OpenStack Havana 部署安装手册

陕西省信息化工程研究院

西安未来国际信息股份有限公司

2013 年 11 月

文档修订记录

版本号	变更内容说明	变更日期	变更人	备注
V0.6	初步安装	2011-11-10	张龙兴	
V0.8	重点解决以下关键问题 (1)虚拟机获取不到 IP (2)虚拟机增加浮动 IP 访问公网，以及通过浮动 IP 访问虚拟机 (3)GRE 网络雏形完成 (4)重新梳理文档	2013-11-15	梁小江	QQ：8495138
V0.8	(1)第 6 章实验	2013-11-18	梁小江	QQ：8495138

目 录

1 序

本文档主要用于指导 Havana 版本初步安装，本文档主要教你在 ubuntu13.10 下一步一步部署，了解 Havana 是怎么运作的，真正生产环境下，肯定要做自动化部署脚本与优化。需要说明的是,本文并不包含 swift、heat、ceilmeter 等安装，本文档仅起抛砖引玉作用，希望大家多多进行技术交流，最后感谢我的团队所有人员。

梁小江 于西安

2013-11-17

2 基础环境准备

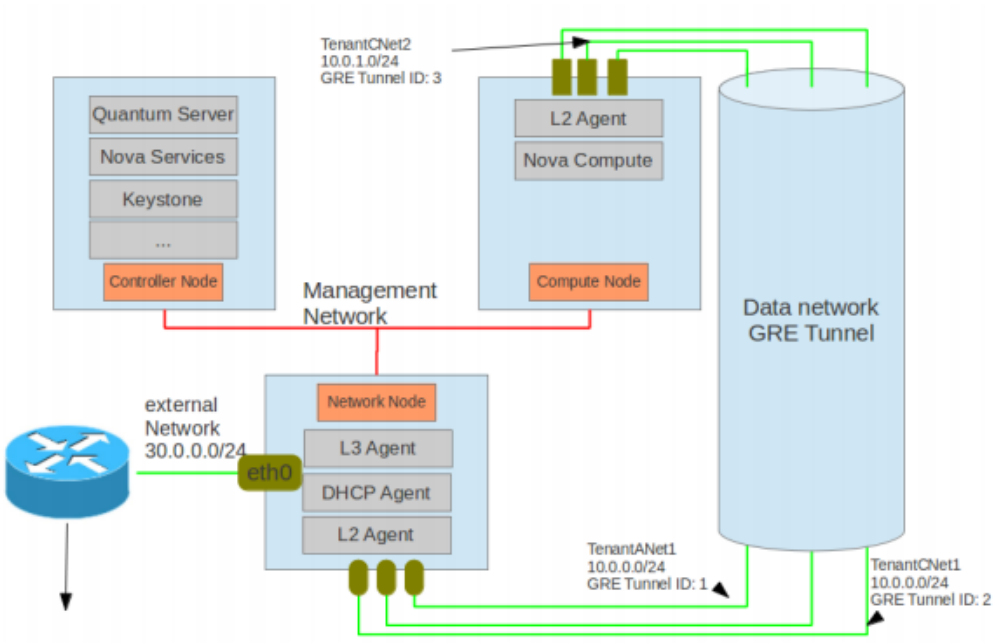
2.1 实验环境

本实验环境是根据作者现场实验环境而编写，参见如下表格

结点	Eth0(公网)	Eth1(管理网络)	Eth2(数据网络)	IMPI 网络
控制结点	10.10.10.11	192.168.100.11	172.16.0.11	192.168.0.11
网络结点	10.10.10.10	192.168.100.10	172.16.0.10	192.168.0.10
计算结点	10.10.10.17	192.168.100.17	172.16.0.17	192.168.0.50

注：Eth0、Eth3 千兆网络，Eth1、Eth2 万兆网络，本实验 Eth3 未使用。实际上控制结点与计算结点不需要公网，因本实验环境网卡太多，而且需要从互联网上拉取在线 deb 包，因此就配置了。

2.2 服务布局



2.3 操作系统安装

操作系统：ubuntu13.10 Server

执行如下操作：

#apt-get update

#apt-get upgrade

（注：为了生产环境下，离线安装，ubuntu13.10 不做 apt-get upgrade 是否可行，需进行验证，我猜想是可行的，类似于 ubuntu12.04 对应用 openstack E 版本）

2.4 网络配置

2.4.1 控制结点网络

```
auto lo
iface lo inet loopback


# The primary network interface
auto eth0
```

```
iface eth0 inet static
   address 10.10.10.11
   netmask 255.255.255.0
   network 10.10.10.0
   broadcast 10.10.10.255
   gateway 10.10.10.1
   # dns-* options are implemented by the resolvconf package, if installed
   dns-nameservers 8.8.8.8
   dns-search ourfuture.cn
auto eth1
iface eth1 inet static
        address 192.168.100.11
        netmask 255.255.255.0
        network 192.168.100.0

auto eth2
iface eth2 inet static
        address 172.16.0.11
        netmask 255.255.255.0
        network 172.16.0.0
```

