OpenStack Icehouse Multiple Virtual Machines Manual

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Chapter 1

Packstack

1.1 Prerequisites

You can use any hypervisor: VMware Workstation, Fusion, Player, ESXi, KVM w/virt-manager (you don't really need virt-manager with KVM, just makes it easier) or VirtualBox. As of this writing download a network-based install CD of Fedora 20. This will allow you to create a minimal install that is all up to date. The OS disk needs minimally 8 GB and a secondary disk for cinder volumes which should be at least 20 GB. I recommend using the NAT network interface since it will provide a route and DNS. We will overlap IP addresses of the DHCP server but that shouldn't be an issue unless you have multiple virtual machines running.

After the OS has been installed lets create our cinder-volumes volume group. In this example the device is named vdb, yours could be different. To determine disk name use `dmesg` or `fdisk -l`.

Listing 1.1: Create Cinder Volume VG

```
1 vgcreate cinder-volumes /dev/vdb
```

Listing 1.2: Disable firewalld, enable iptables-services

```
1 systemctl enable network
2 systemctl disable firewalld
3 yum install iptables-services -y
4 systemctl enable iptables.service
```

The configurations files that Packstack creates will use your IP address not the hostname so we need to make sure that we have a static IP before generating the answer file. Lets first determine your current network information.

Listing 1.3: Current IP address

```
1 [root@virsatpaw001 ~]# ip a
2 1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue state UNKNOWN
```

```
3     link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
4     inet 127.0.0.1/8 scope host lo
5     inet6 ::1/128 scope host
6        valid_lft forever preferred_lft forever
7 2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast
     state UP qlen 1000
8     link/ether 52:54:00:e7:12:47 brd ff:ff:ff:ff:ff:ff
9     inet 192.168.122.10/24 brd 192.168.122.255 scope global eth0
10    inet6 fe80::5054:ff:fee7:1247/64 scope link
11       valid_lft forever preferred_lft forever
```

Line 9 displays our current IP and subnet mask of 192.168.122.10 /24 (or 255.255.255.0).

Listing 1.4: Current Default Route

```
1 [root@virsatpaw001 ~]# ip route
2 192.168.122.0/24 dev eth0  proto kernel  scope link  src 192.168.122.10
3 169.254.0.0/16 dev eth0  scope link  metric 1002
4 default via 192.168.122.1 dev eth0
```

Line 4 displays our current default gateway of 192.168.122.1.

Listing 1.5: Current Resolver

```
1 [root@virsatpaw001 ~]# cat /etc/resolv.conf
2 nameserver 192.168.122.1
```

Based on your device name there will be a corresponding ifcfg file. DEVICE, IPADDR, NET-MASK, GATEWAY and DNS1,2 will be based on your network. Modify the file removing options that don't exist in the example below, adding the options that do.

Listing 1.6: Modify Ethernet interface from DHCP to static

```
1 vi /etc/sysconfig/network-scripts/ifcfg-
```

Listing 1.7: Example Ethernet configuration

```
1 DEVICE=eth0
2 TYPE=Ethernet
3 ONBOOT=yes
4 NM_CONTROLLED=no
5 BOOTPROTO=static
6 NAME="eth0"
7 IPADDR=192.168.122.10
8 NETMASK=255.255.255.0
9 GATEWAY=192.168.122.1
10 DNS1=192.168.122.1
```

At this point let us reboot. When the virtual machine is available make sure that you can still reach the default gateway, then proceed to the next section.

Chapter 2

Physical Hardware

Listing 2.1: 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>
```

2.1 Clone and sysprep

Listing 2.2: Sysprep example

```
1  virt-sysprep -a /dev/virtualmachine/virctlpaw001 --hostname
     virctlpaw001.virtomation.com \
```

```
2 --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" \
3 --firstboot-command 'systemctl restart network' \
4 --firstboot-command 'yum install -y http://rdo.fedorapeople.org/rdo-
      release.rpm' \
5 --firstboot-command 'yum install openstack-packstack -y'
```

Chapter 3

Prerequisites

Listing 3.1: 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 3.2: 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 3.3: RabbitMQ Install

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

Listing 3.4: 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 3.5: 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 4

Keystone

4.1 Installation

Listing 4.1: 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
```

4.2 Database

Listing 4.2: 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:
      trustn01@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 4.3: Start and enable Keystone

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

4.3 Admin User and Tenant

Listing 4.4: 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 4.5: 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 4.6: Keystone Error Message

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

Chapter 5

Swift

⚠ This chapter is a mess, ignore

Listing 5.1: 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 5.2: 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 5.3: 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 5.4: 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 6

Glance

Listing 6.1: 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"
```

6.1   Configuration

Listing 6.2: 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_authtoken auth_host
     10.53.252.61
4 ocs /etc/glance/glance-api.conf keystone_authtoken auth_port 35357
5 ocs /etc/glance/glance-api.conf keystone_authtoken auth_protocol http
6 ocs /etc/glance/glance-api.conf keystone_authtoken admin_tenant_name
     service
7 ocs /etc/glance/glance-api.conf keystone_authtoken admin_user glance
8 ocs /etc/glance/glance-api.conf keystone_authtoen admin_password
     trustn01
```

Listing 6.3: 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 6.4: 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 6.5: 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 6.6: 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 6.7: 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 7

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_authtoken auth_host 10.53.252.61
5 ocs /etc/cinder/cinder.conf keystone_authtoken admin_tenant_name
    service
6 ocs /etc/cinder/cinder.conf keystone_authtoken admin_user cinder
7 ocs /etc/cinder/cinder.conf keystone_authtoken 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 7.1: 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 8

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 alias yi="yum -y install"
9 alias start="systemctl start"
10 alias e="systemctl enable"
11 alias ocs="openstack-config --set"
12 clear
13 ocs /etc/nova/nova.conf database connection mysql://nova:trustn01@10
      .53.252.61/nova
14 ocs /etc/nova/nova.conf DEFAULT rpc_backend rabbit
15 ocs /etc/nova/nova.conf DEFAULT rabbit_host 10.53.252.61
16 ocs /etc/nova/nova.conf DEFAULT rabbit_port 5672
17 ocs /etc/nova/nova.conf DEFAULT rabbit_userid nova
18 ocs /etc/nova/nova.conf DEFAULT rabbit_password '2mM7OaVNFKM='
19 ocs /etc/nova/nova.conf DEFAULT my_ip 10.53.252.62
20 ocs /etc/nova/nova.conf DEFAULT vncserver_listen 10.53.252.62
21 ocs /etc/nova/nova.conf DEFAULT vncserver_proxyclient_address
      10.53.252.62
```

Chapter 9

Neutron

Listing 9.1: 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
```

Listing 9.2: Neutron virneupaw001

```
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 ls
20 rm ml2_conf.ini
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
```