



运维社区-Saltstack

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1 Saltstack 概述

1.1 Saltstack 介绍

Saltstack 是一个新的基础设施管理工具。目前处于快速发展阶段，可以看做是强化的 Func+弱化的 Puppet 的组合。间接的反映出了 saltstack 的两大功能：远程执行和配置管理。

Saltstack 使用 Python 开发的，非常简单易用和轻量级的管理工具。由 Master 和 Minion 构成，通过 ZeroMQ 进行通信。

1.2 Saltstack 安装配置

对于 Centos 和 RedHat 用户，使用 yum 安装时最直接和快捷的。安装最新版本的 epel 仓库
[root@-node1 ~]# rpm -ivh http://mirrors.ustc.edu.cn/fedora/epel/6/x86_64/epel-release-6-8.noarch.rpm

1.2.1 Master 安装配置

服务器端安装

```
[root@master ~]#yum install -y salt-master
```

1.2.2 Minion 安装配置

```
[root@minion ~]# yum install -y salt-minion
```

客户端配置

```
[root@minion ~]# vim /etc/salt/minion
```

master: 192.168.0.11 （修改 master 为 master 的 IP 地址）

id: (客户端的 id。默认不设置会取客户端的 FQDN 主机名)

客户端启动

```
[root@minion ~]# /etc/init.d/salt-minion start
```

客户端日志

```
[root@minion ~]# tail -f /var/log/salt/minion
```

1.3 Master 与 Minion 的通信

1.3.1 Master 与 Minion 认证

1.minion 在第一次启动时，会在/etc/salt/pki/minion/（该路径在/etc/salt/minion 里面设置）下自动生成 minion.pem(private key)和 minion.pub(public key)，然后将 minion.pub 发送给 master。

2.master 在接收到 minion 的 public key 后，通过 salt-key 命令 accept minion public key，这样在 master 的/etc/salt/pki/master/minions 下的将会存放以 minion id 命名的 public key，然后 master 就能对 minion 发送指令了。

1.3.2 Master 与 Minion 的连接

Saltstack master 启动后默认监听 4505 和 4506 两个端口。4505(publish_port)为 salt 的消息发布系统，4506(ret_port)为 salt 客户端与服务端通信的端口。如果使用 lsof 查看 4505 端口，会发现所有的 Minion 在 4505 端口持续保持在 ESTABLISHED 状态。

```
[root@ops-node1 master]# lsof -i:4505
```

1.4 Master 端 Key 认证

在上面一个小节已经提到了 Master 与 Minion 的认证方式，具体的认证命令为 salt-key，常用的有如下命令。

```
-a ACCEPT, --accept=ACCEPT Accept the following key
-A, --accept-all    Accept all pending keys
-r REJECT, --reject=REJECT Reject the specified public key
-R, --reject-all    Reject all pending keys
-d DELETE, --delete=DELETE Delete the named key
-D, --delete-all    Delete all keys
```

例：[root@master ~]# salt-key --accept=web-node1.unixhot.com

1.5 Salt 命令介绍

命令	功能描述
----	------

salt	Salt 主命令，比如执行命令模块
satl-cp	复制文件到指定的系统上去
salt-key	和 Minion 之间进行身份验证
salt-master	Master 主守护进程，用于控制 Minion
salt-run	前端命令执行
salt-syndic	Salt syndic 守护进程，用于多级 salt-master 使用
备注：具体命令的详细内容，可以查看 man 手册。	

2 Saltstack 命令执行

2.1 cmd.run

Saltstack 可以远程执行 shell 命令，使用 cmd.run。如：

```
[root@ops-node1 ~]# salt 'web-node1.10.90.0.24' cmd.run 'w'
web-node1.10.90.0.24:
  14:40:13 up 346 days, 12:06,  1 user,  load average: 1.31, 1.67, 1.95
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU WHAT
jboss     pts/0    10.90.0.24    13:28    1:11m  1:29m  0.01s -bash
```

但是由于 cmd.run 可以执行所有的命令，所以不建议在生产环境中使用 cmd.run，同时，saltstack 提供了大量的命令模块可以使用。

2.2 内置执行模块

官方模块地址：<http://docs.saltstack.com/ref/modules/all/index.html>

下面介绍几个常用的内置命令模块

```
[root@master ~]# salt 'web-node1.unixhot.com' disk.usage
```

3 Saltstack 配置管理

Salt 使用 State 模块文件进行配置管理，使用 YAML 编写，以.sls 结尾。如果进行配置管理首先

需要再 Master 的配置文件中指定“file roots”的选项，Salt 支持环境的配置，比如测试环境和生产环境但是 base 环境是必须的。而且 Base 环境必须包含入口文件 top.sls。