2.4.2 网络结点网络

```
auto lo
iface lo inet loopback

# The primary network interface
auto br-ex
iface br-ex inet static
      address 10.10.10.10
      netmask 255.255.255.0
```

```
        network 10.10.10.0
        broadcast 10.10.10.255
        gateway 10.10.10.1
        # dns-* options are implemented by the resolvconf package, if installed
        dns-nameservers 8.8.8.8
        dns-search ourfuture.cn
auto eth0
iface eth0 inet manual
        up ifconfig $IFACE 0.0.0.0 up
        up ip link set $IFACE promisc on
        down ip link set $IFACE promisc off
        down ifconfig $IFACE down

auto eth1
iface eth1 inet static
        address 192.168.100.10
        netmask 255.255.255.0
        network 192.168.100.0

auto eth2
iface eth2 inet static
        address 172.16.0.10
        netmask 255.255.255.0
        network 172.16.0.0
```

2.4.3 计算结点网络

```
auto lo
iface lo inet loopback

# The primary network interface
```

```
    auto eth0
    iface eth0 inet static
            address 10.10.10.17
            netmask 255.255.255.0
            network 10.10.10.0
            broadcast 10.10.10.255
            gateway 10.10.10.1
            # dns-* options are implemented by the resolvconf package, if
installed
            dns-nameservers 8.8.8.8
            dns-search ourfuture.cn
    auto eth1
    iface eth1 inet static
            address 192.168.100.17
            netmask 255.255.255.0
            network 192.168.100.0


    auto eth2
    iface eth2 inet static
            address 172.16.0.17
            netmask 255.255.255.0
            network 172.16.0.0
```

3 控制结点

3.1 安装 NTP 服务

```
#apt-get install ntp
```

3.2 MySQL

3.2.1 安装

```
#apt-get install mysql-server python-mysqldb
```

3.2.2 配置

```
#sed -i 's/127.0.0.1/0.0.0.0/g' /etc/mysql/my.cnf
```

3.2.3 启动

```
#service mysql restart
```

3.2.4 允许客户端访问

```
# mysql_secure_installation

# mysql -uroot -ppassword

mysql> grant all privileges on *.* to root@"%" identified by "password" with grant option;

mysql>FLUSH PRIVILEGES;

mysql>use mysql;

mysql>delete from user where user="";

mysql>quit;
```

3.2.5 创建数据库

```
#Keystone

CREATE DATABASE keystone;

GRANT ALL ON keystone.* TO 'keystoneUser'@'%' IDENTIFIED BY 'keystonePass';



#Glance

CREATE DATABASE glance;

GRANT ALL ON glance.* TO 'glanceUser'@'%' IDENTIFIED BY 'glancePass';
```

```
#Nova
CREATE DATABASE nova;
GRANT ALL ON nova.* TO 'novaUser'@'%' IDENTIFIED BY 'novaPass';

#Cinder
CREATE DATABASE cinder;
GRANT ALL ON cinder.* TO 'cinderUser'@'%' IDENTIFIED BY 'cinderPass';

#Neutron
CREATE DATABASE neutron;
GRANT ALL ON neutron.* TO 'neutronUser'@'%' IDENTIFIED BY 'neutronPass';

#Heat
CREATE DATABASE heat;
GRANT ALL ON heat.* TO 'heatUser'@'%' IDENTIFIED BY 'heatPass';

FLUSH PRIVILEGES;
quit
```

3.2.6 启动

```
#service mysql restart
```

3.3 安装消息队列

```
#apt-get install rabbitmq-server
```

3.4 Keystone 服务

3.4.1 安装 keystone

```
#apt-get install keystone
```

3.4.2 配置 keystone

```
#vim /etc/keystone/keystone.conf
################################################################################
[sql]
# The SQLAlchemy connection string used to connect to the database
connection = mysql://keystoneUser:keystonePass@localhost/keystone
```

