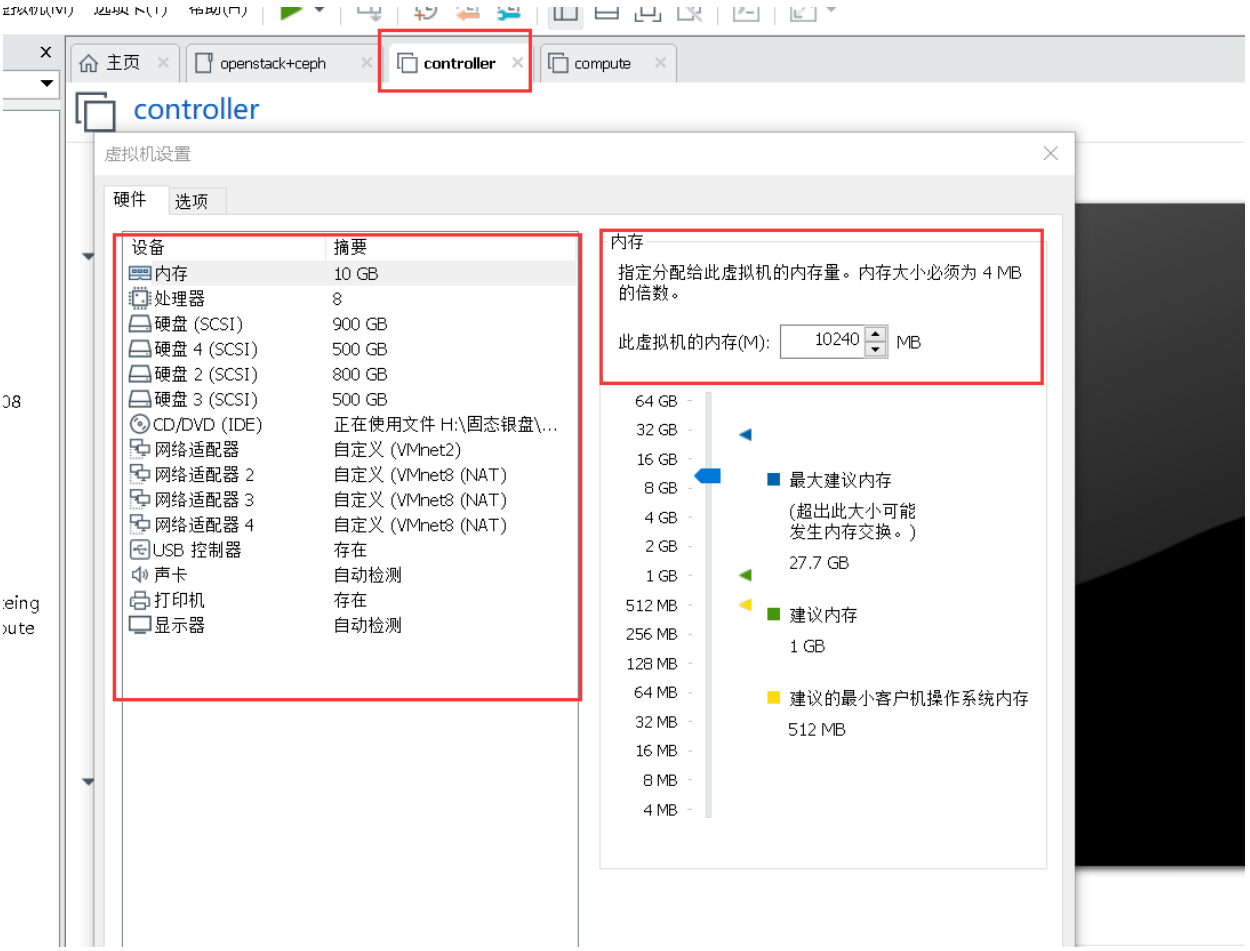
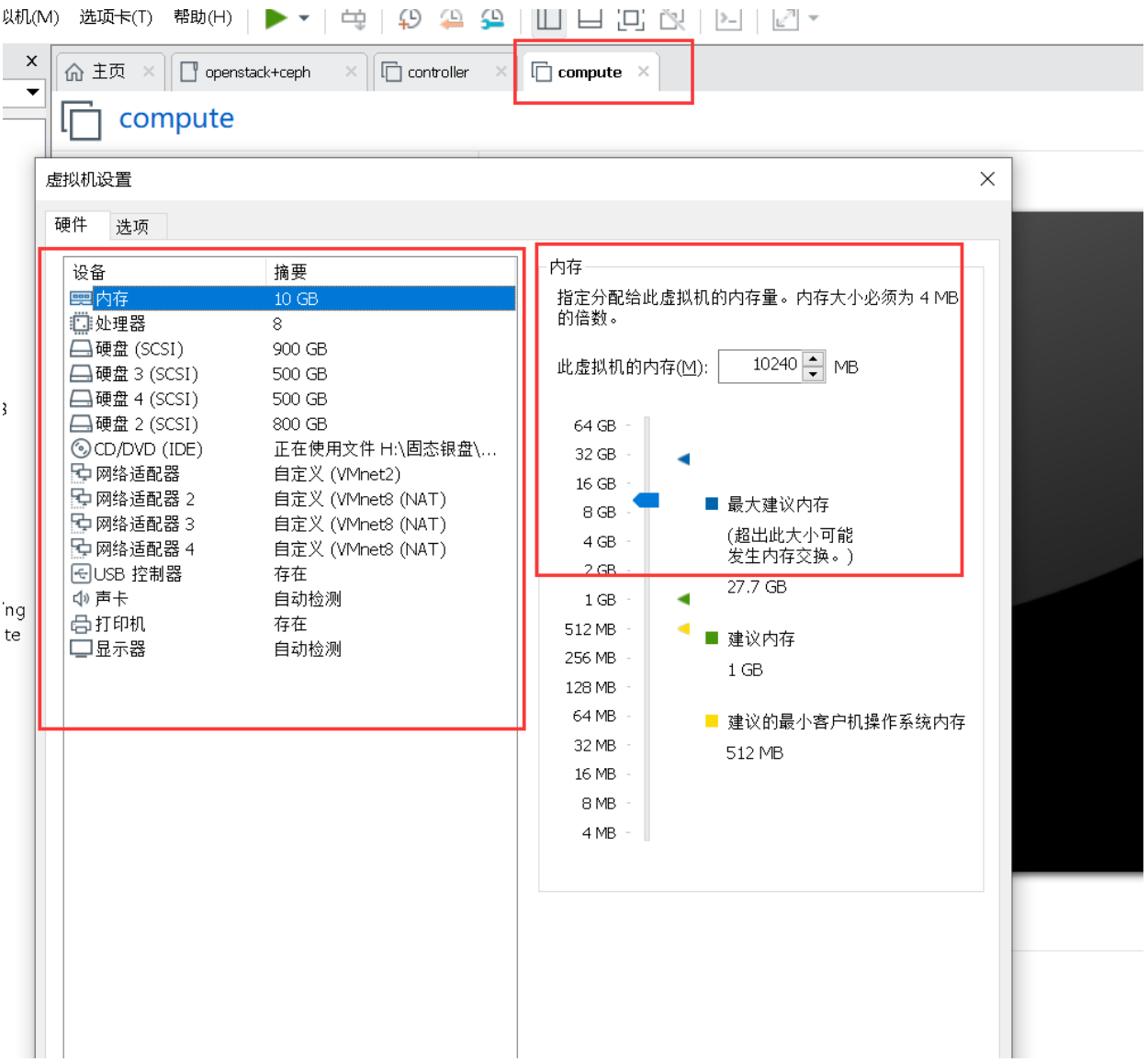
本次实验搭建openstack版本为T版：

操作系统：CentOS-7-x86_64-DVD-2009 最小化安装

主机名	网卡1	网卡2	网卡3	网卡4	磁盘1	磁盘2	磁盘3	磁盘4
compute	仅主机模式	net模式	net模式	net模式	900G	800G	500G	500G
controller	仅主机模式	net模式	net模式	net模式	900G	800G	500G	500G




以机(M) 选项卡(T) 帮助(H)
主页
openstack+ceph
controller
compute
compute
虚拟机设置
硬件
选项
设备
摘要
内存 10 GB
处理器 8
硬盘 (SCSI) 900 GB
硬盘 3 (SCSI) 500 GB
硬盘 4 (SCSI) 500 GB
硬盘 2 (SCSI) 800 GB
CD/DVD (IDE) 正在使用文件 H:\固态银盘\...
网络适配器 自定义 (VMnet2)
网络适配器 2 自定义 (VMnet8 (NAT)
网络适配器 3 自定义 (VMnet8 (NAT)
网络适配器 4 自定义 (VMnet8 (NAT)
USB 控制器 存在
声卡 自动检测
打印机 存在
显示器 自动检测
内存
指定分配给此虚拟机的内存量。内存大小必须为 4 MB 的倍数。
此虚拟机的内存(M): 10240 MB
64 GB
32 GB
16 GB
8 GB
4 GB
2 GB
1 GB
512 MB
256 MB
128 MB
64 MB
32 MB
16 MB
8 MB
4 MB
最大建议内存
(超出此大小可能发生内存交换。)
27.7 GB
建议内存
1 GB
建议的最小客户机操作系统内存
512 MB

一、基础配置：修改主机名、配置IP、关闭防火墙、换源等。

```
controller compute等同操作
[root@localhost ~]# hostnamectl set-hostname compute
[root@localhost ~]# systemctl stop firewalld
[root@localhost ~]# systemctl disable firewalld
Removed symlink /etc/systemd/system/multi-user.target.wants/firewalld.service.
Removed symlink /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
[root@localhost ~]#

[root@localhost ~]# vi /etc/sysconfig/selinux
[root@localhost ~]#
[root@localhost ~]# setenforce 0
[root@localhost ~]# cat /etc/sysconfig/selinux

# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
# enforcing - SELinux security policy is enforced.
# permissive - SELinux prints warnings instead of enforcing.
# disabled - No SELinux policy is loaded.
```

```
SELINUX=disabled
# SELINUXTYPE= can take one of three values:
# targeted - Targeted processes are protected,
# minimum - Modification of targeted policy. Only selected processes a
re protected.
# mls - Multi Level Security protection.
SELINUXTYPE=targeted


[root@controller ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN gr
oup default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens33: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
state UP group default qlen 1000
    link/ether 00:0c:29:ca:b5:4d brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.147/24 brd 192.168.100.255 scope global noprefixrout
e dynamic ens33
       valid_lft 1392sec preferred_lft 1392sec
    inet6 fe80::85fe:953:9b99:cbf5/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
3: ens34: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
state UP group default qlen 1000
    link/ether 00:0c:29:ca:b5:57 brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.33/24 brd 192.168.73.255 scope global noprefixroute d
ynamic ens34
       valid_lft 1393sec preferred_lft 1393sec
    inet6 fe80::c6cd:20fb:39dc:f3c3/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
4: ens35: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
state UP group default qlen 1000
    link/ether 00:0c:29:ca:b5:61 brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.22/24 brd 192.168.73.255 scope global noprefixroute d
ynamic ens35
       valid_lft 1393sec preferred_lft 1393sec
    inet6 fe80::454a:e9a4:8e3a:8026/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
5: ens36: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
state UP group default qlen 1000
```

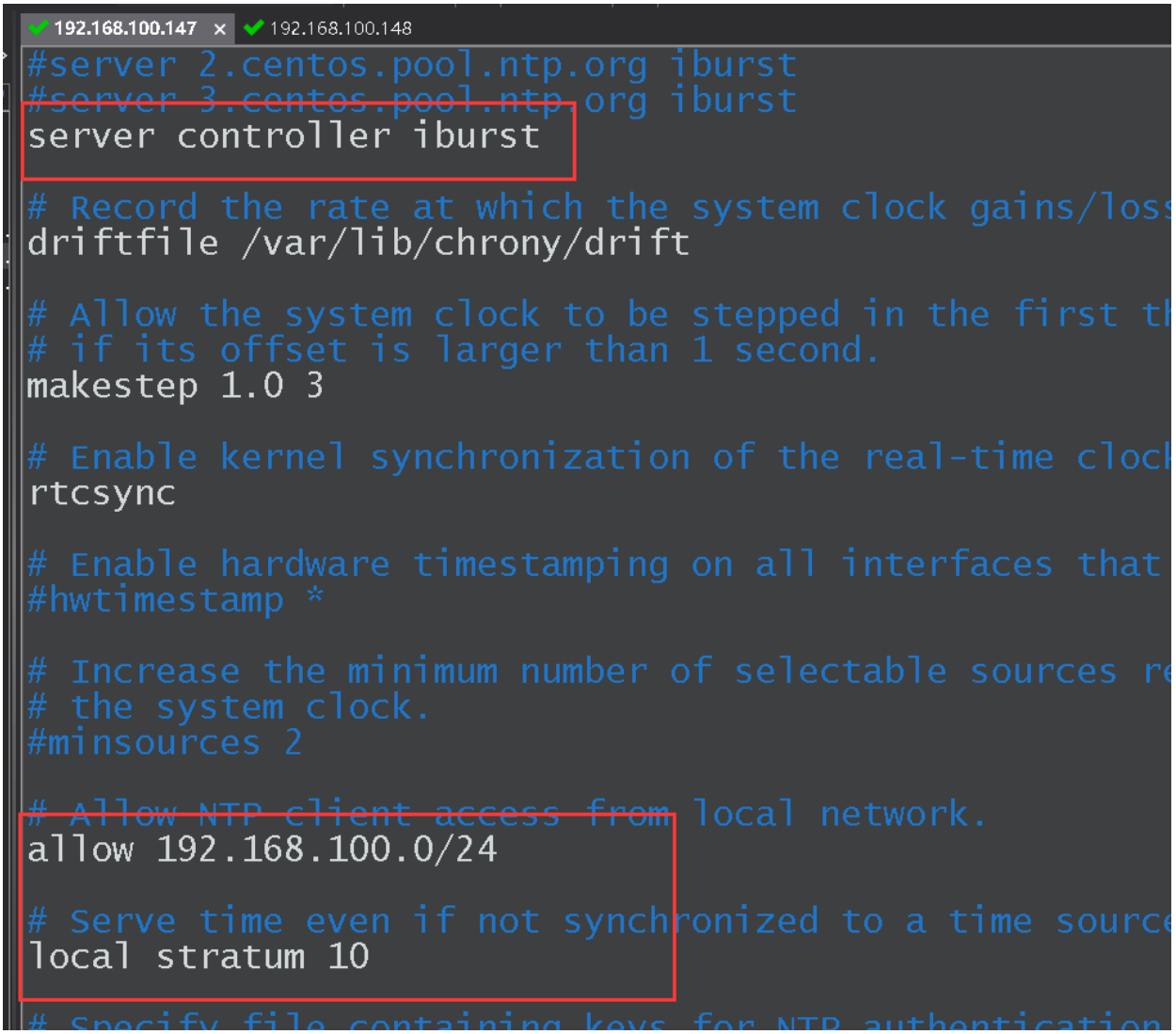
```
    link/ether 00:0c:29:ca:b5:6b brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.38/24 brd 192.168.73.255 scope global noprefixroute d
ynamic ens36
    valid_lft 1393sec preferred_lft 1393sec
    inet6 fe80::ff85:a272:aa89:b205/64 scope link noprefixroute
    valid_lft forever preferred_lft forever



[root@compute ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN gr
oup default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
    valid_lft forever preferred_lft forever
2: ens33: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
state UP group default qlen 1000
    link/ether 00:0c:29:4b:96:64 brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.148/24 brd 192.168.100.255 scope global noprefixrout
e dynamic ens33
    valid_lft 1444sec preferred_lft 1444sec
    inet6 fe80::8987:5ea3:70a9:a911/64 scope link noprefixroute
    valid_lft forever preferred_lft forever
3: ens34: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
state UP group default qlen 1000
    link/ether 00:0c:29:4b:96:6e brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.24/24 brd 192.168.73.255 scope global noprefixroute d
ynamic ens34
    valid_lft 1450sec preferred_lft 1450sec
    inet6 fe80::3e0b:baad:4db3:6cf8/64 scope link noprefixroute
    valid_lft forever preferred_lft forever
4: ens35: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
state UP group default qlen 1000
    link/ether 00:0c:29:4b:96:78 brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.25/24 brd 192.168.73.255 scope global noprefixroute d
ynamic ens35
    valid_lft 1450sec preferred_lft 1450sec
    inet6 fe80::dd47:d7e4:6188:31f4/64 scope link noprefixroute
    valid_lft forever preferred_lft forever
```

```
5: ens36: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
  link/ether 00:0c:29:4b:96:82 brd ff:ff:ff:ff:ff:ff
  inet 192.168.73.36/24 brd 192.168.73.255 scope global noprefixroute dynamic ens36
  valid_lft 1450sec preferred_lft 1450sec
  inet6 fe80::75a3:d244:5cfe:c7ba/64 scope link noprefixroute
  valid_lft forever preferred_lft forever

配置hosts映射
[root@controller ~]# echo "192.168.100.147 controller" >>/etc/hosts
[root@controller ~]# echo "192.168.100.148 compute" >>/etc/hosts
[root@controller ~]#