3.1 Saltstack 配置管理流程

3.1.1 设置 file_roots

修改 Master 配置文件，指定 File_roots。

```
[root@openstack-controller-node1 ~]# vim /etc/salt/master
```

file_roots:

base:

- /etc/salt/base

test:

- /etc/salt/test

prod:

- /etc/salt/prod

dev:

- /etc/salt/dev

然后在/etc/salt 建立相应的目录。**注意：修改完后重启/etc/init.d/salt-master restart**

3.1.2 设置 top.sls

在 top.sls 入口文件设置环境（如生产、开发、测试对应不同的 minion 和模块）。

```
[root@openstack-controller-node1 ~]# vim /etc/salt/base/top.sls
```

base:

'ftest-node1.unixhot.com':

- init

解释：所有的 Minion 均执行 base 目录下的 init.sls，我需要再 init.sls 进行系统初始化的一些配置。

3.1.3 设置模块 init.sls

```
[root@openstack-controller-node1 ~]# vim /etc/salt/base/init.sls （注意空格和缩进）
```

```
/etc/resolv.conf:
```

```
file.managed:
```

- source: salt://files/resolv.conf
- mode: 644
- owner: root
- group: root

创建 file 目录，并将需要再各个 Minion 上生效的 resolv.conf 复制进行。

```
[root@openstack-controller-node1 ~]# mkdir /etc/salt/base/files
```

```
[root@openstack-controller-node1 ~]# cp /etc/resolv.conf /etc/salt/base/files
```

3.1.4 测试状态

对于大批量的配置管理，在执行前测试是必要的。Saltstack 提供了测试的选项。

```
[root@openstack-controller-node1 base]# salt 'ftest-node1.unixhot.com' state.highstate -v test=True
```

3.1.5 Master 主动推送状态

```
[root@openstack-controller-node1 base]# salt 'ftest-node1.unixhot.com' state.highstate
```

3.1.6 Minion 主动拉取状态

如果想让 Minion 定期的来 Master 拉取状态。Saltstack 也是支持的。

3.2 Saltstack 配置管理

Saltstack 使用 salt.states 进行状态配置管理，其中包含了多个模块，设置文件管理、用户和组管理、权限管理、软件包管理、LVM 管理、磁盘管理等等。官方的模块请参考：

<http://docs.saltstack.com/py-modindex.html>

下面将常见的应用例子列出来，仅供参考。

3.2.1 使用 saltstack 管理文件

在 4.1-4.5 章节的例子中，其实已经讲解了 saltstack 对于文件的管理。

官方模块文档 <http://docs.saltstack.com/ref/states/all/salt.states.file.html#module-salt.states.file>

例：

/etc/resolv.conf:

file.managed:

- source: salt://files/resolv.conf
- mode: 644
- user: root
- group: root

3.2.2 使用 saltstack 管理软件包

Saltstack 管理软件包的写法几乎是最简单的，当然有复杂的写法，可以参考官方文档。官方文档：

<http://docs.saltstack.com/ref/states/all/salt.states.pkg.html#module-salt.states.pkg>

例：使用 saltstack 在所有机器上安装并管理 tree 命令。

tree:

pkg.installed

还可以使用软件包列表的方式，比如需要再优化安装的系统上增加一些管理命令。

initpkgs:

pkg.installed:

- pkgs:
- tree
- lrzsz

3.2.3 使用 saltstack 管理用户和组

Saltstack 使用 salt.states.user 和 salt.states.group 来管理系统的用户和组。

官方文档： <http://docs.saltstack.com/ref/states/all/salt.states.group.html#module-salt.states.group>

例：

jboss:

group.present:

- gid: 501

user.present:

- fullname: jboss

- password: 此处可以填写加密后的用户密码。即/etc/shadow 里面的 Hash 串。

- shell: /bin/bash

- home: /home/jboss

- uid: 501

- gid: 501

- groups:

- jboss

(注意: 如果组不存在, 执行会报错, 所以本文先创建的 jboss 组, 后创建了 Jboss 用户)

3.2.4 使用 saltstack 管理服务

对于服务、守护进程的启动、关闭和重启。可以使用 saltstack 顺利完成。

官方模块文档: <http://docs.saltstack.com/ref/states/all/salt.states.service.html#module-salt.states.service>

例:

3.2.5 使用 saltstack 管理计划任务

相信计划任务的管理是每个系统工程师都必须面对, 尤其面对服务器数量在 100 台以上, 没有统一的计划任务管理将会是一个非常混乱的状态。

4 Salt Stack Pillar

5 Salt Stack Grians

6 Salt Stack Returners

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