OpenStack Folsom + OpenVSwitch 2-node Setup

This setup assumes that you have two servers. Node1 will run all of the Folsom services (nova, quantum server, keystone, horizon) as well as some of the quantum agents (DHCP and openvswitch-agent). Node 2 is the compute nade and will run nova-compute and quantum-openvswitch-agent. Both servers have two ethernet ports. Since three networks are needed to set up a dedicated network node, the network node and controller nodes will be on the same server and a Single Flat Network topology (see http://docs.openstack.org/trunk/openstack-network/admin/content/app_demo_flat.html) will be configured.

The eth0 interface will be the public network. The eth1 interface will be used for system management. Make sure all networks are configured before continuing.

Network settings are as follows

node1	eth0	= no IP Address (hostname server3)
	eth1	= 192.168.2.193 (management network)
node2	eth0	= no IP Address (hostname server4)
	eth1	= 192.168.2.194 (management network)

Initial Setup

The following steps should be performed on both servers.

1. Install @Base copy of RHEL 6.4 Beta
2. Subscribe servers to the OpenStack Folsom Preview channels on RHN or Satellite\
3. Configure NTP to provide time service.

```
[root@server3 ~]# ntpdate clock.redhat.com
18 Jan 10:32:43 ntpdate[28361]: adjust time server 66.187.233.4 offset 0.110064 sec
[root@server3 ~]# service ntpd restart
[root@server3 ~]# chkconfig ntpd on
```

Installation and Configuration of Quantum-OpenVSwitch Components

The following steps should be performed on node1

1. Configure SSH keys on node1

```
[root@server3 ~]# ssh-keygen
```

2. Install openstack-packstack package and run packstack –gen-answer-file=answers.txt and edit the file to be similar to the one below:

```
[general]
CONFIG_DEBUG=n
CONFIG_GLANCE_INSTALL=y
CONFIG_CINDER_INSTALL=y
CONFIG_NOVA_INSTALL=y
CONFIG_HORIZON_INSTALL=y
CONFIG_SWIFT_INSTALL=n
CONFIG_CLIENT_INSTALL=y
CONFIG_SSH_KEY=/root/.ssh/id_rsa.pub
CONFIG_MYSQL_HOST=192.168.1.193
CONFIG_MYSQL_USER=root
CONFIG_MYSQL_PW=Passw0rd
```

```
CONFIG_QPID_HOST=192.168.2.193
CONFIG_KEYSTONE_HOST=192.168.2.193
CONFIG_KEYSTONE_ADMINTOKEN=ddc2792a89914c2da85d363b9a61ba09
CONFIG_KEYSTONE_ADMINPASSWD=Passw0rd
CONFIG_GLANCE_HOST=192.168.2.193
CONFIG_CINDER_HOST=192.168.2.193
CONFIG_NOVA_API_HOST=192.168.2.193
CONFIG_NOVA_CERT_HOST=192.168.2.193
CONFIG_NOVA_VNCPROXY_HOST=192.168.2.193
CONFIG_NOVA_COMPUTE_HOSTS=192.168.2.194
CONFIG_LIBVIRT_TYPE=kvm
CONFIG_NOVA_COMPUTE_PRIVIF=eth1
CONFIG_NOVA_NETWORK_HOST=192.168.2.193
CONFIG_NOVA_NETWORK_PUBIF=eth0
CONFIG_NOVA_NETWORK_PRIVIF=eth1
CONFIG_NOVA_NETWORK_FIXEDRANGE=192.168.32.0/22
CONFIG_NOVA_NETWORK_FLOATRANGE=10.3.4.0/22
CONFIG_NOVA_SCHED_HOST=192.168.2.193
CONFIG_OSCLIENT_HOST=192.168.2.193
CONFIG_HORIZON_HOST=192.168.2.193
CONFIG_HORIZON_SECRET_KEY=c620a969f456434ca469892fca11034d
CONFIG_SWIFT_PROXY_HOSTS=192.168.2.193
CONFIG_SWIFT_STORAGE_HOSTS=192.168.2.193
CONFIG_SWIFT_STORAGE_ZONES=1
CONFIG_SWIFT_STORAGE_REPLICAS=1
CONFIG_SWIFT_STORAGE_FSTYPE=ext4
CONFIG_USE_EPEL=n
```

