

# OpenStack Icehouse Multiple Virtual Machines Manual Install

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### **Acknowledgements**

This document is a culmination of the Red Hat and OpenStack documentation for Icehouse.

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# Chapter 1

## Physical Hardware

### 1.1 Cisco Catalyst 4006 Configuration

Listing 1.1: Trunk and Port Channel

---

```
1 interface Port-channel1
2   switchport
3   switchport trunk encapsulation dot1q
4   switchport trunk allowed vlan 2-4,12,80,81,100,250-253,2168
5   switchport mode trunk
6   switchport nonegotiate
7   spanning-tree portfast trunk
8 end
9
10 interface GigabitEthernet3/20
11   switchport access vlan 253
12   switchport trunk encapsulation dot1q
13   switchport trunk allowed vlan 2-4,12,80,81,100,250-253,2168
14   switchport mode trunk
15   switchport nonegotiate
16   channel-group 1 mode active
17 end
18
19 interface GigabitEthernet3/21
20   switchport trunk encapsulation dot1q
21   switchport trunk allowed vlan 2-4,12,80,81,100,250-253,2168
22   switchport mode trunk
23   switchport nonegotiate
24   channel-group 1 mode active
25 end
```

---



## 1.2 Open vSwitch Bridge

Listing 1.2: Open vSwitch

---

```

1 ovs-vsctl add-br ovsbr0
2 ovs-vsctl add-bond ovsbr0 bond0 enp19s4f0 enp19s4f1
3 ovs-vsctl set port bond0 lacp=active
4 ovs-vsctl set port bond0 bond_mode=balance-slb

```

---

Listing 1.3: ifcfg scripts

---

```

1 DEVICE="bond0"
2 ONBOOT="yes"
3 DEVICETYPE="ovs"
4 TYPE="OVSBond"
5 OVS_BRIDGE="ovsbr0"
6 BOOTPROTO="none"
7 BOND_IFACES="enp19s4f0 enp19s4f1"
8 OVS_OPTIONS="bond_mode=balance-slb lacp=active"
9 HOTPLUG="no"
10
11 DEVICE="ovsbr0"
12 ONBOOT="yes"
13 DEVICETYPE="ovs"
14 TYPE="OVSBridge"
15 BOOTPROTO="none"
16 HOTPLUG="no"

```

---

Listing 1.4: Libvirt and Open vSwitch

---

```

1 <network>
2   <name>ovs-network</name>
3   <uuid>2fde288e-242c-4b48-95f4-28f844c768f4</uuid>
4   <forward mode='bridge' />
5   <bridge name='ovsbr0' />
6   <virtualport type='openvswitch' />
7   <portgroup name='vlan-252'>
8     <vlan>
9       <tag id='252' />
10    </vlan>
11  </portgroup>
12  <portgroup name='vlan-253'>
13    <vlan>
14      <tag id='253' />
15    </vlan>
16  </portgroup>
17  <portgroup name='vlan-all'>
18    <vlan trunk='yes'>
19      <tag id='80' />
20      <tag id='81' />

```

```
21     </vlan>
22 </portgroup>
23 </network>
```

---

## 1.3 Clone and sysprep

---

Listing 1.5: Clone using virt-clone

---

```
1 virt-clone -o fedora20 -n virneupaw001 --auto-clone
```

---

---

Listing 1.6: Sysprep using virt-sysprep

---

```
1 virt-sysprep -a /dev/virtualmachine/virtclpaw001 --hostname
  virtclpaw001.virtomation.com --firstboot-command "sed -i -r 's/
  IPADDR=(\b[0-9]{1,3}\.){3}[0-9]{1,3}\b'/IPADDR=10.53.252.61/ /etc/
  sysconfig/network-scripts/ifcfg-eth0" --firstboot-command 'systemctl
  restart network' --firstboot-command 'yum install -y http://rdo.
  fedorapeople.org/rdo-release.rpm' --firstboot-command 'yum install
  openstack-packstack -y'
```

---

## Chapter 2

# Prerequisites

Listing 2.1: Bash Aliases

---

```
1 alias yi="yum -y install"
2 alias start="systemctl start"
3 alias e="systemctl enable"
4 alias ocs="openstack-config --set"
```

---

Listing 2.2: Database Install

---

```
1 yi mariadb mariadb-server
2 e mariadb.service
3 start mariadb.service
4 netstat -tanp | grep 3306
5 mysql_secure_installation
```