```

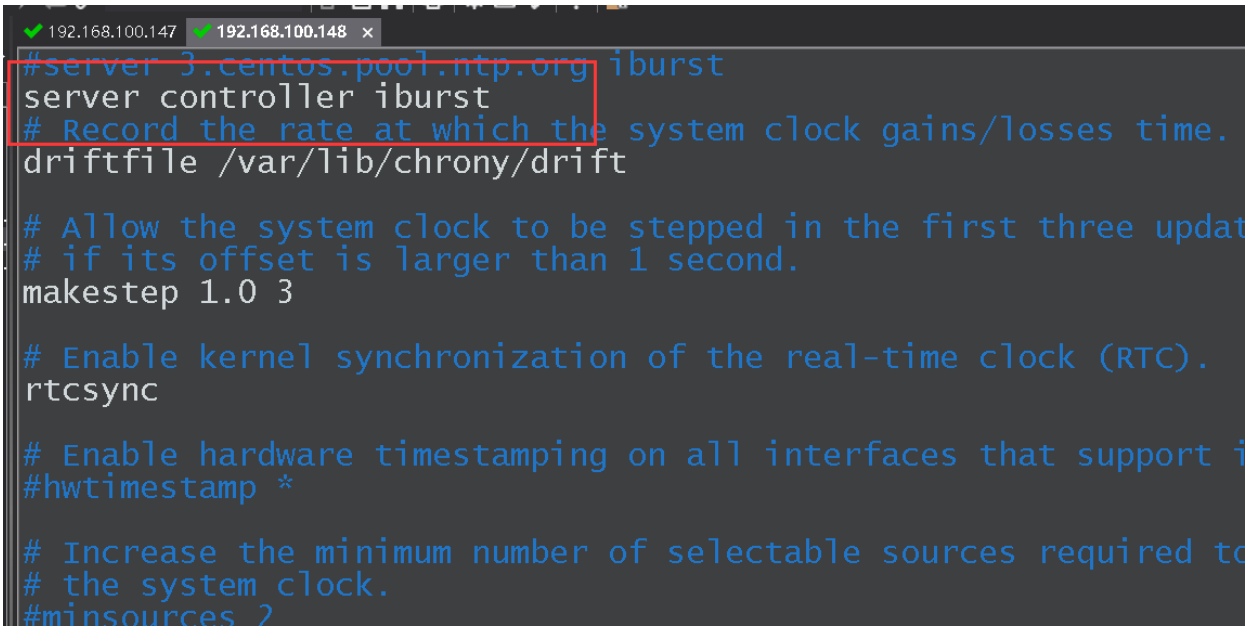
二、时间同步

```
[root@compute ~]# yum install chrony vim -y

```

controller



compute



controller 和 compute

```
[root@controller ~]# systemctl restart chronyd
[root@controller ~]# systemctl enable chronyd
[root@controller ~]# chronyc sources
210 Number of sources = 1
MS Name/IP address Stratum Poll Reach LastRx Last sample
===============================================================================
^* controller 10 6 377 51 -391ns[-3913ns] +/- 18us
[root@controller ~]#
[root@controller ~]# clock -w

 [root@compute ~]# systemctl restart chronyd
 systemctl enable chronyd [root@compute ~]# systemctl enable chronyd
 [root@compute ~]# chronyc sources
 210 Number of sources = 1
 MS Name/IP address Stratum Poll Reach LastRx Last sample
 ===============================================================================
 ^* controller 11 6 17 11 +614ns[ -17us] +/- 241us
 [root@compute ~]#
 [root@compute ~]# clock -w
```

三、安装openstack-T版源

controller 和 compute等同操作

```
[root@controller ~]# yum install centos-release-openstack-train -y
```

```
[root@controller ~]# yum upgrade -y
[root@controller ~]# yum install python-openstackclient -y
[root@controller ~]# yum install openstack-selinux -y
```

```
[root@compute ~]# yum install centos-release-openstack-train -y
[root@compute ~]# yum upgrade -y
[root@compute ~]# yum install python-openstackclient -y
[root@compute ~]# yum install openstack-selinux -y
```

关机打快照

接下来的配置会在controller节点配置（注意细心）

四、mysql等基础服务

1.安装数据库

```
重置数据库
[root@controller ~]# yum install mariadb mariadb-server python2-PyMySQL -y
[root@controller ~]# cat /etc/my.cnf.d/openstack.cnf
[mysqld]

bind-address = 192.168.100.147

default-storage-engine = innodb

 innodb_file_per_table = on

 max_connections = 4096

 collation-server = utf8_general_ci

 character-set-server = utf8
 [root@controller ~]# systemctl enable mariadb.service
 Created symlink from /etc/systemd/system/mysql.service to /usr/lib/systemd/system/mariadb.service.
 Created symlink from /etc/systemd/system/mysqld.service to /usr/lib/systemd/system/mariadb.service.
 Created symlink from /etc/systemd/system/multi-user.target.wants/mariadb.service to /usr/lib/systemd/system/mariadb.service.
 [root@controller ~]# systemctl start mariadb.service
 [root@controller ~]#

```

```
重置数据库密码：000000
[root@controller ~]# mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
 SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user. If you've just installed MariaDB, and
you haven't set the root password yet, the password will be blank,
 so you should just press enter here.

 Enter current password for root (enter for none):
 OK, successfully used password, moving on...

 Setting the root password ensures that nobody can log into the MariaDB
 root user without the proper authorisation.

 Set root password? [Y/n] y
 New password:
 Re-enter new password:
 Password updated successfully!
 Reloading privilege tables..
  ... Success!


 By default, a MariaDB installation has an anonymous user, allowing any
one
 to log into MariaDB without having to have a user account created for
 them. This is intended only for testing, and to make the installation
 go a bit smoother. You should remove them before moving into a
 production environment.

 Remove anonymous users? [Y/n] y
  ... Success!

 Normally, root should only be allowed to connect from 'localhost'. Thi
s
 ensures that someone cannot guess at the root password from the networ
k.

```

```
Disallow root login remotely? [Y/n] y
 ... Success!

By default, MariaDB comes with a database named 'test' that anyone car
access. This is also intended only for testing, and should be removed
before moving into a production environment.

Remove test database and access to it? [Y/n] y
 - Dropping test database...
 ... Success!
 - Removing privileges on test database...
 ... Success!

Reloading the privilege tables will ensure that all changes made so fa
r
will take effect immediately.

Reload privilege tables now? [Y/n] y
 ... Success!

Cleaning up...

All done! If you've completed all of the above steps, your MariaDB
installation should now be secure.

Thanks for using MariaDB!
```

2.安装消息队列*rabbitmq*

```
[root@controller ~]# yum install rabbitmq-server -y
[root@controller ~]# systemctl start rabbitmq-server.service
[root@controller ~]# systemctl enable rabbitmq-server.service
Created symlink from /etc/systemd/system/multi-user.target.wants/rabbi
tmq-server.service to /usr/lib/systemd/system/rabbitmq-server.service
[root@controller ~]# rabbitmqctl add_user openstack 000000 ##创建openst
ack用户并设置000000密码
Creating user "openstack"
[root@controller ~]# rabbitmqctl set_permissions openstack ".*" ".*"
".*" ##赋予权限
Setting permissions for user "openstack" in vhost "/"
[root@controller ~]#
[root@controller ~]# yum install net-tools

```

```
[root@controller ~]# netstat -tnlup
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:25672           0.0.0.0:*               LISTEN      8083/beam.smp
tcp        0      0 192.168.100.147:3306    0.0.0.0:*               LISTEN      7919/mysqld
tcp        0      0 0.0.0.0:4369            0.0.0.0:*               LISTEN      1/systemd
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN      1089/sshd
tcp        0      0 127.0.0.1:25            0.0.0.0:*               LISTEN      1364/master
tcp6       0      0 :::5672                 :::*                    LISTEN      8083/beam.smp
tcp6       0      0 :::22                   :::*                    LISTEN      1089/sshd
tcp6       0      0 ::1:25                  :::*                    LISTEN      1364/master
udp        0      0 0.0.0.0:68              0.0.0.0:*                           777/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           679/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           676/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           670/dhclient
udp        0      0 0.0.0.0:123             0.0.0.0:*                           565/chronyd
udp        0      0 127.0.0.1:323           0.0.0.0:*                           565/chronyd
udp6       0      0 ::1:323                 :::*                                565/chronyd
[root@controller ~]#
```

3.安装memcache

```
[root@controller ~]# yum install memcached python-memcached -y
[root@controller ~]# cat /etc/sysconfig/memcached
PORT="11211"
USER="memcached"
MAXCONN="1024"
CACHESIZE="64"
OPTIONS="-l 127.0.0.1,::1,controller"

[root@controller ~]# systemctl start memcached.service
 [root@controller ~]# systemctl enable memcached.service
 Created symlink from /etc/systemd/system/multi-user.target.wants/memca
ched.service to /usr/lib/systemd/system/memcached.service.
```

```
[root@controller ~]# netstat -tnlup
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:25672           0.0.0.0:*               LISTEN      8083/beam.smp
tcp        0      0 192.168.100.147:3306    0.0.0.0:*               LISTEN      7919/mysqld
tcp        0      0 192.168.100.147:11211   0.0.0.0:*               LISTEN      9195/memcached
tcp        0      0 127.0.0.1:11211         0.0.0.0:*               LISTEN      9195/memcached
tcp        0      0 0.0.0.0:4369            0.0.0.0:*               LISTEN      1/systemd
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN      1089/sshd
tcp        0      0 127.0.0.1:25            0.0.0.0:*               LISTEN      1364/master
tcp6       0      0 :::5672                 :::*                    LISTEN      8083/beam.smp
tcp6       0      0 ::1:11211               :::*                    LISTEN      9195/memcached
tcp6       0      0 :::22                   :::*                    LISTEN      1089/sshd
tcp6       0      0 ::1:25                  :::*                    LISTEN      1364/master
udp        0      0 0.0.0.0:68              0.0.0.0:*                           777/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           679/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           676/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           670/dhclient
udp        0      0 0.0.0.0:123             0.0.0.0:*                           565/chronyd
udp        0      0 127.0.0.1:323           0.0.0.0:*                           565/chronyd
udp6       0      0 ::1:323                 :::*                                565/chronyd
[root@controller ~]#
```

4.安装etcd

```
[root@controller ~]# yum install etcd -y

[root@controller ~]# vim /etc/etcd/etcd.conf
ETCD_DATA_DIR="/var/lib/etcd/default.etcd"
ETCD_LISTEN_PEER_URLS="http://192.168.100.147:2380"
ETCD_LISTEN_CLIENT_URLS="http://192.168.100.147:2379"
```

```
ETCD_NAME="controller"
ETCD_INITIAL_ADVERTISE_PEER_URLS="http://192.168.100.147:2380"
ETCD_ADVERTISE_CLIENT_URLS="http://192.168.100.147:2379"
 ETCD_INITIAL_CLUSTER="controller=http://192.168.100.147:2380"
 ETCD_INITIAL_CLUSTER_TOKEN="etcd-cluster-01"
 ETCD_INITIAL_CLUSTER_STATE="new"

 [root@controller ~]# systemctl start etcd
 [root@controller ~]# systemctl enable etcd
 Created symlink from /etc/systemd/system/multi-
user.target.wants/etcd.service to /usr/lib/systemd/system/etcd.service.
```

```
[root@controller ~]# netstat -tnlup
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:25672           0.0.0.0:*               LISTEN      8083/beam.smp
tcp        0      0 192.168.100.147:3306    0.0.0.0:*               LISTEN      7919/mysqld
tcp        0      0 192.168.100.147:2379    0.0.0.0:*               LISTEN      9653/etcd
tcp        0      0 192.168.100.147:11211   0.0.0.0:*               LISTEN      9195/memcached
tcp        0      0 127.0.0.1:11211         0.0.0.0:*               LISTEN      9195/memcached
tcp        0      0 192.168.100.147:2380    0.0.0.0:*               LISTEN      9653/etcd
tcp        0      0 0.0.0.0:4369            0.0.0.0:*               LISTEN      1/systemd
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN      1089/sshd
tcp        0      0 127.0.0.1:25            0.0.0.0:*               LISTEN      1364/master
tcp6       0      0 :::5672                 :::*                    LISTEN      8083/beam.smp
tcp6       0      0 ::1:11211               :::*                    LISTEN      9195/memcached
tcp6       0      0 :::22                   :::*                    LISTEN      1089/sshd
tcp6       0      0 ::1:25                  :::*                    LISTEN      1364/master
udp        0      0 0.0.0.0:68              0.0.0.0:*                           777/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           679/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           676/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           670/dhclient
udp        0      0 0.0.0.0:123             0.0.0.0:*                           565/chronyd
udp        0      0 127.0.0.1:323           0.0.0.0:*                           565/chronyd
udp6       0      0 ::1:323                 :::*                                565/chronyd
[root@controller ~]#
```

关机打快照

五、keyston服务

1.创建keyston数据库

```
[root@controller ~]# mysql -u root -p000000
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.3.20-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input st
atement.

 MariaDB [(none)]>
 MariaDB [(none)]> CREATE DATABASE keystone;
 Query OK, 1 row affected (0.000 sec)

```

```
MariaDB [(none)]> GRANT ALL PRIVILEGES ON keystone.* TO 'keystone'@'localhost' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON keystone.* TO 'keystone'@'%' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> exit
Bye
```

