Infoblox Installation Guide vNIOS™ for OpenStack with SRIOV

Enabling SRIOV on RHEL 7

Pre-requisite:

- SRIOV capable hardware
- System BIOS configured with SRIOV enabled
- System installed with RHEL 7.2 with sufficient disk space allocated to /

Once the system is ready with RHEL 7.2 and SRIOV feature enabled from BIOS, make the following changes to the system configuration to enable Virtual Function (SRIOV) on the NIC card:

1. Add *" intel_iommu=on igb.max_vfs=7"* to the default GRUB file.
   ```
   [root@rhops2 ~]# cat /etc/default/grub
   GRUB_TIMEOUT=5
   GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
   GRUB_DEFAULT=saved
   GRUB_DISABLE_SUBMENU=true
   GRUB_TERMINAL_OUTPUT="console"
   GRUB_CMDLINE_LINUX="crashkernel=auto rhgb quiet intel_iommu=on igb.max_vfs=7"
   GRUB_DISABLE_RECOVERY="true"
   GRUB_DISABLE_RECOVERY="true"
   ```
2. Re-compile GRUB to make this change the default on bootup.
   ```
   [root@rhops2 ~]# /sbin/grub2-mkconfig -o /boot/grub2/grub.cfg
   Generating grub configuration file ...
   Found linux image: /boot/vmlinuz-3.10.0-327.el7.x86_64
   Found initrd image: /boot/initramfs-3.10.0-327.el7.x86_64.img
   Found linux image: /boot/vmlinuz-0-rescue-156e082173f7431fa38c0afa16c3704a
   Found initrd image: /boot/initramfs-0-rescue-156e082173f7431fa38c0afa16c3704a.img
   done
   ```
3. Create or edit network the driver config file to enable Virtual functions on the NIC card. Specify the number of required vifs on each network interface. [This is OPTIONAL if GRUB is already modified as mentioned in step #1.]
   ```
   [root@rhosp ~]# cat /etc/modprobe.d/igb.conf
   options igb max_vfs=7
   ```
4. Reboot the system to reflect performance changes on the system.
   ```
   [root@rhosp ~]# reboot
   ```
5. Upon system reboot, Virtual functions will be enabled on network interfaces.
   ```
   [root@rhosp ~]# lspci --nn | grep -i net
   ```

Setting up OpenStack with SRIOV

1. Modify the OpenStack config files to enable SRIOV support.

   1. /etc/nova/nova.conf
   2. /etc/neutron/plugins/ml2/ml2_conf.ini
   3. /etc/neutron/plugins/ml2/ml2_conf_sriov.ini
   4. /usr/lib/systemd/system/neutron-server.service

2. Find out the PCI address for the Virtual functions that you intend to use and add it to /etc/nova/nova.conf.

```
[root@rhops2 ~]# lspci -nn | grep -i net
01:00.0 Ethernet controller [0200]: Intel Corporation I350 Gigabit Network Connection
[8086:1521] (rev 01)
01:00.1 Ethernet controller [0200]: Intel Corporation I350 Gigabit Network Connection
[8086:1521] (rev 01)
01:10.0 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:10.1 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:10.4 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:10.5 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:11.0 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:11.1 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:11.4 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
```

```
01:11.5 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:12.0 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:12.1 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:12.4 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:12.5 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:13.0 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:13.1 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
```

3. Since this server has two interfaces, you will be using VFs on one interface for "MGMT" and the VFs on other interface for "LAN", "HA" and "LAN2." If the server has more than two interfaces, they can be mapped differently. (Infoblox recommends that you map the NIOS interfaces individually with virtual functions bound to a different physical interface. This helps HA failover situations).

```
[root@rhops2 ~]# cat /etc/nova/nova.conf
……
……
……
# White list of PCI devices available to VMs. For example:
# pci_passthrough_whitelist = [{"vendor_id": "8086",
# "product_id": "0443"}] (multi valued)
#pci_passthrough_whitelist=
## Virtual Functions on eth0
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:10.0",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:10.1",
"physical_network":"lan1"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:10.4",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:10.5",
"physical_network":"ha"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:11.0",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:11.1",
"physical_network":"lan2"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:11.4",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:11.5",
"physical_network":"lan1"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:12.0",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:12.1",
"physical_network":"ha"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:12.4",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:12.5",
"physical_network":"lan2"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:13.0",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:13.1",
"physical_network":"lan1"}
……
……
……
#
# Options defined in nova.scheduler.host_manager
#

# Filter classes available to the scheduler which may be
# specified more than once. An entry of
# "nova.scheduler.filters.all_filters" maps to all filters
# included with nova. (multi valued)
scheduler_available_filters=nova.scheduler.filters.all_filters

# Which filter class names to use for filtering hosts when not
# specified in the request. (list value)
#scheduler_default_filters=RetryFilter,AvailabilityZoneFilter,RamFilter,ComputeFilter,ComputeCapabilitiesFi
lter,ImagePropertiesFilter,Server
```

```
GroupAntiAffinityFilter,ServerGroupAffinityFilterscheduler_default_filters=RetryFilter,AvailabilityZoneFilt
er,RamFilter,ComputeFilter,ComputeCapabilitiesFilter,ImagePropertiesFilter,CoreFilter,PciPassthroughFilter
......
......
......
```

4. Now add the sriovnic option and flat_network configuration to the ml2_conf.ini file.

```
[root@rhops2 ~]# cat /etc/neutron/plugins/ml2/ml2_conf.ini | grep -v ^$ | grep -v ^#
[ml2]
type_drivers = flat,vlan,gre,vxlan
tenant_network_types = vxlan
mechanism_drivers =openvswitch,sriovnicswitch
[ml2_type_flat]
flat_networks = mgmt,lan1,ha,lan2
[ml2_type_vlan]
[ml2_type_gre]
[ml2_type_vxlan]
vni_ranges =10:100
vxlan_group =224.0.0.1
[securitygroup]
enable_security_group = True
firewall_driver = neutron.agent.linux.iptables_firewall.OVSHybridIptablesFirewallDriver
[ovs]
local_ip = 10.36.31.90
```

5. Add supported PCI "vendor id : product id" and physical device mapping to the */etc/neutron/plugins/ml2/ml2_conf_sriov.ini* file.

```
[root@rhops2 ~]# cat /etc/neutron/plugins/ml2/ml2_conf_sriov.ini | grep -v ^$ | grep -v ^#
[ml2_sriov]
supported_pci_vendor_devs = 8086:1520
agent_required = False
[sriov_nic]
physical_device_mappings = mgmt:eno1,lan1:eno2,ha:eno2,lan2:eno2

Add "ml2_conf_sriov.ini" config file details in
"/usr/lib/systemd/system/neutron-server.service"

[root@rhops2 ~]# cat /usr/lib/systemd/system/neutron-server.service
[Unit]
Description=OpenStack Neutron Server
After=syslog.target network.target

[Service]
Type=notify
User=neutron
ExecStart=/usr/bin/neutron-server --config-file /usr/share/neutron/neutron-dist.conf
--config-dir /usr/share/neutron/server --config-file /etc/neutron/neutron.conf
--config-file /etc/neutron/plugin.ini --config-dir /etc/neutron/conf.d/common --config-dir
/etc/neutron/conf.d/neutron-server --config-file
/etc/neutron/plugins/ml2/ml2_conf_sriov.ini --log-file /var/log/neutron/server.log
PrivateTmp=true
NotifyAccess=all
KillMode=process
[Install]
WantedBy=multi-user.target
```

6. Now restart the OpenStack service for the new configuration to take affect.

```
[root@rhops2 ~]# openstack-service restart
Warning: neutron-server.service changed on disk. Run 'systemctl daemon-reload' to reload units.
```