---

Listing 2.3: RabbitMQ Install

---

```
1 yi rabbitmq-server
2 e rabbitmq-server
3 start rabbitmq-server.service
```

---

Listing 2.4: Create RabbitMQ User Accounts

---

```
1 for serv in "cinder" "nova" "neutron" "heat"; do passwd=`openssl rand -
  base64 8`; echo "$serv - $passwd"; rabbitmqctl add_user $serv
  $passwd; rabbitmqctl set_permissions -p / $serv ".*" ".*" ".*"; done
```

---

Listing 2.5: Result from user account creation

---

```
1 cinder - Q7gPp1FOK5g=
2 Creating user "cinder" ...
3 ...done.
4 nova - 2mM7OaVNFKM=
```

---

```
5 Creating user "nova" ...
6 ...done.
7 neutron - krPOwjPbKJs=
8 Creating user "neutron" ...
9 ...done.
10 heat - l2iDSln7nmw=
11 Creating user "heat" ...
12 ...done.
```

---

# Chapter 3

## Keystone

### 3.1 Installation

Listing 3.1: Install Keystone packages

---

```
1 yi openstack-keystone openstack-utils
2 mysql -u root -p
3 export SERVICE_TOKEN=$(openssl rand -hex 10)
4 echo $SERVICE_TOKEN > ~/ks_admin_token
```

---

### 3.2 Database

Listing 3.2: Keystone configuration

---

```
1 chown -R keystone:keystone /var/log/keystone /etc/keystone/ssl/
2 chmod -R o-rwx /etc/keystone/ssl
3 ocs /etc/keystone/keystone.conf DEFAULT admin_token $SERVICE_TOKEN
4 ocs /etc/keystone/keystone.conf sql connection mysql://keystone:
  trustn0l@10.53.252.61/keystone
5 keystone-manage pki_setup --keystone-user keystone --keystone-group
  keystone
6 su -s /bin/sh -c "keystone-manage db_sync" keystone
```

---

Listing 3.3: Start and enable Keystone

---

```
1 start openstack-keystone
2 e openstack-keystone
```

---

### 3.3 Admin User and Tenant

Listing 3.4: Keystone ???

---

```
1 export OS_SERVICE_TOKEN=$SERVICE_TOKEN
2 export OS_SERVICE_ENDPOINT=http://10.53.252.61:35357/v2.0
3 source /etc/bash_completion.d/keystone.bash_completion
4
5 keystone user-create --name=admin --pass=trustn01
6 keystone role-create --name=admin
7 keystone tenant-create --name=admin --description="Admin Tenant"
8 keystone user-role-add --user=admin --tenant=admin --role=admin
9 keystone user-role-add --user=admin --role=_member_ --tenant=admin
10 keystone tenant-create --name=service --description="Service Tenant"
11 keystone service-create --name=keystone --type=identity --description="
    OpenStack Identity" keystone endpoint-create --service=keystone --
    publicurl=http://10.53.252.61:5000/v2.0 --internalurl=http
    ://10.53.252.61:5000/v2.0 --adminurl=http://10.53.252.61:35357/v2.0
```

---

Listing 3.5: Unset Environment variables

---

```
1 unset OS_SERVICE_ENDPOINT
2 unset OS_ENDPOINT
3 unset OS_SERVICE_TOKEN
4 unset SERVICE_TOKEN
```

---



Make sure that you unset environmental variables or you will receive keystone errors.

Listing 3.6: Keystone Error Message


---

```
1 [root@virctlpaw001 ~]# keystone catalog
2 'NoneType' object has no attribute 'has_service_catalog'
```

---

# Chapter 4

## Swift

 This chapter is a mess, ignore

Listing 4.1: Install Swift

---

```
1 yi glance...
2 yum install -y openstack-swift-proxy \
3 openstack-swift-object \
4 openstack-swift-container \
5 openstack-swift-account \
6 openstack-utils \
7 memcached
```

---

Listing 4.2: Install Swift

---

```
1 fdisk /dev/vdb
2 mkfs.ext4 /dev/vdb1
3 [root@virctlpaw001 ~(keystone_admin)]# blkid /dev/vdb1
4 /dev/vdb1: UUID="7cefc9b8-3313-40cb-941b-78b35c029bac" TYPE="ext4"
   PARTUUID="9faed234-01"
5 vi /etc/fstab
6 mkdir -p /srv/node/d1
7 mount -a
```

