, 553

git_pillar_branch, 553

git_pillar_env, 553

git_pillar_insecure_auth, 555

git_pillar_passphrase, 555

git_pillar_password, 555

git_pillar_provider, 553
git_pillar_pubkey, 555
git_pillar_root, 554
git_pillar_ssl_verify, 554
git_pillar_user, 554
gitfs_base, 544
gitfs_env_blacklist, 545
gitfs_env_whitelist, 544
gitfs_insecure_auth, 545
gitfs_mountpoint, 544
gitfs_passphrase, 546
gitfs_password, 545
gitfs_privkey, 546
gitfs_provider, 543
gitfs_remotes, 543
gitfs_root, 544
gitfs_ssl_verify, 544
gitfs_user, 545
hash_type, 542
hgfs_base, 547
hgfs_branch_method, 546
hgfs_env_blacklist, 548
hgfs_env_whitelist, 547
hgfs_mountpoint, 547
hgfs_remotes, 546
hgfs_root, 547
include, 561
interface, 531
ipv6, 531
job_cache, 534
keep_jobs, 533
log_datefmt, 559
log_datefmt_logfile, 559
log_file, 559
log_fmt_console, 560
log_fmt_logfile, 560
log_granular_levels, 560
log_level, 559
log_level_logfile, 559
loop_interval, 534
master_id, 531
master_job_cache, 535
master_pubkey_signature, 539
master_sign_key_name, 539
master_sign_pubkey, 539
master_tops, 540
master_use_pubkey_signature, 539
max_minions, 536
max_open_files, 532
minion_data_cache, 535
minionfs_blacklist, 551
minionfs_env, 551
minionfs_mountpoint, 551
minionfs_whitelist, 551
nodegroups, 560
open_mode, 537
order_masters, 557
output, 534
peer, 558
peer_run, 558
pidfile, 532
pillar_roots, 552
pillar_source_merging_strategy, 555
pki_dir, 533
presence_events, 536
publish_port, 531
range_server, 560
renderer, 540
ret_port, 532
root_dir, 533
roster_file, 536
rotate_aes_key, 539
runner_dirs, 539
sock_dir, 534
ssh_minion_opts, 536
state_aggregate, 541
state_events, 541
state_output, 541
state_top, 540
state_verbose, 540
svnfs_branches, 550
svnfs_env_blacklist, 550
svnfs_env_whitelist, 550
svnfs_mountpoint, 549
svnfs_remotes, 548
svnfs_root, 549
svnfs_tags, 550
svnfs_trunk, 549
syndic_log_file, 557
syndic_master, 557
syndic_master_log_file, 557
syndic_master_port, 557
test, 541
timeout, 534
token_expire, 538
user, 531
verify_env, 533
win_gitrepos, 562
win_repo, 561
win_repo_mastercachefile, 561
winrepo_branch, 562
winrepo_cachefile, 561
winrepo_dir, 561
winrepo_insecure_auth, 563
winrepo_passphrase, 564
winrepo_password, 563
winrepo_privkey, 563
winrepo_provider, 561
winrepo_pubkey, 563
winrepo_remotes, 562
winrepo_ssl_verify, 562
winrepo_user, 563
worker_threads, 532
yaml_utf8, 541
conf/minion
acceptance_wait_time, 568
acceptance_wait_time_max, 568
always_verify_signature, 575
append_domain, 567
autoload_dynamic_modules, 572
backup_mode, 568
cache_jobs, 567
cache_sreqs, 569
cachedir, 567
clean_dynamic_modules, 572
cython_enable, 571
disable_modules, 570
disable_returners, 570
enable_zip_modules, 571
environment, 572
failhard, 576
file_client, 573
file_roots, 573
grains_cache, 568
grains_dirs, 571
hash_type, 573
id, 567
include, 577
ipc_mode, 569
log_datefmt, 576
log_datefmt_logfile, 576
log_file, 575
log_fmt_console, 576
log_fmt_logfile, 576
log_granular_levels, 576
log_level, 575
log_level_logfile, 575
master, 564
master_finger, 574
master_port, 565
master_sign_key_name, 574
master_type, 565
module_dirs, 533, 570
multiprocessing, 575
open_mode, 574
pidfile, 566
pillar_roots, 574
pki_dir, 566
providers, 571
random_reauth_delay, 568
recon_default, 568
recon_max, 569
render_dirs, 571
render, 572
retry_dns, 565
returner_dirs, 570
root_dir, 566
sock_dir, 568
state_output, 572
state_verbose, 572
states_dirs, 571
sudo_runas, 566
sudo_user, 566
tcp_pub_port, 570
tcp_pull_port, 570
update_restart_services, 577
update_url, 577
use_master_when_local, 573
user, 566
verify_env, 567
verify_master_pubkey_sign, 574
win_gitrepos, 578
win_repo, 578
win_repo_cachefile, 578
winrepo_cachefile, 578
winrepo_dir, 578
winrepo_remotes, 578
conf_test() (in module salt.modules.test), 1208
config() (in module salt.modules.apache), 610
config() (in module salt.modules.freebsdports), 833
config() (in module salt.modules.rsync), 1128
config() (in module salt.modules.syslog_ng), 1196
config() (in module salt.states.syslog_ng), 1748
config_get() (in module salt.modules.git), 846
config_get() (in module salt.modules.redismod), 1113
config_get_regexp() (in module salt.modules.git), 847
config_set() (in module salt.modules.git), 848
config_set() (in module salt.modules.redismod), 1113
config_set() (in module salt.states.git), 1635
config_test() (in module salt.modules.syslog_ng), 1197
config_unset() (in module salt.modules.git), 848
config_unset() (in module salt.states.git), 1636
configfile() (in module salt.states.apache), 1522
configtest() (in module salt.modules.nginx), 1023
configurable_test_state() (in module salt.states.test), 1750
configure_network() (in module salt.modules.ilo), 887
configure_snmp() (in module salt.modules.ilo), 887
connect() (in module salt.modules.network), 998
connect() (in module salt.modules.qemu_nbd), 1101
connect_host() (in module salt.cloud.clouds.vmware), 494
connected() (in module salt.wheel.minions), 1786
contains() (in module salt.modules.file), 807
contains_glob() (in module salt.modules.file), 807
contains_regex() (in module salt.modules.file), 807
contains_regex_multiline() (in module salt.modules.file), 808
context() (in module salt.states.stateconf), 1745
conv (salt.auth.pam.PamConv attribute), 394
convert() (in module salt.modules.btrfs), 684
convert_to_arn() (in module salt.modules.boto_cloudwatch), 644
convert_to_group_ids() (in module salt.modules.boto_secgroup), 668
copy() (in module salt.modules.file), 808
copy() (in module salt.modules.schedule), 1139
copy() (in module salt.states.file), 1622
copy_snapshot() (in module salt.cloud.clouds.ec2), 440
copy_to() (in module salt.modules.container_resource), 730
copy_to() (in module salt.modules.docker), 767
cpu() (in module salt.modules.parted), 1058
cpu() (in module salt.modules.sysbench), 1193
cpuid() (in module salt.modules.osquery), 1045
cpuinfo() (in module salt.modules.status), 1183
cpuload() (in module salt.modules.win_status), 1170
cputstats() (in module salt.modules.status), 1267
cql_query() (in module salt.modules.cassandra_cql), 688
create() (in module salt.cloud.clouds.aliyun), 433
create() (in module salt.cloud.clouds.cloudburst), 436
create() (in module salt.cloud.clouds.digitalocean), 438
create() (in module salt.cloud.clouds.ec2), 440
create() (in module salt.cloud.clouds.gce), 447
create() (in module salt.cloud.clouds.gogrid), 451
create() (in module salt.cloud.clouds.joyent), 453
create() (in module salt.cloud.clouds.libcloud_aws), 456
create() (in module salt.cloud.clouds.linode), 459
create() (in module salt.cloud.clouds.lx), 462
create() (in module salt.cloud.clouds.msaure), 464
create() (in module salt.cloud.clouds.msazure), 479
create() (in module salt.cloud.clouds.opennebula), 481
create() (in module salt.cloud.clouds.openstack), 483
create() (in module salt.cloud.clouds.ip), 484
create() (in module salt.cloud.clouds.proxmox), 486
create() (in module salt.cloud.clouds.rackspace), 488
create() (in module salt.cloud.clouds.retify), 489
create() (in module salt.cloud.clouds.softlayer), 490
create() (in module salt.cloud.clouds.softlayer_lw), 491
create() (in module salt.cloud.clouds.vmware), 494
create() (in module salt.cloud.clouds.vsphere), 502
create() (in module salt.modules.boto_ags), 641
create() (in module salt.modules.boto_cfn), 643
create() (in module salt.modules.boto_elasticache), 650
create() (in module salt.modules.boto_elb), 652
create() (in module salt.modules.boto_rds), 664
create() (in module salt.modules.boto_secgroup), 668
create() (in module salt.modules.boto_sns), 669
create() (in module salt.modules.boto_sqs), 670
create() (in module salt.modules.boto_vpcs), 672
create() (in module salt.modules.cloud), 698
create() (in module salt.modules.docker), 768
create() (in module salt.modules.glusterfs), 865
create() (in module salt.modules.lxc), 940
create() (in module salt.modules.mda), 968
create() (in module salt.modules.saltcloud), 1134
create() (in module salt.modules.serverdensity_device), 1144
create() (in module salt.modules.smaros_vmadm), 1149
create() (in module salt.modules.splunk_search), 1175
create() (in module salt.modules.uptime), 1230
create() (in module salt.modules.virt), 1236
create() (in module salt.modules.crunalynv_mod), 1243
create() (in module salt.modules.win_service), 1264
create() (in module salt.modules.xapi), 1293
create() (in module salt.modules.zfs), 1310
create() (in module salt.modules.zpool), 1313
create() (in module salt.runners.cloud), 1442
create() (salt.cloud.CloudClient method), 431
create_access_key() (in module salt.modules.boto_iam), 655
create_account() (in module salt.modules.stormpath), 1186
create_address() (in module salt.cloud.clouds.gce), 447
create_affinity_group() (in module salt.cloud.clouds.msaure), 464
create_alias() (in module salt.modules.boto_kms), 661
create_attach_volumes() (in module salt.cloud.clouds.ec2), 441
create_attach_volumes() (in module salt.cloud.clouds.libcloud_aws), 456
create_attach_volumes() (in module salt.cloud.clouds.msaure), 464
create_attach_volumes() (in module salt.cloud.clouds.nova), 479
create_caf() (in module salt.modules.tls), 1214
create_ca_signed_cert() (in module salt.modules.tls), 1215
create_cache_security_group() (in module salt.modules.boto_elasticache), 650
create_certificate() (in module salt.modules.x509), 1287
create_cluster() (in module salt.cloud.clouds.vmware), 494
create_config() (in module salt.cloud.clouds.linode), 459
create_container() (in module salt.cloud.clouds.docker), 755
create_csr() (in module salt.modules.x509), 1289
create_csr() (in module salt.modules.x509), 1290
create_customer_gateway()  (in module salt.modules.boto_vpc), 673
create_datacenter()  (in module salt.cloud.clouds.vmware), 494
create_datasource()  (in module salt.modules.jboss7), 914
create_datastore_cluster()  (in module salt.cloud.clouds.vmware), 494
create_dhcp_options()  (in module salt.modules.boto_vpc), 673
create_disk()  (in module salt.cloud.clouds.gce), 447
create_disk_from_distro()  (in module salt.cloud.clouds.linode), 459
create_dns_record()  (in module salt.cloud.clouds.digital_ocean), 438
create_empty_crl()  (in module salt.modules.tls), 1217
create_event()  (in module salt.modules.pagerduty), 1054
create_event()  (in module salt.modules.victorops), 1235
create_event()  (in module salt.runners.pagerduty), 1458
create_event()  (in module salt.states.pagerduty), 1698
create_event()  (in module salt.states.victorops), 1759
create_extension()  (in module salt.modules.postgres), 1086
create_file_vdev()  (in module salt.modules.zpool), 1314
create_floatingip()  (in module salt.modules.neutron), 1005
create_folder()  (in module salt.cloud.clouds.vmware), 494
create_grant()  (in module salt.modules.boto_kms), 661
create_group()  (in module salt.modules.boto_iam), 655
create_hc()  (in module salt.cloud.clouds.gce), 447
create_ikepolicy()  (in module salt.modules.neutron), 1004
create_instance_profile()  (in module salt.modules.boto_iam), 655
create_internet_gateway()  (in module salt.modules.boto_vpc), 673
create_ipsec_site_connection()  (in module salt.modules.neutron), 1004
create_ipsecpolicy()  (in module salt.cloud.clouds.gce), 447
create_ipsecpolicy()  (in module salt.modules.neutron), 1004
create_key()  (in module salt.cloud.clouds.digital_ocean), 438
create_key()  (in module salt.cloud.clouds.gce), 447
create_key()  (in module salt.modules.boto_kms), 661
create_key()  (in module salt.modules.boto_vpc), 673
create_key()  (in module salt.modules.boto_kms), 661
create_key()  (in module salt.modules.boto_vpc), 673
create_keypair()  (in module salt.cloud.clouds.ec2), 441
create_keyspace()  (in module salt.modules.cassandra_cql), 688
create_keytab()  (in module salt.modules.kerberos), 918
create_launch_configuration()  (in module salt.modules.boto_asg), 641
create_lb()  (in module salt.cloud.clouds.gce), 448
create_listeners()  (in module salt.modules.boto_elb), 652
create_login_profile()  (in module salt.modules.boto_iam), 655
create_metadata()  (in module salt.modules.postgres), 1087
create_monit()  (in module salt.modules.bigip), 631
create_monit()  (in module salt.modules.bigip), 1529
create_multi()  (salt.modules.xmpp.SendMsgBot class method), 1299
create_network()  (in module salt.cloud.clouds.gce), 448
create_network()  (in module salt.modules.neutron), 1005
create_network_acl()  (in module salt.modules.boto_vpc), 673
create_network_acl_entry()  (in module salt.modules.boto_vpc), 673
create_node()  (in module salt.cloud.clouds.aliyun), 433
create_node()  (in module salt.cloud.clouds.digital_ocean), 438
create_node()  (in module salt.cloud.clouds.joyent), 484
create_node()  (in module salt.cloud.clouds.parallels), 484
create_node()  (in module salt.cloud.clouds.proxmox), 486
create_node()  (in module salt.modules.bigip), 631
create_node()  (in module salt.states.bigip), 1529
create_option_group()  (in module salt.modules.boto_rds), 664
create_or_update_alarm()  (in module salt.modules.boto_cloudwatch), 644
create_or_update_resource()  (in module salt.modules.pagerduty_util), 1056
create_parameter_group()  (in module salt.modules.boto_rds), 664
create_pkcs12()  (in module salt.modules.tls), 1218
create_pool()  (in module salt.modules.bigip), 631
create_pool()  (in module salt.runners.f5), 1445
create_pool()  (in module salt.states.bigip), 1529
create_pool()  (salt.runners.f5.F5Mgmt method), 1444
create_port()  (in module salt.modules.neutron), 1005
create_ports_tree()  (in module salt.cloud.clouds.poudriere), 1092
create_principal()  (in module salt.modules.kerberos), 918
create_private_ip()  (in module salt.cloud.clouds.linode), 459
create_private_key()  (in module salt.modules.x509), 1290
create_profile()  (in module salt.modules.bigip), 632
create_profile()  (in module salt.modules.x509), 1530
create_queue()  (in module salt.modules.aws_sqs), 626
create_read_replica()  (in module salt.modules.boto_rds), 664
create_replication_group()  (in module salt.modules.boto_elasticache), 650
create_repo
   spm command line option, 422
create_role()  (in module salt.modules.boto_iam), 656
db_repair() (in module salt.modules.mysql), 984
db_tables() (in module salt.modules.mysql), 984
dbsize() (in module salt.modules.redismod), 1113
deal() (in module salt.states.service), 1741
deal() (in module salt.states.supervisord), 1746
deb_packages() (in module salt.modules.osquery), 1045
dec() (in module salt.modules.nacl), 990
dec() (in module salt.runners.nacI), 1457
decrement() (in module salt.modules.memcached), 969
decrypt() (in module salt.modules.boto_kms), 661
decrypt() (in module salt.modules.gpg), 869
decrypt_ciphertext() (in module salt.renderers.gpg), 1380
decrypt_object() (in module salt.renderers.gpg), 1380
default() (in module salt.modules.pysenv), 1099
default() (in module salt.modules.rbenv), 1111
default_config() (in module salt.modules.linux_sysctl), 931
default_hash() (in module salt.modules.bsd_shadow), 683
default_hash() (in module salt.modules.solaris_shadow), 1145
default_hash() (in module salt.modules.solaris_shadow), 1160
default_include
  conf/master, 561
default_route() (in module salt.states.network), 998
default_zone() (in module salt.modules.firewalld), 825
define_vol_xml_path() (in module salt.modules.virt), 1237
define_vol_xml_str() (in module salt.modules.virt), 1237
define_xml_path() (in module salt.modules.virt), 1237
define_xml_str() (in module salt.modules.virt), 1237
defragment() (in module salt.modules.btrfs), 684
defragment() (in module salt.modules.xfs), 1296
deinstall() (in module salt.modules.freebsdports), 834
del_export() (in module salt.modules.nfs3), 1019
del_password() (in module salt.modules.shadow), 1145
del_repo() (in module salt.modules.aptpkg), 612
del_repo() (in module salt.modules.ypnpkg), 1300
del_repo() (in module salt.modules.zypper), 1316
del_repo_key() (in module salt.modules.aptpkg), 613
del_tags() (in module salt.cloud.clouds.libcloud_aws), 441
del_tags() (in module salt.cloud.clouds.libcloud_aws), 456
delete() (in module salt.modules.beacons), 629
delete() (in module salt.modules.boto_asg), 641
delete() (in module salt.modules.boto_cfn), 643
delete() (in module salt.modules.boto_dynamodb), 646
delete() (in module salt.modules.boto_elasticache), 650
delete() (in module salt.modules.boto_elasticloadbalancing), 653
delete() (in module salt.modules.boto_rds), 664
delete() (in module salt.modules.boto_security_groups), 668
delete() (in module salt.modules.boto_sns), 669
delete() (in module salt.modules.boto_sqs), 670
delete() (in module salt.modules.boto_vpc), 674
delete() (in module salt.modules.bridge), 682
delete_dhcp_options() (in module salt.modules.boto_vpc), 675
delete_dict() (in module salt.wheel.key), 1785
delete_disk() (in module salt.cloud.clouds.gce), 448
delete_disk() (in module salt.cloud.clouds.msazure), 465
delete_dns_record() (in module salt.cloud.clouds.digital_ocean), 438
delete-floatingip() (in module salt.cloud.clouds.gce), 1007
delete_fwrule() (in module salt.cloud.clouds.gce), 448
delete_group_policy() (in module salt.modules.boto_iam), 656
delete_hc() (in module salt.cloud.clouds.gce), 448
delete_host() (in module salt.modules.ddns), 740
delete_host() (in module salt.modules.omapi), 1036
delete_ikepolicy() (in module salt.modules.neutron), 1008
delete_input_endpoint() (in module salt.cloud.clouds.gce), 448
delete_instance_profile() (in module salt.modules.boto_iam), 656
delete_internet_gateway() (in module salt.modules.boto_vpc), 675
delete_ipsec_site_connection() (in module salt.modules.neutron), 1008
delete_ipsec_policy() (in module salt.modules.neutron), 1008
delete_jail() (in module salt modules.poudriere), 1092
delete_key() (in module salt.cloud.clouds.joyent), 454
delete_key() (in module salt.modules.boto_ec2), 647
delete_key() (in module salt.modules.gpg), 869
delete_key() (in module salt modules.reg), 1117
delete_key_recursive() (in module salt.modules.reg), 1117
delete_keypair() (in module salt.cloud.clouds.ec2), 441
delete_launch_configuration() (in module salt.modules.boto_asg), 641
delete_lb() (in module salt.cloud.clouds.gce), 448
delete_listeners() (in module salt.modules.boto_elb), 653
delete_management_certificate() (in module salt.cloud.clouds.msazure), 465
delete_message() (in module salt.modules.aws_sqs), 626
delete_monitor() (in module salt.modules.bigip), 633
delete_monitor() (in module salt.states.bigip), 1530
delete_network() (in module salt.cloud.clouds.gce), 448
delete_network() (in module salt.modules.neutron), 1008
delete_network_acl() (in module salt.modules.boto_vpc), 675
delete_network_acl_entry() (in module salt.modules.boto_vpc), 675
delete_node() (in module salt.modules.bigip), 633
delete_node() (in module salt.states.bigip), 1531
delete_option_group() (in module salt.modules.boto_rds), 664
delete_policy() (in module salt.modules.rabbitmq), 1103
delete_pool() (in module salt.modules.bigip), 633
delete_pool() (in module salt.states.bigip), 1531
delete_pool_member() (in module salt.modules.bigip), 634
delete_pool_member() (in module salt.states.bigip), 1531
delete_port() (in module salt.modules.neutron), 1008
delete_principal() (in module salt.modules.kerberos), 919
delete_profile() (in module salt.modules.bigip), 634
delete_profile() (in module salt.states.bigip), 1531
delete_queue() (in module salt.modules.aws_sqs), 626
delete_quota() (in module salt.modules.neutron), 1009
delete_record() (in module salt.modules.boto_route53), 666
delete_resource() (in module saltmodules.pagerduty_util), 1056
delete_role() (in module salt.modules.boto_iam), 656
delete_role_policy() (in module salt.modules.boto_iam), 656
delete_route() (in module salt.modules.boto_vpc), 675
delete_route_table() (in module salt.modules.boto_vpc), 675
delete_router() (in module salt.modules.neutron), 1009
delete_rule() (in module salt.modules.win_firewall), 1251
delete_security_group() (in module salt.modules.neutron), 1009
delete_security_group_rule() (in module salt.modules.neutron), 1009
delete_server() (in module salt.modules.lvs), 935
delete_server_cert() (in module salt.modules.boto_iam), 656
delete_service() (in module salt.cloud.clouds.msazure), 466
delete_service() (in module salt.modules.firewalld), 825
delete_service() (in module salt.modules.lvs), 935
delete_service_certificate() (in module salt.cloud.clouds.msazure), 466
delete_set() (in module salt.modules.ipset), 909
delete_snapshot() (in module salt.cloud.clouds.ec2), 441
delete_snapshot() (in module salt.cloud.clouds.gce), 448
delete_snapshot() (in module salt.cloud.clouds.vsphere), 502
delete_snapshot() (in module salt modules.smartos_vmadm), 1150
delete_ssh_key() (in module salt.modules.ilo), 888
delete_storage() (in module salt.cloud.clouds.msazure), 466
delete_storage_container() (in module salt.cloud.clouds.msazure), 466
Index