3.4.3 初始化表结构

```
#keystone-manage db_sync
#service keystone restart
```

3.4.4 初始化数据库

```
#./keystone_basic_ch.sh
#./keystone_endpoints_basic_ch.sh
```

3.4.5 测试 keystone

```
# keystone user-list
```

```
root@havana2:~# keystone user-list
+----------------------------------+------------+---------+-----------------------+
|                id                |    name    | enabled |         email         |
+----------------------------------+------------+---------+-----------------------+
| 33cbbe9e49d64e8ca3a2b8da197535b4 |   admin    |   True  |    admin@domain.com   |
| 0b1de7b70a184260a5de12fc396a713f | ceilometer |   True  | ceilometer@domain.com |
| 014ed2b3ca274d79974f408dea1f42be |   cinder   |   True  |   cinder@domain.com   |
| 4a9e7ef07a7b441aa340994a2d9e76d6 |   glance   |   True  |   glance@domain.com   |
| 0b1dad8a46e846789bc3723ed11b092b |    heat    |   True  |    heat@domain.com    |
| 9833257836954acc8ac9ef75c59749e0 |  neutron   |   True  |   neutron@domain.com  |
| 96be3c6777aa4638bb4c2cebeef2aafb |    nova    |   True  |    nova@domain.com    |
+----------------------------------+------------+---------+-----------------------+
```

```
# keystone service-list
```

```
root@havana2:~# keystone service-list
+----------------------------------+------------+---------------+----------------------------+
|                id                |    name    |      type     |        description         |
+----------------------------------+------------+---------------+----------------------------+
| 67a2bda5b322438c8b62ed8df6d58a47 | ceilometer |    metering   | Openstack Metering Service |
| 8dce40882cd14ecfbff9bd24b7637c75 |   cinder   |     volume    |  OpenStack Volume Service  |
| 8e539cb1035d49d09b0454adc203a88e |    ec2     |      ec2      |   OpenStack EC2 service    |
| 0f6f4ae9cd7d44eb8510a3b8b48d170f |   glance   |     image     |  OpenStack Image Service   |
| 601ff98dc6064897abda7de6396f5331 |    heat    | orchestration |          Heat API          |
| aa4637530f6d448aa1e60b22ab9edbd8 |  heat-cfn  | cloudformation |  Heat CloudFormation API  |
| 14d1e20921e1435a959c5716219ae92b |  keystone  |    identity   |     OpenStack Identity     |
| b914fe5c1d8a470b8a45b73b1a6504f2 |  neutron   |    network    | OpenStack Networking Service |
| a0eaf934a856424ab484d75fd9cb3388 |    nova    |    compute    |  OpenStack Compute Service |
+----------------------------------+------------+---------------+----------------------------+
```

3.4.6 说明

如果没有达到上述测试效果，下面步骤不要执行了，先解决上面问题。

3.5 Glance 服务

3.5.1 安装

```
# apt-get install glance
```

3.5.2 配置 glance-api.conf

```
# vim /etc/glance/glance-api.conf
#########################################################################
[DEFAULT]
sql_connection = mysql://glanceUser:glancePass@localhost/glance


[paste_deploy]
flavor = keystone
```

```
[keystone_authtoken]
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
admin_tenant_name = service
admin_user = glance
admin_password = service_pass
```

3.5.3 配置 glance-registry.conf

```
#vim /etc/glance/glance-registry.conf
#########################################################################
sql_connection = mysql://glanceUser:glancePass@localhost/glance

[paste_deploy]
flavor = keystone

[keystone_authtoken]
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
admin_tenant_name = service
admin_user = glance
admin_password = service_pass
```

3.5.4 配置 glance-api-paste.ini

```
#vim /etc/glance/glance-api-paste.ini
#################################################################################
[filter:authtoken]
paste.filter_factory = keystoneclient.middleware.auth_token:filter_factory
```

```
delay_auth_decision = true
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
admin_tenant_name = service
admin_user = glance
admin_password = service_pass
```

3.5.5 配置 glance-registry-paste.ini

```
#vim /etc/glance/glance-registry-paste.ini
#################################################################################
[filter:authtoken]
paste.filter_factory = keystoneclient.middleware.auth_token:filter_factory
delay_auth_decision = true
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
admin_tenant_name = service
admin_user = glance
admin_password = service_pass
```

3.5.6 重新启动

```
#restart glance-registry; restart glance-api
```

3.5.7 初始化表结构

```
#glance-manage db_sync
```

3.5.8 上传镜像

```
#glance add name="ubuntu12.04" is_public=true container_format=ovf disk_format=qcow2 <
/root/ubuntu12.04.img
```

3.5.9 测试

```
#glance index
```

```
root@havana2:/opt# glance index
ID                                   Name                        Disk Format          Container Format     Size
------------------------------------ --------------------------- -------------------- -------------------- --------------
dad9926c-a094-4495-a778-6ad95b8f8c75 ubuntu12.04                 qcow2                ovf                       5368709120
```

3.5.10说明

本小节安装测试不成功，不要往下面安装，请检查上面安装过程。

3.6 Nova 服务

3.6.1 安装

```
#apt-get install nova-novncproxy novnc nova-api nova-ajax-console-proxy nova-cert nova-conductor nova-consoleauth nova-doc nova-scheduler
```