3. Run the following command to install openstack on both nodes. It will take about 10 minutes to complete. At the beginning of the installation, you will be asked for the root passwords to the nodes that are being installed. This is for setting up the ssh keys on the other nodes.
```
[root@server3 ~]# packstack --answer-file=answers.txt
```

4. Stop and disable the openstack-nova-network service. Not doing this will cause conflicts with the quantum service.
```
[root@server3 ~]# service openstack-nova-network stop
[root@server3 ~]# chkconfig openstack-nova-network off
```

5. Set a password for root to access the mysql database
```
[root@server3 ~]# mysqladmin -u root password Passw0rd
```

6. Next, we will install the quantum services along with gedit and the python-quantumclient packages. Gedit is used by quantum when it configured networks.
```
[root@server3 ~]# yum install -y openstack-quantum openstack-quantum-openvswitch python-
quantumclient gedit
```

7. Start the openvswitch service
```
[root@server3 ~]# service openvswitch start
[root@server3 ~]# chkconfig openvswitch on
```

8. Source the keystone_adminrc file then create a quantum service and user in keystone. Note that several of the values come from running previous commands.
```
[root@server3 ~]# . ~/keystonerc_admin
[root@server3 ~(keystone_admin)]$ keystone service-create --name quantum --type network
--description 'Quantum Networking Service'
+-------------+----------------------------------+
```

```
|   Property  |              Value               |
+-------------+----------------------------------+
| description |    Quantum Networking Service    |
|      id     | 7b78298078d349af9355174ff84a159a |
|     name    |             quantum              |
|     type    |             network              |
+-------------+----------------------------------+

[root@server3 ~(keystone_admin)]$ keystone endpoint-create --service-id
7b78298078d349af9355174ff84a159a --publicurl 'http://192.168.2.193:9696/' --adminurl
'http://192.168.2.193:9696/' --internalurl 'http://192.168.2.193:9696/'
+-------------+----------------------------------+
|   Property  |              Value               |
+-------------+----------------------------------+
|   adminurl  |    http://192.168.2.193:9696/    |
|      id     | 0188ff95992d4c9fbc63244ad1a3a1a5 |
| internalurl |    http://192.168.2.193:9696/    |
|  publicurl  |    http://192.168.2.193:9696/    |
|    region   |            regionOne             |
|  service_id | 7b78298078d349af9355174ff84a159a |
+-------------+----------------------------------+

[root@server3 ~(keystone_admin)]$ keystone user-create --name quantum --pass Passw0rd
+----------+-------------------------------------------------------------------------------------------------------------------------------------------+
| Property |                                                                  Value                                                                    |
+----------+-------------------------------------------------------------------------------------------------------------------------------------------+
|  email   |                                                                                                                                           |
| enabled  |                                                                   True                                                                    |
|    id    |                                                  8ccafa5757d54f08bc8c00c1a3edc7e0                                                         |
|   name   |                                                                  quantum                                                                  |
| password | $6$rounds=40000$2tHbo/DQONbgprS3$gccYkU/O1o5QJSM0iT4YYMUCZE2Mw1WgVseGQ0fKvMU0RRwTnwkT2amx7b1UwyJoSUVZiYWYeuIL.ProJb.rf0 |
| tenantId |                                                                                                                                           |
+----------+-------------------------------------------------------------------------------------------------------------------------------------------+

[root@server3 ~(keystone_admin)]$ keystone tenant-create --name networkservice
+-------------+----------------------------------+
|   Property  |              Value               |
+-------------+----------------------------------+
| description |                                  |
|   enabled   |               True               |
|      id     | 7088781c9f19416bae31ce0a80b84541 |
|     name    |          networkservice          |
+-------------+----------------------------------+

[root@server3 ~(keystone_admin)]$ keystone role-list
+----------------------------------+--------+
|                id                |  name  |
+----------------------------------+--------+
| 234c8ed78cc145798e909339fbbedb11 | Member |
| 619636a4e4bd43798276af3c9c6e00af | admin  |
+----------------------------------+--------+

[root@server3 ~(keystone_admin)]$ keystone user-role-add --user-id
8ccafa5757d54f08bc8c00c1a3edc7e0 --role-id 619636a4e4bd43798276af3c9c6e00af --tenant-id
7088781c9f19416bae31ce0a80b84541
```