2.安装keyston

```
[root@controller ~]# yum install openstack-keystone httpd mod_wsgi -y
切记在这里千万不要安装epel.repo源
[root@controller ~]# cp /etc/keystone/keystone.conf /etc/keystone/keystone.conf.bak
[root@controller ~]# grep -Ev '^$|#' /etc/keystone/keystone.conf.bak >/etc/keystone/keystone.conf
[root@controller ~]#

[root@controller ~]# vim /etc/keystone/keystone.conf
[database]
connection = mysql+pymysql://keystone:000000@controller/keystone
[token]
provider = fernet
填充数据库并查看数据表
[root@controller ~]# su -s /bin/sh -c "keystone-manage db_sync" keystone
[root@controller ~]# mysql keystone -p000000 -e 'show tables'
+-----------------------------------+
| Tables_in_keystone |
+-----------------------------------+
| access_rule |
| access_token |
| application_credential |
| application_credential_access_rule |
| application_credential_role |
| assignment |
| config_register |
```

```
| consumer |
| credential |
| endpoint |
| endpoint_group |
| federated_user |
| federation_protocol |
| group |
| id_mapping |
| identity_provider |

初始化数据库密钥
[root@controller ~]# keystone-manage fernet_setup --keystone-user keystone --keystone-group keystone
[root@controller ~]# keystone-manage credential_setup --keystone-user keystone --keystone-group keystone
[root@controller ~]# keystone-manage bootstrap --bootstrap-password 000000 --bootstrap-admin-url http://controller:5000/v3/ --bootstrap-internal-url http://controller:5000/v3/ --bootstrap-public-url http://controller:5000/v3/ --bootstrap-region-id RegionOne
[root@controller ~]#

[root@controller ~]# vim /etc/httpd/conf/httpd.conf
 ServerName controller ##修改
创建软链接并设置开机并自启
[root@controller ~]# ln -s /usr/share/keystone/wsgi-keystone.conf /etc/httpd/conf.d/
[root@controller ~]# systemctl restart httpd.service
[root@controller ~]# systemctl enable httpd.service
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.
[root@controller ~]# openstack domain list
+---------+---------+---------+--------------------+
| ID | Name | Enabled | Description |
+---------+---------+---------+--------------------+
| default | Default | True | The default domain |
+---------+---------+---------+--------------------+
[root@controller ~]# openstack project list
+----------------------------------+-------+
| ID | Name |
+----------------------------------+-------+
| 883c664aed47476d93e306deb5ea24f2 | admin |
+----------------------------------+-------+
```

```
[root@controller ~]# openstack user list
+----------------------------------+-------+
| ID | Name |
+----------------------------------+-------+
| dc2a6ca49a97440480d65ae67a18b11a | admin |
+----------------------------------+-------+
 创建服务所使用的项目
 [root@controller ~]# openstack project create --domain default --desc
ription "Service Project" service
+-------------+----------------------------------+
| Field | Value |
+-------------+----------------------------------+
| description | Service Project |
| domain_id | default |
| enabled | True |
| id | 467dfb18208544e2896ca68619b0fb2a |
| is_domain | False |
| name | service |
| options | {} |
| parent_id | default |
| tags | [] |
+-------------+----------------------------------+
 创建user角色
[root@controller ~]# openstack role create user
+-------------+----------------------------------+
| Field | Value |
+-------------+----------------------------------+
| description | None |
| domain_id | None |
| id | 90979d7dc73446f3a8aee50cd2221e45 |
| name | user |
| options | {} |
+-------------+----------------------------------+
[root@controller ~]# unset OS_AUTH_URL OS_PASSWORD
[root@controller ~]#
[root@controller ~]# openstack --os-auth-url http://controller:5000/v3
--os-project-domain-name default --os-user-domain-name default --os-proje
ct-name admin --os-username admin token issue
Password:
Password:
```

```
+------------+----------------------------------------------------------
------------------------------------------------------------------------
-----------------------------------------------------------+
| Field | Value |
+------------+----------------------------------------------------------
------------------------------------------------------------------------
-----------------------------------------------------------+
| expires | 2021-11-08T12:50:57+0000 |
| id | gAAAAABhiQ8h1VKDODrqoATCYzf_U2dGl5ef1e_MfVpywdm3EK82bFRb4cTwDo
K9Um5pYWE7V6RxDyZjMtn2lyfNhGjxITzgY5V4lr4FXePqBoXVmkUOn1z10EFssPZ_uzsmTJI
KnPJTnuLBCst4un4A3kHg5UBtBchx01alrrmeKmBg60JBeD0 |
| project_id | 883c664aed47476d93e306deb5ea24f2 |
| user_id | dc2a6ca49a97440480d65ae67a18b11a |
+------------+----------------------------------------------------------
------------------------------------------------------------------------
-----------------------------------------------------------+
[root@controller ~]#
[root@controller ~]# cat admin-openrc.sh 配置环境变量
export OS_PROJECT_DOMAIN_NAME=default
export OS_USER_DOMAIN_NAME=default
export OS_PROJECT_NAME=admin
export OS_USERNAME=admin
export OS_PASSWORD=000000
export OS_AUTH_URL=http://controller:5000/v3
export OS_IDENTITY_API_VERSION=3
export OS_IMAGE_API_VERSION=2

[root@controller ~]# . admin-openrc.sh ##验证变量
[root@controller ~]# openstack token issue
+------------+----------------------------------------------------------
------------------------------------------------------------------------
-----------------------------------------------------------+
| Field | Value |
+------------+----------------------------------------------------------
------------------------------------------------------------------------
-----------------------------------------------------------+
| expires | 2021-11-08T12:53:02+0000 |
| id | gAAAAABhiQ-epxmjPxjmfBiyhCW-QHv64YxsAZkcfC9ibzo0MDzbzCYOORXDd9
ro2mFX42EtyK2DS2Ar7fE8qBaIPOsl76eKb-8FlNaWN_ROfRimESYytlytN8mGY0dQ5OPgtNr
R7B1-zEdhHJZEbvcViL8at9_EwMp_kC_MLVJBk_ri000fDFc |
| project_id | 883c664aed47476d93e306deb5ea24f2 |
| user_id | dc2a6ca49a97440480d65ae67a18b11a |
+------------+----------------------------------------------------------
------------------------------------------------------------------------
```

```
----------------------------------------------------------+
```

```
[root@controller ~]# curl http://controller:5000 ##查看能否得到API
{"versions": {"values": [{"status": "stable", "updated": "2019-07-19T0
0:00:00Z", "media-types": [{"base": "application/json", "type": "applicat
ion/vnd.openstack.identity-v3+json"}], "id": "v3.13", "links": [{"href":
"http://controller:5000/v3/", "rel": "self"}]}]}}
```

至此keyston部署完成 （关机打快照）

六、glance安装

1.数据库配置

```
[root@controller ~]# mysql -u root -p000000
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.3.20-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input st
atement.

MariaDB [(none)]> CREATE DATABASE glance;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON glance.* TO 'glance'@'localh
ost' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON glance.* TO 'glance'@'%' IDE
NTIFIED BY '000000';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> exit
Bye
```

安装并配置

```
[root@controller ~]# . admin-openrc.sh
创建一个glance用户
```

```
[root@controller ~]# openstack user create --domain default --password 000000 glance
+---------------------+----------------------------------+
| Field | Value |
+---------------------+----------------------------------+
| domain_id | default |
| enabled | True |
| id | ac9093ac589f4e4cacf357419e20bef5 |
| name | glance |
| options | {} |
| password_expires_at | None |
+---------------------+----------------------------------+
```

授权

```
[root@controller ~]# openstack role add --project service --user glance admin
```

创建服务实体

```
[root@controller ~]# openstack service create --name glance --description "OpenStack Image" image
+-------------+----------------------------------+
| Field | Value |
+-------------+----------------------------------+
| description | OpenStack Image |
| enabled | True |
| id | 0175c595f0844cc69fc68da494eae877 |
| name | glance |
| type | image |
+-------------+----------------------------------+
```

创建镜像服务API访问端点

```
[root@controller ~]# openstack endpoint create --region RegionOne image public http://controller:9292
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | 0c47bcd27f26437f83381b16d665b8ec |
| interface | public |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 0175c595f0844cc69fc68da494eae877 |
| service_name | glance |
| service_type | image |
```

```
| url | http://controller:9292 |
+--------------+----------------------------------+
[root@controller ~]# openstack endpoint create --region RegionOne imag
e internal http://controller:9292
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | 94a18a397f41453c802e696ccab2e675 |
| interface | internal |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 0175c595f0844cc69fc68da494eae877 |
| service_name | glance |
| service_type | image |
| url | http://controller:9292 |
+--------------+----------------------------------+
[root@controller ~]# openstack endpoint create --region RegionOne imag
e admin http://controller:9292
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | ec5078f3711c41a9a940a2f5bf3a5d66 |
| interface | admin |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 0175c595f0844cc69fc68da494eae877 |
| service_name | glance |
| service_type | image |
| url | http://controller:9292 |
+--------------+----------------------------------+
安装软件包
[root@controller ~]# yum install openstack-glance -y
编辑glance的配置文件



[database]
connection = mysql+pymysql://glance:000000@controller/glance
[glance_store]
```

```
stores = file,http
default_store = file
filesystem_store_datadir = /var/lib/glance/images/
[keystone_authtoken]
www_authenticate_uri = http://controller:5000
auth_url = http://controller:5000
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = glance
password = 000000
[paste_deploy]
flavor = keystone

填充数据库
[root@controller ~]# su -s /bin/sh -c "glance-manage db_sync" glance
INFO [alembic.runtime.migration] Context impl MySQLImpl.
INFO [alembic.runtime.migration] Will assume non-transactional DDL.
```

```
INFO  [alembic.runtime.migration] Context impl MySQLImpl.
INFO  [alembic.runtime.migration] Will assume non-transactional DDL.
Database is synced successfully.
[root@controller ~]#
```

启动服务

```
[root@controller ~]# systemctl start openstack-glance-api.service
[root@controller ~]# systemctl enable openstack-glance-api.service
```

```
[root@controller ~]# netstat -tnlup
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 127.0.0.1:25            0.0.0.0:*               LISTEN      1767/master
tcp        0      0 0.0.0.0:25672           0.0.0.0:*               LISTEN      1103/beam.smp
tcp        0      0 192.168.100.147:3306    0.0.0.0:*               LISTEN      1365/mysqld
tcp        0      0 192.168.100.147:2379    0.0.0.0:*               LISTEN      1102/etcd
tcp        0      0 192.168.100.147:11211   0.0.0.0:*               LISTEN      1080/memcached
tcp        0      0 127.0.0.1:11211         0.0.0.0:*               LISTEN      1080/memcached
tcp        0      0 0.0.0.0:9292            0.0.0.0:*               LISTEN      11313/python2
tcp        0      0 192.168.100.147:2380    0.0.0.0:*               LISTEN      1102/etcd
tcp        0      0 0.0.0.0:4369            0.0.0.0:*               LISTEN      1/systemd
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN      1079/sshd
tcp6       0      0 ::1:25                  :::*                    LISTEN      1767/master
tcp6       0      0 :::5672                 :::*                    LISTEN      1103/beam.smp
tcp6       0      0 :::5000                 :::*                    LISTEN      1083/httpd
tcp6       0      0 ::1:11211               :::*                    LISTEN      1080/memcached
tcp6       0      0 :::80                   :::*                    LISTEN      1083/httpd
tcp6       0      0 :::22                   :::*                    LISTEN      1079/sshd
udp        0      0 0.0.0.0:68              0.0.0.0:*                           735/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           733/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           734/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           736/dhclient
udp        0      0 0.0.0.0:123             0.0.0.0:*                           551/chronyd
udp        0      0 127.0.0.1:323           0.0.0.0:*                           551/chronyd
udp6       0      0 ::1:323                 :::*                                551/chronyd
[root@controller ~]#
```

测试glance服务是否成功

```
上传镜像
[root@controller ~]# openstack image create --file /root/cirros-0.3.3-x86_64-disk.img --disk-format qcow2 --container-format bare --public cirros-0.3.3
+------------------+------------------------------------------------------+
| Field | Value |
+------------------+------------------------------------------------------+
| checksum | ee1eca47dc88f4879d8a229cc70a07c6 |
| container_format | bare |
| created_at | 2021-11-08T12:48:11Z |
| disk_format | qcow2 |
| file | /v2/images/1cdb078a-8d30-4d31-9cab-1281a0c8b935/file |
| id | 1cdb078a-8d30-4d31-9cab-1281a0c8b935 |
| min_disk | 0 |
| min_ram | 0 |
| name | cirros-0.3.3 |
| owner | 883c664aed47476d93e306deb5ea24f2 |
| properties | os_hash_algo='sha512', os_hash_value='1b03ca1bc3fafe448b90583c12f367949f8b0e665685979d95b004e48574b953316799e23240f4f739d1b5eb4c4ca24d38fdc6f4f9d8247a2bc64db25d6bbdb2', os_hidden='False' |
| protected | False |
| schema | /v2/schemas/image |
| size | 13287936 |
| status | active |
| tags | |
| updated_at | 2021-11-08T12:48:11Z |
| virtual_size | None |
| visibility | public |
+------------------+------------------------------------------------------+
[root@controller ~]# openstack image list
+--------------------------------------+--------------+--------+
| ID | Name | Status |
+--------------------------------------+--------------+--------+
| 1cdb078a-8d30-4d31-9cab-1281a0c8b935 | cirros-0.3.3 | active |
+--------------------------------------+--------------+--------+
[root@controller ~]# ll /var/lib/glance/images/
总用量 12980
```

```
-rw-r----- 1 glance glance 13287936 11月  8 20:48 1cdb078a-8d30-4d31-9cab-1281a0c8b935

```

至此glance完成（关机打快照）

五、安装放置服务placement

1.配置数据库

```
[root@controller ~]# mysql -uroot -p000000
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.3.20-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE DATABASE placement;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON placement.* TO 'placement'@'localhost' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON placement.* TO 'placement'@'%' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> exit
Bye
```

2.创建placement用户

```
[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack user create --domain default --password 000000 placement
+---------------------+----------------------------------+
```

```
| Field | Value |
+---------------------+----------------------------------+
| domain_id | default |
| enabled | True |
| id | 3d86d8629a304c8eb0f2e248a21bc46e |
| name | placement |
| options | {} |
| password_expires_at | None |
+---------------------+----------------------------------+
[root@controller ~]# openstack role add --project service --user placement admin
[root@controller ~]# openstack service create --name placement --description "Placement API" placement
+-------------+----------------------------------+
| Field | Value |
+-------------+----------------------------------+
| description | Placement API |
| enabled | True |
| id | 1e17d911cc1d4d5bab80fbddc2c8ae4d |
| name | placement |
| type | placement |
+-------------+----------------------------------+
```

3.创建placement服务访问端点

```
[root@controller ~]# openstack endpoint create --region RegionOne placement public http://controller:8778
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | ba9ea5ed8909412fa2b6549599f13cfd |
| interface | public |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 1e17d911cc1d4d5bab80fbddc2c8ae4d |
| service_name | placement |
| service_type | placement |
| url | http://controller:8778 |
+--------------+----------------------------------+
```

```
[root@controller ~]# openstack endpoint create --region RegionOne placement internal http://controller:8778
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | b371065f9eaf4243aba6a6761fb0deea |
| interface | internal |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 1e17d911cc1d4d5bab80fbddc2c8ae4d |
| service_name | placement |
| service_type | placement |
| url | http://controller:8778 |
+--------------+----------------------------------+
[root@controller ~]# openstack endpoint create --region RegionOne placement admin http://controller:8778
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | 277d978bc6f64befa54b21dccd58ac6a |
| interface | admin |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 1e17d911cc1d4d5bab80fbddc2c8ae4d |
| service_name | placement |
| service_type | placement |
| url | http://controller:8778 |
+--------------+----------------------------------+

```

4.安装placement软件包并配置

```
[root@controller ~]# yum install openstack-placement-api -y
[root@controller ~]# cp /etc/placement/placement.conf /etc/placement/placement.conf.bak
[root@controller ~]# grep -Ev '^$|#' /etc/placement/placement.conf.bak > /etc/placement/placement.conf
[root@controller ~]#

[root@controller ~]# cat /etc/placement/placement.conf
[DEFAULT]
```

```
[api]
auth_strategy = keystone

[cors]
[keystone_authtoken]
auth_url = http://controller:5000/v3
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = placement
password = 000000

[oslo_policy]
[placement]
[placement_database]
connection = mysql+pymysql://placement:000000@controller/placement

[profiler]
[root@controller ~]#
[root@controller ~]# su -s /bin/sh -c "placement-manage db sync" place
ment
/usr/lib/python2.7/site-packages/pymysql/cursors.py:170: Warning: (128
0, u"Name 'alembic_version_pkc' ignored for PRIMARY key.")
 result = self._query(query)
```

5.修改placement的apache配置文件

```
[root@controller ~]# vim /etc/httpd/conf.d/00-placement-api.conf
 #SSLCertificateFile ...
 <Directory /usr/bin>
 <IfVersion >= 2.4>
 Require all granted
 </IfVersion>
 <IfVersion < 2.4>
 Order allow,deny
 Allow from all
  </IfVersion>
  </Directory>
  #SSLCertificateKeyFile ...

</VirtualHost>
```

```
15
16
```

```
ErrorLog /var/log/placement/placement
#SSLEngine On
#SSLCertificateFile ...
<Directory /usr/bin>
  <IfVersion >= 2.4>
    Require all granted
  </IfVersion>
  <IfVersion < 2.4>
    Order allow,deny
    Allow from all
  </IfVersion>
</Directory>
#SSLCertificateKeyFile ...

</VirtualHost>

Alias /placement-api /usr/bin/placement
```

```
[root@controller ~]#
[root@controller ~]# vim /etc/httpd/conf.d/00-placement-api.conf
[root@controller ~]# systemctl restart httpd
[root@controller ~]# netstat -tnlup
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:25672           0.0.0.0:*               LISTEN      1116/beam.smp
tcp        0      0 192.168.100.147:3306    0.0.0.0:*               LISTEN      1418/mysqld
tcp        0      0 192.168.100.147:2379    0.0.0.0:*               LISTEN      1125/etcd
tcp        0      0 192.168.100.147:11211   0.0.0.0:*               LISTEN      1142/memcached
tcp        0      0 127.0.0.1:11211         0.0.0.0:*               LISTEN      1142/memcached
tcp        0      0 0.0.0.0:9292            0.0.0.0:*               LISTEN      1132/python2
tcp        0      0 192.168.100.147:2380    0.0.0.0:*               LISTEN      1125/etcd
tcp        0      0 0.0.0.0:111             0.0.0.0:*               LISTEN      660/rpcbind
tcp        0      0 0.0.0.0:4369            0.0.0.0:*               LISTEN      1/systemd
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN      1117/sshd
tcp        0      0 127.0.0.1:25            0.0.0.0:*               LISTEN      1811/master
tcp6       0      0 :::5000                 :::*                    LISTEN      9286/httpd
tcp6       0      0 :::5672                 :::*                    LISTEN      1116/beam.smp
tcp6       0      0 :::8778                 :::*                    LISTEN      9286/httpd
tcp6       0      0 ::1:11211               :::*                    LISTEN      1142/memcached
tcp6       0      0 :::111                  :::*                    LISTEN      660/rpcbind
tcp6       0      0 :::80                   :::*                    LISTEN      9286/httpd
tcp6       0      0 :::22                   :::*                    LISTEN      1117/sshd
tcp6       0      0 ::1:25                  :::*                    LISTEN      1811/master
udp        0      0 0.0.0.0:68              0.0.0.0:*                           773/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           764/dhclient
udp        0      0 0.0.0.0:68              0.0.0.0:*                           769/dhclient
```