7. Now create networks in OpenStack setup and map interface (sriov) to these new networks.

```
[root@rhops2 ~(keystone_admin)]# neutron net-list
+--------------------------------------+---------+-----------------------------------------------------+
| id                                   | name    | subnets                                             |
+--------------------------------------+---------+-----------------------------------------------------+
| 43a84db7-acf6-4404-b6af-f8601fbb8eec | public  | 4d176229-3207-4e5e-b1eb-b638accf59f5 172.24.4.224/28 |
| ec7e97b9-8f2f-41c4-bac8-c91352fb2f2a | private | f4c9ded8-07aa-42da-b962-81fb9e691403 10.0.0.0/24    |
+--------------------------------------+---------+-----------------------------------------------------+

[root@rhops2 ~(keystone_admin)]# neutron net-create --provider:physical_network=mgmt
--provider:network_type=flat mgmt.
```

```
Created a new network:
+---------------------------+--------------------------------------+
| Field                     | Value                                |
+---------------------------+--------------------------------------+
| admin_state_up            | True                                 |
| id                        | a72836cb-87b5-46c8-ada9-efbde7ed1698 |
| mtu                       | 0                                    |
| name                      | mgmt                                 |
| provider:network_type     | flat                                 |
| provider:physical_network | mgmt                                 |
| provider:segmentation_id  |                                      |
| router:external           | False                                |
| shared                    | False                                |
| status                    | ACTIVE                               |
| subnets                   |                                      |
| tenant_id                 | d57f8170a21a4f5f970fb7a72f3202a6     |
+---------------------------+--------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron net-create --provider:physical_network=lan1
--provider:network_type=flat lan1

Created a new network:
+---------------------------+--------------------------------------+
| Field                     | Value                                |
+---------------------------+--------------------------------------+
| admin_state_up            | True                                 |
| id                        | 37cae5b8-4598-43e6-8c53-fd23f2c7c45c |
| mtu                       | 0                                    |
| name                      | lan1                                 |
| provider:network_type     | flat                                 |
| provider:physical_network | lan1                                 |
| provider:segmentation_id  |                                      |
| router:external           | False                                |
| shared                    | False                                |
| status                    | ACTIVE                               |
| subnets                   |                                      |
| tenant_id                 | d57f8170a21a4f5f970fb7a72f3202a6     |
+---------------------------+--------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron net-create --provider:physical_network=ha
--provider:network_type=flat ha

Created a new network:
+---------------------------+--------------------------------------+
| Field                     | Value                                |
+---------------------------+--------------------------------------+
| admin_state_up            | True                                 |
| id                        | 0e7efa05-82b9-4498-9915-48a1748a0238 |
| mtu                       | 0                                    |
| name                      | ha                                   |
| provider:network_type     | flat                                 |
| provider:physical_network | ha                                   |
| provider:segmentation_id  |                                      |
| router:external           | False                                |
| shared                    | False                                |
| status                    | ACTIVE                               |
| subnets                   |                                      |
| tenant_id                 | d57f8170a21a4f5f970fb7a72f3202a6     |
+---------------------------+--------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron net-create --provider:physical_network=lan2
--provider:network_type=flat lan2
Created a new network:
+---------------------------+--------------------------------------+
| Field                     | Value                                |
+---------------------------+--------------------------------------+
| admin_state_up            | True                                 |
| id                        | 073b6886-7875-47af-b7aa-44b792099337 |
| mtu                       | 0                                    |
| name                      | lan2                                 |
| provider:network_type     | flat                                 |
| provider:physical_network | lan2                                 |
| provider:segmentation_id  |                                      |
| router:external           | False                                |
| shared                    | False                                |
```

```
| status              | ACTIVE                                |
| subnets             |                                       |
| tenant_id           | d57f8170a21a4f5f970fb7a72f3202a6      |
+--------------------------+--------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron subnet-create --name subnet-mgmt mgmt 10.36.0.0/16
--allocation-pool start=10.36.31.221,end=10.36.31.225 --disable-dhcp
Created a new subnet:
+-------------------+--------------------------------------------------+
| Field             | Value                                            |
+-------------------+--------------------------------------------------+
| allocation_pools  | {"start": "10.36.31.221", "end": "10.36.31.225"} |
| cidr              | 10.36.0.0/16                                      |
| dns_nameservers   |                                                  |
| enable_dhcp       | False                                            |
| gateway_ip        | 10.36.0.1                                         |
| host_routes       |                                                  |
| id                | 824f9edb-3b30-4179-88f1-eb24a8a1b53b             |
| ip_version        | 4                                                |
| ipv6_address_mode |                                                  |
| ipv6_ra_mode      |                                                  |
| name              | subnet-mgmt                                      |
| network_id        | a72836cb-87b5-46c8-ada9-efbde7ed1698             |
| subnetpool_id     |                                                  |
| tenant_id         | d57f8170a21a4f5f970fb7a72f3202a6                 |
+-------------------+--------------------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron subnet-create --name subnet-lan1 lan1
10.34.31.0/24 --allocation-pool start=10.34.31.221,end=10.34.31.225 --disable-dhcp
Created a new subnet:
+-------------------+--------------------------------------------------+
| Field             | Value                                            |
+-------------------+--------------------------------------------------+
| allocation_pools  | {"start": "10.34.31.221", "end": "10.34.31.225"} |
| cidr              | 10.34.31.0/24                                     |
| dns_nameservers   |                                                  |
| enable_dhcp       | False                                            |
| gateway_ip        | 10.34.31.1                                        |
| host_routes       |                                                  |
| id                | fefb9dda-d6e6-43b6-af59-db6f747a7440             |
| ip_version        | 4                                                |
| ipv6_address_mode |                                                  |
| ipv6_ra_mode      |                                                  |
| name              | subnet-lan1                                      |
| network_id        | 37cae5b8-4598-43e6-8c53-fd23f2c7c45c             |
|                   |                                                  |
| subnetpool_id     |                                                  |
| tenant_id         | d57f8170a21a4f5f970fb7a72f3202a6                 |
+-------------------+--------------------------------------------------+

[root@rhops2 ~(keystone_admin)]# neutron subnet-create --name subnet-ha ha 10.34.31.0/24
--allocation-pool start=10.34.31.226,end=10.34.31.230 --disable-dhcp
Created a new subnet:
+-------------------+--------------------------------------------------+
| Field             | Value                                            |
+-------------------+--------------------------------------------------+
| allocation_pools  | {"start": "10.34.31.226", "end": "10.34.31.230"} |
| cidr              | 10.34.31.0/24                                     |
| dns_nameservers   |                                                  |
| enable_dhcp       | False                                            |
| gateway_ip        | 10.34.31.1                                        |
| host_routes       |                                                  |
| id                | 2a81d4fc-2790-4072-9e83-ac075fcfbdde             |
| ip_version        | 4                                                |
| ipv6_address_mode |                                                  |
| ipv6_ra_mode      |                                                  |
| name              | subnet-ha                                        |
| network_id        | 0e7efa05-82b9-4498-9915-48a1748a0238             |
| subnetpool_id     |                                                  |
| tenant_id         | d57f8170a21a4f5f970fb7a72f3202a6                 |
+-------------------+--------------------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron subnet-create --name subnet-lan2 lan2
10.34.31.0/24 --allocation-pool start=10.34.31.231,end=10.34.31.235 --disable-dhcp
Created a new subnet:
```

```
+-------------------+-------------------------------------------------+
| Field             | Value                                           |
+-------------------+-------------------------------------------------+
| allocation_pools  | {"start": "10.34.31.231", "end": "10.34.31.235"} |
| cidr              | 10.34.31.0/24                                    |
| dns_nameservers   |                                                 |
| enable_dhcp       | False                                           |
| gateway_ip        | 10.34.31.1                                       |
| host_routes       |                                                 |
| id                | 485d714e-f34c-4994-9bff-ef9edecf507e            |
| ip_version        | 4                                               |
| ipv6_address_mode |                                                 |
| ipv6_ra_mode      |                                                 |
| name              | subnet-lan2                                     |
| network_id        | 073b6886-7875-47af-b7aa-44b792099337            |
| subnetpool_id     |                                                 |
| tenant_id         | d57f8170a21a4f5f970fb7a72f3202a6                |
+-------------------+-------------------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron net-list
+--------------------------------------+---------+-------------------------------------------------------+
| id                                   | name    | subnets                                               |
+--------------------------------------+---------+-------------------------------------------------------+
| 073b6886-7875-47af-b7aa-44b792099337 | lan2    | 485d714e-f34c-4994-9bff-ef9edecf507e 10.34.31.0/24    |
| 0e7efa05-82b9-4498-9915-48a1748a0238 | ha      | 2a81d4fc-2790-4072-9e83-ac075fcfbdde 10.34.31.0/24    |
| 37cae5b8-4598-43e6-8c53-fd23f2c7c45c | lan1    | fefb9dda-d6e6-43b6-af59-db6f747a7440 10.34.31.0/24    |
| 43a84db7-acf6-4404-b6af-f8601fbb8eec | public  | 4d176229-3207-4e5e-b1eb-b638accf59f5 172.24.4.224/28  |
| a72836cb-87b5-46c8-ada9-efbde7ed1698 | mgmt    | 824f9edb-3b30-4179-88f1-eb24a8a1b53b 10.36.0.0/16     |
| ec7e97b9-8f2f-41c4-bac8-c91352fb2f2a | private | f4c9ded8-07aa-42da-b962-81fb9e691403 10.0.0.0/24      |
+--------------------------------------+---------+-------------------------------------------------------+
```