Index 2293

disable_returners

disable_plugin()(in modulesalt.modules.rabbitmq), 1103
disable_inheritance()(in modulesalt.modules.win_dacl), 1228
disable_modules
disable_key_rotation() (in module salt.modules.boto_kms), 661
disable_modules

disable_returners

discoverable() (in module salt.cloud.clouds.bluez), 639
disinherit() (in module salt.states.win_dacl), 1228
diskstats() (in module salt.states.windows), 1184
diskusage() (in module salt.modules.apache), 808
diskusage() (in module salt.states.windows), 1184
disassociate_network_acl() (in module salt.cloud.clouds.boto_vpc), 677
disassociate_profile_from_role() (in module salt.cloud.clouds.boto_iam), 677
disassociate_rule() (in module salt.cloud.clouds.elasticsearch), 677

disconnect_host() (in module salt.cloud.clouds.vmware), 495

discovery() (in module salt.cloud.clouds.aws), 435
discovery() (in module salt.cloud.clouds.azure), 435
discovery() (in module salt.cloud.clouds.ec2), 442
discovery() (in module salt.cloud.clouds.gce), 435
discovery() (in module salt.cloud.clouds.s3), 435
discovery() (in module salt.cloud.clouds.minio), 435
discovery() (in module salt.cloud.clouds.mongdb), 435
discovery() (in module salt.cloud.clouds.mysql), 435
discovery() (in module salt.cloud.clouds.postgres), 435
discovery() (in module salt.cloud.clouds.rds), 435
discovery() (in module salt.cloud.clouds.mongodb), 435
discovery() (in module salt.cloud.clouds.sharded), 435
discovery() (in module salt.cloud.clouds.rdspostgres), 435
discovery() (in module salt.cloud.clouds.s3), 435
discovery() (in module salt.cloud.clouds.efs), 435
discovery() (in module salt.cloud.clouds.gce), 435
discovery() (in module salt.cloud.clouds.s3), 435
discovery() (in module salt.cloud.clouds.minio), 435
discovery() (in module salt.cloud.clouds.mongdb), 435
discovery() (in module salt.cloud.clouds.postgres), 435
discovery() (in module salt.cloud.clouds.rds), 435
discovery() (in module salt.cloud.clouds.mongodb), 435
discovery() (in module salt.cloud.clouds.rdspostgres), 435
discovery() (in module salt.cloud.clouds.s3), 435
discovery() (in module salt.cloud.clouds.minio), 435
discovery() (in module salt.cloud.clouds.mongdb), 435
discovery() (in module salt.cloud.clouds.postgres), 435
discovery() (in module salt.cloud.clouds.rds), 435
discovery() (in module salt.cloud.clouds.mongodb), 435
discovery() (in module salt.cloud.clouds.rdspostgres), 435
discovery() (in module salt.cloud.clouds.s3), 435
discovery() (in module salt.cloud.clouds.minio), 435
discovery() (in module salt.cloud.clouds.mongdb), 435
discovery() (in module salt.cloud.clouds.postgres), 435
discovery() (in module salt.cloud.clouds.rds), 435
discovery() (in module salt.cloud.clouds.mongodb), 435
discovery() (in module salt.cloud.clouds.rdspostgres), 435
discovery() (in module salt.cloud.clouds.s3), 435

discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435

discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
discovery() (in module salt.cloud.clouds.amazon_s3), 435
enabled() (in module salt.modules.netbsdservice), 993
enabled() (in module salt.modules.openbsdrcctl), 1039
enabled() (in module salt.modules.openbsdservice), 1040
enabled() (in module salt.modules.rh_service), 1123
enabled() (in module salt.modules.smf), 1156
enabled() (in module salt.modules.sysmod), 1205
enabled() (in module salt.states.mount), 1228
enabled() (in module salt.states.pkg), 1265
enabled() (in module salt.states.beacon), 1529
enabled() (in module salt.states.rabbitmq_plugin), 1726
enabled() (in module salt.states.rdp), 1729
enabled() (in module salt.states.schedule), 1738
enabled() (in module salt.states.service), 1741
enabled_service_owners() (in module salt.modules.introspect), 896
event() (in module salt.runners.state), 1463
event_fire() (in module salt.modules.consul), 725
event_list() (in module salt.modules.consul), 725
event_return
  conf/master, 535
event_return() (in module salt.returners.carbon_return), 1405
event_return() (in module salt.returners.cassandra_cql_return), 1407
event_return() (in module salt.returners.hipchat_return), 1413
event_return() (in module salt.returners.local), 1414
event_return() (in module salt.returners.mysql), 1420
event_return() (in module salt.returners.pgjsonb), 1425
Events (class in salt.netapi.rest_cherrypy.app), 1331
EventsSaltAPIHandler (in module salt.netapi.rest_tornado.saltnado), 1345
ex_mod_init() (in module salt.modules.ebuild), 791
exception() (in module salt.modules.test), 1209
exec_action() (in module salt.modules.eselect), 798
exec_code() (in module salt.modules.cmdmod), 700
exec_code_all() (in module salt.modules.cmdmod), 700
eexec() (in module salt.modules.sysmod), 1205
execute() (in module salt.modules.augeas_cfg), 625
execute_salt_restart_task() (in module salt.modules.win_service), 1265
Execution Function, 2145
Execution Module, 2145
execution() (in module salt.runners.doc), 1442
exists() (in module salt.modules.boto_asg), 641
events() (in module salt.modules.boto_cfn), 643
events() (in module salt.modules.boto_dynamodb), 646
events() (in module salt.modules.boto_ec2), 647
events() (in module salt.modules.boto_elasticsearch), 651
events() (in module salt.modules.boto_elb), 653
events() (in module salt.modules.boto_rds), 665
events() (in module salt.modules.boto_s3), 668
events() (in module salt.modules.boto_sns), 669
events() (in module salt.modules.boto_sqs), 670
events() (in module salt.modules.boto_vpc), 677
events() (in module salt.modules.dockerio), 755
events() (in module salt.modules.docker), 770
events() (in module salt.modules.lxc), 942
events() (in module salt.modules.nspawn), 1031
events() (in module salt.modules.parted), 1058
events() (in module salt.modules.redis), 1113
events() (in module salt.modules.win_path), 1257
events() (in module salt.modules.zfs), 1311
events() (in module salt.modules.zpool), 1314
events() (in module salt.states.aws_sqs), 1528
events() (in module salt.states.file), 1624
events() (in module salt.states.win_path), 1763

Index
exit_maintenance_mode() (in module salt.cloud.clouds.vmware), 495
expand_repo_def() (in module salt.modules.aptpkg), 613
expand_repo_def() (in module salt.modules.yumpkg), 1300
expire() (in module salt.modules.redismod), 1114
expireat() (in module salt.modules.redismod), 1114
export() (in module salt.modules.dockerio), 756
export() (in module salt.modules.dockereng), 770
export() (in module salt.modules.svn), 1190
export() (in module salt.modules.zpool), 1314
export() (in module salt.states.svn), 1747
export_key() (in module salt.modules.gpg), 870
ext() (in module salt.modules.pillar), 1061
ext() (in module salt.modules.dockerio), 756
ext() (in module salt.modules.dockerng), 770
ext() (in module salt.modules.svn), 1190
ext() (in module salt.modules.zpool), 1314
extra_action() (salt.cloud.CloudClient method), 431
extract_hash() (in module salt.modules.file), 809
extract_ipv4() (in module salt.roster.cache), 1438
extract_ipv4() (in module salt.roster.cloud), 1439
extract_queries() (salt.pillar.mysql.MyS QLeXtPillar method), 1366
extracted() (in module salt.states.archive), 1523

F
F5Mgmt (class in salt.runners.f5), 1444
fact() (in module salt.modules.puppet), 1095
facts() (in module salt.modules.puppet), 1095
facts_refresh() (in module salt.modules.junos), 918
fail_with_changes() (in module salt.states.test), 1750
fail_without_changes() (in module salt.states.test), 1750
failhard
false() (in module salt.modules.test), 1209
fast_connect_test() (in module salt.modules.ipmi), 897
features() (in module salt.modules.btrfs), 684
features_contains() (in module salt.modules.makeconf), 961
fetch() (in module salt.modules.git), 849
fetch() (in module salt.modules.pkgng), 1073
fetch() (in module salt.modules.sqlite3), 1176
fib() (in module salt.modules.test), 1209
File Server, 2145
file() (in module salt.modules.osquery), 1045
file() (in module salt.modules.temp), 1207
file() (in module salt.states.cron), 1590
file_buffer_size
conf/master, 542
file_changes() (in module salt.modules.osquery), 1045
file_client
conf/minion, 576
file() (in module salt.modules.aptpkg), 613
file() (in module salt.modules.pkgng), 786
file() (in module salt.modules.freebsdpkg), 831
file() (in module salt.modules.pacman), 1052
file() (in module salt.modules.pkgin), 1069
file() (in module salt.modules.rpm), 1126
file() (in module salt.modules.yumpkg), 1300
file() (in module salt.modules.zypper), 1316
file_exists() (in module salt.modules.file), 809
file_hash() (in module salt.fileserver.azurefs), 589
file_hash() (in module salt.fileserver.gitfs), 590
file_hash() (in module salt.fileserver.hgfs), 591
file_hash() (in module salt.fileserver.minionfs), 592
file_hash() (in module salt.fileserver.roots), 593
file_hash() (in module salt.fileserver.s3fs), 594
file_hash() (in module salt.fileserver.svnfs), 595
file_ignore_globs
conf/master, 542
full_query() (salt.cloud.CloudClient method), 431
full_restart() (in module salt.modules.daemontools), 736
full_restart() (in module salt.modules.runit), 1129
full_restart() (in module salt.modules.upstart), 1229
fullversion() (in module salt.modules.apache), 611
fullversion() (in module salt.modules.dnsmasq), 749
fullversion() (in module salt.modules.linux_lvm), 929
fullversion() (in module salt.modules.tomcat), 1222
fullversion() (in module salt.modules.saltmod), 1735
G
gather_bootstrap_script() (in module salt.modules.config), 715
gemset_copy() (in module salt.modules.rvm), 1130
gemset_create() (in module salt.modules.rvm), 1130
gemset_delete() (in module salt.modules.rvm), 1131
gemset_empty() (in module salt.modules.rvm), 1131
gemset_list() (in module salt.modules.rvm), 1131
gemset_list_all() (in module salt.modules.rvm), 1131
gemset_present() (in module salt.modules.rvm), 1734
gen() (in module salt.wheel.key), 1785
gen_accept() (in module salt.wheel.key), 1785
gen_hyper_keys() (in module salt.pillar.libvirt), 1364
gen_local() (in module salt.modules.localemod), 932
gen_password() (in module salt.modules.shadow), 1146
generate() (in module salt.runners.thin), 1465
generate_data_key() (in module salt.modules.boto_kms), 662
generate_data_key_without_plaintext() (in module salt.modules.boto_kms), 662
generate_random() (in module salt.modules.boto_kms), 662
generateBlobs() (in module salt.modules.random_org), 1108
generateDecimalFractions() (in module salt.modules.random_org), 1108
generateGaussians() (in module salt.modules.random_org), 1109
generateIntegers() (in module salt.modules.random_org), 1109
generateStrings() (in module salt.modules.random_org), 1110
generateUUIDs() (in module salt.modules.random_org), 1110
genrepo() (in module salt.modules.win_pkg), 1257
genrepo() (in module salt.modules.win_repos), 1262
genrepo() (in module salt.runners.winrepo), 1467
genrepo() (in module salt.states.winrepo), 1768
genpool_mirrors() (in module salt.modules.mine), 970
genpool_mirrors_contents() (in module salt.modules.saltmod), 738
get() (in module salt.modules.config), 715
get() (in module salt.modules.daemontools), 736
get() (in module salt.modules.data), 738
get() (in module salt.modules.defaults), 746
get() (in module salt.modules.environ), 797
get() (in module salt.modules.etcd_mod), 800
get() (in module salt.modules.freesdsysctl), 828
get() (in module salt.modules.gnome_desktop), 867
get() (in module salt.modules.grains), 875
get() (in module salt.modules.linux_sysctl), 931
get() (in module salt.modules.mincached), 970
get() (in module salt.modules.minion), 970
get() (in module salt.modules.netbsd_sysctl), 992
get() (in module salt.modules.openbsd_sysctl), 1037
get() (in module salt.modules.openstack_config), 1042
get() (in module salt.modules.pillar), 1061
get() (in module salt.modules.rvm), 1131
get() (in module salt.modules.s3), 1133
get() (in module salt.modules.sdb), 1141
get() (in module salt.modules.smartos_imgadm), 1148
get() (in module salt.modules.smartos_vmadm), 1150
get() (in module salt.modules.smbios), 1153
get() (in module salt.modules.splunk_search), 1175
get() (in module salt.modules.swift), 1193
get() (in module salt.modules.sysrc), 1203
get() (in module salt.modules.win_src), 1245
get() (in module salt.modules.runners.thin), 1457
get() (in module salt.runners.sdb), 1462
get() (in module salt.sdb.couchdb), 1793
get() (in module salt.sdb.etcd_db), 1793
get() (in module salt.sdb.keyring_db), 1794
get() (in module salt.sdb.mincached), 1795
get() (in module salt.sdb.sqlite3), 1795
GET() (salt.netapi.rest_cherrypy.app.Events method), 1332
GET() (salt.netapi.rest_cherrypy.app.Jobs method), 1329
GET() (salt.netapi.rest_cherrypy.app.Keys method), 1335
GET() (salt.netapi.rest_cherrypy.app.Login method), 1326
GET() (salt.netapi.rest_cherrypy.app.LowDataAdapter method), 1325
GET() (salt.netapi.rest_cherrypy.app.Minions method), 1328
GET() (salt.netapi.rest_cherrypy.app.Stats method), 1338
GET() (salt.netapi.rest_cherrypy.app.WebsocketEndpoint method), 1337
get_account_id() (in module salt.modules.boto_iam), 657
get_account_policy() (in module salt.modules.boto_iam), 657
get_affinity_group() (in module salt.cloud.clouds.msazure), 466
get_alarm() (in module salt.modules.boto_cloudwatch), 645
get_alias() (in module salt.modules.hosts), 884
get_all() (in module salt.modules.daemontools), 736
get_all() (in module salt.modules.debian_service), 745
get_distribution_id() (in module salt.cloud.clouds.linode), 460
get_dns_config() (in module salt.modules.win_dns_client), 1246
get_dns_servers() (in module salt.modules.win_dns_client), 1246
get_docker() (in module salt.modules.mine), 971
get_elb_config() (in module salt.modules.boto_elb), 653
get_emerge_default_opts() (in module salt.modules.makeconf), 961
get_enabled() (in module salt.modules.debian_service), 745
get_enabled() (in module salt.modules.freebsdjail), 829
get_enabled() (in module salt.modules.freebsd_service), 836
get_enabled() (in module salt.modules.gentoo_service), 841
get_enabled() (in module salt.modules.netbsdservice), 994
get_enabled() (in module salt.modules.openbsdrcctl), 1039
get_enabled() (in module salt.modules.openbsdservice), 1041
get_enabled() (in module salt.modules.rh_service), 1124
get_enabled() (in module salt.modules.smf), 1156
get_enabled() (in module salt.modules.systemd), 1206
get_enabled() (in module salt.modules.upstart), 1229
get_endpoint() (in module salt.modules.boto_rds), 665
get_endtime() (in module salt.returners.local_cache), 1414
get_escalation_policies() (in module salt.modules.pagerduty_util), 1056
get_event_iter_returns() (salt.client.LocalClient method), 428
get_extensions() (in module salt.modules.tls), 1219
get_features() (in module salt.modules.makeconf), 961
get_file() (in module salt.modules.cp), 731
get_file_str() (in module salt.modules.cp), 731
get_flags_from_package_conf() (in module salt.modules.portage_config), 1084
get_fmi() (in module salt.modules.solarisips), 1163
get_fun() (in module salt.modules.ret), 1121
get_fun() (in module salt.returners.cassandra_cql_return), 1407
get_fun() (in module salt.returners.couchdb_return), 1409
get_fun() (in module salt.returners.etcd_return), 1411
get_fun() (in module salt.returners.influxdb_return), 1413
get_fun() (in module salt.returners.memcache_return), 1415
get_fun() (in module salt.returners.mongo_future_return), 1416
get_fun() (in module salt.returners.mongo_return), 1417
get_fun() (in module salt.returners.mysql), 1420
get_fun() (in module salt.returners.odbc), 1423
get_fun() (in module salt.returners.pgjsonb), 1425
get_fun() (in module salt.returners.postgres), 1427
get_fun() (in module salt.returners.redis_return), 1430
get_fun() (in module salt.returners.sqlite3_return), 1434
get_gentoo_mirrors() (in module salt.modules.makeconf), 961
get_gid() (in module salt.modules.file), 811
get_gid() (in module salt.modules.win_file), 1247
get_glob() (salt.roster.ansible.Target method), 1438
get_graphics() (in module salt.modules.virt), 1238
get_group() (in module salt.modules.boto_iam), 658
get_group() (in module salt.modules.boto_rds), 665
get_group() (in module salt.modules.win_file), 1248
get_group_host() (in module salt.modules.boto_elasticache), 651
get_group_id() (in module salt.modules.boto_secgroup), 668
get_group_policy() (in module salt.modules.boto_iam), 658
get_hash() (in module salt.modules.file), 811
get_health() (in module salt.modules.ipmi), 899
get_health_check() (in module salt.modules.boto_elb), 654
get_hibernate_timeout() (in module salt.modules.win_powercfg), 1261
get_hostname() (in module salt.modules.network), 998
get_hwclock() (in module salt.modules.timezone), 1212
get_hwclock() (in module salt.modules.win_timezone), 1273
get_icmp_types() (in module salt.modules.firewall), 826
get_id() (in module salt.modules.boto_ec2), 648
get_id() (in module salt.modules.boto_vpc), 677
get_id() (in module salt.modules.parted), 1058
get_image() (in module salt.cloud.clouds.aliyun), 434
get_image() (in module salt.cloud.clouds.cloudstack), 437
get_image() (in module salt.cloud.clouds.digital_ocean), 438
get_image() (in module salt.cloud.clouds.joyent), 454
get_image() (in module salt.cloud.clouds.nova), 479
get_image() (in module salt.cloud.clouds.opennebula), 481
get_image() (in module salt.cloud.clouds.openstack), 483
get_image() (in module salt.cloud.clouds.parallels), 485
get_image() (in module salt.cloud.clouds.rackspace), 488
get_images() (in module salt.modules.dockerio), 756
get_input_endpoint() (in module salt.cloud.clouds.msaure), 468
get_installed_extension() (in module salt.modules.postgres), 1088
get_installed_use() (in module salt.modules.portage_config), 1084
get_instance() (in module salt.modules.cloud), 698
get_instance_health() (in module salt.modules.boto_elb), 654
get_instances() (in module salt.modules.boto_asg), 642
get_interface() (in module salt.modules.debian_ip), 744
get_interface() (in module salt.modules.rh_ip), 1122
get_interface() (in module salt.modules.win_ip), 1253
get_ip() (in module salt.cloud.clouds.cloudstack), 437
get_ips() (in module salt.modules.hosts), 884
get_iuse() (in module salt.modules.portage_config), 1084
get_jid() (in module salt.returners.cassandra_cql_return), 1407
get_jid() (in module salt.returners.couchbase_cql_return), 1408
get_jid() (in module salt.returners.couchdb_return), 1409
get_jid() (in module salt.returners.etcfd_return), 1411
get_jid() (in module salt.returners.influxdb_return), 1413
get_jid() (in module salt.returners.local_cache), 1414
get_jid() (in module salt.returners.memcache_return), 1415
get_jid() (in module salt.returners.mongo_future_return), 1416
get_jid() (in module salt.returners.mysql), 1420
get_jid() (in module salt.returners.pgjsonb), 1425
get_jid() (in module salt.returners.postgres), 1427
get_jid() (in module salt.returners.postgres_local_cache), 1428
get_jids() (in module salt.returners.redis_local_cache), 1433
get_jids() (in module salt.returners.sqlite3_return), 1435
get_jids_filter() (in module salt.returners.local_cache), 1414
get_jids_filter() (in module salt.returners.mysql), 1420
get_key() (in module salt.cloud.clouds.cloudstack), 437
get_key() (in module salt.modules.boto_ec2), 648
get_key() (in module salt.modules.boto_gpg), 870
get_key() (in module salt.modules.redismod), 1114
get_key_policy() (in module salt.modules.boto_kms), 662
get_key_rotation_status() (in module salt.modules.boto_kms), 662
get_keyid() (in module salt.cloud.clouds.digital_ocean), 438
get_keypair() (in module salt.cloud.clouds.cloudstack), 437
get_keys() (in module salt.modules.boto_ec2), 648
get_known_host() (in module salt.modules.ssh), 1177
get_latest_snapshot() (in module salt.modules.artifactory), 622
get_lb_conn() (in module salt.cloud.clouds.gce), 449
get_linode() (in module salt.cloud.clouds.linode), 460
get_linode_id_from_name() (in module salt.cloud.clouds.linode), 460
get_load() (in module salt.returners.cassandra_cql_return), 1407
get_load() (in module salt.returners.couchbase_cql_return), 1408
get_load() (in module salt.returners.elasticsearch_return), 1408
get_load() (in module salt.returners.etcfd_return), 1411
get_load() (in module salt.returners.influxdb_return), 1413
get_load() (in module salt.returners.local_cache), 1415
get_load() (in module salt.returners.memcache_return), 1415
get_load() (in module salt.returners.mongo_future_return), 1416
get_load() (in module salt.returners.mysql), 1420
get_load() (in module salt.returners.pgjsonb), 1425
get_load() (in module salt.returners.postgres), 1427
get_load() (in module salt.returners.postgres_local_cache), 1428
get_load() (in module salt.returners.redis_local_cache), 1433
get_locale() (in module salt.modules.localemod), 932
get_location() (in module salt.cloud.clouds.aliyun), 434
get_location() (in module salt.cloud.clouds.cloudstack), 437
get_context() (in module salt.returners.cassandra_cql_return), 1407
Index 2303

salt.cloud.clouds.digital_ocean, 438
get_location() (in module salt.cloud.clouds.ec2), 442
get_location() (in module salt.cloud.clouds.joyent), 454
get_location() (in module salt.cloud.clouds.libcloud_aws), 457
get_location() (in module salt.cloud.clouds.opennebula), 481
get_location() (in module salt.cloud.clouds.softlayer), 490
get_location() (in module salt.cloud.clouds.softlayer_hw), 491
get_location_path() (in module salt.cloud.clouds.joyent), 454
get_locked_packages() (in module salt.modules.yumpkg), 1301
get_loginclass() (in module salt.modules.useradd), 1232
get_macs() (in module salt.modules.virt), 1238
get_macs() (in module salt.modules.xapi), 1293
get_makeopts() (in module salt.modules.makeconf), 962
get_managed() (in module salt.modules.file), 811
get_management_certificate() (in module salt.cloud.clouds.msazure), 468
get_masquerade() (in module salt.cloud.clouds.firewallld), 826
get_master_status() (in module salt.modules.mysql), 984
get_minions() (in module salt.modules.ret), 1121
get_minions() (in module salt.returners.cassandra_cql_return), 1407
get_minions() (in module salt.returners.couchdb_return), 1409
get_minions() (in module salt.returners.etcd_return), 1411
get_minions() (in module salt.returners.influxdb_return), 1413
get_minions() (in module salt.returners.memcache_return), 1415
get_minions() (in module salt.returners.mongo_fUTURE_return), 1416
get_minions() (in module salt.returners.mysql), 1420
get_minions() (in module salt.returners.odbc), 1423
get_minions() (in module salt.returners.pgjsonb), 1425
get_minions() (in module salt.returners.postgres), 1427
get_minions() (in module salt.returners.redis_return), 1430
get_minions() (in module salt.returners.sqlite3_return), 1435
get_missing_flags() (in module salt.modules.portage_config), 1084
get_model() (in module salt.modules.file), 812
get_model() (in module salt.modules.quota), 1101
get_model() (in module salt.modules.win_file), 1248
get_modules() (in module salt.modules.eselect), 799
get_monitor_timeout() (in module salt.cloud.clouds.cloudstack), 437
get_network_profile() (in module salt.modules.lxc), 942
get_network_settings() (in module salt.modules.debian_ip), 744
get_network_settings() (in module salt.modules.rb_ip), 1122
get_networkid() (in module salt.cloud.clouds.cloudstack), 437
get_nics() (in module salt.modules.virt), 1238
get_nics() (in module salt.modules.xapi), 1293
get_node() (in module salt.cloud.clouds.cloudstack), 437
get_node() (in module salt.cloud.clouds.joyent), 454
get_node() (in module salt.cloud.clouds.openstack), 483
get_node_host() (in module salt.modules.boto_elasticache), 651
get_offset() (in module salt.modules.timezone), 1212
get_offset() (in module salt.modules.win_timezone), 1273
get_operation_status() (in module salt.cloud.clouds.msazure), 468
get_option() (in module salt.modules.ini_manage), 895
get_opts() (in module salt.modules.test), 1209
get_or_set_hash() (in module salt.modules.grains), 875
get_output_volume() (in module salt.modules.osxdesktop), 1051
get Parameter() (in module salt.modules.lxc), 943
get_password() (in module salt.cloud.clouds.cloudstack), 437
get_password() (in module salt.cloud.clouds.linode), 460
get_password_data() (in module salt.cloud.clouds.ec2), 442
get_path() (in module salt.modules.win_path), 1257
get_pem_entries() (in module salt.modules.x509), 1290
get_pem_entry() (in module salt.modules.x509), 1290
get_pgroup() (in module salt.cloud.clouds.linode), 460
get_pgroup() (in module salt.cloud.clouds.linode), 460
get_policy() (in module salt.cloud.clouds.ec2), 442
get_plan_id() (in module salt.cloud.clouds.linode), 460
get_policy() (in module salt.modules.iptables), 912
get_policy() (in module salt.modules.kerberos), 919
get_principal() (in module salt.modules.kerberos), 919
get_private_ip() (in module salt.cloud.clouds.linode), 461
get_private_key_size() (in module salt.modules.x509), 1290
get_principal() (in module salt.modules.kerberos), 919
get_profiles() (in module salt.modules.virt), 1238
get_project() (in module salt.cloud.clouds.cloudstack), 437
get_provider() (in module salt.cloud.clouds.ec2), 443
get_provider() (in module salt.cloud.clouds.lxc), 463
get_pub_key() (in module salt.cloud.clouds.linode), 461
<table>
<thead>
<tr>
<th>Function Name</th>
<th>Module/Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>get_public_key()</td>
<td>salt.modules.x509</td>
</tr>
<tr>
<td>get_quotas_tenant()</td>
<td>salt.modules.neutron</td>
</tr>
<tr>
<td>get_release()</td>
<td>salt.modules.artifactory</td>
</tr>
<tr>
<td>get_repo()</td>
<td>salt.modules.apt/pkg, salt.modules.zypper</td>
</tr>
<tr>
<td>get_repo_data()</td>
<td>salt.modules.win_pkg, salt.modules.yumpkg</td>
</tr>
<tr>
<td>get_resource()</td>
<td>salt.modules.pagerduty_util</td>
</tr>
<tr>
<td>get_resource_content()</td>
<td>salt.modules.virtualenv_mod</td>
</tr>
<tr>
<td>get_resource_id()</td>
<td>salt.modules.boto_vpc</td>
</tr>
<tr>
<td>get_resources_nodes()</td>
<td>salt.cloud.clouds.proxmox</td>
</tr>
<tr>
<td>get_rule()</td>
<td>win_firewall, iptables, nftables</td>
</tr>
<tr>
<td>get_rules()</td>
<td>iptables, lvs, nftables</td>
</tr>
<tr>
<td>get_running()</td>
<td>modjk, smf</td>
</tr>
<tr>
<td>get_saved_policy()</td>
<td>iptables, artifactory</td>
</tr>
<tr>
<td>get_saved_rules()</td>
<td>iptables, nftables</td>
</tr>
<tr>
<td>get_signing_policy()</td>
<td>x509</td>
</tr>
<tr>
<td>get_service_certificate()</td>
<td>cloud.clouds.msazure</td>
</tr>
<tr>
<td>get_service_name()</td>
<td>salt.modules.win_service</td>
</tr>
<tr>
<td>get_service()</td>
<td>salt.modules.firewalld</td>
</tr>
<tr>
<td>get_services()</td>
<td>salt.modules.pagerduty_util</td>
</tr>
<tr>
<td>get_site_packages()</td>
<td>virtualenv_mod</td>
</tr>
<tr>
<td>get_size()</td>
<td>cloud.clouds.aliyun, cloud.clouds.digital_ocean</td>
</tr>
<tr>
<td>get_size()</td>
<td>cloud.clouds.joyent</td>
</tr>
<tr>
<td>get_size()</td>
<td>cloud.clouds.nova</td>
</tr>
<tr>
<td>get_size()</td>
<td>cloud.clouds.openstack</td>
</tr>
<tr>
<td>get_size()</td>
<td>cloud.clouds.rackspace</td>
</tr>
<tr>
<td>get_size()</td>
<td>cloud.clouds.cloudstack</td>
</tr>
<tr>
<td>get_size()</td>
<td>cloud.clouds.ec2</td>
</tr>
<tr>
<td>get_ssh_gateway_config()</td>
<td>ec2</td>
</tr>
<tr>
<td>get_standby_timeout()</td>
<td>win_powercfg</td>
</tr>
<tr>
<td>get_stats()</td>
<td>makeconf</td>
</tr>
<tr>
<td>get_str()</td>
<td>mod_random</td>
</tr>
<tr>
<td>get_subnet_association()</td>
<td>salt.cloud.clouds.msazure</td>
</tr>
<tr>
<td>get_subnet_length()</td>
<td>salt.cloud.clouds.win_ip</td>
</tr>
<tr>
<td>get_subnetid()</td>
<td>ec2</td>
</tr>
<tr>
<td>get_swap_size()</td>
<td>linode</td>
</tr>
<tr>
<td>get_system_date()</td>
<td>win_system</td>
</tr>
<tr>
<td>get_system_info()</td>
<td>win_system</td>
</tr>
<tr>
<td>get_system_time()</td>
<td>win_system</td>
</tr>
</tbody>
</table>