检查

```
1 [root@controller ~]# placement-status upgrade check
2 +----------------------------------+
3 | Upgrade Check Results |
```

```
+----------------------------------+
| Check: Missing Root Provider IDs |
| Result: Success |
| Details: None |
+----------------------------------+
| Check: Incomplete Consumers |
| Result: Success |
| Details: None |
+----------------------------------+
```

placement配置完成（关机打快照）

六、计算服务nova（控制节点）

1.数据配置

```
[root@controller ~]# mysql -u root -p000000
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.3.20-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input st
atement.

MariaDB [(none)]> CREATE DATABASE nova_api;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> CREATE DATABASE nova;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> CREATE DATABASE nova_cell0;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON nova_api.* TO 'nova'@'localh
ost' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON nova_api.* TO 'nova'@'%' IDE
NTIFIED BY '000000';
```

```
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON nova.* TO 'nova'@'localhost' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON nova.* TO 'nova'@'%' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON nova_cell0.* TO 'nova'@'localhost' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON nova_cell0.* TO 'nova'@'%' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> exit
Bye
```

2.创建nova用户

```
[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack user create --domain default --password 000000 nova
+---------------------+----------------------------------+
| Field | Value |
+---------------------+----------------------------------+
| domain_id | default |
| enabled | True |
| id | 5ebae7ce075d457489a05200799134e3 |
| name | nova |
| options | {} |
| password_expires_at | None |
+---------------------+----------------------------------+
[root@controller ~]# openstack role add --project service --user nova admin
[root@controller ~]# openstack service create --name nova --description "OpenStack Compute" compute
```

```
+-------------+----------------------------------+
| Field | Value |
+-------------+----------------------------------+
| description | OpenStack Compute |
| enabled | True |
| id | 3f96acc7763f4bc6af31648b6d71a59b |
| name | nova |
| type | compute |
+-------------+----------------------------------+
创建Compute API服务端点
[root@controller ~]#
[root@controller ~]# openstack endpoint create --region RegionOne comp
ute public http://controller:8774/v2.1
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | 8878e33f602d40ed9bdab199e6f825d8 |
| interface | public |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 3f96acc7763f4bc6af31648b6d71a59b |
| service_name | nova |
| service_type | compute |
| url | http://controller:8774/v2.1 |
+--------------+----------------------------------+
[root@controller ~]# openstack endpoint create --region RegionOne comp
ute internal http://controller:8774/v2.1
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | f6ec54fc833645aabedea90598de1f92 |
| interface | internal |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 3f96acc7763f4bc6af31648b6d71a59b |
| service_name | nova |
| service_type | compute |
| url | http://controller:8774/v2.1 |
```

```
+--------------+----------------------------------+
[root@controller ~]# openstack endpoint create --region RegionOne comp
ute admin http://controller:8774/v2.1
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | df0bfffab4084d62b5e2a29bd5c0a755 |
| interface | admin |
| region | RegionOne |
| region_id | RegionOne |
| service_id | 3f96acc7763f4bc6af31648b6d71a59b |
| service_name | nova |
| service_type | compute |
| url | http://controller:8774/v2.1 |
+--------------+----------------------------------+
[root@controller ~]#
```

3.安装软件包并配置文件

```
[root@controller ~]# yum install openstack-nova-api openstack-nova-con
ductor openstack-nova-novncproxy openstack-nova-scheduler -y

[root@controller ~]# cp /etc/nova/nova.conf /etc/nova/nova.conf.bak
[root@controller ~]# grep -Ev '^$|#' /etc/nova/nova.conf.bak >/etc/nov
a/nova.conf
[root@controller ~]# vim /etc/nova/nova.conf
[DEFAULT]
enabled_apis = osapi_compute,metadata
transport_url = rabbit://openstack:controller@controller:5672/
my_ip = 192.168.100.147
use_neutron = true
firewall_driver = nova.virt.firewall.NoopFirewallDriver

[api]
auth_strategy = keystone

[api_database]
connection = mysql+pymysql://nova:000000@controller/nova_api

[database]
connection = mysql+pymysql://nova:000000@controller/nova
```

```
21
22 [glance]
23 api_servers = http://controller:9292
24
25 [keystone_authtoken]
26 www_authenticate_uri = http://controller:5000/
27 auth_url = http://controller:5000/
28 memcached_servers = controller:11211
29 auth_type = password
30 project_domain_name = default
31 user_domain_name = default
32 project_name = service
33 username = nova
34 password = 000000
35
36 [oslo_concurrency]
37 lock_path = /var/lib/nova/tmp
38
39 [placement]
40 region_name = RegionOne
41 project_domain_name = default
42 project_name = service
43 auth_type = password
44 user_domain_name = default
45 auth_url = http://controller:5000/v3
46 username = placement
47 password = 000000
48
49 [vnc]
50 enabled = true
51 server_listen = $my_ip
52 server_proxyclient_address = $my_ip
53
```

4.填充数据库并验证nova

```
1 [root@controller ~]# su -s /bin/sh -c "nova-manage api_db sync" nova
2 [root@controller ~]# su -s /bin/sh -c "nova-manage cell_v2 map_cell0"
nova
3 [root@controller ~]# su -s /bin/sh -c "nova-manage cell_v2 create_cell
--name=cell1 --verbose" nova
4 dd639acc-48dd-4f7e-bb09-9cf295bc0fea
5 [root@controller ~]# su -s /bin/sh -c "nova-manage db sync" nova
```

```
/usr/lib/python2.7/site-packages/pymysql/cursors.py:170: Warning: (1831, u'Duplicate index `block_device_mapping_instance_uuid_virtual_name_device_name_idx`. This is deprecated and will be disallowed in a future release')
  result = self._query(query)
/usr/lib/python2.7/site-packages/pymysql/cursors.py:170: Warning: (1831, u'Duplicate index `uniq_instances0uuid`. This is deprecated and will be disallowed in a future release')
  result = self._query(query)
```

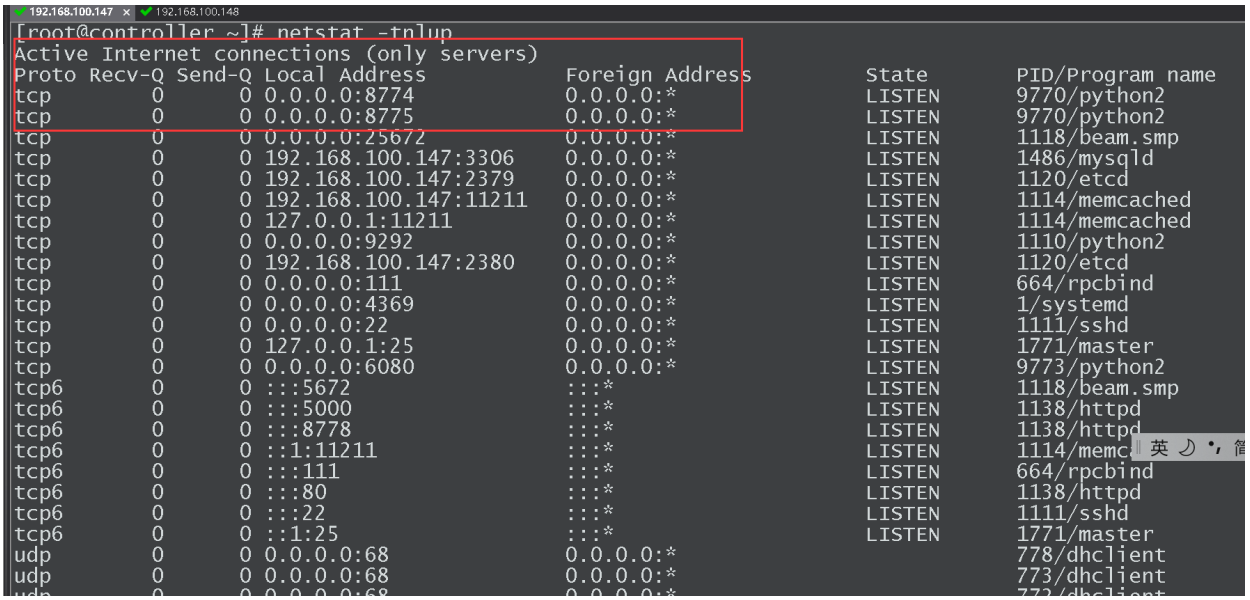
数据库填充好之后，验证nova cell0和cell1是否正确注册：

```
[root@controller ~]# su -s /bin/sh -c "nova-manage cell_v2 list_cells" nova
+-------+--------------------------------------+---------------------------------------------------+---------------------------------------------------+----------+
| 名称  | UUID                                 | Transport URL                                     | 数据库连接                                        | Disabled |
+-------+--------------------------------------+---------------------------------------------------+---------------------------------------------------+----------+
| cell0 | 00000000-0000-0000-0000-000000000000 | none:/                                            | mysql+pymysql://nova:****@controller/nova_cell0   | False    |
| cell1 | dd639acc-48dd-4f7e-bb09-9cf295bc0fea | rabbit://openstack:****@controller:5672/          | mysql+pymysql://nova:****@controller/nova         | False    |
+-------+--------------------------------------+---------------------------------------------------+---------------------------------------------------+----------+
```

启动计算服务nova并将其配置为在系统启动时启动

```
[root@controller ~]# systemctl start openstack-nova-api.service openstack-nova-scheduler.service openstack-nova-conductor.service openstack-nova-novncproxy.service
[root@controller ~]# systemctl enable openstack-nova-api.service openstack-nova-scheduler.service openstack-nova-conductor.service openstack-nova-novncproxy.service
Created symlink from /etc/systemd/system/multi-user.target.wants/openstack-nova-api.service to /usr/lib/systemd/system/openstack-nova-api.service.
Created symlink from /etc/systemd/system/multi-user.target.wants/openstack-nova-scheduler.service to /usr/lib/systemd/system/openstack-nova-scheduler.service.
Created symlink from /etc/systemd/system/multi-user.target.wants/openstack-nova-conductor.service to /usr/lib/systemd/system/openstack-nova-conductor.service.
Created symlink from /etc/systemd/system/multi-user.target.wants/openstack-nova-novncproxy.service to /usr/lib/systemd/system/openstack-nova-novncproxy.service.
```

```
26

27
```




```
1 [root@controller ~]# curl http://controller:8774

2 {"versions": [{"status": "SUPPORTED", "updated": "2011-01-21T11:33:21
Z", "links": [{"href": "http://controller:8774/v2/", "rel": "self"}], "mi
n_version": "", "version": "", "id": "v2.0"}, {"status": "CURRENT", "upda
ted": "2013-07-23T11:33:21Z", "links": [{"href": "http://controller:8774/
v2.1/", "rel": "self"}], "min_version": "2.1", "version": "2.79", "id":
"v2.1"}]}
```

至此控制节点nova服务部署完成（关机打快照）

计算服务nova（计算节点）

1.安装软件包并配置文件

```
1 [root@compute ~]# yum install openstack-nova-compute -y

2

3 因为要安装KVM虚拟化那一套的东东，所以安装的包较多，请耐心等待。如果提示没有包，
则先安装openstack源（参考本系列文章第一部分基础服务的安装）

4

5

6 [root@compute ~]# cp /etc/nova/nova.conf /etc/nova/nova.conf.bak

7 [root@compute ~]# grep -Ev '^$|#' /etc/nova/nova.conf.bak >/etc/nova/n
ova.conf

8 [root@compute ~]# vim /etc/nova/nova.conf

9 [DEFAULT]

10 enabled_apis = osapi_compute,metadata
```

```
transport_url = rabbit://openstack:000000@controller
my_ip = 192.168.100.148
use_neutron = true
firewall_driver = nova.virt.firewall.NoopFirewallDriver

[api]
auth_strategy = keystone

[keystone_authtoken]
www_authenticate_uri = http://controller:5000/
auth_url = http://controller:5000/
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = nova
password = 000000

[glance]
api_servers = http://192.168.100.147:9292

[oslo_concurrency]
lock_path = /var/lib/nova/tmp

[placement]
region_name = RegionOne
project_domain_name = default
project_name = service
auth_type = password
user_domain_name = default
auth_url = http://controller:5000/v3
username = placement
password = 000000

[vnc]
enabled = true
server_listen = 0.0.0.0
server_proxyclient_address = $my_ip
novncproxy_base_url = http://192.168.100.147:6080/vnc_auto.html

```

```
确定计算节点是否支持虚拟机硬件加速
[root@compute ~]# egrep -c '(vmx|svm)' /proc/cpuinfo
8
如果此命令返回值不是0，则计算节点支持硬件加速，不需要加入下面的配置。
如果此命令返回值是0，则计算节点不支持硬件加速，并且必须配置libvirt为使用QEMU而不是KVM，需要编辑/etc/nova/nova.conf 文件中的[libvirt]部分：

[libvirt]
virt_type = qemu
```


```
[root@compute ~]# systemctl enable libvirtd.service openstack-nova-compute.service
Created symlink from /etc/systemd/system/multi-user.target.wants/openstack-nova-compute.service to /usr/lib/systemd/system/openstack-nova-compute.service.
[root@compute ~]# systemctl start libvirtd.service openstack-nova-compute.service


[root@compute ~]# ps -ef | grep nova
nova 9075 1 1 11:36 ? 00:00:03 /usr/bin/python2 /usr/bin/nova-compute
root 9165 7706 0 11:40 pts/0 00:00:00 systemctl start libvirtd.service openstack-nova-compute.service
root 9192 9174 0 11:41 pts/1 00:00:00 grep --color=auto nova
[root@compute ~]# ps -ef | grep libvirtd
root 9058 1 0 11:36 ? 00:00:00 /usr/sbin/libvirtd
root 9165 7706 0 11:40 pts/0 00:00:00 systemctl start libvirtd.service openstack-nova-compute.service
```

至此nova完成（关机打块找）

发现计算节点和验证nova的安装

1确认数据库

```
[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack compute service list --service nova-compute
```

```
+----+--------------+---------+------+---------+-------+----------------------------+
| ID | Binary       | Host    | Zone | Status  | State | Updated At                 |
+----+--------------+---------+------+---------+-------+----------------------------+
| 13 | nova-compute | compute | nova | enabled | up    | 2021-11-09T04:55:33.000000 |
+----+--------------+---------+------+---------+-------+----------------------------+
发现计算节点主机
[root@controller ~]# su -s /bin/sh -c "nova-manage cell_v2 discover_hosts --verbose" nova
Found 2 cell mappings.
Skipping cell0 since it does not contain hosts.
Getting computes from cell 'cell1': 194c0f4e-7fcf-4627-a1fe-a6add07372ef
Checking host mapping for compute host 'compute': b02fa494-14ce-4e27-9e02-92804357153e
Creating host mapping for compute host 'compute': b02fa494-14ce-4e27-9e02-92804357153e
Found 1 unmapped computes in cell: 194c0f4e-7fcf-4627-a1fe-a6add07372ef

设置适当的发现时间间隔（可选）

[root@controller ~]# vim /etc/nova/nova.conf
[root@controller ~]#
[root@controller ~]# systemctl restart openstack-nova-api.service
[scheduler]
discover_hosts_in_cells_interval = 300