Installing OpenStack RHEL 7.2

Follow the steps to install the OpenStack package on the system.

- $ subscription-manager register --username <USERNAME> --password <PASSWORD>
- $ subscription-manager list --available --all
- $ subscription-manager list --available | grep -A8 "Red Hat Enterprise Linux Server"
- $ subscription-manager list --available | grep -A8 "Red Hat Enterprise Linux OpenStack Platform"
- $ subscription-manager attach --auto
- $ subscription-manager repos --disable=*
- $ subscription-manager repos --enable=rhel-7-server-rpms
- $ subscription-manager repos --enable=rhel-7-server-rh-common-rpms
- $ subscription-manager repos --enable=rhel-7-server-optional-rpms
- $ subscription-manager attach --pool=<POOL ID>
- $ subscription-manager list
- $ subscription-manager repos --enable=rhel-7-server-openstack-7.0-rpms
- $ subscription-manager list
- $ yum install -y yum-utils
- $ yum –y update
- $ systemctl disable NetworkManager
- $ systemctl stop NetworkManager

- $ yum install -y openstack-packstack

To configure the OpenStack package:

- packstack --allinone

Sample Configuration Output

```
[root@rhosp ~]# packstack --allinone
Welcome to the Packstack setup utility

The installation log file is available at:
/var/tmp/packstack/20160128-142827-xesixM/openstack-setup.log
Packstack changed given value to required value /root/.ssh/id_rsa.pub

Installing:
Clean Up                                                          [ DONE ]
```

```
Discovering ip protocol version                        [ DONE ]
Setting up ssh keys                                    [ DONE ]
Preparing servers                                      [ DONE ]
Preinstalling Puppet and discovering hosts' details    [ DONE ]
Adding pre install manifest entries                    [ DONE ]
Setting up CACERT                                      [ DONE ]
Adding AMQP manifest entries                           [ DONE ]
Adding MariaDB manifest entries                        [ DONE ]
Fixing Keystone LDAP config parameters to be undef if empty[ DONE ]
Adding Keystone manifest entries                       [ DONE ]
Adding Glance Keystone manifest entries                [ DONE ]
Adding Glance manifest entries                         [ DONE ]
Adding Cinder Keystone manifest entries                [ DONE ]
Checking if the Cinder server has a cinder-volumes v   [ DONE ]
Adding Cinder manifest entries                         [ DONE ]
Adding Nova API manifest entries                       [ DONE ]
Adding Nova Keystone manifest entries                  [ DONE ]
Adding Nova Cert manifest entries                      [ DONE ]
Adding Nova Conductor manifest entries                 [ DONE ]
Creating ssh keys for Nova migration                   [ DONE ]
Gathering ssh host keys for Nova migration             [ DONE ]
Adding Nova Compute manifest entries                   [ DONE ]
Adding Nova Scheduler manifest entries                 [ DONE ]
Adding Nova VNC Proxy manifest entries                 [ DONE ]
Adding OpenStack Network-related Nova manifest entries [ DONE ]
Adding Nova Common manifest entries                    [ DONE ]
Adding Neutron FWaaS Agent manifest entries            [ DONE ]
Adding Neutron LBaaS Agent manifest entries            [ DONE ]
Adding Neutron API manifest entries                    [ DONE ]
Adding Neutron Keystone manifest entries               [ DONE ]
Adding Neutron L3 manifest entries                     [ DONE ]
Adding Neutron L2 Agent manifest entries               [ DONE ]
Adding Neutron DHCP Agent manifest entries             [ DONE ]
Adding Neutron Metering Agent manifest entries         [ DONE ]
Adding Neutron Metadata Agent manifest entries         [ DONE ]
Checking if NetworkManager is enabled and running      [ DONE ]
Adding OpenStack Client manifest entries               [ DONE ]
Adding Horizon manifest entries                        [ DONE ]
Adding Swift Keystone manifest entries                 [ DONE ]
Adding Swift builder manifest entries                  [ DONE ]
Adding Swift proxy manifest entries                    [ DONE ]
Adding Swift storage manifest entries                  [ DONE ]
Adding Swift common manifest entries                   [ DONE ]
Adding Provisioning Demo manifest entries              [ DONE ]
Adding Provisioning Glance manifest entries            [ DONE ]
Adding MongoDB manifest entries                        [ DONE ]
Adding Redis manifest entries                          [ DONE ]
Adding Ceilometer manifest entries                     [ DONE ]
Adding Ceilometer Keystone manifest entries            [ DONE ]
Adding Nagios server manifest entries                  [ DONE ]
Adding Nagios host manifest entries                    [ DONE ]
Adding post install manifest entries                   [ DONE ]
Copying Puppet modules and manifests                   [ DONE ]
Applying 10.36.31.90_prescript.pp
10.36.31.90_prescript.pp:                              [ DONE ]
Applying 10.36.31.90_amqp.pp
Applying 10.36.31.90_mariadb.pp
10.36.31.90_amqp.pp:                                   [ DONE ]
10.36.31.90_mariadb.pp:                                [ DONE ]
Applying 10.36.31.90_keystone.pp
Applying 10.36.31.90_glance.pp
Applying 10.36.31.90_cinder.pp
10.36.31.90_keystone.pp:                               [ DONE ]
10.36.31.90_glance.pp:                                 [ DONE ]
10.36.31.90_cinder.pp:                                 [ DONE ]
Applying 10.36.31.90_api_nova.pp
10.36.31.90_api_nova.pp:                               [ DONE ]
```

```
Applying 10.36.31.90_nova.pp
10.36.31.90_nova.pp:                                    [ DONE ]
Applying 10.36.31.90_neutron.pp
10.36.31.90_neutron.pp:                                 [ DONE ]
Applying 10.36.31.90_osclient.pp
Applying 10.36.31.90_horizon.pp
10.36.31.90_osclient.pp:                                [ DONE ]
10.36.31.90_horizon.pp:                                 [ DONE ]
Applying 10.36.31.90_ring_swift.pp
10.36.31.90_ring_swift.pp:                              [ DONE ]
Applying 10.36.31.90_swift.pp
Applying 10.36.31.90_provision_demo.pp
Applying 10.36.31.90_provision_glance
10.36.31.90_swift.pp:                                   [ DONE ]
10.36.31.90_provision_demo.pp:                          [ DONE ]
10.36.31.90_provision_glance:                           [ DONE ]
Applying 10.36.31.90_mongodb.pp
Applying 10.36.31.90_redis.pp
10.36.31.90_mongodb.pp:                                 [ DONE ]
10.36.31.90_redis.pp:                                   [ DONE ]
Applying 10.36.31.90_ceilometer.pp
10.36.31.90_ceilometer.pp:                              [ DONE ]
Applying 10.36.31.90_nagios.pp
Applying 10.36.31.90_nagios_nrpe.pp
10.36.31.90_nagios.pp:                                  [ DONE ]
10.36.31.90_nagios_nrpe.pp:                             [ DONE ]
Applying 10.36.31.90_postscript.pp
10.36.31.90_postscript.pp:                              [ DONE ]
Applying Puppet manifests                               [ DONE ]
Finalizing                                              [ DONE ]

**** Installation completed successfully ******

Additional information:
* A new answerfile was created in: /root/packstack-answers-20160128-142828.txt
* Time synchronization installation was skipped. Please note that unsynchronized time
on server instances might be problem for some OpenStack components.
* File /root/keystonerc_admin has been created on OpenStack client host 10.36.31.90.
To use the command line tools you need to source the file.
* To access the OpenStack Dashboard browse to http://10.36.31.90/dashboard.
Please, find your login credentials stored in the keystonerc_admin in your home
directory.
* To use Nagios, browse to http://10.36.31.90/nagios username: nagiosadmin, password:
154262e46c914c2b
* The installation log file is available at:
/var/tmp/packstack/20160128-142827-xesixM/openstack-setup.log
* The generated manifests are available at:
/var/tmp/packstack/20160128-142827-xesixM/manifests
Reboot the system once all the packages are installed and configured
[root@rhosp ~]# reboot
```