---

Listing 4.3: Swift account, container, object

---

```
1 ocs /etc/swift/swift.conf swift-hash swift_hash_path_prefix $(openssl
   rand -hex 10)
2 ocs /etc/swift/swift.conf swift-hash swift_hash_path_suffix $(openssl
   rand -hex 10)
3 ocs /etc/swift/object-server.conf DEFAULT bind_ip 10.53.252.61
4 ocs /etc/swift/account-server.conf DEFAULT bind_ip 10.53.252.61
5 ocs /etc/swift/container-server.conf DEFAULT bind_ip 10.53.252.61
6 for ops_service in "openstack-swift-account" "openstack-swift-container"
   " "openstack-swift-object"; do systemctl enable $ops_service;
   systemctl start $ops_service; done
```

---

---

**Listing 4.4: Swift Proxy**

---

```
1 ocs /etc/swift/proxy-server.conf filter:authtoken auth_host
   10.53.252.61
2 ocs /etc/swift/proxy-server.conf filter:authtoken auth_tenant_name
   service
3 ocs /etc/swift/proxy-server.conf filter:authtoken admin_user swift
4 ocs /etc/swift/proxy-server.conf filter:authtoken admin_password
   trustn01
5 for ops_service in "memcached" "openstack-swift-proxy" ; do systemctl
   enable $ops_service; systemctl start $ops_service; done
```

---



# Chapter 5

## Glance

Listing 5.1: Glance Keystone create

---

```
1 keystone user-create --name glance --pass trustn01
2 keystone user-role-add --user glance --role admin --tenant service
3 keystone service-create --name glance --type image --description "
  Glance Image Service"
4 keystone endpoint-create --service glance --publicurl "http
  ://10.53.252.61:9292" --adminurl "http://10.53.252.61:9292" --
  internalurl "http://10.53.252.61:9292"
```

---

### 5.1 Configuration

Listing 5.2: Glance API

---

```
1 openstack-config --set /etc/glance/glance-api.conf DEFAULT
  sql_connection mysql://glance:trustn01@10.53.252.61/glance
2 ocs /etc/glance/glance-api.conf paste_deploy flavor keystone
3 ocs /etc/glance/glance-api.conf keystone_auth_token auth_host
  10.53.252.61
4 ocs /etc/glance/glance-api.conf keystone_auth_token auth_port 35357
5 ocs /etc/glance/glance-api.conf keystone_auth_token auth_protocol http
6 ocs /etc/glance/glance-api.conf keystone_auth_token admin_tenant_name
  service
7 ocs /etc/glance/glance-api.conf keystone_auth_token admin_user glance
8 ocs /etc/glance/glance-api.conf keystone_auth_token admin_password
  trustn01
```

---

Listing 5.3: Glance Registry

---

```
1 ocs /etc/glance/glance-registry.conf DEFAULT sql_connection mysql://
  glance:trustn01@10.53.252.61/glance
```

---

```

2 ocs /etc/glance/glance-registry.conf paste_deploy flavor keystone
3 ocs /etc/glance/glance-registry.conf keystone_authtoken auth_host
  10.53.252.61
4 ocs /etc/glance/glance-registry.conf keystone_authtoken auth_port 35357
5 ocs /etc/glance/glance-registry.conf keystone_authtoken auth_protocol
  http
6 ocs /etc/glance/glance-registry.conf keystone_authtoken
  admin_tenant_name service
7 ocs /etc/glance/glance-registry.conf keystone_authtoken admin_user
  glance
8 ocs /etc/glance/glance-registry.conf keystone_authtoken admin_password
  trustn01