9. If you have not already done so, remove the IP address from eth0.

10. Configure the quantum server openvswitch plugin. This is also known as the L2 plugin

```
[root@server3 ~]# quantum-server-setup --plugin openvswitch
```

```
Quantum plugin: openvswitch
Plugin: openvswitch => Database: ovs_quantum
Please enter the password for the 'root' MySQL user:
Verified connectivity to MySQL.
Would you like to update the nova configuration files? (y/n):
y
Configuration updates complete!
```

11. Update /etc/quantum/quantum.conf. The rpc_backend and qpid hostname values are in the section dedicated to QPID:

```
[DEFAULT]
core_plugin = quantum.plugins.openvswitch.ovs_quantum_plugin.OVSQuantumPluginV2
control_exchange = quantum
rpc_backend = quantum.openstack.common.rpc.impl_qpid
qpid_hostname = 192.168.2.193
```

12. Ensure the following lines are present in /etc/quantum/plugins/openvswitch/ovs_quantum_plugin.ini

```
[DATABSE]
sql_connection = mysql://quantum:quantum@192.168.2.193/ovs_quantum
[OVS]
tenant_network_type = vlan
network_vlan_ranges = physnet1
bridge_mappings:physnet1:br-eth0
```

13. Ensure that the following lines are in /etc/quantum/api-paste.ini and that thy match the setting for the previously created user and service.

```
[filter:authtoken]
paste.filter_factory = keystone.middleware.auth_token:filter_factory
auth_host = 192.168.2.193
auth_port = 35357
auth_protocol = http
admin_tenant_name = networkservice
admin_user = quantum
admin_password = Passw0rd
```

14. Start the quantum server

```
[root@server3 ~]# service quantum-server start
[root@server3 ~]# chkconfig quantum-server on
```

15. Install the quantum L2 service (openvswitch plugin)

```
[root@server3 ~]# quantum-node-setup --plugin openvswitch
Quantum plugin: openvswitch
Please enter the Quantum hostname:
192.168.2.193
Would you like to update the nova configuration files? (y/n):
y
/usr/bin/openstack-config --set|--del config_file section [parameter] [value]
Configuration updates complete!
```

16. Add the integration bridge

```
[root@server3 ~]# ovs-vsctl add-br br-int
```

17. Create the bridge for the public network. These commands will cause eth0 to lose network connectivity.

```
[root@server3 ~]# ovs-vsctl add-br br-eth0
[root@server3 ~]# ovs-vsctl add-port br-eth0 eth0
```

18. Verify the configuration of /etc/nova/nova.conf. Values must match the user and tenant information that was used before

```
network_api_class = nova.network.quantumv2.api.API
quantum_admin_username = quantum
quantum_admin_password = Passw0rd
quantum_admin_auth_url = http://192.168.1.193:35357/v2.0/
quantum_auth_strategy = keystone
quantum_admin_tenant_name = networkservice
quantum_url = http://192.168.1.193:9696/
libvirt_vif_driver = nova.virt.libvirt.vif.LibvirtHybridOVSBridgeDriver
```

19. Restart the nova services

```
for srv in api cert objectstore scheduler; do service openstack-nova-$srv restart ; done
```