Once the system is back online, log in to the OpenStack GUI and change the default password.
The default password is created in the /root/keystonerc_admin file.

```
[root@rhops2 ~]# cat /root/keystonerc_admin
unset OS_SERVICE_TOKEN
export OS_USERNAME=admin
export OS_PASSWORD=c4b0a987075b44df
export OS_AUTH_URL=http://10.36.31.90:5000/v2.0
export PS1='[\u@\h \W(keystone_admin)]\$ '
export OS_TENANT_NAME=admin
export OS_REGION_NAME=RegionOne
```
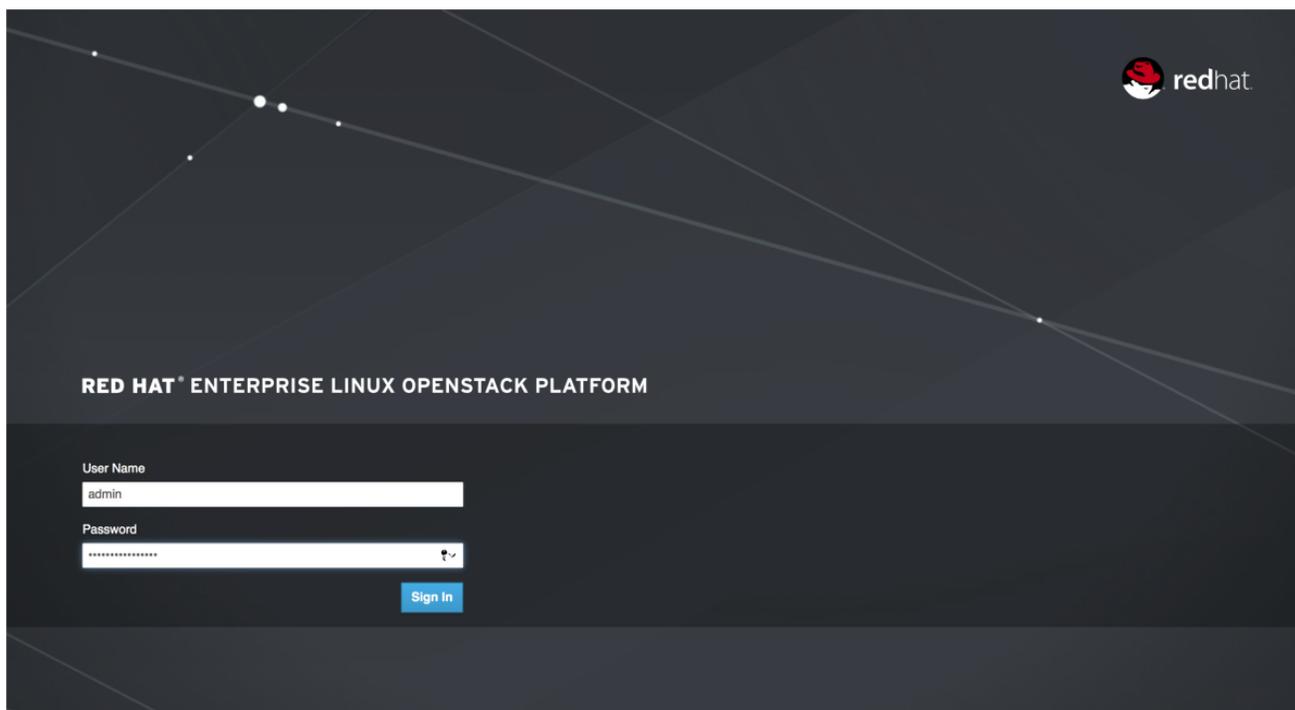
Follow these procedures:
1. Upon login, update the admin credentials.
2. Click "admin" on the top left corner of the screen.
3. Click "Change Password"
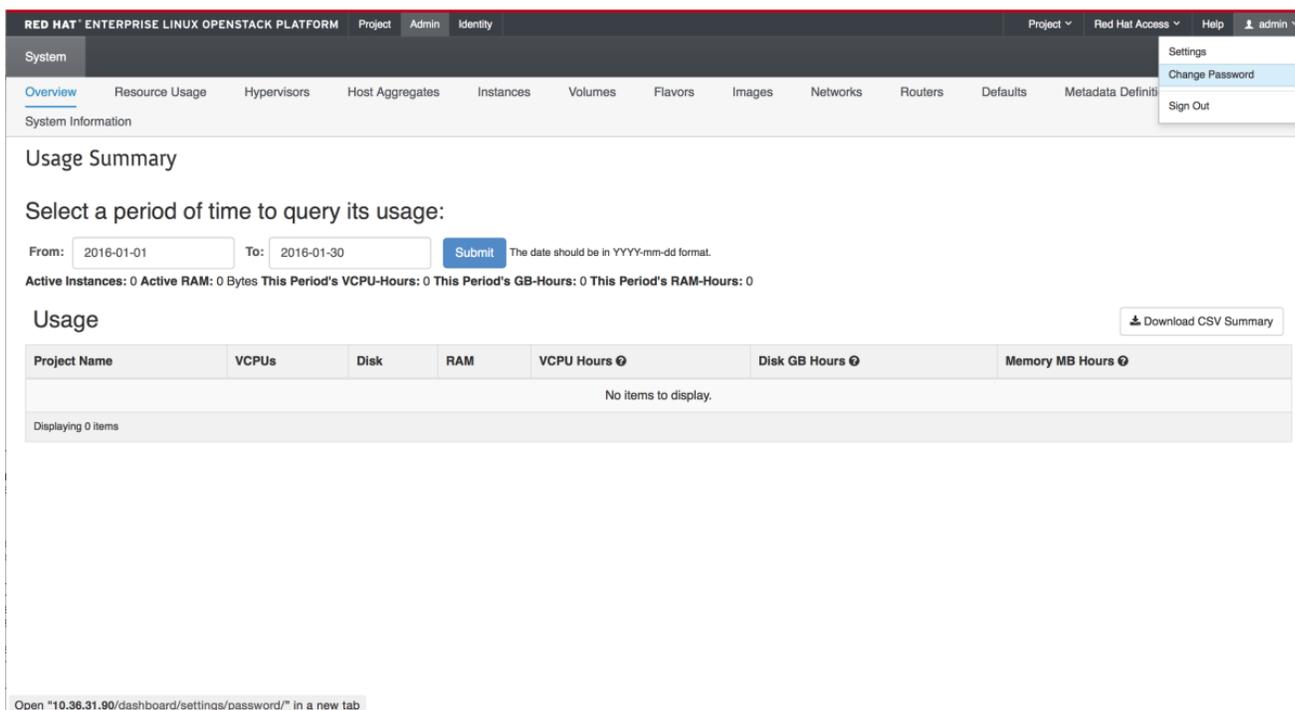
4. Click the "Change" button to submit the password change.
5. Once the password is updated, you will be logged out of the current session immediately.