2304 Index
get_tags() (in module salt.cloud.clouds.ec2), 443
get_tags() (in module salt.cloud.clouds.libcloud_aws), 457
get_target() (in module salt.modules.aliases), 609
get_target_list() (in module salt.modules.eselect), 799
get_template() (in module salt.modules.boto_cfn), 643
get_template() (in module salt.modules.cp), 731
get_tenancy() (in module salt.cloud.clouds.ec2), 443
get_uid() (in module salt.modules.file), 812
get_uid() (in module salt.modules.win_file), 1249
get_url() (in module salt.modules.cp), 731
get_user() (in module salt.modules.boto_iam), 658
get_user() (in module salt.modules.file), 812
get_user() (in module salt.modules.ilo), 888
get_user() (in module salt.modules.ipmi), 900
get_user_access() (in module salt.modules.ipmi), 901
get_user_name() (in module salt.modules.ipmi), 902
get_user_policy() (in module salt.modules.boto_iam), 658
get_users() (in module salt.modules.ipmi), 902
get_users() (in module salt.modulesWins_ilo), 1057
get_valid_salt_views() (in module salt.returners.couchdb_return), 1409
get_var() (in module salt.modules.makeconf), 962
getclock_time() (in module salt.cloud.clouds.vmware), 495
get_vm_size() (in module salt.cloud.clouds.linode), 461
get_vm_status() (in module salt.cloud.clouds.proxmox), 486
get_xmlconfig() (in module salt.cloud.clouds.proxmox), 486
get_weight() (in module salt.modules.haproxyconn), 880
get_wu_settings() (in module salt.modules.win_wua), 1282
get_x() (in module salt.modules.keyboard), 920
get_xml() (in module salt.modules.virt), 1238
get_yaml_loader() (in module salt.modules.yaml), 1398
get_zone() (in module salt.modules.win_timezone), 1212
get_zone() (in module salt.modules.win_timezone), 1212
get_zonecode() (in module salt.modules.win_timezone), 1212
get_zonecode() (in module salt.modules.win_timezone), 1212
get_zones() (in module salt.modules.boto_ec2), 648
get_zones() (in module salt.modules.firewalld), 826
getAceTypeBit() (salt.modules.win_dacl.daclConstants method), 1244
getAceTypeText() (salt.modules.win_dacl.daclConstants method), 1244
GetAvailableCategories() (salt.modules.win_update.PyWinUpdater method), 1766
GetCategories() (salt.modules.win_update.PyWinUpdater method), 1274
GetCategories() (salt.states.win_update.PyWinUpdater method), 1766
getClockFormat() (in module salt.modules.gnomedesktop), 867
getClockShowDate() (in module salt.modules.gnomedesktop), 867
GetDownloadResults() (salt.modules.win_update.PyWinUpdater method), 1274
GetDownloadResults() (salt.states.win_update.PyWinUpdater method), 1766
getenforce() (in module salt.modules.selinux), 1142
getent() (in module salt.modules.groupadd), 877
getent() (in module salt.modules.mac_group), 954
getent() (in module salt.modules.mac_user), 956
getent() (in module salt.modules.pw_group), 1097
getent() (in module salt.modules.pw_user), 1099
getent() (in module salt.modules.solaris_group), 1160
getent() (in module salt.modules.solaris_user), 1162
getent() (in module salt.modules.useradd), 1232
getenforce() (in module salt.modules.win_groupadd), 1252
getenforce() (in module salt.modules.win_useradd), 1279
getfacl() (in module salt.modules.linux_acl), 929
getgoal() (in module salt.modules.moosefs), 978
getClockActivation() (in module salt.modules.gnomedesktop), 867
getClockDelay() (in module salt.modules.gnomedesktop), 867
GetInstallationResults() (salt.modules.win_update.PyWinUpdater method), 1274
GetInstallationResults() (salt.states.win_update.PyWinUpdater method), 1766
GetInstallationResultsPretty() (salt.modules.win_update.PyWinUpdater method), 1274
goObjectTypeBit() (salt.modules.win_dacl.daclConstants method), 1245
getPermissionBit() (salt.modules.win_dacl.daclConstants method), 1245
getPermissionText() (salt.modules.win_dacl.daclConstants method), 1245
getPropagationBit() (salt.modules.win_dacl.daclConstants method), 1245
getPropagationText() (salt.modules.win_dacl.daclConstants method), 1245
GetSearchResults() (salt.modules.win_update.PyWinUpdater method), 1274
GetSearchResultsPretty() (salt.modules.win_update.PyWinUpdater method), 1274
getsebool() (in module salt.modules.selinux), 1143
getSecurityHkey() (salt.modules.win_dacl.daclConstants method), 1766
getSecurityHkey() (salt.modules.win_dacl.daclConstants method), 1274
Salt Documentation, Release 2015.8.0

**method), 1245**
getsid() (in module salt.modules.win_service), 1266
getUsage() (in module salt.modules.random_org), 1110
getUserSid() (in module salt.modules.win_useradd), 1279
getval() (in module salt.modules.data), 739
getvals() (in module salt.modules.data), 739
gid_to_group() (in module salt.modules.file), 813
gid_to_group() (in module salt.modules.win_file), 1249
git_pillar_base
  conf/master, 553
git_pillar_branch
  conf/master, 553
git_pillar_env
  conf/master, 553
git_pillar_insecure_auth
  conf/master, 555
git_pillar_password
  conf/master, 555
git_pillar_privatekey
  conf/master, 555
git_pillar_provider
  conf/master, 553
git_pillar_pubkey
  conf/master, 555
git_pillar_root
  conf/master, 554
git_pillar_ssl_verify
  conf/master, 554
gitfs_base
  conf/master, 554
gitfs_env_blacklist
  conf/master, 545
gitfs_env_whitelist
  conf/master, 545
gitfs_insecure_auth
  conf/master, 545
gitfs_mountpoint
  conf/master, 544
gitfs_password
  conf/master, 545
gitfs_privatekey
  conf/master, 546
gitfs_provider
  conf/master, 543
gitfs_pubkey
  conf/master, 546
gitfs_remotes
  conf/master, 543
gitfs_root
  conf/master, 544
gitfs_ssh_verify
  conf/master, 544
gitfs_user
  conf/master, 545
GivenStatement (class in salt.modules.syslog_ng), 1195
glob() (in module salt.modules.match), 966
global_settings() (in module salt.modules.ilo), 888
glsa_check_list() (in module salt.modules.gentoolkitmod), 842
Grain, 2145
grain() (in module salt.modules.match), 966
grain_funcs() (in module salt.loader), 425
grain_pcre() (in module salt.loader.match), 966
groups() (in module salt.loader), 425
groups() (in module salt.runners.cache), 1441
groups_cache
  conf/minion, 568
groups_dirs
  conf/minion, 571
groups_refresh() (in module salt.modules.rest_sample), 1120
grant_access_to_shared_folders_to() (in module salt.modules.vbox_guest), 1235
grant_access_to_shared_folders_to() (in module salt.states.vbox_guest), 1758
grant_add() (in module salt.modules.mysql), 985
grant_exists() (in module salt.modules.mysql), 985
grant_permission() (in module salt.modules.cassandra_cql), 690
grant_revoke() (in module salt.modules.connector_mysql), 985
grep() (in module salt.modules.file), 813
group_create() (in module salt.modules.postgres), 1088
group_diff() (in module salt.modules.yumpkg), 1301
group_exists() (in module salt.modules.connector_mysql), 1301
group_info() (in module salt.modules.yumpkg), 1301
group_install() (in module salt.modules.postgres), 1088
group_installed() (in module salt.states.pkg), 1706
group_list() (in module salt.modules.yumpkg), 1302
group_present() (in module salt.states.boto_iam), 1555
group_remove() (in module salt.modules.postgres), 1088
group_to_gid() (in module salt.modules.file), 813
group_to_gid() (in module salt.modules.win_file), 1249
group_update() (in module salt.modules.postgres), 1088
groups() (in module salt.auth.ldap), 393
groups() (in module salt.auth.pam), 395
groups() (in module salt.modules.osquery), 1045
gunzip() (in module salt.modules.archive), 620
gzip() (in module salt.modules.archive), 620
H
halt() (in module salt.modules.system), 1204
halt() (in module salt.modules.win_system), 1269
handle (salt.auth.pam.PamHandle attribute), 394
hardware_events() (in module salt.modules.osquery), 1046
has_exec() (in module salt.modules.cmdmod), 700
has_flag() (in module salt.modules.portage_config), 1084
has_instance() (in module salt.modules.cloud), 698
has_key() (in module salt.modules.data), 797
has_method() (in module salt.cloud.clouds.joyent), 454
has_pair() (in module salt.modules.hosts), 884
has_powerpath() (in module salt.modules.powerpath), 1093
has_powershell() (in module salt.modules.win_service), 1266
has_target() (in module salt.modules.aliases), 609
has_use() (in module salt.modules.portage_config), 1084
has_value() (in module salt.modules.environ), 797
has_value() (in module salt.modules.grains), 875
hash() (in module salt.modules.osquery), 1046
hash() (in module salt.modules.osquery), 1046
hash_file() (in module salt.modules.cp), 732
hash_known_hosts() (in module salt.modules.ssh), 1177
hash_type
  conf/master, 542
  conf/minion, 573
head() (in module salt.modules.s3), 1134
head() (in module salt.modules.swift), 1193
health_check() (in module salt.modules.consul), 726
health_node() (in module salt.modules.consul), 726
health_service() (in module salt.modules.consul), 726
health_state() (in module salt.modules.consul), 727
held() (in module salt.states.aptpkg), 1523
hget() (in module salt.modules.redismod), 1114
hgetall() (in module salt.modules.redismod), 1114
hgfs_base
  conf/master, 547
hgfs_branch_method
  conf/master, 546
hgfs_env_blacklist
  conf/master, 548
hgfs_env_whitelist
  conf/master, 547
hgfs_mountpoint
  conf/master, 547
hgfs_remotes
  conf/master, 546
hgfs_root
  conf/master, 547
high() (in module salt.modules.state), 1180
Highdata, 2145
Highstate, 2145
highstate() (in module salt.modules.state), 1180
history() (in module salt.modules.docker), 771
hmac_signature() (in module salt.modules.hashutil), 881
hold() (in module salt.modules.aptpkg), 614
hold() (in module salt.modules.postfix), 1085
hold() (in module salt.modules.ypgpkg), 1302
homebrew_packages() (in module salt.modules.osquery), 1046
host_keys() (in module salt.modules.ssh), 1178
host_status() (in module salt.modules.nagios_rpc), 992
hosts_append() (in module salt.modules.dnsutil), 751
hosts_remove() (in module salt.modules.dnsutil), 751
hw_addr() (in module salt.modules.network), 999
hw_addr() (in module salt.modules.win_network), 1255
hwaddr() (in module salt.modules.network), 999
hwaddr() (in module salt.modules.win_network), 1255
hyper_info() (in module salt.runners.virt), 1466
iam_profile() (in module salt.cloud.clouds.ec2), 443
iam_profile() (in module salt.cloud.clouds.libcloud_aws), 457
id
  conf/minion, 567
ignore() (in module salt.modules.softwareupdate), 1158
ignore_cidr() (in module salt.cloud.clouds.nova), 479
ignore_cidr() (in module salt.cloud.clouds.openstack), 483
image_absent() (in module salt.states.docker), 1600
image_create() (in module salt.modules.glance), 864
image_delete() (in module salt.modules.glance), 864
image_list() (in module salt.modules.glance), 864
image_list() (in module salt.modules.nova), 1026
image_meta_delete() (in module salt.modules.nova), 1026
image_meta_set() (in module salt.modules.nova), 1026
image_present() (in module salt.states.docker), 1601
image_schem() (in module salt.modules.glance), 864
image_show() (in module salt.modules.glance), 864
image_update() (in module salt.modules.glance), 865
images() (in module salt.modules.docker), 772
images() (in module salt.modules.lxc), 943
import() (in module salt.modules.docker), 772
import() (in module salt.modules.smartos_imgadm), 1148
import() (in module salt.modules.zpool), 1314
import_image() (in module salt.modules.docker), 756
import_key() (in module salt.modules.docker), 454
import_key() (in module salt.modules.boto_ec2), 644
import_key() (in module salt.modules.gpg), 871
import_status() (in module salt.modules.solr), 1171
in_subnet() (in module salt.modules.network), 999
in_subnet() (in module salt.modules.win_network), 1255
include
  conf/master, 561
  conf/minion, 577
increment() (in module salt.modules.memcached), 970
index_create() (in module salt.modules.elasticsearch), 796
index_delete() (in module salt.modules.elasticsearch), 796
index_exists() (in module salt.modules.elasticsearch), 796
index_get() (in module salt.modules.elasticsearch), 796
index_template_create() (in module salt.modules.elasticsearch), 796
index_template_delete() (in module salt.modules.elasticsearch), 796
index_template_exists() (in module salt.modules.elasticsearch), 796
index_template_get() (in module salt.modules.elasticsearch), 796
indexes() (in module salt.modules.sqlite3), 1176
indices() (in module salt.modules.sqlite3), 1176
info
  spm command line option, 422
info() (in module salt.modulesbsd_shadow), 683
info() (in module salt.modules.btrfs), 684
info() (in module salt.modules.cassandra), 687
info() (in module salt.modules.cassandra_cql), 690
info() (in module salt.modules.dockerio), 757
info() (in module salt.modules.dockerio), 773
info() (in module salt.modules.dockerng), 786
info() (in module salt.modules.groupadd), 877
info() (in module salt.modules.lxc), 943
info() (in module salt.modules.mac_group), 955
info() (in module salt.modules.mac_user), 956
info() (in module salt.modules.nspawn), 1031
info() (in module salt.modules.ps_user), 1097
info() (in module salt.modules.ps_user), 1099
info() (in module salt.modules.redismod), 1114
info() (in module salt.modules.rpm), 1127
info() (in module salt.modules.shadow), 1146
info() (in module salt.modules.smartos_vmdm), 1150
info() (in module salt.modules.solaris_group), 1160
info() (in module salt.modules.solaris_shadow), 1161
info() (in module salt.modules.solaris_user), 1162
info() (in module salt.modules.svn), 1190
info() (in module salt.modules.udev), 1227
info() (in module salt.modules.useradd), 1232
info() (in module salt.modules.win_groupadd), 1252
info() (in module salt.modules.win_shadow), 1267
info() (in module salt.modules.win_useradd), 1279
info() (in module salt.modules.xfs), 1297
info() (in module salt.modules.zypper), 1317
info() (in module salt.runners.lxc), 1451
info_available() (in module salt.modules.zypper), 1317
info_installed() (in module salt.modules.aptpkg), 614
info_installed() (in module salt.modules.yumpkg), 1302
info_installed() (in module salt.modules.zypper), 1317
inherit() (in module salt.states.win_dacl), 1761
init() (in module salt.fileserver.gifs), 590
init() (in module salt.fileserver.hgfs), 591
init() (in module salt.fileserver.svnfs), 595
init() (in module salt.modules.git), 850
init() (in module salt.modules.lxc), 944
init() (in module salt.modules.gemu_nbd), 1101
init() (in module salt.modules.system), 1204
init() (in module salt.modules.virt), 1238
init() (in module salt.runners.lxc), 1451
init() (in module salt.runners.virt), 1466
inodeusage() (in module salt.modules.disk), 748
insert() (in module salt.modules.iptables), 913
insert() (in module salt.modules.mongodb), 976
insert() (in module salt.modules.nftables), 1022
insert() (in module salt.runners.queue), 1461
insert() (in module salt.states.iptables), 1662
insert() (in module salt.states.nftables), 1696
inspect() (in module salt.modules.dockerio), 737
inspect() (in module salt.modules.node), 1024
inspect_container() (in module salt.modules.dockerio), 757
inspect_container() (in module salt.modules.dockerio), 773
inspect_image() (in module salt.modules.dockerio), 757
inspect_image() (in module salt.modules.dockerio), 773
install
  spm command line option, 422
install() (in module salt.modules.alternatives), 610
install() (in module salt.modules.aptpkg), 614
install() (in module salt.modules.bower), 679
install() (in module salt.modules.brew), 679
install() (in module salt.modules.cabal), 686
install() (in module salt.modules.chocolatery), 694
install() (in module salt.modules.composer), 713
install() (in module salt.modules.cpan), 733
install() (in module salt.modules.cyg), 735
install() (in module salt.modules.darwin_pkgutil), 737
install() (in module salt.modules.ebuild), 791
install() (in module salt.modules.freebsd_pdkg), 832
install() (in module salt.modules.freebsdsports), 834
install() (in module salt.modules.gem), 837
install() (in module salt.modules.macports), 957
install() (in module salt.modules.rpm), 1029
install() (in module salt.modules.opensbbsdpgk), 1037
install() (in module salt.modules.pacman), 1052
install() (in module salt.modules.pecl), 1061
install() (in module salt.modules.php), 1065
install() (in module salt.modules.pkggin), 1069
install() (in module salt.modules.pkgng), 1074
install() (in module salt.modules.pkgutil), 1081
install() (in module salt.modules.pynv), 1100
install() (in module salt.modules.rbenv), 1111
install() (in module salt.modules.rest_package), 1120
install() (in module salt.modules.vrm), 1131
is_hyper() (in module salt.modules.xapi), 1293
is_installed() (in module salt.modules.darwin_pkgutil), 737
is_installed() (in module salt.modules.pyenv), 1100
is_installed() (in module salt.modules.rbenv), 1111
is_installed() (in module salt.modules.rvm), 1132
is_installed() (in module salt.modules.solarisips), 1164
is_installed_extension() (in module salt.modules.postgres), 1088
is_jail() (in module salt.modules.poudriere), 1092
is_kvm_hyper() (in module salt.modules.virt), 1238
is_link() (in module salt.modules.file), 813
is_link() (in module salt.modules.win_file), 1249
is_loaded() (in module salt.modules.freebsdmod), 830
is_loaded() (in module salt.modules.kmod), 925
is_loopback() (in module salt.modules.network), 1000
is_mounted() (in module salt.modules.mount), 979
is_present() (in module salt.modules.portage_config), 1084
is_private() (in module salt.modules.network), 1000
is_replication_enabled() (in module salt.modules.solr), 1171
is_running() (in module salt.modules.dockerio), 757
is_running() (in module salt.modules.saltutil), 1135
is_worktree() (in module salt.modules.git), 850
is_xen_hyper() (in module salt.modules.virt), 1239
item() (in module salt.modules.environ), 797
item() (in module salt.modules.grains), 876
item() (in module salt.modules.pillar), 1062
items() (in module salt.modules.data), 739
items() (in module salt.modules.environ), 797
items() (in module salt.modules.grains), 876
items() (in module salt.modules.pillar), 1062

J
Jinja, 2145
Job, 2145
Job ID, 2145
Job Management, 171
job_cache
   conf/master, 534
jobcheck() (in module salt.modules.at), 624
Jobs (class in salt.netapi.rest_cherrypy.app), 1329
JobsSaltAPIHandler (in module salt.netapi.rest_tornado.saltnado), 1345
join() (in module salt.modules.data), 814
join() (in module salt.states.rabbitmq_cluster), 1725
join_cluster() (in module salt.modules.rabbitmq), 1103
join_domain() (in module salt.modules.win_system), 1269
joined() (in module salt.runners.manage), 1454
joined() (in module salt.states.rabbitmq_cluster), 1725
joyent_node_state() (in module salt.cloud.clouds.joyent), 454

K
keep_jobs
   conf/master, 533
keepvol_on_destroy() (in module salt.cloud.clouds.ec2), 443
kernel_extensions() (in module salt.modules.osquery), 1046
kernel_info() (in module salt.modules.osquery), 1046
kernel_integrity() (in module salt.modules.osquery), 1046
kernel_modules() (in module salt.modules.osquery), 1047
key_absent() (in module salt.states.boto_ec2), 1546
key_absent() (in module salt.states.reg), 1731
key_exists() (in module salt.modules.boto_kms), 662
key_json() (in module salt.pillar.redismod), 1373
key_list() (in module salt.cloud.clouds.joyent), 454
key_present() (in module salt.states.boto_ec2), 1546
key_present() (in module salt.states.boto_kms), 1559
key_regen() (in module salt.runners.manage), 1454
key_str() (in module salt.wheel.key), 1785
key_type() (in module salt.modules.redismod), 1114
key_value() (in module salt.pillar.redismod), 1373
key_value_to_tree() (in module salt.pillar.pepa), 1370
keychain_items() (in module salt.modules.osquery), 1047
keygen() (in module salt.modules.nacl), 990
keygen() (in module salt.runners.nacl), 1458
keyname() (in module salt.cloud.clouds.ec2), 443
keyname() (in module salt.cloud.clouds.libcloud_aws), 457
keypair_add() (in module salt.modules.nova), 1026
keypair_delete() (in module salt.modules.nova), 1027
keypair_list() (in module salt.modules.nova), 1027
Keys (class in salt.netapi.rest_cherrypy.app), 1335
keys() (in module salt.modules.data), 739
keys() (in module salt.modules.nacl), 1062
keys() (in module salt.modules.pillar), 1062
keys() (in module salt.states.boto_iam), 1555
keys_present() (in module salt.states.boto_iam), 1555
keyspace_exists() (in module salt.modules.cassandra_cql), 690
keyspaces() (in module salt.modules.cassandra), 687
kill() (in module salt.modules.dockerio), 757
kill() (in module salt.modules.dockerlog), 773
kill_job() (in module salt.modules.saltutil), 1135
kwaeg() (in module salt.modules.test), 1209