```

验证整个计算服务nova

```
[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack compute service list
+----+----------------+------------+----------+---------+-------+----------------------------+
| ID | Binary         | Host       | Zone     | Status  | State | Updated At                 |
+----+----------------+------------+----------+---------+-------+----------------------------+
| 5  | nova-conductor | controller | internal | enabled | up    | 2021-11-09T04:58:45.000000 |
```

```
| 7 | nova-scheduler | controller | internal | enabled | up | 2021-11-09T04:58:37.000000 |
| 13 | nova-compute | compute | nova | enabled | up | 2021-11-09T04:58:43.000000 |
+----+----------------+------------+----------+---------+-------+----------------------------+


[root@controller ~]# openstack catalog list
+-----------+-----------+-----------------------------------------+
| Name | Type | Endpoints |
+-----------+-----------+-----------------------------------------+
| glance | image | RegionOne |
| | | public: http://controller:9292 |
| | | RegionOne |
| | | internal: http://controller:9292 |
| | | RegionOne |
| | | admin: http://controller:9292 |
| | | |
| placement | placement | RegionOne |
| | | admin: http://controller:8778 |
| | | RegionOne |
| | | internal: http://controller:8778 |
| | | RegionOne |
| | | public: http://controller:8778 |
| | | |
| keystone | identity | RegionOne |
| | | public: http://controller:5000/v3/ |
| | | RegionOne |
| | | admin: http://controller:5000/v3/ |
| | | RegionOne |
| | | internal: http://controller:5000/v3/ |
| | | |
| nova | compute | RegionOne |
| | | internal: http://controller:8774/v2.1 |
| | | RegionOne |
| | | admin: http://controller:8774/v2.1 |
| | | RegionOne |
| | | public: http://controller:8774/v2.1 |
| | | |
+-----------+-----------+-----------------------------------------+
```

```
[root@controller ~]# openstack image list
+--------------------------------------+--------------+--------+
| ID | Name | Status |
+--------------------------------------+--------------+--------+
| 1cdb078a-8d30-4d31-9cab-1281a0c8b935 | cirros-0.3.3 | active |
+--------------------------------------+--------------+--------+

[root@controller ~]# nova-status upgrade check
+--------------------------------+
| Upgrade Check Results |
+--------------------------------+
| Check: Cells v2 |
| Result: Success |
| Details: None |
+--------------------------------+
| Check: Placement API |
| Result: Success |
| Details: None |
+--------------------------------+
| Check: Ironic Flavor Migration |
| Result: Success |
| Details: None |
+--------------------------------+
| Check: Cinder API |
| Result: Success |
| Details: None |
+--------------------------------+
```

关机打快照

七、安装网络服务neutron（双节点）

```
[root@controller ~]# yum install net-tools -y
[root@controller ~]# ifconfig ens34 promisc
[root@controller ~]# ifconfig
```

```
[root@controller ~]# ifconfig ens34 promisc
[root@controller ~]# ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.100.147  netmask 255.255.255.0  broadcast 192.168.100.25
        inet6 fe80::85fe:953:9b99:cbf5  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:ca:b5:4d  txqueuelen 1000  (Ethernet)
        RX packets 224  bytes 78143 (76.3 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 230  bytes 97755 (95.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

ens34: flags=4419<UP,BROADCAST,RUNNING,PROMISC,MULTICAST>  mtu 1500
        inet 192.168.73.33  netmask 255.255.255.0  broadcast 192.168.73.255
        inet6 fe80::c6cd:20fb:39dc:f3c3  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:ca:b5:57  txqueuelen 1000  (Ethernet)
        RX packets 31  bytes 3613 (3.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 16  bytes 1510 (1.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
[root@compute ~]# yum install net-tools -y
[root@compute ~]# ifconfig ens34 promisc
[root@compute ~]# ifconfig
```

```
[root@compute ~]# ifconfig ens34 promisc
[root@compute ~]# ifconfig
ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.100.148  netmask 255.255.255.0  broadcast 192.168.100.255
        inet6 fe80::8987:5ea3:70a9:a911  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:4b:96:64  txqueuelen 1000  (Ethernet)
        RX packets 411  bytes 108517 (105.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 412  bytes 227803 (222.4 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

ens34: flags=4419<UP,BROADCAST,RUNNING,PROMISC,MULTICAST>  mtu 1500
        inet 192.168.73.24  netmask 255.255.255.0  broadcast 192.168.73.255
        inet6 fe80::3e0b:baad:4db3:6cf8  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:4b:96:6e  txqueuelen 1000  (Ethernet)
        RX packets 274  bytes 331514 (323.7 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 66  bytes 4816 (4.7 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

ens35: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
```

将上述命令写入到/etc/profile使下次重启后也生效：（双节点）

```
[root@compute ~]# vim /etc/profile
```

```
unset i
unset -f pathmunge

ifconfig ens34 promisc
:wq
```

重启网络，确认主机间的网络通讯（双节点）

```
[root@compute ~]# vim /etc/profile
[root@compute ~]# systemctl restart network
[root@compute ~]# ping www.baidu.com
PING www.a.shifen.com (183.232.231.174) 56(84) bytes of data.
64 bytes from 183.232.231.174 (183.232.231.174): icmp_seq=1 ttl=128 time=31.5 ms
^C
--- www.a.shifen.com ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 31.553/31.553/31.553/0.000 ms
[root@compute ~]# ping controller
PING controller (192.168.100.147) 56(84) bytes of data.
64 bytes from controller (192.168.100.147): icmp_seq=1 ttl=64 time=0.312 ms
^C
--- controller ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.312/0.312/0.312/0.000 ms
[root@compute ~]#
```

接下来**控制节点操作**

```
检查各个服务是否启动
[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack token issue
+------------+-----------------------------------------------------------------
-------------------------------------------------------------------------------
-----------------------------------------------------------+
| Field | Value |
+------------+-----------------------------------------------------------------
-------------------------------------------------------------------------------
-----------------------------------------------------------+
| expires | 2021-11-09T06:11:20+0000 |
| id | gAAAAABhigL4_5nZyPLPzyFmTS0TdvmHNeKcCq__toC7WAyr0JCMapNjDKCYquw
OcLBxGw3U6bjxDh4MtX3SMwGvtq0psB6yABQaJbdlZqfJ_6YVGRDshgbSczr7KPy7P5g3cTib
ps1GW00KDu-mKwlcn5Tycqb8kfniMUXHnRvmzzi6rJzJEGg |
| project_id | 883c664aed47476d93e306deb5ea24f2 |
| user_id | dc2a6ca49a97440480d65ae67a18b11a |
+------------+-----------------------------------------------------------------
-------------------------------------------------------------------------------
-----------------------------------------------------------+
[root@controller ~]# openstack image list
+--------------------------------------+--------------+--------+
| ID | Name | Status |
+--------------------------------------+--------------+--------+
| 1cdb078a-8d30-4d31-9cab-1281a0c8b935 | cirros-0.3.3 | active |
+--------------------------------------+--------------+--------+
[root@controller ~]# placement-status upgrade check

+----------------------------------+
| Upgrade Check Results |
+----------------------------------+
```

```
| Check: Missing Root Provider IDs |
| Result: Success |
| Details: None |
+----------------------------------+
| Check: Incomplete Consumers |
| Result: Success |
| Details: None |
+----------------------------------+
[root@controller ~]#
[root@controller ~]# openstack compute service list
+----+----------------+------------+----------+---------+-------+----------------------------+
| ID | Binary | Host | Zone | Status | State | Updated At |
+----+----------------+------------+----------+---------+-------+----------------------------+
| 5 | nova-conductor | controller | internal | enabled | up | 2021-11-09T05:11:46.000000 |
| 7 | nova-scheduler | controller | internal | enabled | up | 2021-11-09T05:11:41.000000 |
| 13 | nova-compute | compute | nova | enabled | up | 2021-11-09T05:11:47.000000 |
+----+----------------+------------+----------+---------+-------+----------------------------+

[root@controller ~]# nova service-list
+--------------------------------------+----------------+------------+----------+---------+-------+----------------------------+-----------------+-------------+
| Id | Binary | Host | Zone | Status | State | Updated_at | Disabled Reason | Forced down |
+--------------------------------------+----------------+------------+----------+---------+-------+----------------------------+-----------------+-------------+
| d3b0c03a-a239-43c5-8c69-b6c06be632b6 | nova-conductor | controller | internal | enabled | up | 2021-11-09T05:12:06.000000 | - | False |
| 97d7cf18-e647-4ff6-92c9-17cc35fc566f | nova-scheduler | controller | internal | enabled | up | 2021-11-09T05:12:11.000000 | - | False |
| 1010fd7a-7011-4eb9-85ee-199b9a4b7190 | nova-compute | compute | nova | enabled | up | 2021-11-09T05:12:07.000000 | - | False |
+--------------------------------------+----------------+------------+----------+---------+-------+----------------------------+-----------------+-------------+
[root@controller ~]# nova-status upgrade check
+--------------------------------+
```

```
| Upgrade Check Results |
+-------------------------------+
| Check: Cells v2 |
| Result: Success |
| Details: None |
+-------------------------------+
| Check: Placement API |
| Result: Success |
| Details: None |
+-------------------------------+
| Check: Ironic Flavor Migration |
| Result: Success |
| Details: None |
+-------------------------------+
| Check: Cinder API |
| Result: Success |
| Details: None |
+-------------------------------+
[root@controller ~]#
```

配置数据库

```
[root@controller ~]# mysql -u root -p000000
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 78
Server version: 10.3.20-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input st
atement.

MariaDB [(none)]> CREATE DATABASE neutron;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON neutron.* TO 'neutron'@'loca
lhost' IDENTIFIED BY '000000';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON neutron.* TO 'neutron'@'%' I
DENTIFIED BY '000000';
Query OK, 0 rows affected (0.000 sec)

```

```
MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> exit
Bye
```

创建neutron用户

```
[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack user create --domain default --password 000000 neutron
+---------------------+----------------------------------+
| Field | Value |
+---------------------+----------------------------------+
| domain_id | default |
| enabled | True |
| id | 8f29929d03f94fb8a8e50a0244d13328 |
| name | neutron |
| options | {} |
| password_expires_at | None |
+---------------------+----------------------------------+
[root@controller ~]# openstack role add --project service --user neutron admin
[root@controller ~]# openstack service create --name neutron --description "OpenStack Networking" network
+-------------+----------------------------------+
| Field | Value |
+-------------+----------------------------------+
| description | OpenStack Networking |
| enabled | True |
| id | aa8c1ecbeee14bc7a10ab70ab9de16fd |
| name | neutron |
| type | network |
+-------------+----------------------------------+
[root@controller ~]# openstack endpoint create --region RegionOne network public http://controller:9696
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | 9a9bb8c92f9f405a8f0caecc638052c5 |
| interface | public |
```

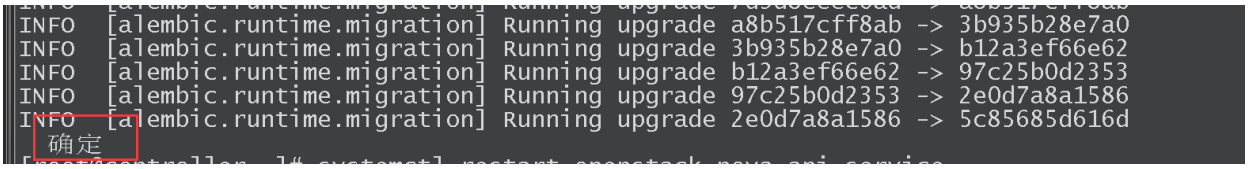
```
| region | RegionOne |
| region_id | RegionOne |
| service_id | aa8c1ecbeee14bc7a10ab70ab9de16fd |
| service_name | neutron |
| service_type | network |
| url | http://controller:9696 |
+--------------+----------------------------------+
[root@controller ~]# openstack endpoint create --region RegionOne netw
ork internal http://controller:9696
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | 17f16722f1d0457da2cc519c12cd7440 |
| interface | internal |
| region | RegionOne |
| region_id | RegionOne |
| service_id | aa8c1ecbeee14bc7a10ab70ab9de16fd |
| service_name | neutron |
| service_type | network |
| url | http://controller:9696 |
+--------------+----------------------------------+
[root@controller ~]# openstack endpoint create --region RegionOne netw
ork admin http://controller:9696
+--------------+----------------------------------+
| Field | Value |
+--------------+----------------------------------+
| enabled | True |
| id | 90cb34b9d2d248b09aa622eec5fc5fcd |
| interface | admin |
| region | RegionOne |
| region_id | RegionOne |
| service_id | aa8c1ecbeee14bc7a10ab70ab9de16fd |
| service_name | neutron |
| service_type | network |
| url | http://controller:9696 |
+--------------+----------------------------------+
[root@controller ~]#
```

配置二层网络

```
1、安装软件包
```

```
[root@controller ~]# yum install openstack-neutron openstack-neutron-ml2 openstack-neutron-linuxbridge ebtables -y
命令
cp /etc/neutron/neutron.conf /etc/neutron/neutron.conf.bak
grep -Ev '^$|#' /etc/neutron/neutron.conf.bak>/etc/neutron/neutron.conf
vim /etc/neutron/neutron.conf
cp /etc/neutron/plugins/ml2/ml2_conf.ini /etc/neutron/plugins/ml2/ml2_conf.ini.bak
cp /etc/neutron/neutron.conf /etc/neutron/neutron.conf.bak
grep -Ev '^$|#' /etc/neutron/neutron.conf.bak>/etc/neutron/neutron.conf
 vim /etc/neutron/neutron.conf
 cp /etc/neutron/plugins/ml2/ml2_conf.ini /etc/neutron/plugins/ml2/ml2_conf.ini.bak
 cp /etc/neutron/plugins/ml2/linuxbridge_agent.ini /etc/neutron/plugins/ml2/linuxbridge_agent.ini.bak
  grep -Ev '^$|#' /etc/neutron/plugins/ml2/linuxbridge_agent.ini.bak>/etc/neutron/plugins/ml2/linuxbridge_agent.ini
  vim /etc/neutron/plugins/ml2/linuxbridge_agent.ini
 vim /etc/sysctl.conf
 modprobe br_netfilter
 sysctl -p
 cp /etc/neutron/dhcp_agent.ini /etc/neutron/dhcp_agent.ini.bak
 grep -Ev '^$|#' /etc/neutron/dhcp_agent.ini.bak> /etc/neutron/dhcp_agent.ini
 vim /etc/neutron/dhcp_agent.ini
 vim /etc/neutron/metadata_agent.ini
 vim /etc/nova/nova.conf


 修改配置文件（附录里面）
 [root@controller ~]# ln -s /etc/neutron/plugins/ml2/ml2_conf.ini /etc/neutron/plugin.ini
 [root@controller ~]# su -s /bin/sh -c "neutron-db-manage --config-file /etc/neutron/neutron.conf --config-file /etc/neutron/plugins/ml2/ml2_conf.ini upgrade head" neutron
 INFO [alembic.runtime.migration] Context impl MySQLImpl.
 INFO [alembic.runtime.migration] Will assume non-transactional DDL.
 /usr/lib/python2.7/site-packages/pymysql/cursors.py:170: Warning: (1280, u"Name 'alembic_version_pkc' ignored for PRIMARY key.")
  result = self._query(query)
```

```
正在对 neutron 运行 upgrade...
systemctl restart openstack-nova-api.service
systemctl start neutron-server.service neutron-linuxbridge-agent.service neutron-dhcp-agent.service neutron-metadata-agent.service
systemctl enable neutron-server.service neutron-linuxbridge-agent.service neutron-dhcp-agent.service neutron-metadata-agent.service

```



在计算节点安装网络服务neutron

```
安装组件
yum install openstack-neutron-linuxbridge ebtables ipset -y
cp /etc/neutron/neutron.conf /etc/neutron/neutron.conf.bak
grep -Ev '^$|#' /etc/neutron/neutron.conf.bak>/etc/neutron/neutron.conf
vim /etc/neutron/neutron.conf ##附录
cp /etc/neutron/plugins/ml2/linuxbridge_agent.ini /etc/neutron/plugins/ml2/linuxbridge_agent.ini.bak
grep -Ev '^$|#' /etc/neutron/plugins/ml2/linuxbridge_agent.ini.bak>/etc/neutron/plugins/ml2/linuxbridge_agent.ini
vim /etc/neutron/plugins/ml2/linuxbridge_agent.ini
vim /etc/sysctl.conf ##附录
 modprobe br_netfilter
 sysctl -p
 vim /etc/nova/nova.conf ##附录
 systemctl restart openstack-nova-compute.service
 systemctl enable neutron-linuxbridge-agent.service
 systemctl start neutron-linuxbridge-agent.service