3.6.2 配置 `nova.conf`

```
#vim /etc/nova/nova.conf
###############################################################################
[DEFAULT]
logdir=/var/log/nova
state_path=/var/lib/nova
lock_path=/run/lock/nova
verbose=True
api_paste_config=/etc/nova/api-paste.ini
compute_scheduler_driver=nova.scheduler.simple.SimpleScheduler
rabbit_host=192.168.100.11
nova_url=http://192.168.100.11:8774/v1.1/
sql_connection=mysql://novaUser:novaPass@localhost/nova
root_helper=sudo nova-rootwrap /etc/nova/rootwrap.conf


# Auth
```

```
use_deprecated_auth=false
auth_strategy=keystone

# Imaging service
glance_api_servers=192.168.100.11:9292
image_service=nova.image.glance.GlanceImageService

# Vnc configuration
novnc_enabled=true
novncproxy_base_url=http://10.10.10.11:6080/vnc_auto.html
novncproxy_port=6080
vncserver_proxyclient_address=192.168.100.11
vncserver_listen=0.0.0.0

# Network settings
network_api_class=nova.network.neutronv2.api.API
neutron_url=http://192.168.100.11:9696/
neutron_auth_strategy=keystone
neutron_admin_tenant_name=service
neutron_admin_username=neutron
neutron_admin_password=service_pass
neutron_admin_auth_url=http://192.168.100.11:35357/v2.0/
libvirt_vif_driver=nova.virt.libvirt.vif.LibvirtHybridOVSBridgeDriver
linuxnet_interface_driver=nova.network.linux_net.LinuxOVSInterfaceDriver
#If you want Neutron + Nova Security groups
#firewall_driver=nova.virt.firewall.NoopFirewallDriver
security_group_api=neutron
#If you want Nova Security groups only, comment the two lines above and uncomment line -1-.
#-1-firewall_driver=nova.virt.libvirt.firewall.IptablesFirewallDriver
```

```
#Metadata
service_neutron_metadata_proxy = True
neutron_metadata_proxy_shared_secret = helloOpenStack

# Compute #
compute_driver=libvirt.LibvirtDriver

# Cinder #
volume_api_class=nova.volume.cinder.API
osapi_volume_listen_port=5900

#ceilometer#
instance_usage_audit=True
instance_usage_audit_period=hour
notify_on_state_change=vm_and_task_state
notification_driver=nova.openstack.common.notifier.rpc_notifier
notification_driver=ceilometer.compute.nova_notifier
```

3.6.3 配置 api-paste.ini

```
#vim /etc/nova/api-paste.ini
#############################################################################
[filter:authtoken]
paste.filter_factory = keystoneclient.middleware.auth_token:filter_factory
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
auth_uri=http://192.168.100.11:5000
admin_tenant_name = service
admin_user = nova
```

```
admin_password = service_pass
signing_dirname = /tmp/keystone-signing-nova
# Workaround for https://bugs.launchpad.net/nova/+bug/1154809
auth_version = v2.0
```

3.6.4 重新启动

```
#restart nova-*   (可 tab 一下，发现服务)
```

3.6.5 初始化表结构

```
#nova-manage db sync
```

3.6.6 测试

```
#nova-manage service list
```

```
root@havana2:/var/log/nova# nova-manage service list
Binary           Host                                 Zone             Status     State Updated_At
nova-consoleauth havana2                              internal         enabled    :-)   2013-11-14 08:01:21
nova-scheduler   havana2                              internal         enabled    :-)   2013-11-14 08:01:22
nova-cert        havana2                              internal         enabled    :-)   2013-11-14 08:01:17
nova-conductor   havana2                              internal         enabled    :-)   2013-11-14 08:01:19
```

如果没有出现这四个服务，说明你配置有问题！

主要是因为你的/etc/hosts 下面没有配置 请配置。

3.6.7 说明

如果测试不成功，请不要往下面执行，请检查！

3.7 Clinder 服务

3.7.1 安装 clinder

```
#apt-get install cinder-api cinder-scheduler
#apt-get install cinder-volume lvm2
```

3.7.2 配置 cinder.conf

```
#vim /etc/cinder/cinder.conf
################################################################################
```

```
[database]
connection = mysql://cinderUser:cinderPass@localhost/cinder
```

3.7.3 配置 api-paste.ini

```
#vim /etc/cinder/api-paste.ini
#############################################################################
[filter:authtoken]
paste.filter_factory = keystoneclient.middleware.auth_token:filter_factory
auth_host =192.168.100.11
auth_port = 35357
auth_protocol = http
admin_tenant_name = service
admin_user = cinder
admin_password = service_pass
```

3.7.4 重新启动

```
#restart cinder-*  (具体服务请按 tab)
```

3.7.5 初始化表结构

```
#cinder-manage db sync
```

3.7.6 测试

此处，仅做测试，生产环境下，请使用真正存储。

(1)准备磁盘

```
dd if=/dev/zero of=cinder-volumes bs=1 count=0 seek=50G
losetup /dev/loop2 cinder-volumes
fdisk /dev/loop2
#Type in the followings:
    n
    p
```

```
    1
    ENTER
    ENTER
    t
    8e
    w
partprobe
```

(2) 创建物理卷的卷组

```
pvcreate /dev/loop2
vgcreate cinder-volumes /dev/loop2
```

(3) 为防重启服务器后丢失

(1) 使用 rc.local

vim /etc/rc.local

在 exit 0 前添加下面一行:

    losetup /dev/loop2 cinder-volumes

退出并保存:

尝试重启系统，并且运行 vgdisplay 命令。

(2)使用 upstart

vim /etc/init/losetup.conf

添加下面内容:

```
description     "Set up loop devices"


start on mounted MOUNTPOINT=/
task
exec /sbin/losetup /dev/loop0 cinder-volumes
```