6. Use the new credentials to log in to the GUI.
7. Once the new password has been updated from the GUI session, update the password in /root/keystone_admin and save the file.

```
[root@rhops2 ~]# cat /root/keystonerc_admin
unset OS_SERVICE_TOKEN
export OS_USERNAME=admin
```

```
export OS_PASSWORD=<NEW PASSWORD>
export OS_AUTH_URL=http://10.36.31.90:5000/v2.0
export PS1='[\u@\h \W(keystone_admin)]\$ '

export OS_TENANT_NAME=admin
export OS_REGION_NAME=RegionOne
```

To perform any OpenStack CLI operation, this file needs to be sourced.
```
[root@rhops2 ~]# source /root/keystonerc_admin
[root@rhops2 ~(keystone_admin)]#
```

The system will return an error message if the files are not sourced.

```
[root@rhops2 ~]# neutron port-list
```
You must provide a username or user ID via --os-username, env[OS_USERNAME] or --os-user-id, env[OS_USER_ID].

Setting up OpenStack with SRIOV

1. Modify the OpenStack config files to enable SRIOV support.

   1. /etc/nova/nova.conf
   2. /etc/neutron/plugins/ml2/ml2_conf.ini
   3. /etc/neutron/plugins/ml2/ml2_conf_sriov.ini
   4. /usr/lib/systemd/system/neutron-server.service

2. Find out the PCI address for the Virtual functions that you intend to use and add it to /etc/nova/nova.conf.

```
[root@rhops2 ~]# lspci -nn | grep -i net
01:00.0 Ethernet controller [0200]: Intel Corporation I350 Gigabit Network Connection
[8086:1521] (rev 01)
01:00.1 Ethernet controller [0200]: Intel Corporation I350 Gigabit Network Connection
[8086:1521] (rev 01)
01:10.0 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:10.1 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:10.4 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:10.5 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:11.0 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:11.1 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:11.4 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:11.5 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:12.0 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:12.1 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:12.4 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:12.5 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:13.0 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
01:13.1 Ethernet controller [0200]: Intel Corporation I350 Ethernet Controller Virtual
Function [8086:1520] (rev 01)
```

3. Since this server has two interfaces, you will be using VFs on one interface for "MGMT" and the VFs on other interface for "LAN", "HA" and "LAN2." If the server has more than two interfaces, they can be mapped differently. (Infoblox recommends that you map the NIOS interfaces individually with virtual functions bound to a different physical interface. This helps HA failover situations).
```
[root@rhops2 ~]# cat /etc/nova/nova.conf
......
......
......
# White list of PCI devices available to VMs. For example:
# pci_passthrough_whitelist = [{"vendor_id": "8086",
# "product_id": "0443"}] (multi valued)
#pci_passthrough_whitelist=
```

```
## Virtual Functions on eth0
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:10.0",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:10.1",
"physical_network":"lan1"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:10.4",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:10.5",
"physical_network":"ha"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:11.0",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:11.1",
"physical_network":"lan2"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:11.4",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:11.5",
"physical_network":"lan1"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:12.0",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:12.1",
"physical_network":"ha"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:12.4",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:12.5",
"physical_network":"lan2"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:13.0",
"physical_network":"mgmt"}
pci_passthrough_whitelist = {"vendor_id": "8086","product_id": "1520", "address":"01:13.1",
"physical_network":"lan1"}
......
......
......
#
# Options defined in nova.scheduler.host_manager
#

# Filter classes available to the scheduler which may be
# specified more than once. An entry of
# "nova.scheduler.filters.all_filters" maps to all filters
# included with nova. (multi valued)
scheduler_available_filters=nova.scheduler.filters.all_filters

# Which filter class names to use for filtering hosts when not
# specified in the request. (list value)
#scheduler_default_filters=RetryFilter,AvailabilityZoneFilter,RamFilter,ComputeFilter,ComputeCapabilitiesFi
lter,ImagePropertiesFilter,Server
GroupAntiAffinityFilter,ServerGroupAffinityFilterscheduler_default_filters=RetryFilter,AvailabilityZoneFilt
er,RamFilter,ComputeFilter,ComputeCapabilitiesFilter,ImagePropertiesFilter,CoreFilter,PciPassthroughFilter
......
......
......
```

4. Now add the sriovnic option and flat_network configuration to the ml2_conf.ini file.

```
[root@rhops2 ~]# cat /etc/neutron/plugins/ml2/ml2_conf.ini | grep -v ^$ | grep -v ^#
[ml2]
type_drivers = flat,vlan,gre,vxlan
tenant_network_types = vxlan
mechanism_drivers =openvswitch,sriovnicswitch
[ml2_type_flat]
flat_networks = mgmt,lan1,ha,lan2
[ml2_type_vlan]
[ml2_type_gre]
[ml2_type_vxlan]
vni_ranges =10:100
vxlan_group =224.0.0.1
[securitygroup]
enable_security_group = True
firewall_driver = neutron.agent.linux.iptables_firewall.OVSHybridIptablesFirewallDriver
[ovs]
local_ip = 10.36.31.90
```

5. Add supported PCI "vendor id : product id" and physical device mapping to the */etc/neutron/plugins/ml2/ml2_conf_sriov.ini* file.

```
[root@rhops2 ~]# cat /etc/neutron/plugins/ml2/ml2_conf_sriov.ini | grep -v ^$ | grep -v ^#
[ml2_sriov]
supported_pci_vendor_devs = 8086:1520
agent_required = False
[sriov_nic]
physical_device_mappings = mgmt:eno1,lan1:eno2,ha:eno2,lan2:eno2
```

Add "ml2_conf_sriov.ini" config file details in
"/usr/lib/systemd/system/neutron-server.service"

```
[root@rhops2 ~]# cat /usr/lib/systemd/system/neutron-server.service
[Unit]
Description=OpenStack Neutron Server
After=syslog.target network.target

[Service]
Type=notify
User=neutron
ExecStart=/usr/bin/neutron-server --config-file /usr/share/neutron/neutron-dist.conf
--config-dir /usr/share/neutron/server --config-file /etc/neutron/neutron.conf
--config-file /etc/neutron/plugin.ini --config-dir /etc/neutron/conf.d/common --config-dir
/etc/neutron/conf.d/neutron-server --config-file
/etc/neutron/plugins/ml2/ml2_conf_sriov.ini --log-file /var/log/neutron/server.log
PrivateTmp=true
NotifyAccess=all
KillMode=process
[Install]
WantedBy=multi-user.target
```

6. Now restart the OpenStack service for the new configuration to take affect.

```
[root@rhops2 ~]# openstack-service restart
```
Warning: neutron-server.service changed on disk. Run 'systemctl daemon-reload' to reload units.