```

验证neutrn服务

```
[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack extension list --network
+---------------------------------------------------------------------------+------------------+-----------------------------------------------------------+
| Name | Alias | Description |
```

```
+-------------------------------------------------------------------------
-------------------------------------------------------------------------
------------------+---------------------------------+--------------------
-------------------------------------------------------------------------
-------------------------------------------------------------+
| Subnet Pool Prefix Operations | subnetpool-prefix-ops | Provides sup
port for adjusting the prefix list of subnet pools |
| Default Subnetpools | default-subnetpools | Provides ability to mark
and use a subnetpool as the default. |
| Network IP Availability | network-ip-availability | Provides IP avai
lability data for each network and subnet. |
| Network Availability Zone | network_availability_zone | Availability
zone support for network. |
| Subnet Onboard | subnet_onboard | Provides support for onboarding su
bnets into subnet pools |
| Network MTU (writable) | net-mtu-writable | Provides a writable MTU
attribute for a network resource. |
| Port Binding | binding | Expose port bindings of a virtual port to e
xternal application |
| agent | agent | The agent management extension. |
| Subnet Allocation | subnet_allocation | Enables allocation of subnet
s from a subnet pool |
| DHCP Agent Scheduler | dhcp_agent_scheduler | Schedule networks amor
g dhcp agents |
| Neutron external network | external-net | Adds external network attr
ibute to network resource. |
| Empty String Filtering Extension | empty-string-filtering | Allow fi
ltering by attributes with empty string value |
| Neutron Service Flavors | flavors | Flavor specification for Neutror
advanced services. |
| Network MTU | net-mtu | Provides MTU attribute for a network resourc
e. |
| Availability Zone | availability_zone | The availability zone extens
ion. |
| Quota management support | quotas | Expose functions for quotas mana
gement per tenant |
| Tag support for resources with standard attribute: subnet, trunk, ne
twork_segment_range, router, network, policy, subnetpool, port, security_
group, floatingip | standard-attr-tag | Enables to set tag on resources w
ith standard attribute. |
| Availability Zone Filter Extension | availability_zone_filter | Add
filter parameters to AvailabilityZone resource |
| If-Match constraints based on revision_number | revision-if-match |
Extension indicating that If-Match based on revision_number is supported.
|
| Filter parameters validation | filter-validation | Provides validati
on on filter parameters. |
```

```
| Multi Provider Network | multi-provider | Expose mapping of virtual networks to multiple physical networks |
| Quota details management support | quota_details | Expose functions for quotas usage statistics per project |
| Address scope | address-scope | Address scopes extension. |
| Agent's Resource View Synced to Placement | agent-resources-synced | Stores success/failure of last sync to Placement |
| Subnet service types | subnet-service-types | Provides ability to set the subnet service_types field |
| Neutron Port MAC address regenerate | port-mac-address-regenerate | Network port MAC address regenerate |
| Add security_group type to network RBAC | rbac-security-groups | Add security_group type to network RBAC |
| Provider Network | provider | Expose mapping of virtual networks to physical networks |
| Neutron Service Type Management | service-type | API for retrieving service providers for Neutron advanced services |
| Neutron Extra DHCP options | extra_dhcp_opt | Extra options configuration for DHCP. For example PXE boot options to DHCP clients can be specified (e.g. tftp-server, server-ip-address, bootfile-name) |
| Port filtering on security groups | port-security-groups-filtering | Provides security groups filtering when listing ports |
| Resource timestamps | standard-attr-timestamp | Adds created_at and updated_at fields to all Neutron resources that have Neutron standard attributes. |
| Resource revision numbers | standard-attr-revisions | This extension will display the revision number of neutron resources. |
| Pagination support | pagination | Extension that indicates that pagination is enabled. |
| Sorting support | sorting | Extension that indicates that sorting is enabled. |
| security-group | security-group | The security groups extension. |
| RBAC Policies | rbac-policies | Allows creation and modification of policies that control tenant access to resources. |
| standard-attr-description | standard-attr-description | Extension to add descriptions to standard attributes |
| IP address substring filtering | ip-substring-filtering | Provides IP address substring filtering when listing ports |
| Port Security | port-security | Provides port security |
| Allowed Address Pairs | allowed-address-pairs | Provides allowed address pairs |
| project_id field enabled | project-id | Extension that indicates that project_id field is enabled. |
| Port Bindings Extended | binding-extended | Expose port bindings of a virtual port to external application |
```

```
+--------------------------------------------------------------------------------------------------------------------+--------------------------------------+--------------------+-------+-------+---------------------------+
[root@controller ~]# openstack network agent list
+--------------------------------------+--------------------+------------+-------------------+-------+-------+---------------------------+
| ID | Agent Type | Host | Availability Zone | Alive | State | Binary |
+--------------------------------------+--------------------+------------+-------------------+-------+-------+---------------------------+
| 8c8f45c3-8354-4c09-8ba2-670b574994cf | DHCP agent | controller | nova | :-) | UP | neutron-dhcp-agent |
| 9bf97f36-d648-4ccb-b530-37d1f6c1e153 | Metadata agent | controller | None | :-) | UP | neutron-metadata-agent |
| b181033d-eee5-4974-9705-efdb918f7039 | Linux bridge agent | compute | None | :-) | UP | neutron-linuxbridge-agent |
| e1b8fba2-b69b-4561-a1fd-d5e638760fe3 | Linux bridge agent | controller | None | :-) | UP | neutron-linuxbridge-agent |
+--------------------------------------+--------------------+------------+-------------------+-------+-------+---------------------------+
[root@controller ~]#
```

至此neturn服务完成

安装仪表板服务horizon

```
[root@compute ~]# yum install openstack-dashboard -y
[root@compute ~]# vim /etc/openstack-dashboard/local_settings
[root@compute ~]#
[root@compute ~]# cd /usr/share/openstack-dashboard
[root@compute openstack-dashboard]# python manage.py make_web_conf --apache > /etc/httpd/conf.d/openstack-dashboard.conf
[root@compute openstack-dashboard]# ln -s /etc/openstack-dashboard /usr/share/openstack-dashboard/openstack_dashboard/conf
[root@compute openstack-dashboard]# systemctl enable httpd.service
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.
[root@compute openstack-dashboard]# systemctl restart httpd.service
[root@compute openstack-dashboard]#
```

配置文件附录（参考可用）

controller节点：

```
数据库
```

```
[root@controller ~]# cat /etc/my.cnf.d/openstack.cnf
[mysqld]

bind-address = 192.168.100.147

default-storage-engine = innodb

innodb_file_per_table = on

 max_connections = 4096

 collation-server = utf8_general_ci

 character-set-server = utf8
 memcache服务
 [root@controller ~]# cat /etc/sysconfig/memcached
 PORT="11211"
 USER="memcached"
 MAXCONN="1024"
 CACHESIZE="64"
 OPTIONS="-l 127.0.0.1,::1,controller"

 ETCD服务
 [root@controller ~]# cat /etc/sysconfig/memcached
 PORT="11211"
 USER="memcached"
 MAXCONN="1024"
 CACHESIZE="64"
 OPTIONS="-l 127.0.0.1,::1,controller"
 [root@controller ~]# cat /etc/etcd/etcd.conf
 cat: vim: 没有那个文件或目录
 #[Member]
 #ETCD_CORS=""
 ETCD_DATA_DIR="/var/lib/etcd/default.etcd"
 #ETCD_DATA_DIR="/var/lib/etcd/default.etcd"
 #ETCD_WAL_DIR=""
 ETCD_LISTEN_PEER_URLS="http://192.168.100.147:2380"
 ETCD_LISTEN_CLIENT_URLS="http://192.168.100.147:2379"
 #ETCD_MAX_SNAPSHOTS="5"
 #ETCD_MAX_WALS="5"
 ETCD_NAME="controller"
```

```
#ETCD_SNAPSHOT_COUNT="100000"
#ETCD_HEARTBEAT_INTERVAL="100"
#ETCD_ELECTION_TIMEOUT="1000"
#ETCD_QUOTA_BACKEND_BYTES="0"
#ETCD_MAX_REQUEST_BYTES="1572864"
#ETCD_GRPC_KEEPALIVE_MIN_TIME="5s"
#ETCD_GRPC_KEEPALIVE_INTERVAL="2h0m0s"
#ETCD_GRPC_KEEPALIVE_TIMEOUT="20s"
#
#[Clustering]
ETCD_INITIAL_ADVERTISE_PEER_URLS="http://192.168.100.147:2380"
ETCD_ADVERTISE_CLIENT_URLS="http://192.168.100.147:2379"
#ETCD_DISCOVERY=""
#ETCD_DISCOVERY_FALLBACK="proxy"
#ETCD_DISCOVERY_PROXY=""
#ETCD_DISCOVERY_SRV=""
ETCD_INITIAL_CLUSTER="controller=http://192.168.100.147:2380"
ETCD_INITIAL_CLUSTER_TOKEN="etcd-cluster-01"
ETCD_INITIAL_CLUSTER_STATE="new"
#ETCD_STRICT_RECONFIG_CHECK="true"
#ETCD_ENABLE_V2="true"
#
#[Proxy]
#ETCD_PROXY="off"
#ETCD_PROXY_FAILURE_WAIT="5000"
#ETCD_PROXY_REFRESH_INTERVAL="30000"
#ETCD_PROXY_DIAL_TIMEOUT="1000"
#ETCD_PROXY_WRITE_TIMEOUT="5000"
#ETCD_PROXY_READ_TIMEOUT="0"
#
#[Security]
#ETCD_CERT_FILE=""
#ETCD_KEY_FILE=""
#ETCD_CLIENT_CERT_AUTH="false"
#ETCD_TRUSTED_CA_FILE=""
#ETCD_AUTO_TLS="false"
#ETCD_PEER_CERT_FILE=""
#ETCD_PEER_KEY_FILE=""
#ETCD_PEER_CLIENT_CERT_AUTH="false"
#ETCD_PEER_TRUSTED_CA_FILE=""
```

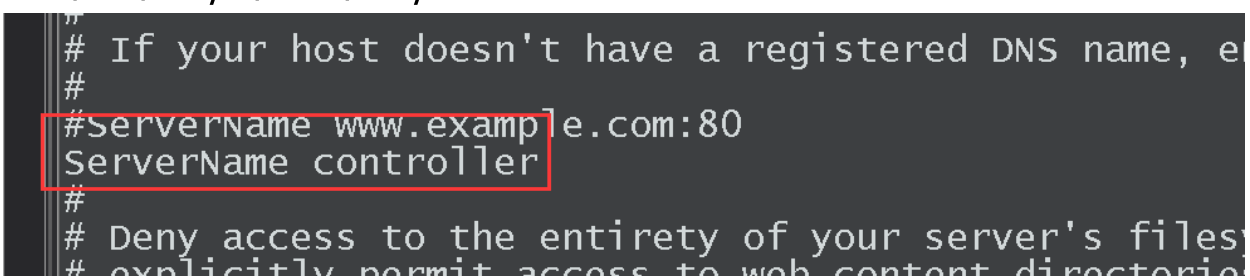
```
#ETCD_PEER_AUTO_TLS="false"
#
#[Logging]
#ETCD_DEBUG="false"
#ETCD_LOG_PACKAGE_LEVELS=""
#ETCD_LOG_OUTPUT="default"
#
#[Unsafe]
#ETCD_FORCE_NEW_CLUSTER="false"
#
#[Version]
#ETCD_VERSION="false"
#ETCD_AUTO_COMPACTION_RETENTION="0"
#
#[Profiling]
#ETCD_ENABLE_PPROF="false"
#ETCD_METRICS="basic"
 #
 #[Auth]
 #ETCD_AUTH_TOKEN="simple"
```

keystone服务

```
[root@controller ~]# cat /etc/keystone/keystone.conf
[DEFAULT]
[application_credential]
[assignment]
[auth]
[cache]
[catalog]
[cors]
[credential]
 [database]
 connection = mysql+pymysql://keystone:000000@controller/keystone

 [domain_config]
 [endpoint_filter]
 [endpoint_policy]
 [eventlet_server]
 [federation]
```

```
[fernet_receipts]
[fernet_tokens]
[healthcheck]
[identity]
[identity_mapping]
[jwt_tokens]
[ldap]
[memcache]
[oauth1]
[oslo_messaging_amqp]
[oslo_messaging_kafka]
[oslo_messaging_notifications]
[oslo_messaging_rabbit]
[oslo_middleware]
[oslo_policy]
[policy]
[profiler]
[receipt]
[resource]
[revoke]
[role]
[saml]
[security_compliance]
[shadow_users]
[token]
provider = fernet

[tokenless_auth]
[totp]
[trust]
[unified_limit]
[wsgi]
[root@controller ~]#
```

vim /etc/httpd/conf/httpd.conf



环境变量

```
[root@controller ~]# cat admin-openrc.sh
export OS_PROJECT_DOMAIN_NAME=default
export OS_USER_DOMAIN_NAME=default
export OS_PROJECT_NAME=admin
export OS_USERNAME=admin
export OS_PASSWORD=000000
export OS_AUTH_URL=http://controller:5000/v3
export OS_IDENTITY_API_VERSION=3
export OS_IMAGE_API_VERSION=2
```

glance服务

```
[root@controller ~]# cat /etc/glance/glance-api.conf
[DEFAULT]
[cinder]
[cors]
[database]
connection = mysql+pymysql://glance:000000@controller/glance

[file]
[glance.store.http.store]
[glance.store.rbd.store]
[glance.store.sheepdog.store]
[glance.store.swift.store]
[glance.store.vmware_datastore.store]
[glance_store]
stores = file,http
default_store = file
filesystem_store_datadir = /var/lib/glance/images/

[image_format]
[keystone_authtoken]
www_authenticate_uri = http://controller:5000
auth_url = http://controller:5000
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = glance
```

```
password = 000000

[oslo_concurrency]
[oslo_messaging_amqp]
[oslo_messaging_kafka]
[oslo_messaging_notifications]
[oslo_messaging_rabbit]
[oslo_middleware]
[oslo_policy]
[paste_deploy]
flavor = keystone

[profiler]
[store_type_location_strategy]
[task]
[taskflow_executor]
[root@controller ~]#
```

placement服务

```
[root@controller ~]# cat /etc/placement/placement.conf
[DEFAULT]
[api]
auth_strategy = keystone

[cors]
[keystone_authtoken]
auth_url = http://controller:5000/v3
memcached_servers = controller:11211
 auth_type = password
 project_domain_name = default
 user_domain_name = default
 project_name = service
 username = placement
 password = 000000

[oslo_policy]
[placement]
[placement_database]
 connection = mysql+pymysql://placement:000000@controller/placement

```

```
[profiler]
[root@controller ~]#
```

```
[root@controller ~]# cat /etc/httpd/conf.d/00-placement-api.conf
Listen 8778

<VirtualHost *:8778>
 WSGIProcessGroup placement-api
 WSGIApplicationGroup %{GLOBAL}
 WSGIPassAuthorization On
 WSGIDaemonProcess placement-api processes=3 threads=1 user=placement group=placement
 WSGIScriptAlias / /usr/bin/placement-api
  <IfVersion >= 2.4>
  ErrorLogFormat "%M"
  </IfVersion>
  ErrorLog /var/log/placement/placement-api.log
  #SSLEngine On
  #SSLCertificateFile ...
  <Directory /usr/bin>
  <IfVersion >= 2.4>
  Require all granted
  </IfVersion>
  <IfVersion < 2.4>
  Order allow,deny
  Allow from all
  </IfVersion>
  </Directory>
  #SSLCertificateKeyFile ...

</VirtualHost>

Alias /placement-api /usr/bin/placement-api
<Location /placement-api>
 SetHandler wsgi-script
 Options +ExecCGI
 WSGIProcessGroup placement-api
 WSGIApplicationGroup %{GLOBAL}
 WSGIPassAuthorization On
</Location>
```

```
[root@controller ~]#
```

服务nova（控制节点）

```
[root@controller ~]# cat /etc/nova/nova.conf
[DEFAULT]
enabled_apis = osapi_compute,metadata
transport_url = rabbit://openstack:000000@controller:5672/
my_ip = 192.168.100.147
use_neutron = true
firewall_driver = nova.virt.firewall.NoopFirewallDriver

[api]
 auth_strategy = keystone
 [api_database]
 connection = mysql+pymysql://nova:000000@controller/nova_api

 [barbican]
 [cache]
 [cinder]
 [compute]
 [conductor]
 [console]
 [consoleauth]
 [cors]
 [database]
 connection = mysql+pymysql://nova:000000@controller/nova

 [devices]
 [ephemeral_storage_encryption]
 [filter_scheduler]
 [glance]
 api_servers = http://controller:9292

 [guestfs]
 [healthcheck]
 [hyperv]
 [ironic]
 [key_manager]
 [keystone]
 [keystone_authtoken]
```

```
www_authenticate_uri = http://controller:5000/
auth_url = http://controller:5000/
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = nova
password = 000000

[libvirt]


[metrics]
[mks]
[neutron]
auth_url = http://controller:5000
auth_type = password
project_domain_name = default
user_domain_name = default
region_name = RegionOne
project_name = service
username = neutron
password = 000000
service_metadata_proxy = true
metadata_proxy_shared_secret = 000000

[notifications]
[osapi_v21]
[oslo_concurrency]
lock_path = /var/lib/nova/tmp

[oslo_messaging_amqp]
[oslo_messaging_kafka]
[oslo_messaging_notifications]
[oslo_messaging_rabbit]
[oslo_middleware]
[oslo_policy]
[pci]
[placement]
```

```
region_name = RegionOne
project_domain_name = default
project_name = service
auth_type = password
user_domain_name = default
auth_url = http://controller:5000/v3
username = placement
password = 000000

[powervm]
[privsep]
[profiler]
[quota]
[rdp]
[remote_debug]
[scheduler]
discover_hosts_in_cells_interval = 300

[serial_console]
[service_user]
[spice]
[upgrade_levels]
[vault]
[vendordata_dynamic_auth]
[vmware]
[vnc]
enabled = true
server_listen = $my_ip
server_proxyclient_address = $my_ip

[workarounds]
[wsgi]
[xenserver]
[xvp]
[zvm]
```