20. Start the L2 service

```
[root@server3 ~]# service quantum-openvswitch-agent start
[root@server3 ~]# chkconfig quantum-openvswitch-agent on
```

21. Configure the DHCP agent

```
[root@server3 ~]# quantum-dhcp-setup --plugin openvswitch
Quantum plugin: openvswitch
Please enter the Quantum hostname:
192.168.2.193
Configuration updates complete!
```

22. Ensure /etc/quantum/dhcp_agent.ini has the right interface driver set and that the authentication information is correct.

```
interface_driver = quantum.agent.linux.interface.OVSInterfaceDriver
root_helper = sudo quantum-rootwrap /etc/quantum/rootwrap.conf
auth_url = http://192.168.2.193:35357/v2.0/
admin_username = quantum
admin_password = Passw0rd
admin_tenant_name = quantum
use_namespaces = False
```

23. Start the quantum-dhcp-agent service

```
[root@server3 ~]# service quantum-dhcp-agent start
[root@server3 ~]# chkconfig quantum-dhcp-agent on
```

24. Since we are only setting up a flat network, it is not necessary to configure the L3 agent.

The following steps should be performed on node2

1. Install and configure the quantum services

```
[root@server4 ~]# yum install -y openstack-quantum openstack-quantum-openvswitch
```

2. Start the openvswitch service

```
[root@server4 ~]# service openvswitch start
[root@server4 ~]# chkconfig openvswitch on
```

3. Install the quantum L2 service (openvswitch plugin)

```
[root@server4 ~]# quantum-node-setup --plugin openvswitch
Quantum plugin: openvswitch
Please enter the Quantum hostname:
```

```
192.168.2.193
Would you like to update the nova configuration files? (y/n):
y
/usr/bin/openstack-config --set|--del config_file section [parameter] [value]
Configuration updates complete!
```

4. Verify the configuration of /etc/nova/nova.conf. Values must match the user and tenant information that was used before.
```
network_api_class = nova.network.quantumv2.api.API
quantum_admin_username = quantum
quantum_admin_password = Passw0rd
quantum_admin_auth_url = http://192.168.2.193:35357/v2.0/
quantum_auth_strategy = keystone
quantum_admin_tenant_name = networkservice
quantum_url = http://192.168.2.193:9696/
libvirt_vif_driver = nova.virt.libvirt.vif.LibvirtHybridOVSBridgeDriver
```

5. Restart the nova-compute service
```
[root@server4 ~]# service openstack-nova-compute restart
```

6. Add the integration bridge
```
[root@server4 ~]# ovs-vsctl add-br br-int
```

7. Update /etc/quantum/quantum.conf. The rpc_backend and qpid hostname values are in the section dedicated to QPID. Alternatly, you can scp this file from node1 since its contents are the same.
```
[DEFAULT]
core_plugin = quantum.plugins.openvswitch.ovs_quantum_plugin.OVSQuantumPluginV2
auth_strategy = keystone
control_exchange = quantum
rpc_backend = quantum.openstack.common.rpc.impl_qpid
qpid_hostname = 192.168.2.193
```

8. Ensure the following entries are present in /etc/quantum/plugins/openvswitch/ovs_quantum_plugin.ini. Comment out any other sql values in the file.
```
[DATABASE}
sql_connection = mysql://quantum:quantum@192.168.1.193/ovs_quantum
reconnect_interval = 2
[OVS]
tenant_network_type = vlan
network_vlan_ranges = physnet1
bridge_mappings = physnet1:br-eth0
```

9. Create the bridge for the internal data network. These commands will cause eth0 to lose network connectivity.
```
[root@server4 ~]# ovs-vsctl add-br br-eth0
[root@server4 ~]# ovs-vsctl add-port br-eth0 eth0
```

10. Start the L2 service
```
[root@server4 ~]# service quantum-openvswitch-agent start
[root@server4 ~]# chkconfig quantum-openvswitch-agent on
```

Network Configuration

These steps will be performed on node1.