7. Now create networks in OpenStack setup and map interface (sriov) to these new networks.

```
[root@rhops2 ~(keystone_admin)]# neutron net-list
+--------------------------------------+---------+-------------------------------------------------------+
| id                                   | name    | subnets                                               |
+--------------------------------------+---------+-------------------------------------------------------+
| 43a84db7-acf6-4404-b6af-f8601fbb8eec | public  | 4d176229-3207-4e5e-b1eb-b638accf59f5 172.24.4.224/28 |
| ec7e97b9-8f2f-41c4-bac8-c91352fb2f2a | private | f4c9ded8-07aa-42da-b962-81fb9e691403 10.0.0.0/24     |
+--------------------------------------+---------+-------------------------------------------------------+

[root@rhops2 ~(keystone_admin)]# neutron net-create --provider:physical_network=mgmt
--provider:network_type=flat mgmt.
Created a new network:
+---------------------------+--------------------------------------+
| Field                     | Value                                |
+---------------------------+--------------------------------------+
| admin_state_up            | True                                 |
| id                        | a72836cb-87b5-46c8-ada9-efbde7ed1698 |
| mtu                       | 0                                    |
| name                      | mgmt                                 |
| provider:network_type     | flat                                 |
| provider:physical_network | mgmt                                 |
| provider:segmentation_id  |                                      |
| router:external           | False                                |
| shared                    | False                                |
| status                    | ACTIVE                               |
| subnets                   |                                      |
| tenant_id                 | d57f8170a21a4f5f970fb7a72f3202a6     |
+---------------------------+--------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron net-create --provider:physical_network=lan1
--provider:network_type=flat lan1

Created a new network:
+---------------------------+--------------------------------------+
| Field                     | Value                                |
+---------------------------+--------------------------------------+
| admin_state_up            | True                                 |
| id                        | 37cae5b8-4598-43e6-8c53-fd23f2c7c45c |
| mtu                       | 0                                    |
| name                      | lan1                                 |
```

```
| provider:network_type   | flat                                 |
| provider:physical_network | lan1                               |
| provider:segmentation_id |                                     |
| router:external         | False                                |
| shared                  | False                                |
| status                  | ACTIVE                               |
| subnets                 |                                      |
| tenant_id               | d57f8170a21a4f5f970fb7a72f3202a6     |
+-------------------------+--------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron net-create --provider:physical_network=ha
--provider:network_type=flat ha

Created a new network:
+-------------------------+--------------------------------------+
| Field                   | Value                                |
+-------------------------+--------------------------------------+
| admin_state_up          | True                                 |
| id                      | 0e7efa05-82b9-4498-9915-48a1748a0238 |
| mtu                     | 0                                    |
| name                    | ha                                   |
| provider:network_type   | flat                                 |
| provider:physical_network | ha                                 |
| provider:segmentation_id |                                     |
| router:external         | False                                |
| shared                  | False                                |
| status                  | ACTIVE                               |
| subnets                 |                                      |
| tenant_id               | d57f8170a21a4f5f970fb7a72f3202a6     |
+-------------------------+--------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron net-create --provider:physical_network=lan2
--provider:network_type=flat lan2
Created a new network:
+-------------------------+--------------------------------------+
| Field                   | Value                                |
+-------------------------+--------------------------------------+
| admin_state_up          | True                                 |
| id                      | 073b6886-7875-47af-b7aa-44b792099337 |
| mtu                     | 0                                    |
| name                    | lan2                                 |
| provider:network_type   | flat                                 |
| provider:physical_network | lan2                               |
| provider:segmentation_id |                                     |
| router:external         | False                                |
| shared                  | False                                |
| status                  | ACTIVE                               |
| subnets                 |                                      |
| tenant_id               | d57f8170a21a4f5f970fb7a72f3202a6     |
+-------------------------+--------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron subnet-create --name subnet-mgmt mgmt 10.36.0.0/16
--allocation-pool start=10.36.31.221,end=10.36.31.225 --disable-dhcp
Created a new subnet:
+-------------------+----------------------------------------------------+
| Field             | Value                                              |
+-------------------+----------------------------------------------------+
| allocation_pools  | {"start": "10.36.31.221", "end": "10.36.31.225"}   |
| cidr              | 10.36.0.0/16                                        |
| dns_nameservers   |                                                    |
| enable_dhcp       | False                                              |
| gateway_ip        | 10.36.0.1                                          |
| host_routes       |                                                    |
| id                | 824f9edb-3b30-4179-88f1-eb24a8a1b53b               |
| ip_version        | 4                                                  |
| ipv6_address_mode |                                                    |
| ipv6_ra_mode      |                                                    |
| name              | subnet-mgmt                                        |
| network_id        | a72836cb-87b5-46c8-ada9-efbde7ed1698               |
| subnetpool_id     |                                                    |
| tenant_id         | d57f8170a21a4f5f970fb7a72f3202a6                   |
+-------------------+----------------------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron subnet-create --name subnet-lan1 lan1
10.34.31.0/24 --allocation-pool start=10.34.31.221,end=10.34.31.225 --disable-dhcp
Created a new subnet:
```

```
+-------------------+---------------------------------------------+
| Field             | Value                                       |
+-------------------+---------------------------------------------+
| allocation_pools  | {"start": "10.34.31.221", "end": "10.34.31.225"} |
| cidr              | 10.34.31.0/24                               |
| dns_nameservers   |                                             |
| enable_dhcp       | False                                       |
| gateway_ip        | 10.34.31.1                                  |
| host_routes       |                                             |
| id                | fefb9dda-d6e6-43b6-af59-db6f747a7440        |
| ip_version        | 4                                           |
| ipv6_address_mode |                                             |
| ipv6_ra_mode      |                                             |
| name              | subnet-lan1                                 |
| network_id        | 37cae5b8-4598-43e6-8c53-fd23f2c7c45c        |
|                   |                                             |
| subnetpool_id     |                                             |
| tenant_id         | d57f8170a21a4f5f970fb7a72f3202a6            |
+-------------------+---------------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron subnet-create --name subnet-ha ha 10.34.31.0/24
--allocation-pool start=10.34.31.226,end=10.34.31.230 --disable-dhcp
Created a new subnet:
+-------------------+---------------------------------------------+
| Field             | Value                                       |
+-------------------+---------------------------------------------+
| allocation_pools  | {"start": "10.34.31.226", "end": "10.34.31.230"} |
| cidr              | 10.34.31.0/24                               |
| dns_nameservers   |                                             |
| enable_dhcp       | False                                       |
| gateway_ip        | 10.34.31.1                                  |
| host_routes       |                                             |
| id                | 2a81d4fc-2790-4072-9e83-ac075fcfbdde        |
| ip_version        | 4                                           |
| ipv6_address_mode |                                             |
| ipv6_ra_mode      |                                             |
| name              | subnet-ha                                   |
| network_id        | 0e7efa05-82b9-4498-9915-48a1748a0238        |
| subnetpool_id     |                                             |
| tenant_id         | d57f8170a21a4f5f970fb7a72f3202a6            |
+-------------------+---------------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron subnet-create --name subnet-lan2 lan2
10.34.31.0/24 --allocation-pool start=10.34.31.231,end=10.34.31.235 --disable-dhcp
Created a new subnet:
+-------------------+---------------------------------------------+
| Field             | Value                                       |
+-------------------+---------------------------------------------+
| allocation_pools  | {"start": "10.34.31.231", "end": "10.34.31.235"} |
| cidr              | 10.34.31.0/24                               |
| dns_nameservers   |                                             |
| enable_dhcp       | False                                       |
| gateway_ip        | 10.34.31.1                                  |
| host_routes       |                                             |
| id                | 485d714e-f34c-4994-9bff-ef9edecf507e        |
| ip_version        | 4                                           |
| ipv6_address_mode |                                             |
| ipv6_ra_mode      |                                             |
| name              | subnet-lan2                                 |
| network_id        | 073b6886-7875-47af-b7aa-44b792099337        |
| subnetpool_id     |                                             |
| tenant_id         | d57f8170a21a4f5f970fb7a72f3202a6            |
+-------------------+---------------------------------------------+
[root@rhops2 ~(keystone_admin)]# neutron net-list
+--------------------------------------+--------+-------------------------------------------------------+
| id                                   | name   | subnets                                               |
+--------------------------------------+--------+-------------------------------------------------------+
| 073b6886-7875-47af-b7aa-44b792099337 | lan2   | 485d714e-f34c-4994-9bff-ef9edecf507e 10.34.31.0/24    |
| 0e7efa05-82b9-4498-9915-48a1748a0238 | ha     | 2a81d4fc-2790-4072-9e83-ac075fcfbdde 10.34.31.0/24    |
| 37cae5b8-4598-43e6-8c53-fd23f2c7c45c | lan1   | fefb9dda-d6e6-43b6-af59-db6f747a7440 10.34.31.0/24    |
| 43a84db7-acf6-4404-b6af-f8601fbb8eec | public | 4d176229-3207-4e5e-b1eb-b638accf59f5 172.24.4.224/28  |
```

```
| a72836cb-87b5-46c8-ada9-efbde7ed1698 | mgmt    | 824f9edb-3b30-4179-88f1-eb24a8a1b53b 10.36.0.0/16   |
| ec7e97b9-8f2f-41c4-bac8-c91352fb2f2a | private | f4c9ded8-07aa-42da-b962-81fb9e691403 10.0.0.0/24    |
+--------------------------------------+---------+----------------------------------------------------+
```