```

---

#### Listing 5.4: Bugzilla 1090648 - glance-manage db\_sync silently fails to prepare the database

---

```

2014-08-12 15:06:55.083 1694 CRITICAL glance [-] ValueError: Tables "
  migrate_version" have non utf8 collation, please make sure all
  tables are CHARSET=utf8
2014-08-12 15:06:55.083 1694 TRACE glance Traceback (most recent call
  last):
2014-08-12 15:06:55.083 1694 TRACE glance File "/bin/glance-manage",
  line 10, in <module>
2014-08-12 15:06:55.083 1694 TRACE glance sys.exit(main())
2014-08-12 15:06:55.083 1694 TRACE glance File "/usr/lib/python2.7/
  site-packages/glance/cmd/manage.py", line 259, in main
2014-08-12 15:06:55.083 1694 TRACE glance return CONF.command.
  action_fn()
2014-08-12 15:06:55.083 1694 TRACE glance File "/usr/lib/python2.7/
  site-packages/glance/cmd/manage.py", line 160, in sync
2014-08-12 15:06:55.083 1694 TRACE glance CONF.command.
  current_version)
2014-08-12 15:06:55.083 1694 TRACE glance File "/usr/lib/python2.7/
  site-packages/glance/cmd/manage.py", line 137, in sync
2014-08-12 15:06:55.083 1694 TRACE glance sanity_check=self.
  _need_sanity_check()
2014-08-12 15:06:55.083 1694 TRACE glance File "/usr/lib/python2.7/
  site-packages/glance/openstack/common/db/sqlalchemy/migration.py",
  line 195, in db_sync
2014-08-12 15:06:55.083 1694 TRACE glance _db_schema_sanity_check(
  engine)
2014-08-12 15:06:55.083 1694 TRACE glance File "/usr/lib/python2.7/
  site-packages/glance/openstack/common/db/sqlalchemy/migration.py",
  line 221, in _db_schema_sanity_check
2014-08-12 15:06:55.083 1694 TRACE glance ) % ','.join(table_names)
  )
2014-08-12 15:06:55.083 1694 TRACE glance ValueError: Tables "
  migrate_version" have non utf8 collation, please make sure all
  tables are CHARSET=utf8
2014-08-12 15:06:55.083 1694 TRACE glance

```

---

---

Listing 5.5: Workaround - db\_enforce\_mysql\_charset=False

---

```
1 vi /etc/glance/glance-api.conf
2 su -s /bin/sh -c "glance-manage db_sync" glance
3 mysql -u glance -p -e "show tables" glance
```

---

---

Listing 5.6: Start and enable Glance Services

---

```
1 for ops_service in "openstack-glance-registry" "openstack-glance-api" ;
   do systemctl enable $ops_service; systemctl start $ops_service;
   done
```

---

---

Listing 5.7: Add Cirros Image

---

```
1 wget http://download.cirros-cloud.net/0.3.2/cirros-0.3.2-x86_64-disk.
   img
2
3 glance image-create --name "cirros" --is-public true --disk-format
   qcow2 --container-format bare --file cirros-0.3.2-x86_64-disk.img
```

---

## Chapter 6

# Cinder

---

```
1 keystone user-create --name cinder --pass trustn01
2
3 keystone user-role-add --user cinder --role admin --tenant service
4 keystone service-create --name cinder --type volume --description "
  Cinder Volume Service"
5
6 keystone endpoint-create --service cinder --publicurl "http
  ://10.53.252.62:8776/v1/\$(tenant_id)s" --adminurl "http
  ://10.53.252.62:8776/v1/\$(tenant_id)s" --internalurl "http
  ://10.53.252.62:8776/v1/\$(tenant_id)s"
7
8 mysql -u cinder -p -e "show tables" cinder
```

---

```
1 yi openstack-cinder openstack-utils scsi-target-utils
2
3 ocs /etc/cinder/cinder.conf DEFAULT auth_strategy keystone
4 ocs /etc/cinder/cinder.conf keystone_auth_token auth_host 10.53.252.61
5 ocs /etc/cinder/cinder.conf keystone_auth_token admin_tenant_name
  service
6 ocs /etc/cinder/cinder.conf keystone_auth_token admin_user cinder
7 ocs /etc/cinder/cinder.conf keystone_auth_token admin_password trustn01
8
9 vgcreate cinder-volumes /dev/vdb
10
11
12 ocs /etc/cinder/cinder.conf DEFAULT rpc_backend cinder.openstack.common
  .rpc.impl_kombu
13 ocs /etc/cinder/cinder.conf DEFAULT rabbit_host 10.53.252.61
14 ocs /etc/cinder/cinder.conf DEFAULT rabbit_port 5672
15 ocs /etc/cinder/cinder.conf DEFAULT rabbit_userid cinder
16 ocs /etc/cinder/cinder.conf DEFAULT rabbit_password Q7gPp1FOK5g=
17
18 ocs /etc/cinder/cinder.conf DEFAULT sql_connection mysql://cinder:
```

---

```
trustn01@10.53.252.61/cinder
19
20 su -s /bin/sh -c "cinder-manage db sync" cinder
```

---

---

Listing 6.1: add \* to include /etc/cinder/volumes/

---

```
1 add * to include /etc/cinder/volumes/
2 vi /etc/tgt/conf.d/cinder.conf
```