3.7.7 说明

请确保 clinder 服务正常。

3.8 Neutron 服务

3.8.1 安装

```
#apt-get install neutron-server
```

3.8.2 配置 neutron.conf

```
#vim /etc/neutron/neutron.conf
###############################################################################
[DEFAULT]
core_plugin = neutron.plugins.openvswitch.ovs_neutron_plugin.OVSNeutronPluginV2
control_exchange = neutron
rabbit_host = 192.168.100.11
notification_driver = neutron.openstack.common.notifier.rabbit_notifier
[keystone_authtoken]
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
admin_tenant_name = service
admin_user = neutron
admin_password = service_pass
signing_dir = $state_path/keystone-signing
auth_url = http://192.168.100.11:35357/v2.0
auth_strategy = keystone
[database]
connection = mysql://neutronUser:neutronPass@localhost:3306/neutron
```

3.8.3 配置 ovs_neutron_plugin.ini

```
#vim /etc/neutron/plugins/openvswitch/ovs_neutron_plugin.ini
###############################################################################
[ovs]
```

```
tenant_network_type = gre
tunnel_id_ranges = 1:1000
enable_tunneling = True
[securitygroup]
firewall_driver = neutron.agent.linux.iptables_firewall.OVSHybridIptablesFirewallDriver
```

3.8.4 配置 api-paste.ini

```
#vim /etc/neutron/api-paste.ini
#############################################################################
[filter:authtoken]
auth_host=192.168.100.11
auth_uri=http://192.168.100.11:5000
admin_tenant_name = service
admin_user = neutron
admin_password = service_pass
```

3.8.5 重启

```
#restart neutron-* (按 tab)
```

3.9 Heat 服务

3.9.1 安装

```
#apt-get install heat-api heat-api-cfn heat-engine
```

3.9.2 配置 heat.conf

```
#vim /etc/heat/heat.conf
#############################################################################
[DEFAULT]
log_dir=/var/log/heat
sql_connection = sqlite:////var/lib/heat/heat.sqlite
```

```
[database]
sql_connection = mysql://heatUser:heatPass@localhost/heat
```

3.9.3 配置 api-paste.ini

```
#vim /etc/heat/api-paste.ini
#############################################################################
[filter:authtoken]
paste.filter_factory = heat.common.auth_token:filter_factory
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
admin_tenant_name = service
admin_user = heat
admin_password = service_pass
```

3.9.4 初始化表结构

```
#heat-manage db_sync
```

3.9.5 重新启动

```
#restart heat-* （按 tab）
```

3.9.6 说明

Heat 本文还没有进行测试，也没有深入研究，希望读者研究后，有机会告诉本作者，谢谢！QQ：8495138

3.10 Ceilometer 服务

Ceilometer 本人还没有进行详细测试，希望读者研究后，有机会告诉本作者，谢谢！QQ：8495138

3.11 Horizon 服务

3.11.1安装

```
#apt-get install apache2
#apt-get install memcached libapache2-mod-wsgi openstack-dashboard
```

3.11.2卸载 ubuntu 主题

```
#apt-get remove --purge openstack-dashboard-ubuntu-theme
```

3.11.1测试

http://192.168.100.11/horizon

用户名：admin

密 码：admin_pass

4 网络结点

4.1 时钟同步

```
#ntpdate 192.168.100.11
#hwclock -w
#echo '10 8 *** root /usr/sbin/ntpdate 192.168.100.11;hwclock -w'>>/etc/crontab
```

4.2 IP 转发

```
sed -i 's/#net.ipv4.ip_forward=1/net.ipv4.ip_forward=1/' /etc/sysctl.conf
sed -i 's/#net.ipv4.conf.all.rp_filter=1/net.ipv4.conf.all.rp_filter=0/' /etc/sysctl.conf
sed -i 's/#net.ipv4.conf.default.rp_filter=1/net.ipv4.conf.default.rp_filter=0/' /etc/sysctl.conf
# 为了不重启服务器，执行以下命令：
sysctl -p
```

4.3 安装 neutron 服务

```
apt-get install neutron-plugin-openvswitch-agent neutron-dhcp-agent neutron-l3-agent
```

```
apt-get install neutron-plugin-openvswitch-agent openvswitch-switch
```

4.4 创建网桥

```
#为 Open vSwitch 创建网桥：
ovs-vsctl add-br br-int
#为 Openvswitch 创建外部网络的网桥：
ovs-vsctl add-br br-ex
ovs-vsctl add-port br-ex eth0
```

4.5 配置 neutron.conf

```
#vim /etc/neutron/neutron.conf
#########################注配置文件要包含下面内容#############################
[DEFAULT]
rabbit_host = 192.168.100.11
[keystone_authtoken]
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
auth_url = http://192.168.100.11:35357/v2.0
auth_strategy = keystone
admin_tenant_name = service
admin_user = neutron
admin_password = service_pass
signing_dir = $state_path/keystone-signing
[database]
connection = mysql://neutronUser:neutronPass@192.168.100.11/neutron
```

4.6 配置 ovs_neutron_plugin.ini

```
vim /etc/neutron/plugins/openvswitch/ovs_neutron_plugin.ini
```

```
[ovs]
tenant_network_type = gre
tunnel_id_ranges = 1:1000
enable_tunneling = True
local_ip = 172.16.0.10
[securitygroup]
firewall_driver = neutron.agent.linux.iptables_firewall.OVSHybridIptablesFirewallDriver
```