L
lane_stats() (in module salt.runners.manage), 1454
last() (in module salt.modules.osquery), 1047
last_run() (in module salt.runners.jobs), 1449
lastsave() (in module salt.modules.redismod), 1115
latest() (in module salt.states.git), 1637
latest() (in module salt.states.hg), 1647
list_datastore_clusters() (in module salt.cloud.clouds.vmware), 496
list_datastores() (in module salt.cloud.clouds.vmware), 496
list_datastores() (in module salt.cloud.clouds.vsphere), 502
list_deployments() (in module salt.modules.jboss7), 915
list_directories() (in module salt.modules.stormpath), 1186
list_disabled() (in module salt.modules.state), 1180
list_disks() (in module salt.cloud.clouds.msaure), 471
list_downloads() (in module salt.modules.softwareupdate), 1159
list_dvs() (in module salt.cloud.clouds.vmware), 496
list_employees() (in module salt.modules.bamboohr), 627
list_env() (in module salt.wheel.file_roots), 1785
list_env() (in module salt.wheel.pillar_roots), 1786
list_escalation_policies() (in module salt.modules.pagerduty), 1055
list_escalation_policies() (in module salt.runners.pagerduty), 1459
list_exports() (in module salt.modules.nfs3), 1019
list_extensions() (in module salt.modules.neutron), 1010
list_floatingsips() (in module salt.modules.neutron), 1011
list_folders() (in module salt.cloud.clouds.vmware), 496
list_folders() (in module salt.cloud.clouds.vsphere), 502
list_functions() (in module salt.modules.sysmod), 1199
list_grants() (in module salt.modules.boto_kms), 662
list_groups() (in module salt.modules.mac_user), 956
list_groups() (in module salt.modules.pw_user), 1099
list_groups() (in module salt.modules.solaris_user), 1163
list_groups() (in module salt.modules.useradd), 1232
list_groups() (in module salt.modules.win_useradd), 1280
list_hbas() (in module salt.cloud.clouds.vmware), 496
list_hosted_services() (in module salt.cloud.clouds.msaure), 471
list_hosts() (in module salt.cloud.clouds.vmware), 497
list_hosts() (in module salt.cloud.clouds.vsphere), 502
list_hosts() (in module salt.modules.state), 884
list_hosts_by_cluster() (in module salt.cloud.clouds.vmware), 497
list_hosts_by_datacenter() (in module salt.cloud.clouds.vmware), 497
list_icmp_block() (in module salt.modules.firewalld), 826
list_ignored() (in module salt.modules.softwareupdate), 1159
list_ikepolicies() (in module salt.modules.neutron), 1011
list_images() (in module salt.modules.cloud), 698
list_images() (in module salt.runners.cloud), 1442
list_images() (salt.cloud.CloudClient method), 431
list_inactive_vms() (in module salt.modules.virt), 1239
list_incidents() (in module salt.modules.pagerduty), 1055
list_incidents() (in module salt.runners.pagerduty), 1459
list_input_endpoints() (in module salt.cloud.clouds.msaure), 471
list_installed() (in module salt.modules.win_servermanager), 1263
list_installed_patterns() (in module salt.modules.zypper), 1318
list_ipsec_site_connections() (in module salt.modules.neutron), 1011
list_ipsec_policies() (in module salt.modules.neutron), 1011
list_items() (in module salt.modules.rallydev), 1107
list_items() (in module salt.modules.runners.queue), 1461
list_jobs() (in module salt.modules.poudriere), 1092
list_job() (in module salt.modules.runners.jobs), 1449
list_jobs_filter() (in module salt.modules.runners.jobs), 1449
list_key_policies() (in module salt.modules.boto_kms), 663
list_keypairs() (in module salt.cloud.clouds.digital_ocean), 438
list_keys() (in module salt.cloud.clouds.joyent), 455
list_keys() (in module salt.modules.gpg), 871
list_keyspaces() (in module salt.modules.cassandra_cql), 691
list_length() (in module salt.modules.neutron), 1010
list_local() (in module salt.modules.layman), 927
list_locations() (in module salt.modules.cloud), 699
list_locations() (in module salt.modules.runners.cloud), 1442
list_locations() (salt.cloud.CloudClient method), 431
list_locks() (in module salt.modules.zypper), 1318
list_management_certificates() (in module salt.cloud.clouds.msaure), 471
list_master() (in module salt.modules.cp), 732
list_master_dirs() (in module salt.modules.cp), 732
list_master_symlinks() (in module salt.modules.cp), 732
list_meta_fields() (in module salt.modules.bamboohr), 627
list_minion() (in module salt.modules.cp), 732
list_modules() (in module salt.modules.sysmod), 1199
list_monitor() (in module salt.modules.bigip), 634
list_monitor() (in module salt.states.bigip), 1531
list_monitor_data() (in module salt.cloud.clouds.aliyun), 434
list_networks() (in module salt.cloud.clouds.aliyun), 434
list_nodes() (in module salt.cloud.clouds.cloudstack), 437
list_nodes() (in module salt.cloud.clouds.digital_ocean), 439
list_nodes() (in module salt.cloud.clouds.ec2), 443
list_nodes() (in module salt.cloud.clouds.gce), 449
list_nodes() (in module salt.cloud.clouds.gogrid), 451
list_nodes() (in module salt.cloud.clouds.joyent), 455
list_nodes() (in module salt.cloud.clouds.linode), 461
list_nodes() (in module salt.cloud.clouds.lxc), 463
list_nodes() (in module salt.cloud.clouds.msazure), 471
list_nodes() (in module salt.cloud.clouds.nova), 479
list_nodes() (in module salt.cloud.clouds.opennebula), 481
list_nodes() (in module salt.cloud.clouds.openstack), 483
list_nodes() (in module salt.cloud.clouds.parallels), 485
list_nodes() (in module salt.cloud.clouds.proxmox), 486
list_nodes() (in module salt.cloud.clouds.rackspace), 489
list_nodes() (in module salt.cloud.clouds.saltify), 492
list_nodes() (in module salt.cloud.clouds.softlayer), 490
list_nodes() (in module salt.cloud.clouds.softlayer_hw), 492
list_nodes() (in module salt.cloud.clouds.vmware), 497
list_nodes() (in module salt.cloud.clouds.vsphere), 498
list_nodes_full() (in module salt.cloud.clouds.aliyun), 434
list_nodes_full() (in module salt.cloud.clouds.cloudstack), 437
list_nodes_full() (in module salt.cloud.clouds.ec2), 443
list_nodes_full() (in module salt.cloud.clouds.gce), 449
list_nodes_full() (in module salt.cloud.clouds.gogrid), 451
list_nodes_full() (in module salt.cloud.clouds.joyent), 455
list_nodes_full() (in module salt.cloud.clouds.linode), 461
list_nodes_full() (in module salt.cloud.clouds.lxc), 463
list_nodes_full() (in module salt.cloud.clouds.msazure), 471
list_nodes_full() (in module salt.cloud.clouds.nova), 479
list_nodes_full() (in module salt.cloud.clouds.opennebula), 481
list_nodes_full() (in module salt.cloud.clouds.openstack), 483
list_nodes_full() (in module salt.cloud.clouds.parallels), 485
list_nodes_full() (in module salt.cloud.clouds.proxmox), 486
list_nodes_full() (in module salt.cloud.clouds.rackspace), 489
list_nodes_full() (in module salt.cloud.clouds.saltify), 492
list_nodes_full() (in module salt.cloud.clouds.softlayer), 490
list_nodes_full() (in module salt.cloud.clouds.softlayer_hw), 492
list_nodes_full() (in module salt.cloud.clouds.vmware), 498
list_nodes_select() (in module salt.cloud.clouds.aliyun), 434
list_nodes_select() (in module salt.cloud.clouds.cloudstack), 437
list_nodes_select() (in module salt.cloud.clouds.ec2), 444
list_nodes_select() (in module salt.cloud.clouds.gce), 449
list_nodes_select() (in module salt.cloud.clouds.gogrid), 452
list_nodes_select() (in module salt.cloud.clouds.joyent), 455
list_nodes_select() (in module salt.cloud.clouds.linode), 461
list_nodes_select() (in module salt.cloud.clouds.lxc), 463
list_nodes_select() (in module salt.cloud.clouds.msazure), 471
list_nodes_select() (in module salt.cloud.clouds.nova), 479
list_nodes_select() (in module salt.cloud.clouds.opennebula), 481
list_nodes_select() (in module salt.cloud.clouds.openstack), 483
list_nodes_select() (in module salt.cloud.clouds.parallels), 485
list_nodes_select() (in module salt.cloud.clouds.proxmox), 487
list_nodes_select() (in module salt.cloud.clouds.rackspace), 489
list_nodes_select() (in module salt.cloud.clouds.saltify), 492
list_nodes_select() (in module salt.cloud.clouds.softlayer), 490
list_nodes_select() (in module salt.cloud.clouds.softlayer_hw), 492
list_nodes_select() (in module salt.cloud.clouds.vsphere), 498
list_not_state() (in module salt.runners.manage), 1455
list_passwords() (in module salt.cloud.clouds.gogrid), 452
list_permissions() (in module salt.modules.glusterfs), 866
list_peers() (in module salt.modules.glusterfs), 866
list_permissions() (in module salt.modules.cassandra_cql), 691
list_tags() (in module salt.modules.dockerio), 774
list_tags() (in module salt.modules.git), 851
list_templates() (in module salt.cloud.clouds.vmware), 498
list_transaction() (in module salt.modules.bigip), 635
list_updates() (in module salt.modules.winau), 1283
list_updates() (in module salt.modules.win_update), 1276
list_updates() (in module salt.modules.win_wua), 1284
list_upgrades() (in module salt.modules.aptpkg), 616
list_upgrades() (in module salt.modules.brew), 680
list_upgrades() (in module salt.modules.editable), 792
list_upgrades() (in module salt.modules.gem), 837
list_upgrades() (in module salt.modules.macports), 958
list_upgrades() (in module salt.modules.pacman), 1053
list_upgrades() (in module salt.modules.pip), 1066
list_upgrades() (in module salt.modules.pkgutil), 1082
list_upgrades() (in module salt.modules.softwareupdate), 1159
list_upgrades() (in module salt.modules.solarisips), 1164
list_upgrades() (in module salt.modules.win_pkg), 1259
list_upgrades() (in module salt.modules.yumtpkg), 1304
list_upgrades() (in module salt.modules.zypper), 1318
list_upgrades() (in module salt.runners.ilo), 1104
list_users() (in module salt.modules.bamboohr), 628
list_users() (in module salt.modules.cassandra_cql), 692
list_users() (in module salt.modules.hipchat), 884
list_users() (in module salt.modules.ios), 889
list_users() (in module salt.modules.mac_user), 956
list_users() (in module salt.modules.pagerduty), 1055
list_users() (in module salt.modules.pw_user), 1099
list_users() (in module salt.modules.rabbitmq), 1104
list_users() (in module salt.modules.rallydev), 1107
list_users() (in module salt.modules.slack_notify), 1148
list_users() (in module salt.modules.useradd), 1232
list_users() (in module salt.modules.win_useradd), 1280
list_users() (in module salt.runners.pagerduty), 1459
list_users_info() (in module salt.modules.ilo), 889
list_vapps() (in module salt.cloud.clouds.vmware), 498
list_vhosts() (in module salt.modules.rabbitmq), 1104
list_virtual() (in module salt.modules.bigip), 635
list_virtual() (in module salt.states.bigip), 1532
list_virtual_networks() (in module salt.cloud.clouds.vmware), 472
list_vlans() (in module salt.cloud.clouds.softlayer), 490
list_vms() (in module salt.cloud.clouds.softlayer_hw), 492
list_vms() (in module salt.modules.virt), 1239
list_vms() (in module salt.modules.xapi), 1293
list_volumes() (in module salt.modules.glusterfs), 866
list_vpservices() (in module salt.modules.neutron), 1013
list_webpi() (in module salt.modules.chocolatey), 697
list_windows() (in module salt.modules.pagerduty), 1055
list_windows() (in module salt.runners.pagerduty), 1459
list_windowsfeatures() (in module salt.modules.chocolatey), 697
list_worktrees() (in module salt.modules.git), 851
list_zones() (in module salt.modules.firewalld), 827
listening_ports() (in module salt.modules.osquery), 1047
llen() (in module salt.modules.redismod), 1115
load() (in module salt.modules.data), 739
load() (in module salt.modules.dockerio), 757
load() (in module salt.modules.dockergen), 774
load() (in module salt.modules.freebsdmod), 830
load() (in module salt.modules.kmod), 925
load_states() (in module salt.renderers.pyobjects), 1394
loadavg() (in module salt.modules.status), 1184
loadavg() (in module salt.states.status), 1745
loaddata() (in module salt.modules.djangomod), 749
load() (in module salt.states.docker), 1596
load_states() (in module salt.states.docker), 1596
LoaderError, 598, 600
LocalClient(class in salt.client), 422
local() (salt.netapi.NetapiClient method), 374
local_async() (salt.netapi.NetapiClient method), 374
local_batch() (salt.netapi.NetapiClient method), 374
LocalClient (class in salt.client), 425
locate() (in module salt.modules.ilo), 932
lock() (in module salt.fileserver.gifs), 590
lock() (in module salt.fileserver.hgfs), 591
lock() (in module salt.fileserver.svnfs), 595
lock() (in module salt.modules.nova), 1027
lock() (in module salt.modules.osxdesktop), 1051
lock() (in module salt.modules.win_system), 1270
lock() (in module salt.modules.zk_concurrency), 1311
lock() (in module salt.states.zk_concurrency), 1774
lock() (in module salt.states.zk_concurrency), 1312
log_datefmt
log_datefmt
conf/logging, 580
conf/master, 559
conf/minion, 576
log_datefmtlogfile
log_datefmtlogfile
conf/logging, 580
conf/master, 559
conf/minion, 576
log_file
log_file
conf/logging, 579
conf/master, 559
conf/minion, 575
log_fnt_consoled
log_fnt_consoled
conf/logging, 580
conf/master, 560
conf/minion, 576
log_fnt_logfile
log_fnt_logfile
conf/logging, 581
conf/master, 560
conf/minion, 576
log_granular_levels
  conf/logging, 581
  conf/master, 560
  conf/minion, 576
log_level
  conf/logging, 580
  conf/master, 559
  conf/minion, 575
log_level_logfile
  conf/logging, 580
  conf/master, 559
  conf/minion, 575
logged_in_users() (in module salt.modules.osquery), 1047
Login (class in salt.netapi.rest_cherrypy.app), 1326
login() (in module salt.modules.dockerio), 757
login_exists() (in module salt.modules.mssql), 981
login_test() (in module salt.modules.influx), 892
Logout (class in salt.netapi.rest_cherrypy.app), 1327
logs() (in module salt.modules.dockerio), 758
logs() (in module salt.modules.dockereng), 775
lookup() (in module salt.modules.smartos_vmadm), 1151
lookup_jid() (in module salt.runners.jobs), 1449
loop_interval
  conf/master, 534
Low State, 2145
low() (in module salt.modules.state), 1181
low() (salt.cloud.CloudClient method), 431
LowDataAdapter (class in salt.netapi.rest_cherrypy.app), 1325
lowstate, 1339
lrange() (in module salt.modules.redismod), 1115
ls() (in module salt.modules.augeas_cfg), 625
ls() (in module salt.modules.cron), 734
ls() (in module salt.modules.etc_md_mod), 800
ls() (in module salt.modules.grains), 876
ls() (in module salt.modules.incron), 890
ls() (in module salt.modules.pillar), 1063
ls() (in module salt.modules.scsi), 1141
ls() (in module salt.modules.serverdensity_device), 1144
ls() (in module salt.modules.tomcat), 1222
ls_remote() (in module salt.modules.git), 852
lsmod() (in module salt.modules.freesbdkmmod), 830
lsmod() (in module salt.modules.lvmmod), 925
lstat() (in module salt.modules.file), 815
lucene_version() (in module salt.modules.solr), 1171
lv_absent() (in module salt.states.lvm), 1672
lv_present() (in module salt.states.lvm), 1672
lvcreate() (in module salt.modules.linux_lvm), 929
lvdisplay() (in module salt.modules.linux_lvm), 929
lvremove() (in module salt.modules.linux_lvm), 930
lvresize() (in module salt.modules.linux_lvm), 930

M
make_blob_url() (in module salt.cloud.clouds.msazure), 472
make_image() (in module salt.modules.qemu_img), 1101
make_pkgng_aware() (in module salt.modules.poudriere), 1092
make_repo() (in module salt.modules.rpmbuild), 1128
make_src_pkg() (in module salt.modules.rpmbuild), 1128
makedirs() (in module salt.modules.file), 815
makedirs_perms() (in module salt.modules.file), 816
makeopts_contains() (in module salt.modules.makeconf), 962
manage_file() (in module salt.modules.file), 816
manage_mode() (in module salt.modules.config), 717
manage_monitor() (in module salt.states.bigip), 1532
manage_node() (in module salt.states.bigip), 1532
manage_pool() (in module salt.states.bigip), 1532
manage_pool_members() (in module salt.states.bigip), 1533
manage_profile() (in module salt.states.bigip), 1533
manage_virtual() (in module salt.states.bigip), 1533
managed() (in module salt.states.file), 1624
managed() (in module salt.states.mencached), 1679
managed() (in module salt.states.network), 1693
managed() (in module salt.states.ntp), 1697
managed() (in module salt.states.pkgrepo), 1715
managed() (in module salt.states.sysrc), 1749
managed() (in module salt.states.virtualenv_mod), 1760
managed() (in module salt.states.win_network), 1763
managedcloud() (in module salt.cloud.clouds.nova), 479
managedcloud() (in module salt.cloud.clouds.openstack), 483
Map (class in salt.utils.aggregation), 597
map_run() (in module salt.runners.cloud), 1442
map_run() (salt.cloud.CloudClient method), 432
mapping_create() (in module salt.modules.elasticsearch), 797
mapping_delete() (in module salt.modules.elasticsearch), 797
mapping_get() (in module salt.modules.elasticsearch), 797
mask() (in module salt.modules.systemd), 1206
masked() (in module salt.states.systemd), 1206
Master, 2146
master
  conf/minion, 564
Master Tops, 2146
master() (in module salt.modules.status), 1184
master() (in module salt.modules.win_status), 1267
master_finger
  conf/minion, 574
mod_hostname() (in module salt.modules.network), 1000
mod_list() (in module salt.modules.freesbdkmod), 830
mod_list() (in module salt.modules.kmod), 925
mod_repo() (in module salt.modules.aptpkg), 616
mod_repo() (in module salt.modules.yumtpkg), 1305
mod_repo() (in module salt.modules.zypper), 1319
mod_run_check() (in module salt.states.cmd), 1581
mod_run_check() (in module salt.states.git), 1639
mod_run_check_cmd() (in module salt.states.file), 1628
mod_watch() (in module salt.states.cmd), 1581
mod_watch() (in module salt.states.docker), 1597
mod_watch() (in module salt.states.dockerng), 1602
mod_watch() (in module salt.states.etcd_mod), 1613
mod_watch() (in module salt.states.module), 1682
mod_watch() (in module salt.states.mount), 1685
mod_watch() (in module salt.states.service), 1741
mod_watch() (in module salt.states.supervisord), 1746
mod_watch() (in module salt.states.test), 1750
mod_watch() (in module salt.states.tomcat), 1752
mode() (in module salt.states.quota), 1725
mode() (in module salt.states.selinix), 1739
modfacl() (in module salt.modules.linux_acl), 929
modified() (in module salt.modules.rpm), 1127
modified() (in module salt.modules.yumtpkg), 1305
modified() (in module salt.modules.zypper), 1319
modify() (in module salt.modules.beacons), 630
modify() (in module salt.modules.schedule), 1140
modify() (in module salt.modules.sqlite3), 1176
modify() (in module salt.modules.xfs), 1298
modify_monitor() (in module salt.modules.bigip), 635
modify_monitor() (in module salt.states.bigip), 1533
modify_node() (in module salt.modules.bigip), 636
modify_node() (in module salt.states.bigip), 1534
modify_pool() (in module salt.modules.bigip), 636
modify_pool() (in module salt.states.bigip), 1534
modify_pool_member() (in module salt.modules.bigip), 636
modify_pool_member() (in module salt.states.bigip), 1534
modify_profile() (in module salt.modules.bigip), 637
modify_profile() (in module salt.states.bigip), 1534
modify_virtual() (in module salt.modules.bigip), 637
modify_virtual() (in module salt.states.bigip), 1535
module_dirs

conf/minion, 533, 570
module_report() (in module salt.states.test), 1209
modules() (in module salt.modules.apache), 611
modules() (in module salt.modules.syslog_ng), 1197
monitor() (in module salt.modules.monit), 977
monitor() (in module salt.states.monit), 1684
monitored() (in module salt.states.serverdensity_device), 1740
monitored() (in module salt.states.uptime), 1756
mount() (in module salt.modules.mount), 979
mount() (in module salt.modules.qemu_nbd), 1101
mount_image() (in module salt.modules.img), 890
mounted() (in module salt.states.mount), 1685
mounts() (in module salt.modules.moosefs), 978
mounts() (in module salt.modules.osquery), 1047
move() (in module salt.modules.file), 817
move() (in module salt.modules.schedule), 1140
msg (salt.auth.pam.PamMessage attribute), 394
msg_style (salt.auth.pam.PamMessage attribute), 394
Multi-Master, 2146
multipath_flush() (in module salt.modules.devmap), 746
multipath_list() (in module salt.modules.devmap), 747
multiprocessing

conf/minion, 575
mutex() (in module salt.modules.sysbench), 1194
MX() (in module salt.modules.dig), 747
MX() (in module salt.modules.dnsutil), 750
MySQLExtPillar (class in salt.pillar.mysql), 1366