8. Create ports and associate them with appropriate VFs, as follows:

```
[root@rhops2 ~(keystone_admin)]# neutron port-list
+--------------------------------------+------+-------------------+--------------------------------------
--------------------------------------------+
| id                                   | name | mac_address       |
fixed_ips                                                                                       |
+--------------------------------------+------+-------------------+--------------------------------------
--------------------------------------------+
| a4f13d16-5e90-46d7-8a9e-ea5c117e6b1d |      | fa:16:3e:20:64:4e | {"subnet_id":
"f4c9ded8-07aa-42da-b962-81fb9e691403", "ip_address": "10.0.0.1"}       |
| a5d4c50f-d092-43ce-868b-7d7ee5f4e0c5 |      | fa:16:3e:58:6c:13 | {"subnet_id":
"f4c9ded8-07aa-42da-b962-81fb9e691403", "ip_address": "10.0.0.2"}       |
| af026bf1-8c2e-4ea8-9dcf-5f2b1c6954b2 |      | fa:16:3e:82:34:0d | {"subnet_id":
"4d176229-3207-4e5e-b1eb-b638accf59f5", "ip_address": "172.24.4.226"} |
+--------------------------------------+------+-------------------+--------------------------------------
--------------------------------------------+

[root@rhops2 ~(keystone_admin)]# neutron port-create mgmt --name sriov.mgmt.4010
--binding:vnic-type direct
Created a new port:
+-----------------------+-----------------------------------------------------------------------------
---+
| Field                 |
Value                                                                                           |
+-----------------------+-----------------------------------------------------------------------------
---+
| admin_state_up        |
True                                                                                            |
| allowed_address_pairs |
                                                                                                |
| binding:host_id       |
                                                                                                |
| binding:profile       |
{}                                                                                              |
| binding:vif_details   |
{}                                                                                              |
| binding:vif_type      | unbound
  |
| binding:vnic_type     |
direct                                                                                          |
| device_id             |
  |
| device_owner          |
                                                                                                |
| fixed_ips             | {"subnet_id": "824f9edb-3b30-4179-88f1-eb24a8a1b53b", "ip_address":
"10.36.31.221"} |
| id                    |
86a8baa1-0184-46a6-a761-9f4558a66006                                                            |
| mac_address           |
fa:16:3e:a5:99:3c                                                                               |
| name                  |
sriov.mgmt.4010                                                                                 |
| network_id            | a72836cb-87b5-46c8-ada9-efbde7ed1698
  |
| security_groups       | eeb24d27-7d4f-4a74-819a-bb828c838a33
  |
| status                | DOWN
  |
| tenant_id             |
d57f8170a21a4f5f970fb7a72f3202a6                                                                |
+-----------------------+-----------------------------------------------------------------------------
---+
[root@rhops2 ~(keystone_admin)]# neutron port-create lan1 --name sriov.lan1.4010
--binding:vnic-type direct
Created a new port:
+-----------------------+-----------------------------------------------------------------------------
---+
| Field                 |
```

```
                                                      Value                     |
+-----------------------+----------------------------------------------------------------------------
---+
| admin_state_up        |
True                                                                             |
| allowed_address_pairs
|                                                                                          |
| binding:host_id
|                                                                                          |
| binding:profile       | {}
   |
| binding:vif_details   |
{}                                                                              |
| binding:vif_type      | unbound
   |
| binding:vnic_type     |
direct                                                                          |
| device_id
|                                                                                          |
| device_owner          |
   |
| fixed_ips             | {"subnet_id": "fefb9dda-d6e6-43b6-af59-db6f747a7440", "ip_address":
"10.34.31.221"} |
| id                    |
fa8efa4b-434d-4dbf-956e-423f431059cc                                            |
| mac_address           |
fa:16:3e:42:fc:c9                                                               |
| name                  |
sriov.lan1.4010                                                                 |
| network_id            |
37cae5b8-4598-43e6-8c53-fd23f2c7c45c                                            |
| security_groups       |
eeb24d27-7d4f-4a74-819a-bb828c838a33                                            |
| status                |
DOWN                                                                            |
| tenant_id             |
d57f8170a21a4f5f970fb7a72f3202a6                                                |
+-----------------------+----------------------------------------------------------------------------
---+
[root@rhops2 ~(keystone_admin)]# neutron port-create ha --name sriov.ha.4010
--binding:vnic-type direct
Created a new port:
+-----------------------+----------------------------------------------------------------------------
---+
| Field                 |
Value                                                                           |
+-----------------------+----------------------------------------------------------------------------
---+
| admin_state_up        | True
   |
| allowed_address_pairs |
   |
| binding:host_id       |
   |
| binding:profile       |
{}                                                                              |
| binding:vif_details   |
{}                                                                              |
| binding:vif_type      |
unbound                                                                         |
| binding:vnic_type     |
direct                                                                          |
| device_id
|                                                                                          |
| device_owner
|                                                                                          |
| fixed_ips             | {"subnet_id": "2a81d4fc-2790-4072-9e83-ac075fcfbdde", "ip_address":
"10.34.31.226"} |
| id                    |
2ee3079a-79ea-4c82-8fee-037abebb8171                                            |
| mac_address           |
fa:16:3e:da:aa:97                                                               |
```

```
| name                 |
sriov.ha.4010                                                                                    |
| network_id           |
0e7efa05-82b9-4498-9915-48a1748a0238                                                             |
| security_groups      |
eeb24d27-7d4f-4a74-819a-bb828c838a33                                                             |
| status               | DOWN
      |
| tenant_id            | d57f8170a21a4f5f970fb7a72f3202a6
      |
+----------------------+--------------------------------------------------------------------------
---+
[root@rhops2 ~(keystone_admin)]# neutron port-create lan2 --name sriov.lan2.4010
--binding:vnic-type direct
Created a new port:
+----------------------+--------------------------------------------------------------------------
---+
| Field                | Value
      |
+----------------------+--------------------------------------------------------------------------
---+
| admin_state_up       |
True                                                                                             |
| allowed_address_pairs
                                                                                                 |
| binding:host_id
                                                                                                 |
| binding:profile      |
{}                                                                                               |
| binding:vif_details  |
{}                                                                                               |
| binding:vif_type     | unbound
      |
| binding:vnic_type    |
direct                                                                                           |
| device_id
                                                                                                 |
| device_owner
                                                                                                 |
| fixed_ips            | {"subnet_id": "485d714e-f34c-4994-9bff-ef9edecf507e", "ip_address":
"10.34.31.231"} |
| id                   |
5b6d6231-52e7-4048-9a1a-da5106b167a4                                                             |
| mac_address          |
fa:16:3e:cc:76:88                                                                                |
| name                 |
sriov.lan2.4010                                                                                  |
| network_id           |
073b6886-7875-47af-b7aa-44b792099337                                                             |
| security_groups      | eeb24d27-7d4f-4a74-819a-bb828c838a33
      |
| status               |
DOWN                                                                                             |
| tenant_id            | d57f8170a21a4f5f970fb7a72f3202a6
      |
+----------------------+--------------------------------------------------------------------------
---+
[root@rhops2 ~(keystone_admin)]# neutron port-list
+--------------------------------------+-----------------+-------------------+--------------------------
-----------------------------------------------------+
| id                                   | name            | mac_address       | fixed_ips
                            |
+--------------------------------------+-----------------+-------------------+--------------------------
-----------------------------------------------------+
| 2ee3079a-79ea-4c82-8fee-037abebb8171 | sriov.ha.4010   | fa:16:3e:da:aa:97 | {"subnet_id":
"2a81d4fc-2790-4072-9e83-ac075fcfbdde", "ip_address": "10.34.31.226"} |
| 5b6d6231-52e7-4048-9a1a-da5106b167a4 | sriov.lan2.4010 | fa:16:3e:cc:76:88 | {"subnet_id":
"485d714e-f34c-4994-9bff-ef9edecf507e", "ip_address": "10.34.31.231"} |
| 86a8baa1-0184-46a6-a761-9f4558a66006 | sriov.mgmt.4010 | fa:16:3e:a5:99:3c | {"subnet_id":
"824f9edb-3b30-4179-88f1-eb24a8a1b53b", "ip_address": "10.36.31.221"} |
| a4f13d16-5e90-46d7-8a9e-ea5c117e6b1d |                 | fa:16:3e:20:64:4e | {"subnet_id":
"f4c9ded8-07aa-42da-b962-81fb9e691403", "ip_address": "10.0.0.1"}    |
```

```
| a5d4c50f-d092-43ce-868b-7d7ee5f4e0c5 |                    | fa:16:3e:58:6c:13 | {"subnet_id":
"f4c9ded8-07aa-42da-b962-81fb9e691403", "ip_address": "10.0.0.2"}       |
| af026bf1-8c2e-4ea8-9dcf-5f2b1c6954b2 |                    | fa:16:3e:82:34:0d | {"subnet_id":
"4d176229-3207-4e5e-b1eb-b638accf59f5", "ip_address": "172.24.4.226"} |
| fa8efa4b-434d-4dbf-956e-423f431059cc | sriov.lan1.4010 | fa:16:3e:42:fc:c9 | {"subnet_id":
"fefb9dda-d6e6-43b6-af59-db6f747a7440", "ip_address": "10.34.31.221"} |
+------------------------------------+----------------+------------------+--------------------------
-------------------------------------------------------+

[root@rhops2 ~(keystone_admin)]# nova boot --flavor Infoblox-VM-4010 --image IB-VM-4010
--nic port-id=86a8baa1-0184-46a6-a761-9f4558a66006 --nic
port-id=fa8efa4b-434d-4dbf-956e-423f431059cc --nic
port-id=2ee3079a-79ea-4c82-8fee-037abebb8171 --nic
port-id=5b6d6231-52e7-4048-9a1a-da5106b167a4 DDI-VM-4010
+-----------------------------------+-------------------------------------------------------+
| Property                          | Value                                                 |
+-----------------------------------+-------------------------------------------------------+
| OS-DCF:diskConfig                 | MANUAL                                                |
| OS-EXT-AZ:availability_zone       |                                                       |
| OS-EXT-SRV-ATTR:host              | -                                                     |
| OS-EXT-SRV-ATTR:hypervisor_hostname | -                                                   |
| OS-EXT-SRV-ATTR:instance_name     | instance-0000000e                                     |
| OS-EXT-STS:power_state            | 0                                                     |
| OS-EXT-STS:task_state             | scheduling                                            |
| OS-EXT-STS:vm_state               | building                                              |
| OS-SRV-USG:launched_at            | -                                                     |
| OS-SRV-USG:terminated_at          | -                                                     |
| accessIPv4                        |                                                       |
| accessIPv6                        |                                                       |
| adminPass                         | tjY5xVsAkmJB                                          |
| config_drive                      |                                                       |
| created                           | 2016-02-02T02:22:28Z                                  |
| flavor                            | Infoblox-VM-4010 (2e425be7-dc58-4a01-8c57-f862c60559a0) |
| hostId                            |                                                       |
| id                                | 4c2fb9dd-fbe2-42db-9174-56cfa2449068                  |
| image                             | IB-VM-4010 (13e32e67-d6a0-4225-a127-64472c4cdb64)     |
| key_name                          | -                                                     |
| metadata                          | {}                                                    |
| name                              | DDI-VM-4010                                           |
| os-extended-volumes:volumes_attached | []                                                 |
| progress                          | 0                                                     |
| security_groups                   | default                                               |
| status                            | BUILD                                                 |
| tenant_id                         | d57f8170a21a4f5f970fb7a72f3202a6                      |
| updated                           | 2016-02-02T02:22:28Z                                  |
| user_id                           | 57770ecc6ca4457d83eb670055de8228                      |
+-----------------------------------+-------------------------------------------------------+
```