4.7 配置 l3_agent.ini

```
#vim /etc/neutron/l3_agent.ini
##############################################################################
[DEFAULT]
interface_driver=neutron.agent.linux.interface.OVSInterfaceDriver
auth_url = http://192.168.100.11:35357/v2.0
admin_tenant_name = service
admin_user = neutron
admin_password = neutron_pass
metadata_ip = 192.168.100.11
use_namespaces = True
ovs_use_veth = True
handle_internal_only_routers = True
external_network_bridge = br-ex
```

4.8 配置 api-paste.ini

```
#vim /etc/neutron/api-paste.ini
#################################################################
[DEFAULT]
auth_host=192.168.100.11
```

```
auth_uri=http://192.168.100.11:5000
admin_user=neutron
admin_tenant_name=service
admin_password=service_pass
```

4.9 配置 dhcp_agent.ini

```
#vim /etc/neutron/dhcp_agent.ini
########################################################################
interface_driver = neutron.agent.linux.interface.OVSInterfaceDriver
use_namespaces = True
dhcp_driver = neutron.agent.linux.dhcp.Dnsmasq
```

4.10 配置 metadata_agent.ini

```
#vim /etc/neutron/metadata_agent.ini
########################################################################
auth_url = http://192.168.100.11:5000/v2.0
auth_region = RegionOne
admin_tenant_name = service
admin_user = neutron
admin_password = service_pass
nova_metadata_ip = 192.168.100.11
nova_metadata_port = 8775
```

4.11 重启相关服务

```
#restart neutron-* (按 tab)
```

5 计算结点

5.1 时钟同步

```
#ntpdate 192.168.100.11
#hwclock -w
#echo '10 8 *** root /usr/sbin/ntpdate 192.168.100.11;hwclock -w'>>/etc/crontab
```

5.2 IP 转发

```
sed -i 's/#net.ipv4.ip_forward=1/net.ipv4.ip_forward=1/' /etc/sysctl.conf
sed -i 's/#net.ipv4.conf.all.rp_filter=1/net.ipv4.conf.all.rp_filter=0/' /etc/sysctl.conf
sed -i 's/#net.ipv4.conf.default.rp_filter=1/net.ipv4.conf.default.rp_filter=0/' /etc/sysctl.conf
# 为了不重启服务器，执行以下命令：
sysctl -p
```

5.3 安装 KVM

```
#apt-get install kvm libvirt-bin pm-utils
```

5.4 配置 KVM

```
#vim  /etc/libvirt/qemu.conf
################################################################################
cgroup_device_acl = [
"/dev/null", "/dev/full", "/dev/zero",
"/dev/random", "/dev/urandom",
"/dev/ptmx", "/dev/kvm", "/dev/kqemu",
"/dev/rtc", "/dev/hpet","/dev/net/tun"
]
################################################################################
#vim /etc/libvirt/libvirtd.conf
```

```
################################################################################
listen_tls = 0
listen_tcp = 1
auth_tcp = "none"
################################################################################
#vim /etc/init/libvirt-bin.conf
################################################################################
env libvirtd_opts="-d -l"
################################################################################
#vim /etc/default/libvirt-bin
################################################################################
libvirtd_opts="-d -l"
```

5.5 删除 KVM 默认网桥

```
#virsh net-destroy default
#virsh net-undefine default
```

5.6 重启 KVM 服务

```
#service dbus restart && service libvirt-bin restart
### dbus 必须先启动,否则 libvirt-bin 不能启动
```

5.7 Nova 服务

5.7.1 安装 nova

```
#apt-get install nova-compute-kvm python-guestfs
```

5.7.2 配置 nova.conf

```
#vim /etc/nova/nova.conf
################################################################################
[DEFAULT]
```

```
logdir=/var/log/nova
state_path=/var/lib/nova
lock_path=/run/lock/nova
verbose=True
api_paste_config=/etc/nova/api-paste.ini
compute_scheduler_driver=nova.scheduler.simple.SimpleScheduler
rabbit_host=192.168.100.11
nova_url=http://192.168.100.11:8774/v1.1/
sql_connection=mysql://novaUser:novaPass@192.168.100.11/nova
root_helper=sudo nova-rootwrap /etc/nova/rootwrap.conf

# Auth
use_deprecated_auth=false
auth_strategy=keystone

# Imaging service
glance_api_servers=192.168.100.11:9292
image_service=nova.image.glance.GlanceImageService

# Vnc configuration
novnc_enabled=true
novncproxy_base_url=http://10.10.10.11:6080/vnc_auto.html
novncproxy_port=6080
vncserver_proxyclient_address=192.168.100.17
vncserver_listen=0.0.0.0

# Network settings
network_api_class=nova.network.neutronv2.api.API
neutron_url=http://192.168.100.11:9696/
```

```
neutron_auth_strategy=keystone
neutron_admin_tenant_name=service
neutron_admin_username=neutron
neutron_admin_password=service_pass
neutron_admin_auth_url=http://192.168.100.11:35357/v2.0/
libvirt_vif_driver=nova.virt.libvirt.vif.LibvirtHybridOVSBridgeDriver
linuxnet_interface_driver=nova.network.linux_net.LinuxOVSInterfaceDriver
#If you want Neutron + Nova Security groups
#firewall_driver=nova.virt.firewall.NoopFirewallDriver
security_group_api=neutron
#If you want Nova Security groups only, comment the two lines above and uncomment line -1-.
#-1-firewall_driver=nova.virt.libvirt.firewall.IptablesFirewallDriver

#Metadata
service_neutron_metadata_proxy = True
neutron_metadata_proxy_shared_secret = helloOpenStack

# Compute #
compute_driver=libvirt.LibvirtDriver

# Cinder #
volume_api_class=nova.volume.cinder.API
osapi_volume_listen_port=5900

#ceilometer#
instance_usage_audit=True
instance_usage_audit_period=hour
notify_on_state_change=vm_and_task_state
notification_driver=nova.openstack.common.notifier.rpc_notifier
```

```
notification_driver=ceilometer.compute.nova_notifier
```