服务nova（计算节点）

```
[root@compute openstack-dashboard]# cat /etc/nova/nova.conf
[DEFAULT]
```

```
enabled_apis = osapi_compute,metadata
transport_url = rabbit://openstack:000000@controller
my_ip = 192.168.100.148
use_neutron = true
firewall_driver = nova.virt.firewall.NoopFirewallDriver

[api]
auth_strategy = keystone

[api_database]
[barbican]
[cache]
[cinder]
[compute]
[conductor]
[console]
[consoleauth]
[cors]
[database]
[devices]
[ephemeral_storage_encryption]
[filter_scheduler]
[glance]
api_servers = http://controller:9292

[guestfs]
[healthcheck]
[hyperv]
[ironic]
[key_manager]
[keystone]
[keystone_authtoken]
www_authenticate_uri = http://controller:5000/
auth_url = http://controller:5000/
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = nova
```

```
password = 000000

[libvirt]
virt_type = qemu
[metrics]
[mks]
[neutron]
auth_url = http://controller:5000
auth_type = password
project_domain_name = default
user_domain_name = default
region_name = RegionOne
project_name = service
username = neutron
password = 000000

[notifications]
[osapi_v21]
[oslo_concurrency]
lock_path = /var/lib/nova/tmp

[oslo_messaging_amqp]
[oslo_messaging_kafka]
[oslo_messaging_notifications]
[oslo_messaging_rabbit]
[oslo_middleware]
[oslo_policy]
[pci]
[placement]
region_name = RegionOne
project_domain_name = default
project_name = service
auth_type = password
user_domain_name = default
auth_url = http://controller:5000/v3
username = placement
password = 000000

[powervm]
[privsep]
```

```
[profiler]
[quota]
[rdp]
[remote_debug]
[scheduler]
[serial_console]
[service_user]
[spice]
[upgrade_levels]
[vault]
[vendordata_dynamic_auth]
[vmware]
[vnc]
enabled = true
server_listen = 0.0.0.0
server_proxyclient_address = $my_ip
novncproxy_base_url = http://192.168.100.147:6080/vnc_auto.html

[workarounds]
[wsgi]
[xenserver]
[xvp]
[zvm]
```

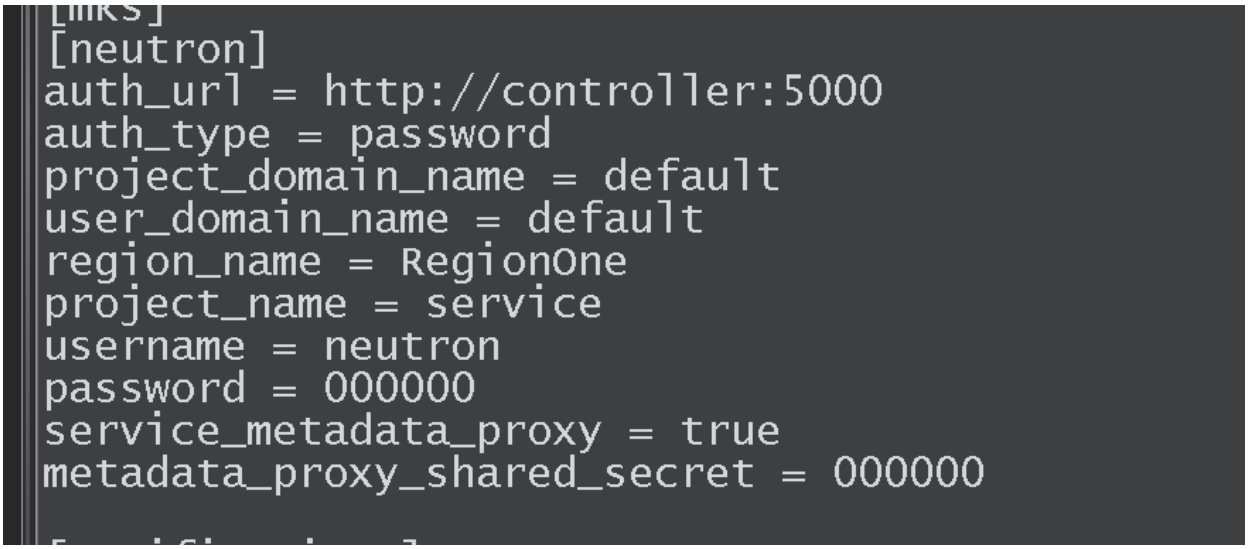
服务neutron controller节点

```
[root@controller ~]# cat /etc/neutron/neutron.conf
[DEFAULT]
core_plugin = ml2
service_plugins =
transport_url = rabbit://openstack:000000@controller
auth_strategy = keystone
notify_nova_on_port_status_changes = true
notify_nova_on_port_data_changes = true

[cors]
[database]
connection = mysql+pymysql://neutron:000000@controller/neutron

```

```
[keystone_authtoken]
www_authenticate_uri = http://controller:5000
auth_url = http://controller:5000
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = neutron
password = 000000

[oslo_concurrency]
lock_path = /var/lib/neutron/tmp

[oslo_messaging_amqp]
[oslo_messaging_kafka]
[oslo_messaging_notifications]
[oslo_messaging_rabbit]
[oslo_middleware]
[oslo_policy]
[privsep]
[ssl]
[nova]
auth_url = http://controller:5000
auth_type = password
project_domain_name = default
user_domain_name = default
region_name = RegionOne
project_name = service
username = nova
password = 000000

[root@controller ~]#
[root@controller ~]# cat /etc/neutron/plugins/ml2/ml2_conf.ini
[DEFAULT]

[ml2]
type_drivers = flat,vlan
tenant_network_types =
mechanism_drivers = linuxbridge
```

```
54 extension_drivers = port_security
55
56 [ml2_type_flat]
57 flat_networks = provider
58
59 [securitygroup]
60 enable_ipset = true
61
62 [root@controller ~]# cat /etc/neutron/plugins/ml2/linuxbridge_agent.ir
i
63 [DEFAULT]
64
65 [linux_bridge]
66 physical_interface_mappings = provider:ens34
67
68 [vxlan]
69 enable_vxlan = false
70
71 [securitygroup]
72 enable_security_group = true
73 firewall_driver = neutron.agent.linux.iptables_firewall.IptablesFirewa
llDriver
74 [root@controller ~]#
75
76 [root@controller ~]# cat /etc/sysctl.conf
77 # sysctl settings are defined through files in
78 # /usr/lib/sysctl.d/, /run/sysctl.d/, and /etc/sysctl.d/.
79 #
80 # Vendors settings live in /usr/lib/sysctl.d/.
81 # To override a whole file, create a new file with the same in
82 # /etc/sysctl.d/ and put new settings there. To override
83 # only specific settings, add a file with a lexically later
84 # name in /etc/sysctl.d/ and put new settings there.
85 #
86
87 net.bridge.bridge-nf-call-iptables = 1
88 net.bridge.bridge-nf-call-ip6tables = 1
89 # For more information, see sysctl.conf(5) and sysctl.d(5).
90
91 [root@controller ~]# cat /etc/neutron/dhcp_agent.ini
92 [DEFAULT]
```

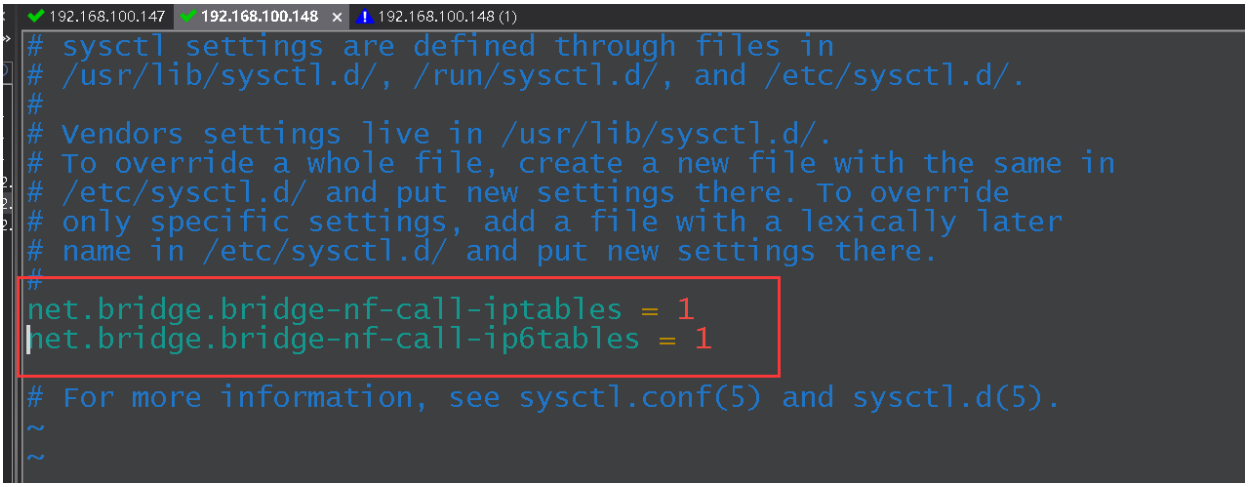
```
93
94 interface_driver = linuxbridge
95 dhcp_driver = neutron.agent.linux.dhcp.Dnsmasq
96 enable_isolated_metadata = true
97 [root@controller ~]#
98
99 [root@controller ~]# cat /etc/neutron/metadata_agent.ini
100 [DEFAULT]
101 nova_metadata_host = controller
102 metadata_proxy_shared_secret = 000000
103
104
105 [root@controller ~]# vim /etc/nova/nova.conf
```



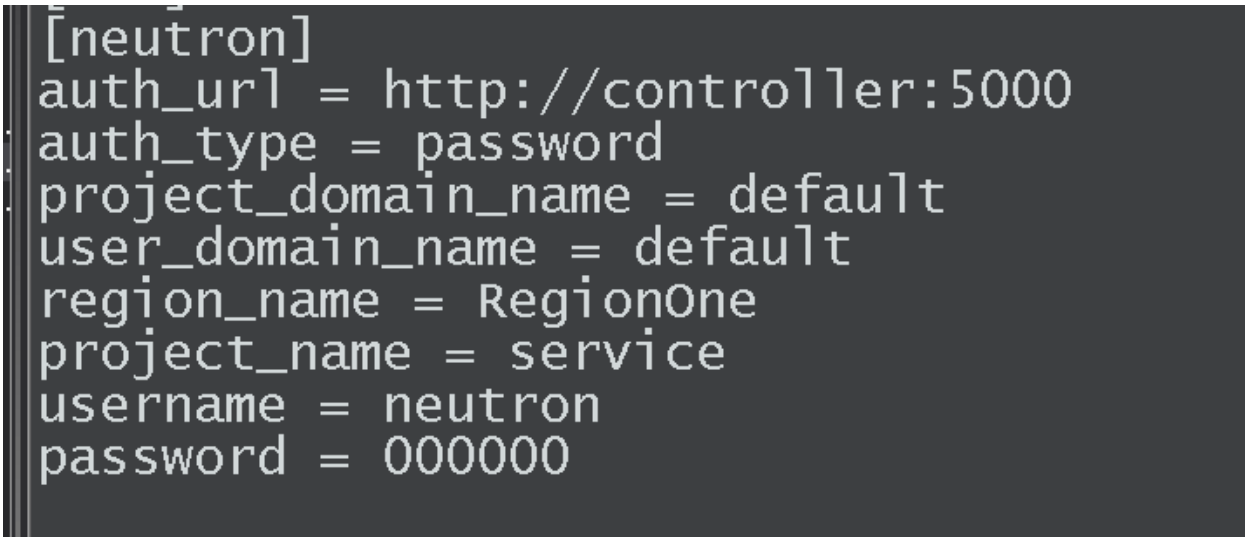
计算节点网络服务neutron

```
1 [root@compute openstack-dashboard]# cat /etc/neutron/neutron.conf
2 [DEFAULT]
3 transport_url = rabbit://openstack:000000@controller
4 auth_strategy = keystone
5
6 [cors]
7 [database]
8 [keystone_authtoken]
9 www_authenticate_uri = http://controller:5000
10 auth_url = http://controller:5000
11 memcached_servers = controller:11211
12 auth_type = password
13 project_domain_name = default
14 user_domain_name = default
```

```
project_name = service
username = neutron
password = 000000

[oslo_concurrency]

lock_path = /var/lib/neutron/tmp
[oslo_messaging_amqp]
[oslo_messaging_kafka]
[oslo_messaging_notifications]
[oslo_messaging_rabbit]
[oslo_middleware]
[oslo_policy]
[privsep]
[ssl]
[root@compute openstack-dashboard]#

[root@compute openstack-dashboard]# cat /etc/neutron/plugins/ml2/linux
bridge_agent.ini
[DEFAULT]

[linux_bridge]
physical_interface_mappings = provider:ens34

[vxlan]
enable_vxlan = false

[securitygroup]
enable_security_group = true
firewall_driver = neutron.agent.linux.iptables_firewall.IptablesFirewa
llDriver
[root@compute openstack-dashboard]#

[root@compute openstack-dashboard]# vim /etc/sysctl.conf
[root@compute openstack-dashboard]#
```




```
[root@compute openstack-dashboard]# vim /etc/nova/nova.conf
```



服务horizon

```
ALLOWED_HOSTS = ['*']

CACHES = {
 'default': {
 'BACKEND': 'django.core.cache.backends.memcached.MemcachedCache',
 'LOCATION': 'controller:11211',
 },
}
SESSION_ENGINE = 'django.contrib.sessions.backends.cache'
EMAIL_BACKEND = 'django.core.mail.backends.console.EmailBackend'

OPENSTACK_HOST = "controller"
```

```
OPENSTACK_KEYSTONE_URL = "http://%s:5000/v3" % OPENSTACK_HOST

# The OPENSTACK_NEUTRON_NETWORK settings can be used to enable optiona
l
# services provided by neutron. Options currently available are load
# balancer service, security groups, quotas, VPN service.
OPENSTACK_KEYSTONE_MULTIDOMAIN_SUPPORT = True
OPENSTACK_KEYSTONE_DEFAULT_DOMAIN = "Default"
OPENSTACK_KEYSTONE_DEFAULT_ROLE = "user"
OPENSTACK_API_VERSIONS = {
"identity": 3,
"image": 2,
"volume": 3,
}

OPENSTACK_NEUTRON_NETWORK = {
 'enable_auto_allocated_network': False,
 'enable_distributed_router': False,
 'enable_fip_topology_check': False,
 'enable_ha_router': False,
 'enable_ipv6': False,
 # TODO(amotoki): Drop OPENSTACK_NEUTRON_NETWORK completely from here.
 # enable_quotas has the different default value here.
 'enable_quotas': False,
 'enable_lb': False,
 'enable_rbac_policy': False,
 'enable_router': False,

 'default_dns_nameservers': [],
 'supported_provider_types': ['*'],
 'segmentation_id_range': {},
 'extra_provider_types': {},
 'supported_vnic_types': ['*'],
 'physical_networks': [],

}

# The timezone of the server. This should correspond with the timezone
# of your entire OpenStack installation, and hopefully be in UTC.
TIME_ZONE = "Asia/Shanghai"
```