N

name() (in module salt.modules.parted), 1059
name() (in module salt.modules.udev), 1227
NamedStatement (class in salt.modules.syslog_ng), 1195
namenode_format() (in module salt.modules.hadoop), 879
nameservers() (in module salt.modules.drac), 788
NestDisplay (class in salt.output.nested), 1350
NestDisplay (class in salt.output.no_return), 1351
NetapiClient (class in salt.netapi), 374
netdev() (in module salt.modules.status), 1184
netstat() (in module salt.modules.network), 1001
netstat() (in module salt.modules.win_network), 1256
netstats() (in module salt.modules.cassandra), 687
netstats() (in module salt.modules.status), 1185
network() (in module salt.modules.ilo), 889
network() (in module salt.states.drac), 1610
network_acl_exists() (in module salt.modules.boto_vpc), 677
network_create() (in module salt.cloud.clouds.nova), 479
network_create() (in module salt.modules.cloud), 699
network_info() (in module salt.modules.drac), 788
network_list() (in module salt.cloud.clouds.nova), 479
network_list() (in module salt.modules.cloud), 699
networks() (in module salt.cloud.clouds.openstack), 484
new_chain() (in module salt.modules.iptables), 913
new_chain() (in module salt.modules.nftables), 1022
new_service() (in module salt.modules.firewalld), 827
new_set() (in module salt.modules.ipsset), 909
new_table() (in module salt.modules.nftables), 1022
new_zone() (in module salt.modules.firewalld), 827
next_hyper() (in module salt.runners.virt), 1466
nfs Shares() (in module salt.modules.osquery), 1047
Node Group, 2146
node_info() (in module salt.modules.virt), 1239
node_info() (in module salt.modules.xapi), 1294
nodegroups
    conf/master, 560
noop() (in module salt.modules.puppet), 1095
normalize_name() (in module salt.modules.solarisips), 1164
normalize_name() (in module salt.modules.yumpkg), 1305
normpath() (in module salt.modules.file), 817
noscan() (in module salt.modules.bluez), 639
not_alived() (in module salt.runners.bluez_runner), 1455
not_allowed() (in module salt.runners.manage), 1455
not_joined() (in module salt.runners.manage), 1455
not_loaded() (in module salt.modules.test), 1209
not_present() (in module salt.runners.manage), 1456
not_reaped() (in module salt.runners.manage), 1456
NotImplemented, 598, 600
nproc() (in module salt.modules.status), 1185
NS() (in module salt.modules.dig), 747
NS() (in module salt.modules.dnsutil), 750
nslookup() (in module salt.modules.win_network), 1256
nvram() (in module salt.modules.osquery), 1048
obfuscate() (in module salt.modules.pillar), 1063
off() (in module salt.modules.quota), 1102
off() (in module salt.modules.tuned), 1226
offline() (in module salt.states.trafficserver), 1225
offline() (in module salt.modules.zpool), 1315
offline() (in module salt.states.trafficserver), 1754
on() (in module salt.modules.quota), 1102
online() (in module salt.modules.zpool), 1315
open_files() (in module salt.modules.file), 817
open_mode
    conf/master, 537
    conf/minion, 574
optimize() (in module salt.modules.solr), 1172
optimize_providers() (in module salt.cloud.clouds.ec2), 444
Option (class in salt.modules.syslog_ng), 1195
option() (in module salt.modules.config), 717
option_group_exists() (in module salt.modules.boto_rds), 665
options() (in module salt.modules.supervisord), 1187
options_absent() (in module salt.states.ini_manage), 1653
options_present() (in module salt.states.ini_manage), 1653
opts_pkg() (in module salt.modules.test), 1209
orchestrate() (in module salt.runners.state), 1463
orchestrate_high() (in module salt.runners.state), 1464
orchestrate_single() (in module salt.runners.state), 1464
order_masters
    conf/master, 557
os_version() (in module salt.modules.osquery), 1048
osquery_extensions() (in module salt.modules.osquery), 1048
osquery_flags() (in module salt.modules.osquery), 1048
osquery_info() (in module salt.modules.osquery), 1048
osquery_registry() (in module salt.modules.osquery), 1048
output
    conf/master, 534
    output() (in module salt.output.compact), 1348
    output() (in module salt.output.highstate), 1349
    output() (in module salt.output.json_out), 1349
    output() (in module salt.output.key), 1349
    output() (in module salt.output.nested), 1350
    output() (in module salt.output.pprint_out), 1351
    output() (in module salt.output.newline_values_only), 1351
    output() (in module salt.output.no_out), 1351
    output() (in module salt.output.no_return), 1351
    output() (in module salt.output.overstatestage), 1352
    output() (in module salt.output.pprint_out), 1352
    output() (in module salt.output.progress), 1352
    output() (in module salt.output.raw), 1352
    output() (in module salt.output.txt), 1353
    output() (in module salt.output.virt_query), 1353
    output() (in module salt.output.yaml_out), 1353
    Outputter, 2146
    outputter() (in module salt.modules.test), 1210
    overview() (in module salt.modules.drbd), 790
    owner() (in module salt.modules.aptpkg), 616
    owner() (in module salt.modules.pacman), 1053
    owner() (in module salt.modules.rpm), 1127
    owner() (in module salt.modules.yumpkg), 1306
    owner() (in module salt.modules.zypper), 1319
    owner_to() (in module salt.modules.postgres), 1088
P
pack() (in module salt.modules.genesis), 840
pack() (salt.exceptions.SaltException method), 599, 601
pack_sources() (in module salt.modules.pkg_resource), 1068
pair() (in module salt.modules.bluez), 639
PamConv (class in salt.auth.pam), 394
PamHandle (class in salt.auth.pam), 394
PamMessage (class in salt.auth.pam), 394
PamResponse (class in salt.auth.pam), 394
param_set() (in module salt.modules.varnish), 1233
param_show() (in module salt.modules.varnish), 1233
Parameter (class in salt.modules.syslog_ng), 1195
parameter_group_exists() (in module salt.modules.boto_rds), 665
ParameterValue (class in salt.modules.syslog_ng), 1195
pardir() (in module salt.modules.file), 817
parse_config() (in module salt.modules.pkg_resource), 1075
parse_config() (in module salt.modules.poudriere), 1093
parse_hosts() (in module salt.modules.dnsutil), 751
parse_targets() (in module salt.modules.pkg_resource), 1068
parse_zone() (in module salt.modules.dnsutil), 751
party_members() (in module salt.modules.zk_concurrency), 1312
passwd() (in module salt.modules.tomcat), 1222
passwd_changes() (in module salt.modules.osquery), 1048
patch() (in module salt.modules.file), 818
patch() (in module salt.modules.udev), 1227
path_exists_glob() (in module salt.modules.file), 818
pause() (in module salt.modules.dockerio), 758
pause() (in module salt.modules.dockerng), 775
pause() (in module salt.modules.virt), 1239
pause() (in module salt.modules.xapi), 1294
pause() (in module salt.runners.virt), 1466
pci_devices() (in module salt.modules.osquery), 1048
pcre() (in module salt.modules.match), 967
peer
  conf/master, 558
PeerCommunication, 2146
peer() (in module salt.modules.glusterfs), 866
peer_run
  conf/master, 558
preferred_ip() (in module salt.states.glusterfs), 1771
percent() (in module salt.modules.disk), 748
percent() (in module salt.modules.freebsd_sysctl), 828
percent() (in module salt.modules.linux_sysctl), 931
percent() (in module salt.modules.netbsd_sysctl), 992
pid() (in module salt.modules.dockerio), 775
pid() (in module salt.modules.nspawn), 1032
pid() (in module salt.modules.status), 1185
pidfile
  conf/master, 532
  conf/minion, 566
Pillar, 2146
pillar() (in module salt.modules.match), 967
pillar() (in module salt.runners.queue), 1461
pillar() (in module salt.runners.xapi), 1294
pillar_pcre() (in module salt.modules.osquery), 1048
pillar_dir() (in module salt.pillar.svn_pillar.SvnPillar method), 1375
pillar_roots
  conf/master, 552
  conf/minion, 574
pillar_source_merging_strategy
  conf/master, 555
ping() (in module salt.modules.gnomedesktop), 867
ping() (in module salt.modules.junos), 918
ping() (in module salt.modules.network), 1001
ping() (in module salt.modules.redismod), 1115
ping() (in module salt.modules.rest_sample), 1120
ping() (in module salt.modules.solr), 1172
ping() (in module salt.modules.sysbench), 1194
ping() (in module salt.modules.test), 1210
ping() (in module salt.modules.test_virtual), 1211
ping() (in module salt.modules.win_network), 1256
pkg() (in module salt.modules.state), 1095
PkgParseError, 598, 600
pki_dir
  conf/master, 552
  conf/minion, 566
plugin_is_enabled() (in module salt.modules.rabbitmq), 1104
plugin_sync() (in module salt.modules.puppet), 1095
policy_exists() (in module salt.modules.rabbitmq), 1104
pop() (in module salt.modules.data), 739
pop() (in module salt.runners.queue), 1461
port() (in module salt.modules.dockerio), 758
port() (in module salt.modules.dockerng), 775
porttree_matches() (in module salt.modules.ebuild), 792
POST (salt.netapi.rest_cherrypy.app.LowDataAdapter attribute), 1326
POST() (salt.netapi.rest_cherrypy.app.Keys method), 1336
POST() (salt.netapi.rest_cherrypy.app.Login method), 1326
POST() (salt.netapi.rest_cherrypy.app.Logout method), 1327
POST() (salt.netapi.rest_cherrypy.app.Minions method), 1328
POST() (salt.netapi.rest_cherrypy.app.Run method), 1330
POST() (salt.netapi.rest_cherrypy.app.Webhook method), 1333
post_message() (in module salt.modules.pushover_notify), 1096
post_message() (in module salt.modules.slack_notify), 1148
post_message() (in module salt.modules.pushover), 1722
post_message() (in module salt.states.pushover), 1742
power() (in module salt.modules.bluez), 640
power() (in module salt.states.ipmi), 1655
poweroff() (in module salt.modules.nspawn), 1032
poweroff() (in module salt.modules.system), 1204
poweroff() (in module salt.runners.drac), 1443
preferences() (in module salt.modules.osquery), 1048
preferred_ip() (in module salt.cloud.clouds.nova), 479
preferred_ip() (in module salt.cloud.clouds.openstack), 484
preferred_ip() (in module salt.cloud.clouds.rackspace), 489
prep_bootstrap() (in module salt.modules.seed), 1142
prep_jid() (in module salt.runners.carbon_return), 1405
present() (in module salt.states.stormpath_account), 1746
present() (in module salt.states.sysctl), 1748
present() (in module salt.states.user), 1757
present() (in module salt.states.win_dacl), 1761
primary_suffix() (in module salt.states.win_dns_client), 1762
print_job() (in module salt.runners.jobs), 1450
private_key_managed() (in module salt.states.x509), 1771
probe() (in module salt.modules.parted), 1059
process() (in module salt.modules.status), 1745
process_envs() (in module salt.modules.osquery), 1048
process_memory_map() (in module salt.modules.osquery), 1049
process_open_files() (in module salt.modules.osquery), 1049
process_open_sockets() (in module salt.modules.osquery), 1049
process_queue() (in module salt.runners.queue), 1049
processlist() (in module salt.modules.mysql), 985
processPath() (salt.modules.win_dacl.daclConstants method), 1245
proc() (in module salt.modules.status), 1185
proc() (in module salt.modules.win_status), 1267
profile() (in module salt.modules.cloud), 699
profile() (in module salt.modules.tuned), 1226
profile() (in module salt.runners.cloud), 1442
profile() (in module salt.states.cloud), 1578
profile() (in module salt.states.tuned), 1756
profile() (salt.cloud.CloudClient method), 432
profile_associated() (in module salt.states.btrfs), 432
progress_iter() (in module salt.output.progress), 1352
properties() (in module salt.modules.btrfs), 685
provider() (in module salt.modules.test), 1210
providers
  conf/minion, 571
  providers() (in module salt.modules.test), 1210
Proxy Minion, 2146
prune_dump() (in module salt.modules.xfs), 1298
ps() (in module salt.modules.dockerng), 775
psed() (in module salt.modules.file), 818
psql_query() (in module salt.modules.postgres), 1088
publish() (in module salt.modules.publish), 1094
publish() (in module salt.modules.raet_publish), 1106
publish_port
  conf/master, 531
PublishError, 598, 600
pull() (in module salt.modules.dockerio), 758
pull() (in module salt.modules.dockerio), 776
pull() (in module salt.modules.git), 854
pull() (in module salt.modules.hg), 882
pull() (salt.pillar.hg_pillar.Repo method), 1363
pull_dkr() (in module salt.modules.nspawn), 1032
pull_raw() (in module salt.modules.nspawn), 1033
pull_tar() (in module salt.modules.nspawn), 1033
pulled() (in module salt.states.dockerio), 1597
purge() (in module salt.modules.apt/pkg), 617
purge() (in module salt.modules.ebuild), 792
purge() (in module salt.modules.openbsd/pkg), 1038
purge() (in module salt.modules.pacman), 1053
purge() (in module salt.modules.pkgutil), 1082
purge() (in module salt.modules.package), 1140
purge() (in module salt.modules.solaris/pkg), 1164
purge() (in module salt.modules.solaris/pkg), 1167
purge() (in module salt.modules.varnish), 1233
purge() (in module salt.modules.virt), 1240
purge() (in module salt.modules.win_pkg), 1259
purge() (in module salt.modules.yum/pkg), 1306
purge() (in module salt.modules.zypper), 1320
purge() (in module salt.runners.solaris/lc), 1452
purge() (in module salt.runners.virt), 1466
purged() (in module salt.states.pkg), 1711
push() (in module salt.modules.cp), 732
push() (in module salt.modules.dockerio), 758
push() (in module salt.modules.docker/), 776
push() (in module salt.modules.git), 855
push_dir() (in module salt.modules.cp), 733
pushed() (in module salt.modules.packman), 1597
put() (in module salt.modules.consul), 727
put() (in module salt.modules.s3), 1134
put() (in module salt.modules.swift), 1193
put_blob() (in module salt.cloud.clouds.msat), 472
put_group_policy() (in module salt.modules.boto_iam), 659
put_key_policy() (in module salt.modules.boto_kms), 663
put_user_policy() (in module salt.modules.boto_iam), 659
pv_absent() (in module salt.states.lvm), 1673
pv_present() (in module salt.states.lvm), 1673
pvcreate() (in module salt.modules.linux_lvm), 930
pvdisplay() (in module salt.modules.linux_lvm), 930
pvremove() (in module salt.modules.linux_lvm), 930
pxe() (in module salt.runners.drac), 1443
PyDSL, 2146
PyWinUpdater (class in salt.modules.win_update), 1274
PyWinUpdater (class in module salt.states.win_update), 1766
Q
quarantine() (in module salt.modules.osquery), 1049
query() (in module salt.cloud.clouds.aliyun), 434
query() (in module salt.cloud.clouds.digital_ocean), 439
query() (in module salt.cloud.clouds.ec2), 444
query() (in module salt.cloud.clouds.joyent), 455
query() (in module salt.cloud.clouds.msazure), 473
query() (in module salt.cloud.clouds.parallels), 485
query() (in module salt.cloud.clouds.proxmox), 487
query() (in module salt.modules.cloud), 699
query() (in module salt.modules.http), 886
query() (in module salt.modules.influx), 892
query() (in module salt.modules.mysql), 985
query() (in module salt.modules.node), 1024
query() (in module salt.modules.osquery), 1049
query() (in module salt.runners.cloud), 1442
query() (in module salt.runners.http), 1448
query() (in module salt.runners.search), 1462
query() (in module salt.runners.virt), 1466
query() (in module salt.states.http), 1650
query() (salt.cloud.CloudClient method), 432
query_instance() (in module salt.cloud.clouds.ec2), 444
query_instance() (in module salt.cloud.clouds.joyent), 455
query_item() (in module salt.modules.rallydev), 1107
query_user() (in module salt.modules.rallydev), 1107
queue_exists() (in module salt.modules.aws_sqs), 627
queue_instances() (in module salt.cloud.clouds.ec2), 444
queue_stop() (in module salt.cloud.clouds.pyrax), 488
queue_start() (in module salt.cloud.clouds.pyrax), 488
queue_exists() (in module salt.cloud.clouds.pyrax), 488
queue_show() (in module salt.cloud.clouds.pyrax), 488
quote_identifier() (in module salt.modules.mysql), 986