5.7.3 配置 api-paste.ini

```
#vim /etc/nova/api-paste.ini
#############################################################################
[filter:authtoken]
paste.filter_factory = keystoneclient.middleware.auth_token:filter_factory
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
auth_uri=http://192.168.100.11:5000
admin_tenant_name = service
admin_user = nova
admin_password = service_pass
signing_dirname = /tmp/keystone-signing-nova
# Workaround for https://bugs.launchpad.net/nova/+bug/1154809
auth_version = v2.0
```

5.7.4 重启相关服务

```
#restart nova-*(按 tab)
```

5.8 Nentron 服务

5.8.1 安装

```
#apt-get install openvswitch-switch neutron-plugin-openvswitch-agent
```

5.8.2 创建网桥

```
#ovs-vsctl add-br br-int
```

5.8.3 配置 neutron.conf

```
#vim /etc/neutron/neutron.conf
```

```
##############################################################################
[DEFAULT]
rabbit_password = guest
rabbit_host = 192.168.100.11
[keystone_authtoken]
auth_host = 192.168.100.11
auth_port = 35357
auth_protocol = http
admin_tenant_name = service
admin_user = neutron
admin_password = service_pass
signing_dir = $state_path/keystone-signing
auth_url = http://192.168.100.11:35357/v2.0
auth_strategy = keystone
[database]
connection = mysql://neutronUser:neutronPass@192.168.100.11/neutron
```

5.8.4 配置 ovs_neutron_plugin.ini

```
#vim /etc/neutron/plugins/openvswitch/ovs_neutron_plugin.ini
##############################################################################
[ovs]
tenant_network_type = gre
tunnel_id_ranges = 1:1000
enable_tunneling = True
local_ip = 172.16.0.17
tunnel_bridge = br-tun
integration_bridge = br-int
[database]
connection = mysql://neutronUser:neutronPass@192.168.100.11:3306/neutron
[securitygroup]
```

```
firewall_driver = neutron.agent.linux.iptables_firewall.OVSHybridIptablesFirewallDriver
```

配置 api-paste.ini

```
#vim /etc/neutron/api-paste.ini
#################################################################################
[filter:authtoken]
paste.filter_factory = keystoneclient.middleware.auth_token:filter_factory
auth_host=192.168.100.11
admin_user=neutron
admin_tenant_name=service
admin_password=service_pass
```