---



### Confirm RabbitMQ Status

---

```
1 rabbitmqctl status
```

---

## Chapter 7

# Nova Controller

---

```
1 yum install openstack-nova-api openstack-nova-cert openstack-nova-
   conductor openstack-nova-console openstack-nova-novncproxy openstack
   -nova-scheduler python-novaclient
2 ocs /etc/nova/nova.conf database connection mysql://nova:trustn01@10
   .53.252.61/nova
3 ocs /etc/nova/nova.conf DEFAULT rpc_backend rabbit
4 ocs /etc/nova/nova.conf DEFAULT rabbit_host 10.53.252.61
5 ocs /etc/nova/nova.conf DEFAULT rabbit_port 5672
6 ocs /etc/nova/nova.conf DEFAULT rabbit_userid nova
7 ocs /etc/nova/nova.conf DEFAULT rabbit_password '2mM7OaVNFKM='
8
9 ocs /etc/nova/nova.conf database connection mysql://nova:trustn01@10
   .53.252.61/nova
10 ocs /etc/nova/nova.conf DEFAULT rpc_backend rabbit
11 ocs /etc/nova/nova.conf DEFAULT rabbit_host 10.53.252.61
12 ocs /etc/nova/nova.conf DEFAULT rabbit_port 5672
13 ocs /etc/nova/nova.conf DEFAULT rabbit_userid nova
14 ocs /etc/nova/nova.conf DEFAULT rabbit_password '2mM7OaVNFKM='
15 ocs /etc/nova/nova.conf DEFAULT my_ip 10.53.252.62
16 ocs /etc/nova/nova.conf DEFAULT vncserver_listen 10.53.252.62
17 ocs /etc/nova/nova.conf DEFAULT vncserver_proxyclient_address
   10.53.252.62
```

---

Listing 7.1: virctlpaw001

---

```
1 keystone user-create --name=nova --pass=trustn01
2 keystone user-role-add --user=nova --tenant=service --role=admin
3
4 mysql -u root -p
5 keystone endpoint-create --service nova --publicurl=http
   ://10.53.252.62:8774/v2/%(tenant_id)s --internalurl=http
   ://10.53.252.62:8774/v2/%(tenant_id)s --adminurl=http
   ://10.53.252.62:8774/v2/%(tenant_id)s
```

```

6 keystone service-create --name=nova --type=compute --description="
  OpenStack Compute"
7 keystone endpoint-create --service nova --publicurl=http
  ://10.53.252.62:8774/v2/%(tenant_id)s --internalurl=http
  ://10.53.252.62:8774/v2/%(tenant_id)s --adminurl=http
  ://10.53.252.62:8774/v2/%(tenant_id)s
8 mysql -u nova -p -e "show tables" nova

```

---

Listing 7.2: virctlpaw002

```

1 ocs /etc/nova/nova.conf DEFAULT auth_strategy keystone
2 ocs /etc/nova/nova.conf keystone_authtoken auth_uri http
  ://10.53.252.61:5000
3 ocs /etc/nova/nova.conf keystone_authtoken auth_host 10.53.252.61
4 ocs /etc/nova/nova.conf keystone_authtoken auth_protocol http
5 ocs /etc/nova/nova.conf keystone_authtoken auth_port 35357
6 ocs /etc/nova/nova.conf keystone_authtoken admin_user nova
7 ocs /etc/nova/nova.conf keystone_authtoken admin_tenant_name service
8 ocs /etc/nova/nova.conf keystone_authtoken admin_password trustn01
9 su -s /bin/sh -c "nova-manage db sync" nova
10 for ops_service in "openstack-nova-api" "openstack-nova-cert" "
  openstack-nova-consoleauth" "openstack-nova-scheduler" "openstack-
  nova-conductor" "openstack-nova-novncproxy"; do systemctl enable
  $ops_service; systemctl start $ops_service; done
11 egrep 'ERROR' /var/log/nova/*

```

---

Listing 7.3: Nova Glance configuration

```

1 ocs /etc/nova/nova.conf DEFAULT image_service nova.image.glance.
  GlanceImageService
2 ocs /etc/nova/nova.conf DEFAULT glance_host 10.53.252.61
3 ocs /etc/nova/nova.conf DEFAULT glance_port 9292
4 ocs /etc/nova/nova.conf DEFAULT glance_protocol http
5 ocs /etc/nova/nova.conf DEFAULT glance_api_servers 10.53.252.61:9292