R
rconnect() (in module salt.cloud.clouds.nova), 479
rconnect() (in module salt.cloud.clouds.openstack), 484
rand_int() (in module salt.modules.mod_random), 972
rand_sleep() (in module salt.modules.test), 1210
rand_str() (in module salt.modules.test), 1210
random_reauth_delay
  conf/minion, 568
range_server
  conf/master, 560
rar() (in module salt.modules.archive), 620
raw() (in module salt.modules.pillar), 1063
raw_arg() (in module salt.runners.test), 1465
raw_command() (in module salt.modules.ipmi), 902
raw_cron() (in module salt.modules.cron), 734
raw_incron() (in module salt.modules.incron), 890
raw_interface_configs() (in module salt.modules.win_ip), 1254
raw_mod() (in module salt.loader), 425
raw_system_incron() (in module salt.modules.incron), 890
re_encrypt() (in module salt.modules.boto_kms), 663
Reactor, 152, see Event, 2146
read() (in module salt.wheel.file_roots), 1785
read() (in module salt.wheel.pillar_roots), 1786
read_certificate() (in module salt.modules.x509), 1291
read_certificates() (in module salt.modules.x509), 1291
read_conf() (in module salt.modules.lxc), 946
read_crl() (in module salt.modules.x509), 1291
read_csr() (in module salt.modules.x509), 1291
read_datasource() (in module salt.modules.jboss7), 915
read_file() (in module salt.modules.pem), 1057
read_key() (in module salt.modules.reg), 1118
read_simple_binding() (in module salt.modules.jboss7), 915
read_value() (in module salt.modules.reg), 1119
read_var() (in module salt.modules.trafficserver), 1225
readdir() (in module salt.modules.file), 819
readlink() (in module salt.modules.file), 819
readlink() (in module salt.modules.win_file), 1250
reaped() (in module salt.runners.manage), 1456
rebase() (in module salt.modules.git), 856
reboot() (in module salt.cloud.clouds.aliyun), 434
reboot() (in module salt.cloud.clouds.ec2), 444
reboot() (in module salt.cloud.clouds.gce), 449
reboot() (in module salt.cloud.clouds.gogrid), 452
reboot() (in module salt.cloud.clouds.joyent), 455
reboot() (in module salt.cloud.clouds.linode), 461
reboot() (in module salt.cloud.clouds.nova), 480
reboot() (in module salt.cloud.clouds.openstack), 484
reboot() (in module salt.modules.lxc), 946
reboot() (in module salt.modules.nspawn), 1033
reboot() (in module salt.modules.smartos_vmadm), 1151
reboot() (in module salt.modules.system), 1204
reboot() (in module salt.modules.virt), 1240
reboot() (in module salt.modules.win_system), 1270
reboot() (in module salt.modules.xapi), 1294
reboot() (in module salt.runners.drac), 1443
reboot_host() (in module salt.cloud.clouds.vmware), 499
receipts() (in module salt.modules.system_profiler), 1205
receive() (in module salt.modules.smartos_vmadm), 1151
receive_keys() (in module salt.modules.pgp), 871
receive_message() (in module salt.modules.aws_sqs), 627
reconfig
  conf/minion, 568
reconf
  conf/minion, 568
reconf_randomize
  conf/minion, 569
reconfigure() (in module salt.modules.lxc), 946
records() (in module salt.modules.smbios), 1154
recover_all() (in module salt.modules.modjk), 974
recurse() (in module salt.states.file), 1629
recv() (in module salt.modules.ep), 733
recv_known_host() (in module salt.modules.ssh), 1178
refresh() (in module salt.cloud.clouds.joyent), 455
refresh() (in module salt.modules.trafficserver), 1225
refresh() (in module salt.states.trafficserver), 1754
refresh_beacons() (in module salt.modules.saltutil), 1136
refresh_db() (in module salt.modules.aptpkg), 617
refresh_db() (in module salt.modules.brew), 680
refresh_db() (in module salt.modules.ebuild), 793
remove() (in module salt.modules.alternatives), 610
remove() (in module salt.modules.aptpkg), 617
remove() (in module salt.modules.augears_cfg), 625
remove() (in module salt.modules.brew), 681
remove() (in module salt.modules.cpan), 733
remove() (in module salt.modules.ebuild), 793
remove() (in module salt.modules.file), 819
remove() (in module salt.modules.freebsdmod), 830
remove() (in module salt.modules.freebsdpkgs), 833
remove() (in module salt.modules.grains), 876
remove() (in module salt.modules.kmod), 926
remove() (in module salt.modules.logadm), 933
remove() (in module salt.modules.macports), 958
remove() (in module salt.modules.mongodb), 976
remove() (in module salt.modules.nspawn), 1033
remove() (in module salt.modules.openbsdmod), 1038
remove() (in module salt.modules.ypkg), 1054
remove() (in module salt.modules.yumcg), 1070
remove() (in module salt.modules.yumcgng), 1076
remove() (in module salt.modules.yumcgutil), 1082
remove() (in module salt.modules.rest_package), 1120
remove() (in module salt.modules.solarisips), 1165
remove() (in module salt.modules.solarispkg), 1167
remove() (in module salt.modules.supervisord), 1187
remove() (in module salt.modules.sysrq), 1203
remove() (in module salt.modules.win_path), 1257
remove() (in module salt.modules.win_pkgs), 1259
remove() (in module salt.modules.win_rpm), 1261
remove() (in module salt.modules.www), 1263
remove() (in module salt.modules.zfs), 1306
remove() (in module salt.modules.zypper), 1320
remove() (in module salt.states.alternatives), 1521
remove_all_snapshots() (in module salt.cloud.clouds.vmware), 499
remove_container() (in module salt.modules.dockerio), 758
remove_datasource() (in module salt.modules.dockerio), 758
remove_gateway_router() (in module salt.modules.neutron), 915
remove_host() (in module salt.cloud.clouds.vmware), 1013
remove_image() (in module salt.modules.dockerio), 759
remove_interface_router() (in module salt.modules.neutron), 1013
remove_key() (in module salt.cloud.clouds.digital_ocean), 439
remove_license() (in module salt.modules.powerpath), 1093
remove_lock() (in module salt.modules.zypper), 1320
remove_masquerade() (in module salt.modules.firewalld), 827
Regenerates storage keys, 1136
Regen_keys() (in module saltutil), 1159
Refresh pillar, 1251
Refresh_modules(), 1257
Refresh_db(), 1275
Refresh_db(), 1287
Refresh_db(), 1299
Refresh_db(), 1311
Refresh_db(), 1323
Refresh_db(), 1335
Refresh_db(), 1347
Refresh_db(), 1359
Refresh_db(), 1371
Refresh_db(), 1383
Refresh_db(), 1395
Refresh_db(), 1407
Refresh_db(), 1419
Refresh_db(), 1431
Refresh_db(), 1443
Refresh_db(), 1455
Refresh_db(), 1467
Refresh_db(), 1479
Refresh_db(), 1491
Refresh_db(), 1503
Refresh_db(), 1515
Refresh_db(), 1527
Refresh_db(), 1539
Refresh_db(), 1551
Refresh_db(), 1563
Refresh_db(), 1575
Refresh_db(), 1587
Refresh_db(), 1599
Refresh_db(), 1611
Refresh_db(), 1623
Refresh_db(), 1635
Refresh_db(), 1647
Refresh_db(), 1659
Refresh_db(), 1671
Refresh_db(), 1683
Refresh_db(), 1695
Refresh_db(), 1707
Refresh_db(), 1719
Refresh_db(), 1731
Refresh_db(), 1743
Refresh_db(), 1755
Refresh_db(), 1767
Refresh_db(), 1779
Refresh_db(), 1791
Refresh_db(), 1803
Refresh_db(), 1815
Refresh_db(), 1827
Refresh_db(), 1839
Refresh_db(), 1851
Refresh_db(), 1863
Refresh_db(), 1875
Refresh_db(), 1887
Refresh_db(), 1899
Refresh_db(), 1911
Refresh_db(), 1923
Refresh_db(), 1935
Refresh_db(), 1947
Refresh_db(), 1959
Refresh_db(), 1971
refresh_db() (in module salt.cloud.clouds.msazure), 473
register_instances() (in module salt.modules.boto_elb), 654
Registry (class in salt.modules.reg), 1116
rehash() (in module salt.modules.pyenv), 1100
rehash() (in module salt.modules.rbenv), 1112
rehash() (in module salt.modules.win_path), 1257
rehashconf() (in module salt.modules.znc), 1313
reinstall_ruby() (in module salt.modules.rvm), 1132
reject() (in module salt.wheel.key), 1785
reject_dict() (in module salt.wheel.key), 1785
reload() (in module salt.modules.daemontools), 736
reload() (in module salt.modules.debian_service), 745
reload() (in module salt.modules.freebsd_service), 836
reload() (in module salt.modules.jboss7), 915
reload() (in module salt.modules.netbsd_service), 994
reload() (in module salt.modules.openbsdrcctl), 1039
reload() (in module salt.modules.openbsdmod), 1041
reload() (in module salt.modules.rh_service), 1124
reload() (in module salt.modules.runit), 1129
reload() (in module salt.modules.schedule), 1141
reload() (in module salt.modules.service), 1145
reload() (in module salt.modules.smf), 1157
reload() (in module salt.modules.syslog_ng), 1197
reload() (in module salt.modules.systemd), 1206
reload() (in module salt.modules.tomcat), 1222
reload() (in module salt.modules.upstart), 1229
reload_core() (in module salt.modules.solr), 1172
reload_import_config() (in module salt.modules.solr), 1173
reload_modules() (in module salt.modules.sysmod), 1201
reloaded() (in module saltstates.jboss7), 1667
reloaded() (in module salt.states.syslog_ng), 1748
remote_get() (in module salt.modules.git), 856
remote_refs() (in module salt.modules.git), 856
remote_set() (in module salt.modules.git), 857
remotes() (in module salt.modules.git), 858
remount() (in module salt.modules.mount), 979
Spm command line option, 422
remove() (in module salt.modules.alternatives), 610
remove() (in module salt.modules.aptpkg), 617
remove() (in module salt.modules.augears_cfg), 625
remove() (in module salt.modules.brew), 681
remove() (in module salt.modules.cpan), 733
remove() (in module salt.modules.ebuild), 793
remove() (in module salt.modules.file), 819
remove() (in module salt.modules.freebsdmod), 830
remove() (in module salt.modules.freebsdpkgs), 833
remove() (in module salt.modules.grains), 876
remove() (in module salt.modules.kmod), 926
remove() (in module salt.modules.logadm), 933
remove() (in module salt.modules.macports), 958
remove() (in module salt.modules.mongodb), 976
remove() (in module salt.modules.nspawn), 1033
remove() (in module salt.modules.openbsdpkgs), 1038
remove() (in module salt.modules.ypkg), 1306
remove() (in module salt.modules.zypper), 1320
remove() (in module salt.states.alternatives), 1521
remove_all_snapshots() (in module salt.cloud.clouds.vmware), 499
remove_container() (in module salt.modules.dockerio), 758
remove_datasource() (in module salt.modules.dockerio), 758
remove_gateway_router() (in module salt.modules.neutron), 915
remove_host() (in module salt.cloud.clouds.vmware), 1013
remove_image() (in module salt.modules.dockerio), 759
remove_interface_router() (in module salt.modules.neutron), 1013
remove_key() (in module salt.cloud.clouds.digital_ocean), 439
remove_license() (in module salt.modules.powerpath), 1093
remove_lock() (in module salt.modules.zypper), 1320
remove_masquerade() (in module salt.modules.firewalld), 827
Index
remove_option() (in module salt.modules.ini_manage), 895
remove_port() (in module salt.modules.firewalld), 827
remove_port_fwd() (in module salt.modules.firewalld), 828
remove_service() (in module salt.modules.ini_manage), 896
remove_user_from_group() (in module salt.modules.boto_iam), 659
remove_var() (in module salt.modules.makeconf), 962
removed() (in module salt.states.bower), 1575
removed() (in module salt.states.cabal), 1576
removed() (in module salt.states.cyg), 1591
removed() (in module salt.states.gem), 1635
removed() (in module salt.states.npm), 1697
removed() (in module salt.states.pecl), 1702
removed() (in module salt.states.pip_state), 1704
removed() (in module salt.modules.win_servermanager), 1765
removed() (salt.states.cyg.DictDiffer method), 1591
rename() (in module salt.cloud.clouds.ec2), 444
rename() (in module salt.cloud.clouds.libcloud_aws), 457
rename() (in module salt.modules.file), 819
rename() (in module salt.modules.mac_user), 956
rename() (in module salt.modules.pw_user), 1099
rename() (in module salt.modules.solaris_user), 1163
rename() (in module salt.modules.useradd), 1232
rename() (in module salt.cloud.clouds.win_useradd), 1280
rename() (in module salt.modules.btrfs), 685
render() (in module salt.renderers.cheetah), 1378
render() (in module salt.renderers.genshi), 1378
render() (in module salt.renderers.gpg), 1380
render() (in module salt.renderers.hjson), 1380
render() (in module salt.renderers.jinja), 1383
render() (in module salt.renderers.json), 1385
render() (in module salt.renderers.mako), 1385
render() (in module salt.renderers.msgpack), 1385
render() (in module salt.renderers.py), 1386
render() (in module salt.renderers.pydsl), 1390
render() (in module salt.renderers.pyobjects), 1394
render() (in module salt.renderers.wempy), 1397
render() (in module salt.renderers.yaml), 1398
render() (in module salt.renderers.yamllex), 1399
render_dirs
conf/master, 540
conf/minion, 572
renderer_doc() (in module salt.modules.sysmod), 1201
replace() (in module salt.modules.file), 820
replace() (in module salt.modules.memcached), 970
replace() (in module salt.modules.zpool), 1315
replace() (in module salt.states.file), 1631
replace_network_acl_entry() (in module salt.modules.boto_vpc), 678
replace_pool_members() (in module salt.modules.bigip), 638
replace_route() (in module salt.modules.boto_vpc), 678
replace_route_table_association() (in module salt.modules.boto_vpc), 678
replica_present() (in module salt.states.boto_rds), 1564
replication_details() (in module salt.modules.solr), 1173
repo() (in class salt.pillar.hg_pillar), 1363
report() (in module salt.modules.quota), 1102
reprovision() (in module salt.modules.smartos_vmadm), 1151
request() (in module salt.modules.state), 1181
request_instance() (in module salt.cloud.clouds.ec2), 444
request_instance() (in module salt.cloud.clouds.nova), 480
request_instance() (in module salt.cloud.clouds.openstack), 484
requeue() (in module salt.modules.postfix), 1085
reread() (in module salt.modules.supervisord), 1188
rescan_all() (in module salt.modules.scsi), 1141
rescan_hba() (in module salt.cloud.clouds.vmware), 499
rescue() (in module salt.modules.parted), 1059
reset() (in module salt.cloud.clouds.vmware), 499
reset() (in module salt.cloud.clouds.vsphere), 503
reset() (in module salt.modules.git), 858
reset() (in module salt.modules.rabbitmq), 1105
reset() (in module salt.modules.virt), 1240
reset() (in module salt.modules.xapi), 1294
reset() (in module salt.modules.runners.virt), 1466
reset_ignored() (in module salt.modules.softwareupdate), 1159
reset_stats() (in module salt.modules.modjk), 974
resize() (in module salt.modules.btrfs), 685
resize() (in module salt.modules.parted), 1060
resize2fs() (in module salt.modules.blockdev), 639
resource_absent() (in module salt.modules.pagerduty_util), 1057
resource_exists() (in module salt.modules.boto_vpc), 678
resource_present() (in module salt.modules.pagerduty_util), 1057
resp (salt.auth.pam.PamResponse attribute), 394
resp_retcode (salt.auth.pam.PamResponse attribute), 394
restart() (in module salt.modules.daemontools), 736
restart() (in module salt.modules.debian_service), 745
Index 2325
Index
--versions-report, 413
-c CONFIG_DIR, --config-dir=CONFIG_dir, 413
-d, --daemon, 413
-h, --help, 413
-l LOG_LEVEL, --log-level=LOG_LEVEL, 413
-u USER, --user=USER, 413
salt-minion command line option
--log-file-level=LOG_LEVEL_LOGFILE, 414
--log-file=LOG_FILE, 414
--pid-file PIDFILE, 414
--version, 414
--versions-report, 414
-c CONFIG_DIR, --config-dir=CONFIG_dir, 414
-d, --daemon, 414
-h, --help, 414
-l LOG_LEVEL, --log-level=LOG_LEVEL, 414
-u USER, --user=USER, 414
salt-proxy command line option
--log-file-level=LOG_LEVEL_LOGFILE, 415
--log-file=LOG_FILE, 415
--pid-file PIDFILE, 415
--proxyid, 415
--version, 415
--versions-report, 415
-c CONFIG_DIR, --config-dir=CONFIG_dir, 415
-d, --daemon, 415
-h, --help, 415
-l LOG_LEVEL, --log-level=LOG_LEVEL, 415
-u USER, --user=USER, 415
salt-run command line option
--hard-crash, 416
--log-file-level=LOG_LEVEL_LOGFILE, 416
--log-file=LOG_FILE, 416
--version, 416
--versions-report, 416
-c CONFIG_DIR, --config-dir=CONFIG_dir, 416
-d, --doc, --documentation, 416
-h, --help, 416
-l LOG_LEVEL, --log-level=LOG_LEVEL, 416
-t TIMEOUT, --timeout=TIMEOUT, 416
salt-syndic command line option
--log-file-level=LOG_LEVEL_LOGFILE, 420
--log-file=LOG_FILE, 420
--pid-file PIDFILE, 420
--version, 419
--versions-report, 419
-c CONFIG_DIR, --config-dir=CONFIG_dir, 420
-d, --daemon, 420
-h, --help, 420
-l LOG_LEVEL, --log-level=LOG_LEVEL, 420
-u USER, --user=USER, 420
salt.auth.auto (module), 391
salt.auth.django (module), 391
salt.auth.keystone (module), 392
salt.auth.ldap (module), 393
salt.auth.mysql (module), 393
salt.auth.pam (module), 394
salt.auth.pki (module), 395
salt.auth.stormpath (module), 395
salt.auth.yubico (module), 396
salt.beacons.btmp (module), 1786
salt.beacons.diskusage (module), 1787
salt.beacons.inotify (module), 1787
salt.beacons.journald (module), 1788
salt.beacons.load (module), 1788
salt.beacons.network_info (module), 1789
salt.beacons.service (module), 1789
salt.beacons.sh (module), 1790
salt.beacons.twilio_txt_msg (module), 1790
salt.beacons.wtmp (module), 1791
salt.cloud.clouds.aliyun (module), 433
salt.cloud.clouds.amazonaws (module), 435
salt.cloud.clouds.cloudstack (module), 436
salt.cloud.clouds.digitalocean (module), 437
salt.cloud.clouds.ec2 (module), 439
salt.cloud.clouds.gce (module), 446
salt.cloud.clouds.gogrid (module), 451
salt.cloud.clouds.joyent (module), 453
salt.cloud.clouds.libcloud_aws (module), 456
salt.cloud.clouds.linode (module), 458
salt.cloud.clouds.lxc (module), 462
salt.cloud.clouds.msazure (module), 463
salt.cloud.clouds.nova (module), 477
salt.cloud.clouds.opennebula (module), 480
salt.cloud.clouds.openstack (module), 481
salt.cloud.clouds.parallels (module), 484
salt.cloud.clouds.proxmox (module), 485
salt.cloud.clouds.pyrax (module), 487
salt.cloud.clouds.rackspace (module), 488
salt.cloud.clouds.saltify (module), 489
salt.cloud.clouds.softlayer (module), 489
salt.cloud.clouds.softlayer_hw (module), 491
salt.cloud.clouds.vmware (module), 492
salt.cloud.clouds.vsphere (module), 500
salt.engines.logstash (module), 1791
salt.engines.sqs_events (module), 1791
salt.engines.test (module), 1792
salt.exceptions (module), 597, 600
salt.fileserver.azurefs (module), 581
salt.fileserver.s3fs (module), 594
salt.fileserver.svnfs (module), 594
salt.log.handlers.logstash_mod (module), 581
salt.log.handlers.sentry_mod (module), 583
salt.modulesaliases (module), 609
salt.modules.alternatives (module), 609
salt.modules.apache (module), 610
salt.modules.aptpkg (module), 612
salt.modules.archive (module), 619
salt.modules.artifactory (module), 622
salt.modules.at (module), 624
salt.modules.augeas_cfg (module), 624
salt.modules.aws_sqs (module), 626
salt.modules.bamboohr (module), 627
salt.modules.beacons (module), 629
salt.modules.bigip (module), 630
salt.modules.blockdev (module), 638
salt.modules.bluez (module), 639
salt.modules.boto_asg (module), 640
salt.modules.boto_cfn (module), 642
salt.modules.boto_cloudwatch (module), 644
salt.modules.boto_dynamodb (module), 645
salt.modules.boto_ec2 (module), 646
salt.modules.boto_elb (module), 649
salt.modules.boto_iam (module), 652
salt.modules.boto_kms (module), 654
salt.modules.boto_rds (module), 663
salt.modules.boto_route53 (module), 666
salt.modules.boto_secgROUP (module), 667
salt.modules.boto_sns (module), 668
salt.modules.boto_sqs (module), 670
salt.modules.boto_vpc (module), 671
salt.modules.bower (module), 679
salt.modules.brew (module), 679
salt.modules.bridge (module), 681
salt.modulesbsd_shadow (module), 683
salt.modules.btrfs (module), 683
salt.modules.cabal (module), 686
salt.modules.cassandra (module), 687
salt.modules.cassandra_cql (module), 688
salt.modules.chef (module), 693
salt.modules.chocolatey (module), 694
salt.modules.cloud (module), 698
salt.modules.cmdmod (module), 700
salt.modules.composer (module), 701
salt.modules.config (module), 705
salt.modules.consul (module), 717
salt.modules.container_resource (module), 729
salt.modules.cp (module), 730
salt.modules.cpan (module), 733
salt.modules.cron (module), 734
salt.modules.cyg (module), 735
salt.modules.daemontools (module), 736
salt.modules.darwin_pkgutil (module), 737
salt.modules.darwin_sysctl (module), 737
salt.modules.data (module), 738
salt.modules.ddns (module), 740
salt.modules.deb_apache (module), 741
salt.modules.deb_postgres (module), 742
salt.modules.debconfmod (module), 742
salt.modules.debian_ip (module), 743
salt.modules.debian_service (module), 744
salt.modules.defaults (module), 746
salt.modules.devmap (module), 746
salt.modules.dig (module), 747
salt.modules.disk (module), 748
salt.modules.django (module), 748
salt.modules.docker (module), 749
salt.modules.dnsutil (module), 750
salt.modules.dockerio (module), 751
salt.modules.doctest (module), 751
salt.modules.docker (module), 762
salt.modules.dpkg (module), 766
salt.modules.drac (module), 787
salt.modules.dbcheck (module), 790
salt.modules.ebuild (module), 790
salt.modules.eix (module), 794
salt.modules.elasticsearch (module), 794
salt.modules.environ (module), 797
salt.modules.es (module), 798
salt.modules.etc (module), 799
salt.modules.event (module), 800
salt.modules.ext (module), 802
salt.modules.file (module), 804
salt.modules.firewall (module), 805
salt.modules.freebsd (module), 828
salt.modules.freenbs (module), 829
salt.modules.freesystem (module), 830
salt.modules.freesdpkg (module), 831
salt.modules.freesystem (module), 833
salt.modules.freemodule (module), 835
salt.modules.freemod (module), 837
salt.modules.genesis (module), 839
salt.modules.ghost (module), 840
salt.modules.generic (module), 842
salt.modules.git (module), 843
salt.modules.glance (module), 863
salt.modules.glusterfs (module), 865
salt.modules.gnomedesktop (module), 867
salt.modules.gpg (module), 868
salt.modules.grains (module), 873
salt.modules.groupadd (module), 877
salt.modules.grub (module), 878
salt.modules.hadoop (module), 878
salt.modules.haproxy (module), 879
salt.modules.hashutil (module), 880
salt.modules.hg (module), 881
salt.modules.hipchat (module), 883
salt.modules.hosts (module), 884
salt.modules.https (module), 885
salt.modules.https (module), 886
salt.modules.ifconfig (module), 887
salt.modules.iio (module), 887
salt.modules.im (module), 889
salt.modules.incron (module), 890
salt.modules.influx (module), 891
salt.modules.ini_manage (module), 895
salt.modules.introspect (module), 896
salt.modules.ipmi (module), 897
salt.modules.ipset (module), 908
salt.modulesiptables (module), 910
salt.modules.jboss7 (module), 914
salt.modules.jboss7_cli (module), 917
salt.modules.junos (module), 918
salt.modules.kerberos (module), 918
salt.modules.key (module), 919
salt.modules.keyboard (module), 920
salt.modules.keystone (module), 920
salt.modules.kmod (module), 925
salt.modules.launchctl (module), 926
salt.modules.layman (module), 927
salt.modules.ldapmod (module), 928
salt.modules.linux_acl (module), 928
salt.modules.linux_lvm (module), 929
salt.modules.linux_sysctl (module), 931
salt.modules.locate (module), 932
salt.modules.logadm (module), 933
salt.modules.logrotate (module), 934
salt.modules.lvs (module), 934
salt.modules.lxc (module), 936
salt.modules.mac_group (module), 954
salt.modules.mac_user (module), 955
salt.modules.macports (module), 956
salt.modules.makeconf (module), 959
salt.modules.match (module), 965
salt.modules.mdadm (module), 968
salt.modules.memcached (module), 969
salt.modules.mine (module), 970
salt.modules.mod_random (module), 971
salt.modules.modjk (module), 973
salt.modules.mongodb (module), 975
salt.modules.monit (module), 977
salt.modules.mooosefs (module), 978
salt.modules.mount (module), 978
salt.modules.mysql (module), 980
salt.modules.munin (module), 982
salt.modules.mysql (module), 982
salt.modules.nacl (module), 989
salt.modules.nagios (module), 990
salt.modules.nagios_rpc (module), 992
salt.modules.netbsd_sysctl (module), 992
salt.modules.netbsd_service (module), 993
salt.modules.netscaler (module), 994
salt.modules.network (module), 997
salt.modules.neutron (module), 1002
salt.modules.nfs3 (module), 1019
salt.modules.nftables (module), 1019
salt.modules.nginx (module), 1023
salt.modules.node (module), 1024
salt.modules.nova (module), 1025
salt.modules.npm (module), 1029
salt.modules.nspaw (module), 1030
salt.modules.omapi (module), 1036
salt.modules.openbsd_sysctl (module), 1037
salt.modules.openbsdpkg (module), 1037
salt.modules.openbdsr (module), 1038
salt.modules.openbdservice (module), 1040
salt.modules.openstack_config (module), 1042
salt.modules.oracle (module), 1042
salt.modules.osquery (module), 1043
salt.modules.osxdesktop (module), 1051
salt.modules.pacman (module), 1052
salt.modules.pagerduty (module), 1054
salt.modules.pagerduty_util (module), 1056
salt.modules.pam (module), 1057
salt.modules.parted (module), 1057
salt.modules.pecl (module), 1061
salt.modules.pillar (module), 1061
salt.modules.pip (module), 1063
salt.modules.pkg (module), 602
salt.modules.pkg_resource (module), 1068
salt.modules.pkgs (module), 1069
salt.modules.pkgutil (module), 1071
salt.modules.pq (module), 1081
salt.modules.portage_config (module), 1083
salt.modules.postfix (module), 1085
salt.modules.postgres (module), 1086
salt.modules.pou (module), 1092
salt.modules.powerpath (module), 1093
salt.modules.publish (module), 1093
salt.modules.puppet (module), 1095
salt.modules.pushover_notify (module), 1096
salt.modules.pw_group (module), 1097
salt.modules.pw_user (module), 1097
salt.modules.pynv (module), 1099
salt.modules.qemu_img (module), 1101
salt.modules.qemu_nbd (module), 1101
salt.modules.quota (module), 1101
salt.modules.rabbitmq (module), 1102
salt.modules.raet_publish (module), 1106
salt.modules.rallydev (module), 1107
salt.modules.random_org (module), 1108
salt.modules.reg (module), 1111
salt.modules.rdp (module), 1112
salt.modules.redismod (module), 1113
salt.modules.reg (module), 1116
salt.modules.rest_package (module), 1120
salt.modules.rest_sample (module), 1120
salt.modules.rest_service (module), 1120
salt.netapi.rest_tornado.saltnado_websockets (module), 1340
salt.netapi.rest_wsgi (module), 1345
salt.output.compact (module), 1347
salt.output.highstate (module), 1348
salt.output.json_out (module), 1349
salt.output.key (module), 1349
salt.output.nested (module), 1349
salt.output.newline_values_only (module), 1350
salt.output.no_out (module), 1351
salt.output.no_return (module), 1351
salt.output.overstatestage (module), 1352
salt.output.progress (module), 1352
salt.output.pprint_out (module), 1352
salt.output.raw (module), 1352
salt.output.txt (module), 1353
salt.output.virt_query (module), 1353
salt.output.yaml_out (module), 1353
salt.pillar.cmd_json (module), 1355
salt.pillar.cmd_yaml (module), 1356
salt.pillar.cmd_yamlex (module), 1356
salt.pillar.cobbler (module), 1356
salt.pillar.django_orm (module), 1356
salt.pillar.ec2_pillar (module), 1358
salt.pillar.etcd_pillar (module), 1358
salt.pillar.file_tree (module), 1359
salt.pillar.foreman (module), 1361
salt.pillar.git_pillar (module), 1361
salt.pillar.hg_pillar (module), 1363
salt.pillar.hiera (module), 1364
salt.pillar.libvirt (module), 1364
salt.pillar.mysql (module), 1365
salt.pillar.pepa (module), 1366
salt.pillar.pillar_ladap (module), 1371
salt.pillar.puppet (module), 1372
salt.pillar.reclass_adapter (module), 1372
salt.pillar.redismod (module), 1373
salt.pillar.s3 (module), 1374
salt.pillar.svn_pillar (module), 1375
salt.pillar.varstack_pillar (module), 1375
salt.pillar.virtkey (module), 1376
salt.renderers.cheetah (module), 1378
salt.renderers.genshi (module), 1378
salt.renderers.gpg (module), 1379
salt.renderers.hjson (module), 1380
salt.renderers.jinja (module), 1380
salt.renderers.jinja (module), 1380
salt.renderers.json (module), 1385
salt.renderers.mako (module), 1385
salt.renderers.msgpack (module), 1385
salt.renderers.py (module), 1385
salt.renderers.pydfl (module), 1386
salt.renderers.pyobjects (module), 1391
salt.renderers.stateconf (module), 1394
salt.renderers.wempy (module), 1397
salt.renderers.yml (module), 1398
salt.renderers.yamlex (module), 1399
salt.returners.carbon_return (module), 1405
salt.returners.cassandra_cql_return (module), 1406
salt.returners.cassandra_return (module), 1408
salt.returners.couchbase_return (module), 1408
salt.returners.couchdb_return (module), 1409
salt.returners.couchdb_return (module), 1410
salt.returners.elasticsearch_return (module), 1410
salt.returners.etcd_return (module), 1411
salt.returners.hipchat_return (module), 1412
salt.returners.influxdb_return (module), 1413
salt.returners.kafka_return (module), 1414
salt.returners.local (module), 1414
salt.returners.local_cache (module), 1414
salt.returners.memcache_return (module), 1415
salt.returners.mongo_future_return (module), 1416
salt.returners.mongo_return (module), 1417
salt.returners.multi_returner (module), 1417
salt.returners.mysql (module), 1418
salt.returners.nagios_return (module), 1420
salt.returners.odbc (module), 1421
salt.returners.pgjsonb (module), 1423
salt.returners.postgres (module), 1425
salt.returners.postgres_local_cache (module), 1427
salt.returners.pushover_return (module), 1428
salt.returners.redis_return (module), 1430
salt.returners.sentry_return (module), 1430
salt.returners.slack_returner (module), 1431
salt.returners.sms_return (module), 1432
salt.returners.smtp_return (module), 1432
salt.returners.sqlite3_return (module), 1434
salt.returners.syslog_return (module), 1435
salt.returners.xmpp_return (module), 1435
salt.roster.ansible (module), 1437
salt.roster.cache (module), 1438
salt.roster.cloud (module), 1439
salt.roster.clustershell (module), 1439
salt.roster.flat (module), 1439
salt.roster.scan (module), 1439
salt.runners.cache (module), 1441
salt.runners.cloud (module), 1442
salt.runners.doc (module), 1442
salt.runners.drac (module), 1443
salt.runners.error (module), 1443
salt.runners.f5 (module), 1444
salt.runners.filesrv (module), 1445
salt.runners.git_pillar (module), 1448
salt.runners.http (module), 1448
salt.runners.jobs (module), 1449
salt.runners.launchd (module), 1450
salt.runners.lxc (module), 1450
salt.runners.manage (module), 1453
Index
servicegroup_server_exists() (in module salt.modules.netscaler), 996
servicegroup_server_up() (in module salt.modules.netscaler), 996
services() (in module salt.modules.rkiak), 1125
session_create() (in module salt.modules.consul), 728
session_destroy() (in module salt.modules.consul), 728
session_info() (in module salt.modules.consul), 728
session_list() (in module salt.modules.consul), 729
sessions() (in module salt.modules.tomcat), 1223
set() (in module salt.modules.alternatives), 610
set() (in module salt.modules.debcfgmod), 742
set() (in module salt.modules.etcd_mod), 800
set() (in module salt.modules.grains), 876
set() (in module salt.modules.logeoate), 933
set() (in module salt.modules.memcached), 970
set() (in module salt.modules.openstack_config), 1042
set() (in module salt.modules.parted), 1060
set() (in module salt.modules.quota), 1102
set() (in module salt.modules.sqlite3), 1141
set() (in module salt.modules.sdb), 1141
set() (in module salt.modules.sycr), 1203
set() (in module salt.runners.sdb), 1462
set() (in module salt.sqlite3), 1793
set() (in module salt.sqlite3.db), 1793
set() (in module salt.sqlite3.keyring_db), 1794
set() (in module salt.sqlite3.memcached), 1795
set() (in module salt.sqlite3.sqlite3), 1795
set() (in module salt.states.alternatives), 1521
set() (in module salt.states.debcfgmod), 1593
set() (in module salt.states.eselect), 1611
set() (in module salt.states.etc_mod), 1613
set() (in module salt.states.sateconf), 1745
set_absent() (in module salt.states.ipset), 1697
set_attribute() (in module salt.states.boto_ec2), 648
set_attributes() (in module salt.states.boto_elb), 654
set_attributes() (in module salt.states.boto_sqs), 670
set_attributes() (in module salt.states.win_file), 1250
set_auth_key() (in module salt.states.ssh), 1178
set_auth_key_from_file() (in module salt.states.ssh), 1178
set_automaster() (in module salt.states.mount), 979
set_autostart() (in module salt.states.virt), 1240
set_binary_path() (in module salt.states.syslog_ng), 1197
set_blob_properties() (in module salt.cloud.clouds.msazure), 473
set_blob_service_properties() (in module salt.cloud.clouds.msazure), 473
set_bootdev() (in module salt.states.ipmi), 903
set_ca_path() (in module salt.states.ills), 1220
set_cflags() (in module salt.states.makeconf), 962
set_change() (in module salt.states.ipmi), 904
set_channel_access() (in module salt.states.ipmi), 904
set_chost() (in module salt.states.makeconf), 962
set_computer_desc() (in module salt.states.win_system), 1270
set_computer_name() (in module salt.states.win_system), 1271
set_config() (in module salt.states.dnsmasq), 749
set_config_file() (in module salt.states.syslog_ng), 1197
set_cxxflags() (in module salt.states.makeconf), 963
set_date() (in module salt.states.shadow), 1146
set_default() (in module salt.states.rvm), 1132
set_default_zone() (in module salt.states.firewalld), 828
set_dhcp_all() (in module salt.states.win_ip), 1254
set_dhcp_dns() (in module salt.states.win_ip), 1254
set_dhcp_ip() (in module salt.states.win_ip), 1254
set_disk_timeout() (in module salt.states.win_powercfg), 1261
set_dns() (in module salt.states.lxc), 951
set_emerge_default_opts() (in module salt.states.makeconf), 963
set_env() (in module salt.states.cron), 734
set_expire() (in module salt.states.bsd_shadow), 683
set_expire() (in module salt.states.shadow), 1146
set_file() (in module salt.states.debcfgmod), 742
set_file() (in module salt.states.debcfgmod), 1593
set fstab() (in module salt.states.mount), 979
set_gentoo_mirrors() (in module salt.states.makeconf), 963
set_health_check() (in module salt.states.boto_elb), 654
set_hibernate_timeout() (in module salt.states.win_powercfg), 1261
set_host() (in module salt.states.hosts), 885
set_hostname() (in module salt.states.junos), 918
set_http_port() (in module salt.states.ilo), 889
set https_port() (in module salt.states.ilo), 889
set_hwclock() (in module salt.states.timezone), 1212
set_hwclock() (in module salt.states.win_timezone), 1273
set_id() (in module salt.states.parted), 1060
set_identifier() (in module salt.states.ipmi), 905
set_inactdays() (in module salt.states.shadow), 1146
set_is_polling() (in module salt.states.solr), 1173
set_job() (in module salt.states.cron), 734
set_job() (in module salt.states.incron), 891
set key() (in module salt.states.redismod), 1115
set known_host() (in module salt.states.reg), 1119
set_key() (in module salt.states.reg), 1119
set_locate() (in module salt.states.ssh), 1178
set localize() (in module salt.modules.localmod), 932
set main() (in module salt.modules.postfix), 1085
set makeopts() (in module salt.modules.makeconf), 963
set master() (in module salt.modules.postfix), 1085
set maxdays() (in module salt.modules.shadow), 1146
setmem() (in module salt.modules.virt), 1240
setmem() (in module salt.modules.xapi), 1294
setpassword() (in module salt.modules.win_useradd), 1281
setsebool() (in module salt.modules.selinux), 1143
setsebools() (in module salt.modules.selinux), 1143
setval() (in module salt.modules.environ), 798
setval() (in module salt.modules.grains), 876
setvalue() (in module salt.modules.augeas_cfg), 625
setvcpus() (in module salt.modules.virt), 1240
setvcpus() (in module salt.modules.xapi), 1295
sha256_digest() (in module salt.modules.hashutil), 881
sha512_digest() (in module salt.modules.hashutil), 881
shadow_hash() (in module salt.modules.mod_random), 972
shared_memory() (in module salt.modules.osquery), 1049
shell() (in module salt.modules.cmdmod), 711
shell_history() (in module salt.modules.osquery), 1050
shells() (in module salt.modules.cmdmod), 713
show() (in module salt.modules.bridge), 682
show() (in module salt.modules.cpan), 733
show() (in module salt.modules.darwin_sysctl), 738
show() in module salt.modules.debianmod, 743
show() (in module salt.modules.freebsd_sysctl), 828
show() (in module salt.modules.linux_sysctl), 931
show() (in module salt.modules.netbsd_sysctl), 993
show() (in module salt.modules.nova), 1028
show() (in module salt.modules.openbsd_sysctl), 1037
show() (in module salt.modules.smartos_imgadm), 1149
show() (in module salt.modules.splay), 1174
show() (in module salt.modules.systemd), 1206
show_account() (in module salt.modules.stormpath), 1186
show_address() (in module salt.cloud.clouds.gce), 449
show_ancestry() (in module salt.cloud.clouds.gce), 449
show_all_prices() (in module salt.cloud.clouds.ec2), 445
show_deployment() (in module salt.cloud.clouds.msaure), 475
show_disk() (in module salt.cloud.clouds.aliyun), 435
show_disk() (in module salt.cloud.clouds.gce), 449
show_disk() (in module salt.cloud.clouds.msaure), 475
show_employee() (in module salt.modules.bamboo), 628
show_env() (in module salt.modules.oracle), 1043
show_floatingip() (in module salt.modules.neutron), 1013
show_frontends() (in module salt.cloud.clouds.msaure), 475
show_instance() (in module salt.cloud.clouds.aliyun), 435
show_instance() (in module salt.cloud.clouds.cloudstack), 437
show_instance() (in module salt.cloud.clouds.digital_ocean), 439
show_instance() (in module salt.cloud.clouds.ec2), 445
show_instance() (in module salt.cloud.clouds.gce), 450
show_instance() (in module salt.cloud.clouds.gogrid), 452
show_instance() (in module salt.cloud.clouds.joyent), 455
show_instance() (in module salt.cloud.clouds.linode), 462
show_instance() (in module salt.cloud.clouds.lxc), 463
show_instance() (in module salt.cloud.clouds.msaure), 475
show_instance() (in module salt.cloud.clouds.nova), 480
show_instance() (in module salt.cloud.clouds.opennebula), 481
show_instance() (in module salt.cloud.clouds.openstack), 484
show_instance() (in module salt.cloud.clouds.parallels), 485
show_instance() (in module salt.cloud.clouds.proxmox), 487
show_instance() (in module salt.cloud.clouds.rackspace), 489
show_instance() (in module salt.cloud.clouds.softlayer), 491
show_instance() (in module salt.cloud.clouds.softlayer_hw), 492
show_instance() (in module salt.cloud.clouds.vmware), 499
show_instance() (in module salt.cloud.clouds.vsphere), 503
秀mem() (in module salt.modules.xapi), 1295
setpassword() (in module salt.modules.win_useradd), 1281
setsebool() (in module salt.modules.selinux), 1143
setsebools() (in module salt.modules.selinux), 1143
setval() (in module salt.modules.environ), 798
setval() (in module salt.modules.grains), 876
setvalue() (in module salt.modules.augeas_cfg), 625
setvcpus() (in module salt.modules.virt), 1240
setvcpus() (in module salt.modules.xapi), 1295
sha256_digest() (in module salt.modules.hashutil), 881
sha512_digest() (in module salt.modules.hashutil), 881
shadow_hash() (in module salt.modules.mod_random), 972
shared_memory() (in module salt.modules.osquery), 1049
shell() (in module salt.modules.cmdmod), 711
shell_history() (in module salt.modules.osquery), 1050
shells() (in module salt.modules.cmdmod), 713
show() (in module salt.modules.bridge), 682
show() (in module salt.modules.cpan), 733
show() (in module salt.modules.darwin_sysctl), 738
show() (in module salt.modules.debianmod), 743
show() (in module salt.modules.freebsd_sysctl), 828
show() (in module salt.modules.linux_sysctl), 931
show() (in module salt.modules.netbsd_sysctl), 993
show() (in module salt.modules.nova), 1028
show() (in module salt.modules.openbsd_sysctl), 1037
show() (in module salt.modules.smartos_imgadm), 1149
show() (in module salt.modules.splay), 1174
show() (in module salt.modules.systemd), 1206
show_account() (in module salt.modules.stormpath), 1186
show_address() (in module salt.cloud.clouds.gce), 449
show_ancestry() (in module salt.cloud.clouds.gce), 449
show_all_prices() (in module salt.cloud.clouds.ec2), 445
show_deployment() (in module salt.cloud.clouds.msaure), 475
show_disk() (in module salt.cloud.clouds.aliyun), 435
show_disk() (in module salt.cloud.clouds.gce), 449
show_disk() (in module salt.cloud.clouds.msaure), 475
show_employee() (in module salt.modules.bamboo), 628
show_env() (in module salt.modules.oracle), 1043
show_floatingip() (in module salt.modules.neutron), 1013
show_frontends() (in module salt.cloud.clouds.msaure), 475
show_instance() (in module salt.cloud.clouds.aliyun), 435
show_instance() (in module salt.cloud.clouds.cloudstack), 437
show_instance() (in module salt.cloud.clouds.digital_ocean), 439
show_instance() (in module salt.cloud.clouds.ec2), 445
show_instance() (in module salt.cloud.clouds.gce), 450
show_instance() (in module salt.cloud.clouds.gogrid), 452
show_instance() (in module salt.cloud.clouds.joyent), 455
show_instance() (in module salt.cloud.clouds.linode), 462
show_instance() (in module salt.cloud.clouds.lxc), 463
show_instance() (in module salt.cloud.clouds.msaure), 475
show_instance() (in module salt.cloud.clouds.nova), 480
show_instance() (in module salt.cloud.clouds.opennebula), 481
show_instance() (in module salt.cloud.clouds.openstack), 484
show_instance() (in module salt.cloud.clouds.parallels), 485
show_instance() (in module salt.cloud.clouds.proxmox), 487
show_instance() (in module salt.cloud.clouds.rackspace), 489
show_instance() (in module salt.cloud.clouds.softlayer), 491
show_instance() (in module salt.cloud.clouds.softlayer_hw), 492
show_instance() (in module salt.cloud.clouds.vmware), 499
show_instance() (in module salt.cloud.clouds.vsphere), 503
solo() (in module salt.states.chef), 1577
sort_pkglist() (in module salt.modules.pkg_resource), 1068
source_list() (in module salt.modules.file), 823
sources_add() (in module salt.modules.gem), 838
sources_add() (in module salt.states.gem), 1635
sources_remove() (in module salt.modules.gem), 838
sources_remove() (in module salt.states.gem), 1635
SPF() (in module salt.modules.dig), 747
SPF() (in module salt.modules.dnsutil), 750
splay() (in module salt.modules.splay), 1174
spm command line option
   --log-file-level=LOG_LEVEL_LOGFILE, 422
   --log-file=LOG_FILE, 422
   -f, --force, 421
   -l LOG_LEVEL, --log-level=LOG_LEVEL, 422
   -y, --assume-yes, 421
   build, 422
   create_repo, 422
   files, 422
   info, 422
   install, 422
   local, 422
   remove, 422
   update_repo, 422
sqlite_version() (in module salt.modules.sqlite3), 1176
ssh_interface() (in module salt.cloud.clouds.ec2), 445
ssh_interface() (in module salt.cloud.clouds.joyent), 455
ssh_interface() (in module salt.cloud.clouds.libcloud_aws), 457
ssh_interface() (in module salt.cloud.clouds.nova), 480
ssh_interface() (in module salt.cloud.clouds.openstack), 484
ssh_interface() (in module salt.cloud.clouds.rackspase), 489
ssh_minion_opts
   conf/master, 536
ssh_username() (in module salt.cloud.clouds.libcloud_aws), 457
SSHClient (class in salt.client.ssh.client), 432
stack() (in module salt.modules.test), 1210
start() (in module salt.cloud.clouds.aliyun), 435
start() (in module salt.cloud.clouds.ec2), 445
start() (in module salt.cloud.clouds.gogrid), 452
start() (in module salt.cloud.clouds.joyent), 455
start() (in module salt.cloud.clouds.libcloud_aws), 457
start() (in module salt.cloud.clouds.linode), 462
start() (in module salt.cloud.clouds.parallels), 485
start() (in module salt.cloud.clouds.proxmox), 487
start() (in module salt.cloud.clouds.vmware), 500
start() (in module salt.cloud.clouds.vsphere), 503
start() (in module salt.engines.logstash), 1791
start() (in module salt.engines.sqs_events), 1792
start() (in module salt.engines.test), 1792
start() (in module salt.modules.bluez), 640
start() (in module salt.modules.daemontools), 737
start() (in module salt.modules.debian_service), 746
start() (in module salt.modules.dockerio), 761
start() (in module salt.modules.dockerkngrng), 782
start() (in module salt.modules.freesbsjail), 829
start() (in module salt.modules.freesbservice), 836
start() (in module salt.modules.gentoo_service), 841
start() (in module salt.modules.launchctl), 926
start() (in module salt.modules.lxc), 951
start() (in module salt.modules.monit), 977
start() (in module salt.modules.netbsdservice), 994
start() (in module salt.modules.nspawn), 1036
start() (in module salt.modules.openbsdsrcctl), 1040
start() (in module salt.modules.openbdservice), 1041
start() (in module salt.modules.rest_service), 1121
start() (in module salt.modules.rh_service), 1124
start() (in module salt.modules.rh_service), 1125
start() (in module salt.modules.runit), 1129
start() (in module salt.modules.service), 1145
start() (in module salt.modules.smartos_vmadm), 1152
start() (in module salt.modules.smf), 1157
start() (in module salt.modules.supervisord), 1188
start() (in module salt.modules.syslog_ng), 1198
start() (in module salt.modules.systemd), 1206
start() (in module salt.modules.tomcat), 1223
start() (in module salt.modules.upstart), 1229
start() (in module salt.modules.virt), 1241
start() (in module salt.modules.win_service), 1266
start() (in module salt.modules.xapi), 1295
start() (in module salt.runners.lxc), 1452
start() (in module salt.runners.virt), 1466
start() (saltạitmodules.xmpp.SendMsgBot method), 1299
start() (salt.returners.xmpp_return.SendMsgBot method), 1436
start_app() (in module salt.modules.rabbitmq), 1105
start_time_service() (in module salt.modules.win_system), 1272
start_transaction() (in module salt.modules.bigip), 638
start_volume() (in module salt.modules.glusterfs), 866
started() (in module salt.modules.glusterfs), 1640
started() (in module salt.modules.lxc), 1677
started() (in module salt.modules.syslog_ng), 1748
startup() (in module salt.modules.trafficserver), 1225
startup() (in module salt.modules.trafficserver), 1755
startup_items() (in module salt.modules.osquery), 1050
stash() (in module salt.modules.git), 860
State Compiler, 2147
State Declaration, 2147
State Function, 2147
State Module, 2147
State Run, 2147
state() (in module salt.modules.dockerio), 784
stop() (in module salt.modules.virt), 1241
stop() (in module salt.modules.win_service), 1266
stop() (in module salt.runners.interval), 1452
stop_app() (in module salt.modules.rabbitmq), 1105
stop_server() (in module salt.modules.jboss7), 916
stop_time_service() (in module salt.modules.win_system), 1273
stop_volume() (in module salt.modules.glusterfs), 867
stopped() (in module salt.states.dockerng), 1609
stopped() (in module salt.states.lxc), 1677
stopped() (in module salt.states.syslog_ng), 1749
stp() (in module salt.modules.bridge), 682
str_encode() (in module salt.modules.mod_random), 972
stream() (in module salt.runners.test), 1465
stringify() (in module salt.modules.pkg_resource), 1068
subnet_absent() (in module salt.states.boto_vpc), 1574
subnet_exists() (in module salt.modules.boto_vpc), 1574
subnet_group_absent() (in module salt.states.boto_elasticache), 1548
subnet_group_absent() (in module salt.states.boto_rds), 1548
subnet_group_exists() (in module salt.modules.boto_vpc), 1574
subnet_group_exists() (in module salt.states.boto_elasticache), 1548
subnet_group_exists() (in module salt.states.boto_rds), 1548
subnet_present() (in module salt.modules.boto_vpc), 1574
subnet_present() (in module salt.states.boto_vpc), 1574
subnets() (in module salt.modules.network), 1001
subnets() (in module salt.modules.win_network), 1256
subnets() (in module salt.modules.network), 1001
subscribe() (in module salt.modules.boto_sns), 669
succeed_with_changes() (in module salt.states.test), 1751
succeed_without_changes() (in module salt.states.test), 1751