1. Create a shared network using the admin tenant id.
```
[root@server3 ~(keystone_admin)]$ keystone tenant-list
```

```
+----------------------------------+----------------+---------+
|                id                |      name      | enabled |
+----------------------------------+----------------+---------+
| 47c799a11534402694d6e0f9ffad1987 |    services    |   True  |
| 7088781c9f19416bae31ce0a80b84541 | networkservice |   True  |
| e969269848a9470f8b7692798e724502 |     admin      |   True  |
+----------------------------------+----------------+---------+

[root@server3 ~(keystone_admin)]$ quantum net-create --tenant-id
e969269848a9470f8b7692798e724502 sharednet1 --shared --provider:network_type flat
--provider:physical_network physnet1
Created a new network:
+---------------------------+--------------------------------------+
| Field                     | Value                                |
+---------------------------+--------------------------------------+
| admin_state_up            | True                                 |
| id                        | 01a3d976-2c72-4a30-8f20-6c9eb20095dd |
| name                      | sharednet1                           |
| provider:network_type     | flat                                 |
| provider:physical_network | physnet1                             |
| provider:segmentation_id  |                                      |
| router:external           | False                                |
| shared                    | True                                 |
| status                    | ACTIVE                               |
| subnets                   |                                      |
| tenant_id                 | e969269848a9470f8b7692798e724502     |
+---------------------------+--------------------------------------+
```

2. Add a the public subnet to the network.

```
[root@server3 ~(keystone_admin)]$ quantum subnet-create --tenant-id
e969269848a9470f8b7692798e724502 sharednet1 192.168.1.0/24
Created a new subnet:
+------------------+------------------------------------------------------+
| Field            | Value                                                |
+------------------+------------------------------------------------------+
| allocation_pools | {"start": "192.168.1.2", "end": "192.168.1.254"}     |
| cidr             | 192.168.1.0/24                                       |
| dns_nameservers  |                                                      |
| enable_dhcp      | True                                                 |
| gateway_ip       | 192.168.1.1                                          |
| host_routes      |                                                      |
| id               | 34f49585-0d3c-4a82-b493-80e27a1bacd3                 |
| ip_version       | 4                                                    |
| name             |                                                      |
| network_id       | 01a3d976-2c72-4a30-8f20-6c9eb20095dd                 |
| tenant_id        | e969269848a9470f8b7692798e724502                     |
+------------------+------------------------------------------------------+
```

3. Check for a “tap” interface on node1. If the interface is down, bring it online. This is the DHCP server. If it is offline, then instance will not get addresses.

```
[root@server3 ~(keystone_admin)]$ ip link set tapb0a5baec-b2 up
```

4. Start a VM instance and add it to the network.

```
[root@server3 ~(keystone_admin)]$ nova boot --image f17-jeos --flavor 2 --nic net-
id=01a3d976-2c72-4a30-8f20-6c9eb20095dd testvm01
+-------------------------------------+--------------------------------------+
| Property                            | Value                                |
```

OS-DCF:diskConfig	MANUAL
OS-EXT-SRV-ATTR:host	None
OS-EXT-SRV-ATTR:hypervisor_hostname	None
OS-EXT-SRV-ATTR:instance_name	instance-00000001
OS-EXT-STS:power_state	0
OS-EXT-STS:task_state	scheduling
OS-EXT-STS:vm_state	building
accessIPv4	
accessIPv6	
adminPass	6pGAVtWb3vTp
config_drive	
created	2013-01-19T20:27:59Z
flavor	m1.small
hostId	
id	1c752adf-7740-4dee-bc69-a2c705846a28
image	f17-jeos
key_name	None
metadata	{}
name	testvm01
progress	0
security_groups	[{u'name': u'default'}]
status	BUILD
tenant_id	e969269848a9470f8b7692798e724502
updated	2013-01-19T20:27:59Z
user_id	18b410399b4f4295b7694d4e1fb3a6aa