拓展

创建虚拟网络

```
双节点
[root@controller ~]# yum remove NetworkManager -y

[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack network create --share --external --pro
vider-physical-network provider --provider-network-type flat vm-network
+---------------------------+----------------------------------------
----------------------------------------------------------------------
---------------------------------------+
| Field | Value |
+---------------------------+----------------------------------------
----------------------------------------------------------------------
---------------------------------------+
| admin_state_up | UP |
| availability_zone_hints | |
| availability_zones | |
| created_at | 2021-11-09T06:36:12Z |
| description | |
| dns_domain | None |
| id | 521f714a-6671-4d89-b968-db12263882a5 |
| ipv4_address_scope | None |
| ipv6_address_scope | None |
| is_default | None |
| is_vlan_transparent | None |
| location | cloud='', project.domain_id=, project.domain_name='defaul
t', project.id='883c664aed47476d93e306deb5ea24f2', project.name='admin',
region_name='', zone= |
| mtu | 1500 |
| name | vm-network |
| port_security_enabled | True |
| project_id | 883c664aed47476d93e306deb5ea24f2 |
| provider:network_type | flat |
| provider:physical_network | provider |
```

```
| provider:segmentation_id | None |
| qos_policy_id | None |
| revision_number | 1 |
| router:external | External |
| segments | None |
| shared | True |
| status | ACTIVE |
| subnets | |
| tags | |
| updated_at | 2021-11-09T06:36:12Z |
+---------------------------+----------------------------------------
----------------------------------------------------------------------
--------------------------------------+
[root@controller ~]# openstack subnet create --network vm-network --al
location-pool start=10.8.20.50,end=10.8.20.60 --dns-nameserver 10.8.20.1
--gateway 10.8.20.1 --subnet-range 10.8.20.0/24 vm-subnetwork^C
[root@controller ~]# openstack subnet create --network vm-network --al
location-pool start=192.168.73.10,end=192.168.73.254 --dns-nameserver 19
2.168.73.1 --gateway 192.168.73.1 --subnet-range 192.168.73.0/24 vm-subne
twork
+-------------------+----------------------------------------------------
----------------------------------------------------------------------
-------------------------------+
| Field | Value |
+-------------------+----------------------------------------------------
----------------------------------------------------------------------
-------------------------------+
| allocation_pools | 192.168.73.10-192.168.73.254 |
| cidr | 192.168.73.0/24 |
| created_at | 2021-11-09T06:37:40Z |
| description | |
| dns_nameservers | 192.168.73.1 |
| enable_dhcp | True |
| gateway_ip | 192.168.73.1 |
| host_routes | |
| id | 3981ccd2-3119-46ad-a98b-c97dde4b459f |
| ip_version | 4 |
| ipv6_address_mode | None |
| ipv6_ra_mode | None |
| location | cloud='', project.domain_id=, project.domain_name='defaul
t', project.id='883c664aed47476d93e306deb5ea24f2', project.name='admin',
region_name='', zone= |
| name | vm-subnetwork |
```

```
| network_id | 521f714a-6671-4d89-b968-db12263882a5 |
| prefix_length | None |
| project_id | 883c664aed47476d93e306deb5ea24f2 |
| revision_number | 0 |
| segment_id | None |
| service_types | |
| subnetpool_id | None |
| tags | |
| updated_at | 2021-11-09T06:37:40Z |
+-------------------+------------------------------------------------------------------------------------------------------------------------------+
[root@controller ~]# openstack network list
+--------------------------------------+------------+--------------------------------------+
| ID | Name | Subnets |
+--------------------------------------+------------+--------------------------------------+
| 521f714a-6671-4d89-b968-db12263882a5 | vm-network | 3981ccd2-3119-46ad-a98b-c97dde4b459f |
+--------------------------------------+------------+--------------------------------------+
[root@controller ~]#

[root@controller ~]# ip a
```

```
    inet6 fe80::ff85:a272:aa89:b205/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
6: tap1dd8d327-a3@if2: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master brq521f714a-66 state UP group default qlen 1000
    link/ether 26:be:ac:6c:e3:e8 brd ff:ff:ff:ff:ff:ff link-netnsid 0
7: brq521f714a-66: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 00:0c:29:ca:b5:57 brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.33/24 brd 192.168.73.255 scope global brq521f714a-66
       valid_lft forever preferred_lft forever
```

[root@controller ~]# systemctl restart network

[root@controller ~]# ip a

```
       valid_lft forever preferred_lft forever
6: tap1dd8d327-a3@if2: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master brq521f714a-66 state UP group default qlen 1000
    link/ether 26:be:ac:6c:e3:e8 brd ff:ff:ff:ff:ff:ff link-netnsid 0
7: brq521f714a-66: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default qlen 1000
    link/ether 00:0c:29:ca:b5:57 brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.33/24 brd 192.168.73.255 scope global brq521f714a-66
       valid_lft forever preferred_lft forever
    inet6 fe80::10be:f2ff:fe9e:f68a/64 scope link
```

```
3: ens34: <BROADCAST,MULTICAST,PROMISC,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast master brq521f714a-66 state UP group default qlen 1000
    link/ether 00:0c:29:ca:b5:57 brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.35/24 brd 192.168.73.255 scope global dynamic ens34
       valid_lft 1790sec preferred_lft 1790sec
    inet6 fe80::d273:e06f:6642:699d/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
    inet6 fe80::20c:29ff:feca:b557/64 scope link
```

```
[root@controller ~]# yum install bridge-utils -y
[root@controller ~]# brctl show
bridge name bridge id STP enabled interfaces
brq521f714a-66 8000.000c29cab557 no ens34
 tap1dd8d327-a3
```

启动实例

```
（1）确认已经停止或者删除了NetworkManager软件包
systemctl stop NetworkManager
systemctl disable NetworkManager
yum remove NetworkManager -y
（2）重启网络
systemctl restart network

创建实例类型
[root@controller ~]# . admin-openrc.sh
[root@controller ~]# openstack flavor create --id 0 --vcpus 1 --ram 64
--disk 1 m1.nano
+----------------------------+---------+
| Field | Value |
+----------------------------+---------+
| OS-FLV-DISABLED:disabled | False |
| OS-FLV-EXT-DATA:ephemeral | 0 |
| disk | 1 |
| id | 0 |
| name | m1.nano |
| os-flavor-access:is_public | True |
| properties | |
| ram | 64 |
| rxtx_factor | 1.0 |
| swap | |
| vcpus | 1 |
+----------------------------+---------+
[root@controller ~]# openstack flavor list
+----+---------+-----+------+-----------+-------+-----------+
| ID | Name | RAM | Disk | Ephemeral | VCPUs | Is Public |
+----+---------+-----+------+-----------+-------+-----------+
| 0 | m1.nano | 64 | 1 | 0 | 1 | True |
+----+---------+-----+------+-----------+-------+-----------+
```

```
[root@controller ~]# openstack user create --domain default --password 000000 yp
+---------------------+----------------------------------+
| Field               | Value                            |
+---------------------+----------------------------------+
| domain_id           | default                          |
| enabled             | True                             |
| id                  | 1cecdf6a68834655b60be79d2b0441be |
| name                | yp                               |
| options             | {}                               |
| password_expires_at | None                             |
+---------------------+----------------------------------+
[root@controller ~]# openstack project create --domain default --description "yp Project" yp-project +-------------+--------------------------------+
| Field       | Value                            |
+-------------+----------------------------------+
| description | yp Project                       |
| domain_id   | default                          |
| enabled     | True                             |
| id          | 9093803189af46119e0aa87d665a4abb |
| is_domain   | False                            |
| name        | yp-project                       |
| options     | {}                               |
| parent_id   | default                          |
| tags        | []                               |
+-------------+----------------------------------+

[root@controller ~]# openstack role add --project yp-project --user yp user
[root@controller ~]#

[root@controller ~]# cat yp-openrc.sh
export OS_PROJECT_DOMAIN_NAME=default

export OS_USER_DOMAIN_NAME=default

export OS_PROJECT_NAME=yp-project

export OS_USERNAME=yp

export OS_PASSWORD=000000
```

```
export OS_AUTH_URL=http://controller:5000/v3

export OS_IDENTITY_API_VERSION=3

export OS_IMAGE_API_VERSION=2

创建密钥
[root@controller ~]# . yp-openrc.sh
[root@controller ~]# ssh-keygen -q -N ""
Enter file in which to save the key (/root/.ssh/id_rsa):
[root@controller ~]# openstack keypair create --public-key ~/.ssh/id_rsa.pub ypkey
+-------------+-------------------------------------------------+
| Field | Value |
+-------------+-------------------------------------------------+
| fingerprint | 04:74:97:89:d6:03:e3:f1:be:29:31:84:fc:ca:60:a3 |
| name | ypkey |
| user_id | 1cecdf6a68834655b60be79d2b0441be |
+-------------+-------------------------------------------------+
[root@controller ~]# openstack keypair list
+-------+-------------------------------------------------+
| Name | Fingerprint |
+-------+-------------------------------------------------+
| ypkey | 04:74:97:89:d6:03:e3:f1:be:29:31:84:fc:ca:60:a3 |
+-------+-------------------------------------------------+
[root@controller ~]#

创建安全组
[root@controller ~]# openstack security group rule create --proto icmp default
+-------------------+--------------------------------------------------------------------------------------------------------------------------------------+
| Field | Value |
+-------------------+--------------------------------------------------------------------------------------------------------------------------------------+
| created_at | 2021-11-09T06:51:50Z |
| description | |
| direction | ingress |
| ether_type | IPv4 |
```

```
| id | 625ab51e-39d2-44ba-8cc4-d8724331b2ca |
| location | cloud='', project.domain_id=, project.domain_name='defau
lt', project.id='9093803189af46119e0aa87d665a4abb', project.name='yp-proj
ect', region_name='', zone= |
| name | None |
| port_range_max | None |
| port_range_min | None |
| project_id | 9093803189af46119e0aa87d665a4abb |
| protocol | icmp |
| remote_group_id | None |
| remote_ip_prefix | 0.0.0.0/0 |
| revision_number | 0 |
| security_group_id | 256f82ee-7ad8-42a9-9ba3-cc310d28075f |
| tags | [] |
| updated_at | 2021-11-09T06:51:50Z |
+-------------------+--------------------------------------------------
--------------------------------------------------------------------------
-----------------------------------+
[root@controller ~]# openstack security group rule create --proto tcp
--dst-port 22 default
+-------------------+--------------------------------------------------
--------------------------------------------------------------------------
-----------------------------------+
| Field | Value |
+-------------------+--------------------------------------------------
--------------------------------------------------------------------------
-----------------------------------+
| created_at | 2021-11-09T06:52:00Z |
| description | |
| direction | ingress |
| ether_type | IPv4 |
| id | d497543c-eff3-4004-9ee0-19b6da378e3e |
| location | cloud='', project.domain_id=, project.domain_name='defau
lt', project.id='9093803189af46119e0aa87d665a4abb', project.name='yp-proj
ect', region_name='', zone= |
| name | None |
| port_range_max | 22 |
| port_range_min | 22 |
| project_id | 9093803189af46119e0aa87d665a4abb |
| protocol | tcp |
| remote_group_id | None |
| remote_ip_prefix | 0.0.0.0/0 |
| revision_number | 0 |
```

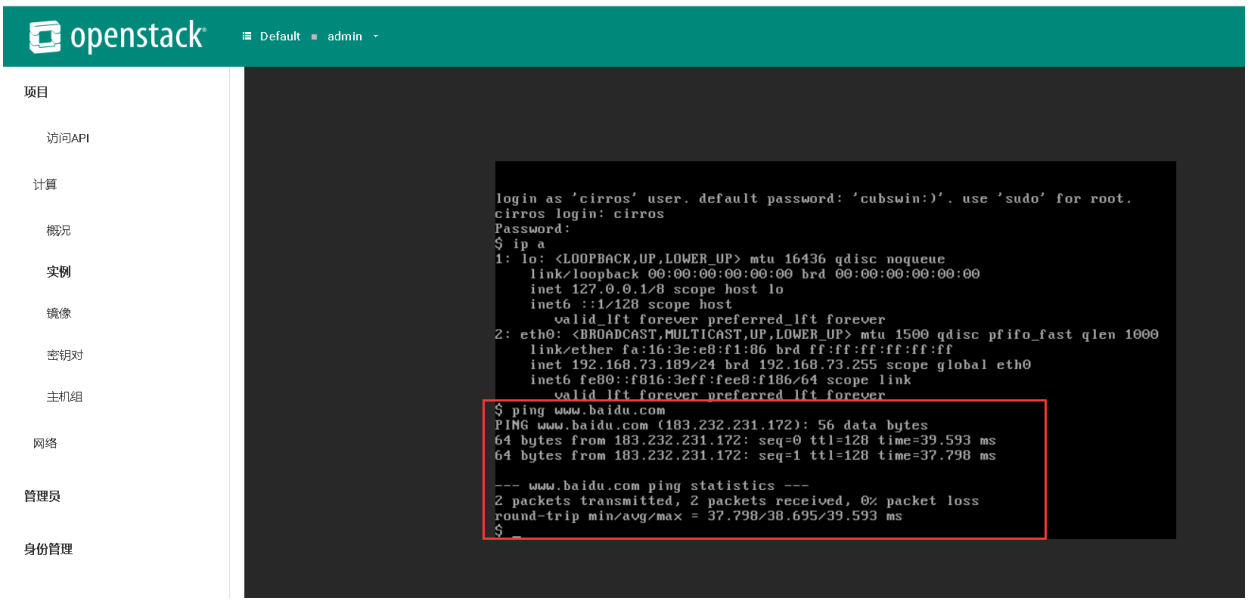
```
| security_group_id | 256f82ee-7ad8-42a9-9ba3-cc310d28075f |
| tags | [] |
| updated_at | 2021-11-09T06:52:00Z |
+-------------------+--------------------------------------------------------------------------------------+
[root@controller ~]#

[root@controller ~]# openstack flavor list
+----+---------+-----+------+-----------+-------+-----------+
| ID | Name | RAM | Disk | Ephemeral | VCPUs | Is Public |
+----+---------+-----+------+-----------+-------+-----------+
| 0 | m1.nano | 64 | 1 | 0 | 1 | True |
+----+---------+-----+------+-----------+-------+-----------+
[root@controller ~]# openstack image list
+--------------------------------------+--------------+--------+
| ID | Name | Status |
+--------------------------------------+--------------+--------+
| 1cdb078a-8d30-4d31-9cab-1281a0c8b935 | cirros-0.3.3 | active |
+--------------------------------------+--------------+--------+
[root@controller ~]#
[root@controller ~]# openstack network list
+--------------------------------------+------------+--------------------------------------+
| ID | Name | Subnets |
+--------------------------------------+------------+--------------------------------------+
| 521f714a-6671-4d89-b968-db12263882a5 | vm-network | 3981ccd2-3119-46ad-a98b-c97dde4b459f |
+--------------------------------------+------------+--------------------------------------+
[root@controller ~]#
[root@controller ~]# openstack security group list
+--------------------------------------+---------+-------------+----------------------------------+------+
| ID | Name | Description | Project | Tags |
+--------------------------------------+---------+-------------+----------------------------------+------+
| 256f82ee-7ad8-42a9-9ba3-cc310d28075f | default | 缺省安全组 | 9093803189af46119e0aa87d665a4abb | [] |
+--------------------------------------+---------+-------------+----------------------------------+------+

```

```
171 [root@controller ~]# vim /etc/nova/nova.conf
```

```
192.168.100.147 × 192.168.100.148 192.168.100.148 (1)
[DEFAULT]
enabled_apis = osapi_compute,metadata
transport_url = rabbit://openstack:000000@controller:5672/
my_ip = 192.168.100.147
use_neutron = true
firewall_driver = nova.virt.firewall.NoopFirewallDriver
vif_plugging_is_fatal = false

vif_plugging_timeout = 0
```

```
1 [root@controller ~]# . admin-openrc.sh
2 [root@controller ~]# openstack server list
3 +--------------------------------------+--------+--------+------------
---------------+--------------+---------+
4 | ID | Name | Status | Networks | Image | Flavor |
5 +--------------------------------------+--------+--------+------------
---------------+--------------+---------+
6 | 60ccf870-efb5-4401-a1cd-23294a9bea8b | cirrOS | ACTIVE | vm-
network=192.168.73.189 | cirros-0.3.3 | m1.nano |
7 +--------------------------------------+--------+--------+------------
---------------+--------------+---------+
```

```
[root@controller ~]# brctl show
bridge name     bridge id               STP enabled     interfaces
brq521f714a-66          8000.000c29cab557       no              ens34
                                                        tap1dd8d327-a3
[root@controller ~]#
```



```
login as 'cirros' user. default password: 'cubswin:)'. use 'sudo' for root.
cirros login: cirros
Password:
$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast qlen 1000
    link/ether fa:16:3e:e8:f1:86 brd ff:ff:ff:ff:ff:ff
    inet 192.168.73.189/24 brd 192.168.73.255 scope global eth0
    inet6 fe80::f816:3eff:fee8:f186/64 scope link
       valid_lft forever preferred_lft forever
$ ping www.baidu.com
PING www.baidu.com (183.232.231.174): 56 data bytes
64 bytes from 183.232.231.174: seq=0 ttl=128 time=35.869 ms
64 bytes from 183.232.231.174: seq=1 ttl=128 time=32.545 ms
64 bytes from 183.232.231.174: seq=2 ttl=128 time=37.218 ms

--- www.baidu.com ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 32.545/35.210/37.218 ms
$
```

openstack-T版搭建完成，至于后面的服务就得给位自己动脑经了