sudo_runas
conf/minion, 566
sudo_user
conf/minion, 566
suid_bin() (in module salt.modules.osquery), 1050
summary() (in module salt.modules.monit), 977
summary() (in module salt.modules.puppet), 1096
suspend() (in module salt.cloud.clouds.vmware), 500
suspend() (in module salt.cloud.clouds.vsphere), 503
suspend() (in module salt.modules.nova), 1028
svnfs_branches
conf/master, 550
svnfs_env_blacklist
conf/master, 550
svnfs_env_whitelist
conf/master, 550
svnfs_mountpoint
conf/master, 549
svnfs_remotes
conf/master, 549
svnfs_root
conf/master, 549
svnfs_tags
conf/master, 550
svnfs_trunk
conf/master, 549
SvnPillar (class in salt.pillar.svn_pillar), 1375
swap() (in module salt.states.mount), 1685
swappoff() (in module salt.states.mount), 980
swapon() (in module salt.states.mount), 980
swaps() (in module salt.states.mount), 980
switch() (in module salt.modules.svn), 1191
symbolic_ref() (in module salt.modules.git), 861
symlink() (in module salt.modules.file), 823
symlink() (in module salt.modules.win_file), 1251
symlink() (in module salt.states.file), 1632
symlink_list() (in module salt.fileserver.gitfs), 591
symlink_list() (in module salt.fileserver.roots), 593
symlink_list() (in module salt.runners.fileserver), 1447
sync() (in module salt.modules.eix), 794
sync() (in module salt.modules.layman), 927
sync_all() (in module salt.modules.saltutil), 1137
sync_beacons() (in module salt.modules.saltutil), 1137
sync_contents() (in module salt.modules.saltutil), 1137
sync_grains() (in module salt.modules.saltutil), 1137
sync_log_handlers() (in module salt.modules.saltutil), 1137
sync_modules() (in module salt.modules.saltutil), 1137
sync_outputters() (in module salt.modules.saltutil), 1138
sync_renderers() (in module salt.modules.saltutil), 1138
sync_returners() (in module salt.modules.saltutil), 1138
sync_states() (in module salt.modules.saltutil), 1138
sync_utils() (in module salt.modules.saltutil), 1138
syncdb() (in module salt.modules.djangomod), 749
Syndic, 2147
syndic_log_file
conf/master, 557
syndic_master
conf/master, 557
syndic_master_log_file
conf/master, 557
syndic_master_port
conf/master, 557
sysctl() (in module salt.modules.freebsdjail), 829
syslog() (in module salt.modules.drac), 789
SyslogNgError, 1196
sysrq() (in module salt.modules.smartos_vmadm), 1153
system() (in module salt.states.keyboard), 1667
system() (in module salt.states.locale), 1672
system() (in module salt.states.network), 1693
system() (in module salt.states.timezone), 1751
system_controls() (in module salt.modules.osquery), 1050
system_info() (in module salt.modules.drac), 789
system_types() (in module salt.modules.parted), 1060
systemctl_reload() (in module salt.modules.systemd), 1207
systemd_running_state() (in module salt.modules.lxc), 952
tables() (in module salt.modules.sqlite3), 1176
tablespace_alter() (in module salt.modules.postgres), 1090
tablespace_create() (in module salt.modules.postgres), 1090
tablespace_exists() (in module salt.modules.postgres), 1090
tablespace_list() (in module salt.modules.postgres), 1091
tablespace_remove() (in module salt.modules.postgres), 1091
tag() (in module salt.modules.dockerio), 762
tag() (in module salt.modules.dockereng), 785
take_action() (in module salt.cloud.clouds.joyent), 456
Target, 2147
Target (class in salt.roster.ansible), 1438
targets() (in module salt.roster.ansible), 1438
targets() (in module salt.roster.cache), 1438
targets() (in module salt.roster.cloud), 1439
targets() (in module salt.roster.clustershell), 1439
targets() (in module salt.roster.flat), 1439
targets() (in module salt.roster.scan), 1440
targets() (salt.roster.ansible.Target method), 1438
targets() (salt.roster.flat.RosterMatcher method), 1439
targets() (salt.roster.scan.RosterMatcher method), 1439
tcp_pub_port
    conf/minion, 570
tcp_pull_port
    conf/minion, 570
template() (in module salt.modules.state), 1183
template_str() (in module salt.modules.state), 1183
templates() (in module salt.modules.lxc), 952
tenant_absent() (in module salt.states.keystone), 1669
tenant_create() (in module salt.states.keystone), 923
tenant_delete() (in module salt.states.keystone), 923
tenant_get() (in module salt.states.keystone), 923
tenant_list() (in module salt.states.keystone), 923
tenant_present() (in module salt.states.keystone), 1669
tenant_update() (in module salt.states.keystone), 923
term() (in module salt.modules.daemontools), 737
term() (in module salt.modules.runit), 1130
term_job() (in module salt.modules.saltutil), 1138
terminate() (in module salt.cloud.clouds.vmware), 500
terminate() (in module salt.modules.boto_ec2), 649
terminate() (in module salt.modules.nspawn), 1036
test
    conf/master, 541
test() (in module salt.modules.ipset), 910
test() (in module salt.modules.riak), 1126
test_bare_started_state() (in module salt.modules.lxc), 953
test_sd_started_state() (in module salt.modules.lxc), 953
test_vcenter_connection() (in module salt.cloud.clouds.vmware), 500
timeouts() (in module salt.modules.sysbench), 1194
time() (in module salt.modules.osquery), 1050
time() (in module salt.modules.redismod), 1116
TimedProcTimeoutError, 599, 601
toggle() (in module salt.modules.parted), 1060
token_expire
    conf/master, 538
token_get() (in module salt.modules.keystone), 923
TokenAuthenticationError, 599, 601
tokenize_grant() (in module salt.modules.mysql), 987
Top File, 2147
top() (in module salt.modules.dockerio), 762
top() (in module salt.modules.dockereng), 785
top() (in module salt.modules.state), 1183
top() (in module salt.tops.cobbler), 1781
top() (in module salt.tops.ext_nodes), 1782
top() (in module salt.tops.mongo), 1783
top() (in module salt.tops.reclass_adapter), 1783
touch() (in module salt.modules.file), 823
touch() (in module salt.modules.state), 1633
tpstats() (in module salt.modules.cassandra), 687
tracerroute() (in module salt.modules.network), 1002
tracerroute() (in module salt.modules.win_network), 1256	tree() (in module salt.modules.augeas_cfg), 626
tree() (in module salt.modules.etcd_mod), 800
trigger_event() (in module salt.modules.ifftt), 887
trigger_event() (in module salt.modules.states), 1650
trim_cflags() (in module salt.modules.makeconf), 964
trim_cxxflags() (in module salt.modules.makeconf), 964
trim_emerge_default_opts() (in module salt.modules.makeconf), 964
trim_features() (in module salt.modules.makeconf), 964
trim_gentoo_mirrors() (in module salt.modules.makeconf), 964
trim_makeopts() (in module salt.modules.makeconf), 965
trim_var() (in module salt.modules.makeconf), 965
true() (in module salt.modules.test), 1211
truncate() (in module salt.modules.file), 823
trust_key() (in module salt.modules.gpg), 872
try() (in module salt.modules.test), 1211
tsql_query() (in module salt.modules.mssql), 981
tty() (in module salt.modules.cmdmod), 713
tty() (in module salt.modules.test), 1211
tune() (in module salt.modules.blockdev), 639
tune() (in module salt.modules.extfs), 803
tuned() (in module salt.states.blockdev), 1536
TXTI() (in module salt.states.digraph), 747
TypedParameter (class in salt.modules.syslog_ng), 1196
TypedParameterValue (class in salt.modules.syslog_ng), 1196