```

---

## Chapter 8

# Neutron

Listing 8.1: Neutron virctlpaw001

---

```
1 keystone user-create --name neutron --pass trustn01
2 keystone user-role-add --user neutron --role admin --tenant service
3 keystone service-create --name neutron --type network --description "
  OpenStack Networking Service"
4 keystone endpoint-create --service neutron --publicurl "http
  ://10.53.252.63:9696" --adminurl "http://10.53.252.63:9696" --
  internalurl "http://10.53.252.63:9696"
5
6 mysql -u root -p
7 ocs /etc/neutron/plugin.ini DATABASE sql_connection mysql://neutron:
  trustn01@10.53.252.61/neutron_ml2
8 mysql -u neutron -p -e "show tables" neutron
```

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Listing 8.2: Neutron virneupaw001

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```
1 yum install openstack-neutron openstack-neutron-ml2 openstack-utils -y
2 alias yi="yum -y install"
3 alias start="systemctl start"
4 alias e="systemctl enable"
5 alias ocs="openstack-config --set"
6 ocs /etc/neutron/neutron.conf DEFAULT auth_strategy keystone
7 ocs /etc/neutron/neutron.conf keystone_authtoken auth_host 10.53.252.61
8 ocs /etc/neutron/neutron.conf keystone_authtoken admin_tenant_name
  service
9 ocs /etc/neutron/neutron.conf keystone_authtoken admin_user neutron
10 ocs /etc/neutron/neutron.conf keystone_authtoken admin_password
  trustn01
11 clear
12 ocs /etc/neutron/neutron.conf DEFAULT rpc_backend neutron.openstack.
  common.rpc.impl_kombu
13 ocs /etc/neutron/neutron.conf DEFAULT rabbit_host 10.53.252.61
14 ocs /etc/neutron/neutron.conf DEFAULT rabbit_port 5672
```

---



```
15 ocs /etc/neutron/neutron.conf DEFAULT rabbit_userid neutron
16 ocs /etc/neutron/neutron.conf DEFAULT rabbit_password 'krPOwjPbKJs='
17 ln -s /etc/neutron/plugins/ml2/ml2_conf.ini
18 ln -s /etc/neutron/plugins/ml2/ml2_conf.ini /etc/neutron/plugin.ini
19
20
21 ocs /etc/neutron/plugin.ini DATABASE sql_connection mysql://neutron:
    trustn01@10.53.252.61/neutron
22 ocs /etc/neutron/plugin.ini DATABASE sql_connection mysql://neutron:
    trustn01@10.53.252.61/neutron_ml2
23 neutron-db-manage --config-file /usr/share/neutron/neutron-dist.conf --
    config-file /etc/neutron/neutron.conf --config /etc/neutron/plugin.
    ini upgrade head
24 neutron-db-manage --config-file /usr/share/neutron/neutron-dist.conf --
    config-file /etc/neutron/neutron.conf --config-file /etc/neutron/
    plugin.ini upgrade head
25 vi /etc/neutron/plugin.ini
26 vi /etc/neutron/neutron.conf
27 neutron-db-manage --config-file /usr/share/neutron/neutron-dist.conf --
    config-file /etc/neutron/neutron.conf --config-file /etc/neutron/
    plugin.ini upgrade head
28 touch /etc/sysconfig/iptables
29 ocs /etc/neutron/dhcp_agent.ini DEFAULT auth_strategy keystone
30 ocs /etc/neutron/dhcp_agent.ini keystone_authtoken auth_host
    10.53.252.61
31 ocs /etc/neutron/dhcp_agent.ini keystone_authtoken admin_tenant_name
    service
32 ocs /etc/neutron/dhcp_agent.ini keystone_authtoken admin_user neutron
33 ocs /etc/neutron/dhcp_agent.ini keystone_authtoken admin_password
    trustn01
34 ocs /etc/neutron/dhcp_agent.ini DEFAULT interface_driver neutron.agent.
    linux.interface.OVSInterfaceDriver
35 clear
36 for ops_service in "neutron-server" "neutron-dhcp-agent" ; do systemctl
    enable $ops_service; systemctl start $ops_service; done
37 cd /var/log/neutron/
38 ls
39 tail server.log
40 vi /etc/neutron/plugin.ini
41 systemctl restart neutron-server.service
42 ls
43 tail server.log
44 vi /etc/neutron/plugin.ini
45 systemctl restart neutron-server.service
46 tail server.log
47 cat /etc/neutron/plugin.ini
48 yum install openstack-neutron-openvswitch.noarch -y
```

---