重启相关服务

```
#restart netron-*(按 tab)
```

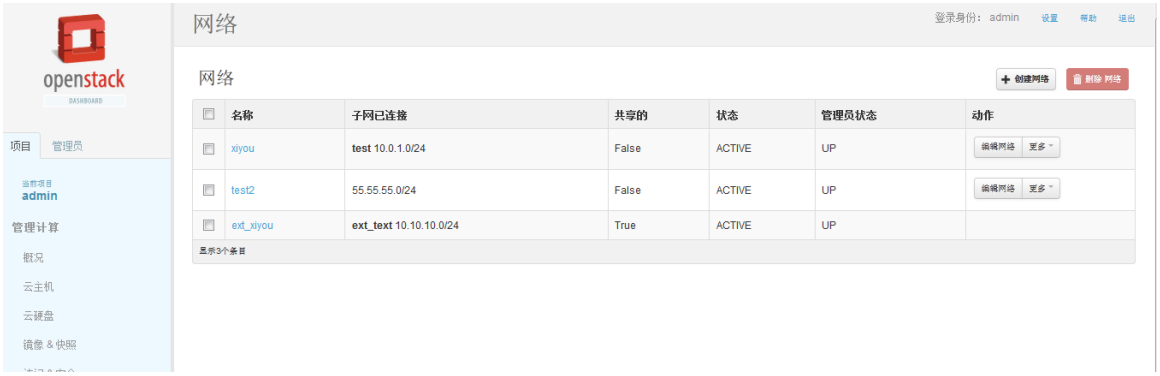
6 测试

http://10.10.10.11/horizon

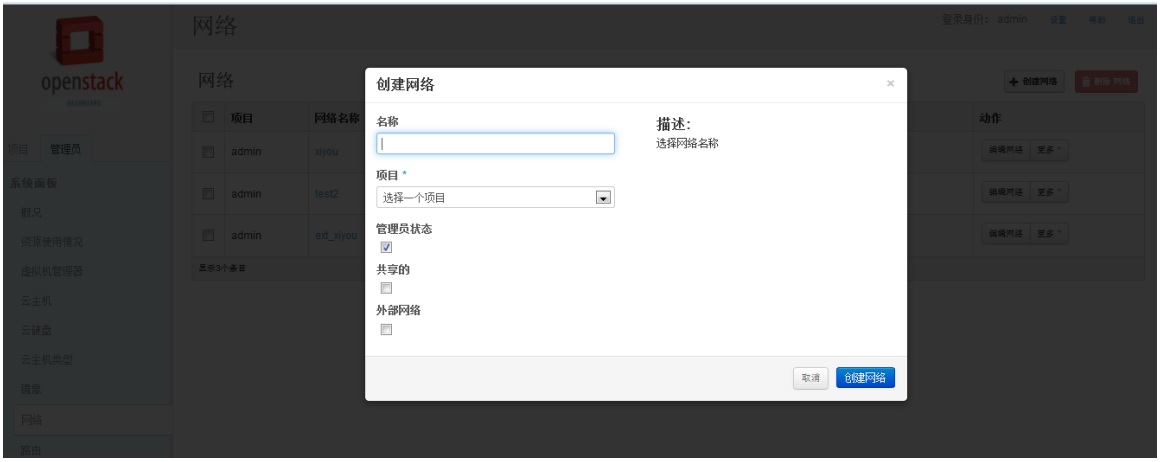
用户名:admin

密码:admin_pass

6.1 添加基本网络



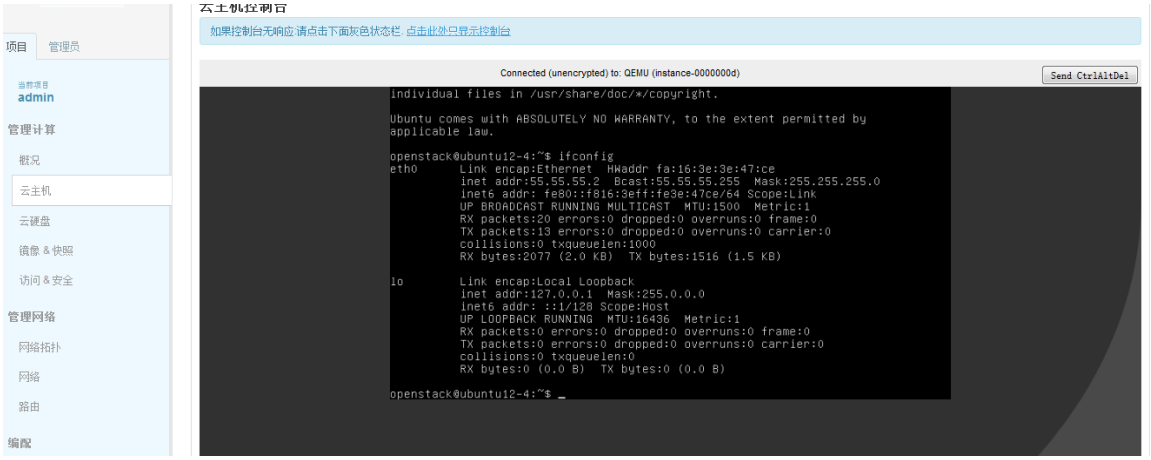
6.2 添加外部网络



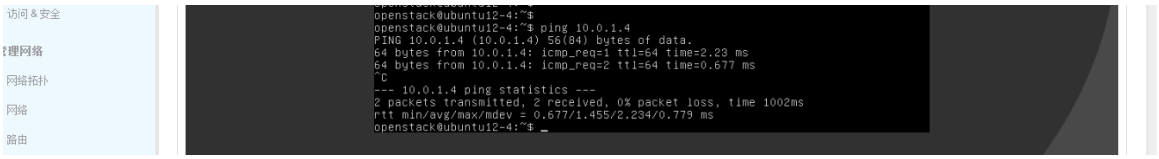
6.3 设置路由

6.4 设置安全组

6.5 查看创建虚拟机是否获得 IP



6.6 同一网络相互 ping



6.7 分配不同网络 floatIP

云主机名称	镜像名称	IP 地址	配置	密钥对	状态	任务	电源状态	正常运行时间	动作
test3	ubuntu12.04	55.55.55.2 10.10.10.122	m1.small | 2GB 内存 | 1 虚拟内核 | 20.0GB 盘	-	Active	None	Running	3 分钟	创建快照 更多
test3	ubuntu12.04	10.0.1.4 10.10.10.123	m1.small | 2GB 内存 | 1 虚拟内核 | 20.0GB 盘	-	Active	None	Running	2 天, 15 小时	创建快照 更多
test2	ubuntu12.04	10.0.1.2 10.10.10.122	m1.small | 2GB 内存 | 1 虚拟内核 | 20.0GB 盘	-	Active	None	Running	2 天, 15 小时	创建快照 更多

显示3个条目

6.8 ssh 虚拟机公网