U

uid_to_user() (in module salt.modules.file), 823
uid_to_user() (in module salt.modules.win_file), 1251
umount() (in module salt.modules.mount), 980
umount_image() (in module salt.modules.img), 890
unblock() (in module salt.modules.bluez), 640
unchanged() (salt.states.cyg.DictDiffer method), 1591
uncomment() (in module salt.modules.file), 824
uncomment() (in module salt.states.file), 1633
undefine() (in module salt.modules.virt), 1241
undeploy() (in module salt.modules.jboss?), 916
undeploy() (in module salt.modules.tomcat), 1224
undeployed() (in module salt.states.tomcat), 1752
unfreeze() (in module salt.modules.lxc), 953
unfreeze() (in module salt.runners.lxc), 1452
unhold() (in module salt.modules.aptpkg), 618
unhold() (in module salt.modules.postfix), 1086
unhold() (in module salt.modules.ypmkgs), 1307
uninstall() (in module salt.modules.bower), 679
uninstall() (in module salt.modules.cabal), 686
uninstall() (in module salt.modules.chrome), 697
uninstall() (in module salt.modules.cyg), 735
uninstall() (in module salt.modules.gem), 838
uninstall() (in module salt.modules.rpm), 1030
uninstall() (in module salt.modules.pecl), 1061
uninstall() (in module salt.modules.pip), 1066
uninstall_python() (in module salt.modules.pyenv), 1100
uninstall_ruby() (in module salt.modules.rbenv), 1112
unjoin_domain() (in module salt.modules.win_system), 1273
unlock() (in module salt.modules.zk_concurrency), 1312
unlock() (in module salt.states.zk_concurrency), 1774
unmask() (in module salt.modules.systemd), 1207
unmonitor() (in module salt.modules.monit), 978
unmonitor() (in module salt.states.monit), 1684
unmounted() (in module salt.states.mount), 1685
UnnamedStatement (class in salt.modules.syslog_ng), 1196
unpack() (in module salt.modules.genesis), 840
unpair() (in module salt.modules.bluez), 640
unpause() (in module salt.modules.dockerng), 785
unpurge() (in module salt.modules.dpkg), 787
unrar() (in module salt.modules.archive), 621
unzip() (in module salt.modules.archive), 621
up() (in module salt.modules.debian_ip), 744
up() (in module salt.modules.rh_ip), 1123
up() (in module salt.runners.manage), 1457
update() (in module salt.filesystem.azurefs), 589
update() (in module salt.filesystem.gitfs), 591
update() (in module salt.filesystem.hgfs), 592
update() (in module salt.filesystem.minionfs), 592
update() (in module salt.filesystem.roots), 593
update() (in module salt.filesystem.s3fs), 594
update() (in module salt.filesystem.svnfs), 595
update() (in module salt.modules.boto_asg), 642
update() (in module salt.modules.cabals), 686
update() (in module salt.modules.choco), 697
update() (in module salt.modules.composer), 714
update() (in module salt.modules.cyg), 736
update() (in module salt.modules.data), 740
update() (in module salt.modules.ddns), 740
update() (in module salt.modules.elasticsearch), 793
update() (in module salt.modules.eix), 794
update() (in module salt.modules.freebsdports), 835
update() (in module salt.modules.gem), 839
update() (in module salt.modules.hg), 883
update() (in module salt.modules.lxc), 971
update() (in module salt.modules.pecl), 1061
update() (in module salt.modules.pyenv), 1100
update() (in module salt.modules.rbenv), 1112
update() (in module salt.modules.saltutil), 1139
update() (in module salt.modules.splunk_account), 1144
update() (in module salt.modules.smartos_imgadm), 1149
update() (in module salt.modules.smartos_vmadm), 1153
update() (in module salt.modules.splunk_search), 1176
update() (in module salt.modules.supervisord), 1189
update() (in module salt.modules.svn), 1192
update() (in module salt.modules.win_useradd), 1281
update() (in module salt.pillar.boto_asg), 1364
update() (in module salt.runners.fileserver), 1447
update() (in module salt.runners.git_pillar), 1448
update() (in module salt.states.composer), 1587
update() (salt.pillar.boto_asg.Repo method), 1363
update() (salt.pillar.svn_pillar.SvnPillar method), 1375
update_account() (in module salt.modules.stormpath), 1186
update_account_password_policy() (in module salt.modules.boto_iam), 659
update_affinity_group() (in module salt.cloud.clouds.msazure), 477
update_assume_role_policy() (in module salt.modules.boto_iam), 659
update_ca_bundle() (in module salt.modules.http), 886
update_ca_bundle() (in module salt.runners.http), 1448
update_config() (in module salt.pillar.svn_pillar), 1784
update_datasource() (in module salt.modules.jboss7), 916
update_disk() (in module salt.cloud.clouds.msazure), 477
update_employee() (in module salt.modules.bamboohr), 629
update_endtime() (in module salt.returners.local_cache), 1415
update_floatingip() (in module salt.modules.neutron), 1016
update_git_repos() (in module salt.runners.winrepo), 1467
update_git_repos() (in module salt.modules.win_repo), 1262
update_input_endpoint() (in module salt.cloud.clouds.msazure), 477
update_item() (in module salt.modules.rallydev), 1108
update_jail() (in module salt.modules.poudriere), 1093
update_key_description() (in module salt.modules.boto_kms), 663
update_linode() (in module salt.cloud.clouds.linode), 462
update_lxc_conf() (in module salt.modules.lxc), 953
update_network() (in module salt.modules.neutron), 1016
update_package_site() (in module salt.modules.pkgng), 1079
update_pricing() (in module salt.cloud.clouds.ec2), 445
update_pricing() (in module salt.cloud.clouds.gce), 450
update_pricing() (in module salt.modules.neutron), 1017
update_port() (in module salt.modules.poudriere), 1093
update_ports_tree() (in module salt.modules.poudriere), 1093
update_record() (in module salt.modules.boto_route53), 667
update_repo
  spm command line option, 422
update_restart_services
  conf/minion, 577
update_router() (in module salt.modules.neutron), 1017
update_security_group() (in module salt.modules.neutron), 1018
update_simple_binding() (in module salt.modules.jboss7), 917
update_stack() (in module salt.modules.boto_cfn), 643
update_storage() (in module salt.cloud.clouds.msazure), 477
update_subnet() (in module salt.modules.neutron), 1018
update_system() (in module salt.modules.gem), 839
update_url
  conf/minion, 577
update_user() (in module salt.modules.rallydev), 1108
update_vpn_service() (in module salt.modules.neutron), 1018
updated() (in module salt.states.cyg), 1591
updatedb() (in module salt.modules.locate), 933
updating() (in module salt.modules.pkgng), 1079
upgrade() (in module salt.modules.aptpkg), 618
upgrade() (in module salt.modules.brew), 681
upgrade() (in module salt.modules.ebuild), 793
upgrade() (in module salt.modules.freebsd_pkg), 833
upgrade() (in module salt.modules.macports), 958
upgrade() (in module salt.modules.pacman), 1054
upgrade() (in module salt.modules.pip), 1067
upgrade() (in module salt.modules.pkgutil), 1083
upgrade() (in module salt.modules.pkgng), 958
upgrade() (in module salt.modules.pkgutil), 1082
upgrade() (in module salt.modules.softwareupdate), 1159
upgrade() (in module salt.modules.solarisips), 1165
upgrade() (in module salt.modules.win_pkg), 1260
upgrade() (in module salt.modules.yumpkg), 1307
upgrade_available() (in module salt.modules.aptpkg), 619
upgrade_available() (in module salt.modules.brew), 681
upgrade_available() (in module salt.modules.ebuild), 794
upgrade_available() (in module salt.modules.macports), 958
upgrade_available() (in module salt.modules.pacman), 1054
upgrade_available() (in module salt.modules.pip), 1067
upgrade_available() (in module salt.modules.pkgutil), 1083
upgrade_available() (in module salt.modules.pkgng), 958
upgrade_available() (in module salt.modules.softwareupdate), 1160
upgrade_available() (in module salt.modules.solarisips), 1165
upgrade_available() (in module salt.modules.solarispkg), 1168
upgrade_available() (in module salt.modules.win_pkg), 1260
upgrade_available() (in module salt.modules.yumpkg), 1307
upgrade_available() (in module salt.modules.zypper), 1321
upgrade_bootstrap() (in module salt.modules.zcbuildout), 1310
upgrade_tools() (in module salt.cloud.clouds.vmware), 500
upgrade_tools_all() (in module salt.cloud.clouds.vmware), 500
upload_server_cert() (in module salt.modules.boto_iam), 660
uptime() (in module salt.modules.status), 1185
uptime() (in module salt.modules.win_status), 1268
uptodate() (in module salt.states.pip_state), 1705
uptodate() (in module salt.states.pkg), 1711
usage() (in module salt.modules.btrfs), 685
usage() (in module salt.modules.disk), 748
usage() (in module salt.modules.win_disk), 1245
usb_devices() (in module salt.modules.osquery), 1050
use_master_when_local
  conf/minion, 573
user
  conf/master, 531
  conf/minion, 566
User (class in salt.modules.win_dacl), 1244
user_absent() (in module salt.states.boto_iam), 1556
user_absent() (in module salt.states.ipmi), 1655
user_absent() (in module salt.states.keystone), 1669
user_chpasswd() (in module salt.modules.influx), 893
user_chpasswd() (in module salt.modules.mysql), 987
user_create() (in module salt.modules.influx), 893
user_create() (in module salt.modules.keystone), 924
user_create() (in module salt.modules.mongodb), 976
user_create() (in module salt.modules.mssql), 981
user_create() (in module salt.modules.mysql), 987
user_create() (in module salt.modules.postgres), 1091
user_delete() (in module salt.modules.ipmi), 908
user_delete() (in module salt.modules.keystone), 924
user_exists() (in module salt.modules.influx), 894
user_exists() (in module salt.modules.mongodb), 976
user_exists() (in module salt.modules.mysql), 981
user_exists() (in module salt.modules.mysql), 988
user_exists() (in module salt.modules.postgres), 1091
user_exists() (in module salt.modules.rabbitmq), 1105
user_exists() (in module salt.states.htpasswd), 1649
user_exists_in_group() (in module
  salt.modules.boto_iam), 660
user_get() (in module salt.modules.keystone), 924
user_grant_roles() (in module salt.modules.mongodb), 976
user_grants() (in module salt.modules.mysql), 988
user_info() (in module salt.modules.mysql), 988
user_keys() (in module salt.modules.sh), 1178
user_list() (in module salt.modules.influx), 894
user_list() (in module salt.modules.keystone), 924
user_list() (in module salt.modules.mongodb), 976
user_list() (in module salt.modules.mssql), 982
user_list() (in module salt.modules.mysql), 988
user_list() (in module salt.modules.postgres), 1091
user_password_update() (in module
  salt.modules.keystone), 924
user_present() (in module salt.states.boto_iam), 1556
user_present() (in module salt.states.ipmi), 1655
user_present() (in module salt.states.keystone), 1670
user_remove() (in module salt.modules.influx), 894
user_remove() (in module salt.modules.mongodb), 977
user_remove() (in module salt.modules.mssql), 982
user_remove() (in module salt.modules.mysql), 988
user_remove() (in module salt.modules.postgres), 1091
user_revoke_roles() (in module salt.modules.mongodb), 977
user_role_add() (in module salt.modules.keystone), 924
user_role_list() (in module salt.modules.keystone), 924
user_role_remove() (in module salt.modules.keystone), 924
user_roles_exists() (in module salt.modules.mongodb), 977
user_to_uid() (in module salt.modules.file), 824
user_to_uid() (in module salt.modules.win_file), 1251
user_update() (in module salt.modules.keystone), 925
user_update() (in module salt.modules.postgres), 1091
user_verify_password() (in module
  salt.modules.keystone), 925
useradd() (in module salt.modules.apache), 611
useradd() (in module salt.modules.htpasswd), 885
useradd_all() (in module salt.modules.htpasswd), 885
userdel() (in module salt.modules.apache), 612
userdel() (in module salt.modules.htpasswd), 886
users() (in module salt.modules.osquery), 1050
ustring() (salt.output.nested.NestDisplay method), 1350
V
vacuum() (in module salt.modules.smartos_imgadm), 1149
valid_certificate() (in module salt.states.tls), 1751
valid_fileproto() (in module salt.modules.config), 717
validate() (in module salt.beacons.bytmp), 1786
validate() (in module salt.beacons.diskusage), 1787
validate() (in module salt.beacons.inotify), 1788
validate() (in module salt.beacons.journald), 1788
validate() (in module salt.beacons.load), 1788
validate() (in module salt.beacons.network_info), 1789
validate() (in module salt.beacons.service), 1790
validate() (in module salt.beacons.sh), 1790
validate() (in module salt.beacons.twilio_txt_msg), 1790
validate() (in module salt.beacons.wtmp), 1791
validate() (in module salt.pillar.pepa), 1370
validate_template() (in module salt.modules.boto_cfn), 643
values() (in module salt.modules.data), 740
values() (in module salt.wheel.config), 1784
var_contains() (in module salt.modules.makeconf), 965
vcpu_pin() (in module salt.modules.xapi), 1295
verify() (in module salt.modules.gpg), 873
verify() (in module salt.modules.rpm), 1127
verify() (in module salt.modules.yumpkg), 1307
verify() (in module salt.modules.zypper), 1321
verify_crl() (in module salt.modules.x509), 1292
verify_env
  conf/master, 533
  conf/minion, 567
verify_master_pubkey_sign
  conf/minion, 574
verify_private_key() (in module salt.modules.x509), 1292
verify_signature() (in module salt.modules.x509), 1292
version() (in module salt.modules.apache), 612
version() (in module salt.modules.aptpkg), 619
version() (in module salt.modules.bluez), 640
version() (in module salt.modules.btrfs), 686
version() (in module salt.modules.cassandra), 688
version() (in module salt.modules.cassandra_cql), 692
version() (in module salt.modules.chocolately), 697
version() (in module salt.modules.dnsmasq), 750
version() (in module salt.modules.dockerio), 762
version() (in module salt.modules.dockerkg), 785
version() (in module salt.modules.ebuild), 794
version() (in module salt.modules.firewallld), 828
version() (in module salt.modules.freebsdpgk), 833
version() (in module salt.modules.git), 862
version() (in module salt.modules.grub Legacy), 878
version() (in module salt.modules.hadoop), 879
version() (in module salt.modules.ipsed), 910
version() (in module salt.modules.iptables), 913
version() (in module salt.modules.linux_acl), 929
version() (in module salt.modules.linux_lvm), 930
version() (in module salt.modules.locate), 933
version() (in module salt.modules.lxc), 953
version() (in module salt.modules.macports), 959
version() (in module salt.modules.modjk), 974
version() (in module salt.modules.mssql), 982
version() (in module salt.modules.mysql), 988
version() (in module salt.modules.nftables), 1023
version() (in module salt.modules.nginx), 1023
version() (in module salt.modules.openbsdpgk), 1038
version() (in module salt.modules.oracle), 1043
version() (in module salt.modules.osquery), 1050
version() (in module salt.modules.pacman), 1054
version() (in module salt.modules.pip), 1067
version() (in module salt.modules.pkg_resource), 1068
version() (in module salt.modules.pkgutil), 1071
version() (in module salt.modules.pkgng), 1080
version() (in module salt.modules.pkgutil), 1083
version() (in module salt.modules.postgres), 1092
version() (in module salt.modules.poudriere), 1093
version() (in module salt.modules.rest_package), 1120
version() (in module salt.modules.rsync), 1128
version() (in module salt.modules.smartos_imgadm), 1149
version() (in module salt.modules.solarisips), 1165
version() (in module salt.modules.solarispkg), 1168
version() (in module salt.modules.solr), 1174
version() (in module salt.modules.sqlite3), 1176
version() (in module salt.modules.status), 1185
version() (in module salt.modules.syslog_ng), 1198
version() (in module salt.modules.test), 1211
version() (in module salt.modules.tomcat), 1224
version() (in module salt.modules.varnish), 1233
version() (in module salt.modules.win_pkg), 1260
version() (in module salt.modules.yumpkg), 1308
version() (in module salt.modules.znc), 1313
version() (in module salt.modules.zypper), 1321
version() (in module salt.runners.drac), 1443
version_clean() (in module salt.modules.ebuild), 794
version_clean() (in module salt.modules.pkg_resource), 1069
version_cmp() (in module salt.modules.aptpkg), 619
version_cmp() (in module salt.modules.ebuild), 794
version_cmp() (in module salt.modules.yumpkg), 1308
versions() (in module salt.modules.pyenv), 1100
versions() (in module salt.modules.ribenv), 1112
versions() (in module salt.modules.test), 1211
versions() (in module salt.runners.manage), 1457
versions_information() (in module salt.modules.test), 1211
versions_report() (in module salt.modules.test), 1211
vg_absent() (in module salt.states.lvm), 1673
g_parant() (in module salt.states.lvm), 1673
g_create() (in module salt.modules.linux_lvm), 930
gdisplay() (in module salt.modules.linux_lvm), 930
gextend() (in module salt.modules.linux_lvm), 931
gremove() (in module salt.modules.linux_lvm), 931
vhost_exists() (in module salt.modules.rabbitmq), 1105
vhosts() (in module salt.modules.apache), 612
type() (in module salt.modules.virt), 1241
type() (in module salt.cloud.nova), 480
virtual_interface_create() (in module salt.cloud.nova), 480
virtual_interface_create() (in module salt.cloud.clouds.nova), 480
virtual_interface_list() (in module salt.cloud.clouds.nova), 480
virtual_interface_list() (in module salt.modules.cloud), 699
vm_cputime() (in module salt.modules.virt), 1241
vm_cputime() (in module salt.modules.xapi), 1295
vm_diskstats() (in module salt.modules.virt), 1241
vm_diskstats() (in module salt.modules.xapi), 1295
vm_info() (in module salt.modules.virt), 1242
vm_info() (in module salt.modules.xapi), 1296
vm_info() (in module salt.runners.virt), 1466
vm_netstats() (in module salt.modules.virt), 1242
vm_netstats() (in module salt.modules.xapi), 1296
vm_state() (in module salt.modules.virt), 1242
vm_state() (in module salt.modules.xapi), 1296
vmstats() (in module salt.modules.status), 1185
volume_absent() (in module salt.states.lvm), 1578
volume_attach() (in module salt.cloud.clouds.nova), 480
volume_attach() (in module salt.modules.clouds.nova), 480
volume_attach() (in module salt.modules.ebuild), 699
volume_attach() (in module salt.modules.nova), 1028
volume_attachment() (in module salt.modules.status), 1578
volume_create() (in module salt.cloud.clouds.nova), 480
volume_create() (in module salt.modules.cloud), 700
volume_create() (in module salt.modules.nova), 1028
volume_create_attach() (in module salt.cloud.clouds.nova), 480
volume_delete() (in module salt.cloud.clouds.nova), 480
volume_delete() (in module salt.modules.cloud), 700
volume_delete() (in module salt.modules.nova), 1029
volume_detach() (in module salt.cloud.clouds.nova), 480
volume_detach() (in module salt.modules.cloud), 700
volume_detach() (in module salt.modules.nova), 1029
volumedetachedd() (in module salt.modules.clouds.nova), 1578
volume_list() (in module salt.cloud.clouds.nova), 480
volume_list() (in module salt.modules.cloud), 700
volume_list() (in module salt.modules.nova), 1029
volume_present() (in module salt.states.cloud), 1578
volume_show() (in module salt.modules.nova), 1029
vserver_add() (in module salt.modules.netscaler), 996
vserver_delete() (in module salt.modules.netscaler), 997
vserver_exists() (in module salt.modules.netscaler), 997
vserver_servicegroup_add() (in module salt.modules.netscaler), 997
vserver_servicegroup_delete() (in module salt.modules.netscaler), 997
vserver_servicegroup_exists() (in module salt.modules.netscaler), 997
vserver_sslcert_add() (in module salt.modules.netscaler), 997
vserver_sslcert_delete() (in module salt.modules.netscaler), 997
vserver_sslcert_exists() (in module salt.modules.netscaler), 997

W

w() (in module salt.modules.status), 1185
wait() (in module salt.modules.dockerio), 762
wait() (in module salt.modules.dockerng), 785
wait() (in module salt.states.cmd), 1584
wait() (in module salt.states.event), 1613
wait() (in module salt.states.module), 1682
wait() (in module salt.states.tomcat), 1752
wait_call() (in module salt.states.cmd), 1585
wait_for_created() (in module salt.cloud.clouds.proxmox), 487
wait_for_event() (in module salt.states.saltmod), 1736
wait_for_instance() (in module salt.cloud.clouds.ec2), 446
wait_for_ip() (in module salt.cloud.clouds.vsphere), 503
wait_for_state() (in module salt.cloud.clouds.proxmox), 487
wait_rm() (in module salt.states.etcd_mod), 1613
wait_script() (in module salt.states.cmd), 1585
wait_set() (in module salt.states.etcd_mod), 1613
wait_started() (in module salt.modules.lxc), 953
wait_until() (in module salt.cloud.clouds.parallels), 485
war_deployed() (in module salt.states.tomcat), 1753
warn() (in module salt.modules.quota), 1102
Webhook (class in salt.netapi.rest_cherrypy.app), 1333
WebhookSaltAPIHandler (in module salt.netapi.rest_tornado.saltnado), 1345
WebsocketEndpoint (class in salt.netapi.rest_cherrypy.app), 1336
wheel() (in module salt.modules.saltutil), 1139
wheel() (in module salt.states.saltmod), 1736
wheel() (salt.netapi.NetapiClient method), 375
WheelClient (class in salt.wheel), 430
which() (in module salt.modules.saltmod), 713
which() (in module salt.modules.saltmods), 1080
which_bin() (in module salt.modules.saltcmd), 713
win_gitrepos
  conf/master, 562
  conf/minion, 578
win_repo
  conf/master, 561
  conf/minion, 578
win_repo_cachefile
  conf/minion, 578
win_repo_mastercachefile
  conf/master, 561
winrepo_branch
  conf/master, 562
winrepo_cachefile
  conf/master, 561
  conf/minion, 578
winrepo_dir
  conf/master, 561
  conf/minion, 578
winrepo_insecure_auth
  conf/master, 563
winrepo_passphrase
  conf/master, 564
winrepo_password
  conf/master, 563
winrepo_privkey
  conf/master, 563
winrepo_provider
  conf/master, 561
winrepo_pubkey
  conf/master, 563
winrepo_remotes
  conf/master, 562
  conf/minion, 578
winrepo_ssl_verify
  conf/master, 562
winrepo_user
  conf/master, 563
wipe() (in module salt.modules.blockdev), 639
wipefacls() (in module salt.modules.linux_acl), 929

Index 2351
wm_preferences() (in module salt.states.gnomedesktop), 1641
wol() (in module salt.modules.network), 1002
wol() (in module salt.runners.network), 1458
wollist() (in module salt.runners.network), 1458
Worker, 2147
worker_activate() (in module salt.modules.modjk), 974
worker_activated() (in module salt.states.modjk), 1679
worker_disable() (in module salt.modules.modjk), 975
worker_disabled() (in module salt.states.modjk), 1680
worker_edit() (in module salt.modules.modjk), 975
worker_recover() (in module salt.modules.modjk), 975
worker_recover() (in module salt.states.modjk), 1680
worker_status() (in module salt.modules.modjk), 975
worker_stop() (in module salt.modules.modjk), 975
worker_stopped() (in module salt.states.modjk), 1680
worker_threads
conf/master, 532
workers() (in module salt.modules.modjk), 975
worktree_add() (in module salt.modules.git), 862
worktree_prune() (in module salt.modules.git), 862
worktree_rm() (in module salt.modules.git), 863
wrapper() (in module salt.modules.rvm), 1132
write() (in module salt.modules.file), 824
write() (in module salt.wheel.file_roots), 1785
write() (in module salt.wheel.pillar_roots), 1786
write_conf() (in module salt.modules.lxc), 954
write_config() (in module salt.modules.syslog_ng), 1198
write_cron_file() (in module salt.modules.cron), 735
write_cron_file_verbose() (in module salt.modules.cron), 735
write_incron_file() (in module salt.modules.incron), 891
write_incron_file_verbose() (in module salt.modules.incron), 891
write_launchd_plist() (in module salt.runners.launchd), 1450
write_pem() (in module salt.modules.x509), 1292
write_version() (in module salt.modules.syslog_ng), 1198
X
xattr_where_from() (in module salt.modules.osquery), 1051
xorg() (in module salt.states.keyboard), 1667
xprotect_entries() (in module salt.modules.osquery), 1051
xprotect_reports() (in module salt.modules.osquery), 1051
Y
yaml_utf8
conf/master, 541
Z
zcard() (in module salt.modules.redismod), 1116
zero() (in module salt.modules.lvs), 936
zero_cluster() (in module salt.modules.trafficserver), 1226
zero_cluster() (in module salt.states.trafficserver), 1755
zero_node() (in module salt.modules.trafficserver), 1755
zero_node() (in module salt.states.trafficserver), 1755
zip() (in module salt.modules.archive), 622
zone_compare() (in module salt.modules.timezone), 1212
zone_compare() (in module salt.modules.win_timezone), 1274
zone_exists() (in module salt.modules.boto_route53), 667
zpool_list() (in module salt.modules.zpool), 1315
zrange() (in module salt.modules.redismod), 1116
2352 Index