Installing Infoblox VM Image on OpenStack with SRIOV

1. Create new flavor on OpenStack server that is suitable for the NIOS VM-4010 image.

• 8x VCPU's

• 24 GB Memory

• 160 GB Root Disk

2. Log in to the OpenStack GUI. Go to the "Image" tab and click "Create Image."

Installing Infoblox VM Image on Openstack with SRIOV

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Note that for Reporting members, you must enter 500 GB in the Ephemeral Disk (GB) field.

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3. Once the image creation is finished, go back to the CLI login and bring up the instance.

4. Get the SRIOV interface ID using the following command:

[root@rhops2 ~(keystone_admin)]# neutron port-list

```
+-----------------------------------+-----------------+------------------+--------------------------------------------------------------------------------------+
| id | name | mac_address | fixed_ips |
+-----------------------------------+-----------------+------------------+--------------------------------------------------------------------------------------+
```

| 2ee3079a-79ea-4c82-8fee-037abebb8171 | sriov.ha.4010 | fa:16:3e:da:aa:97 | {"subnet_id": "2a81d4fc-2790-4072-9e83-ac075fcfbdde", "ip_address": "10.34.31.226"} |

| 5b6d6231-52e7-4048-9a1a-da5106b167a4 | sriov.lan2.4010 | fa:16:3e:cc:76:88 | {"subnet_id": "485d714e-f34c-4994-9bff-ef9edecf507e", "ip_address": "10.34.31.231"} |

| 86a8baa1-0184-46a6-a761-9f4558a66006 | sriov.mgmt.4010 | fa:16:3e:a5:99:3c | {"subnet_id": "824f9edb-3b30-4179-88f1-eb24a8a1b53b", "ip_address": "10.36.31.221"} |

| a4f13d16-5e90-46d7-8a9e-ea5c117e6b1d | | fa:16:3e:20:64:4e | {"subnet_id": "f4c9ded8-07aa-42da-b962-81fb9e691403", "ip_address": "10.0.0.1"} |

| a5d4c50f-d092-43ce-868b-7d7ee5f4e0c5 | | fa:16:3e:58:6c:13 | {"subnet_id": "f4c9ded8-07aa-42da-b962-81fb9e691403", "ip_address": "10.0.0.2"} |

| af026bf1-8c2e-4ea8-9dcf-5f2b1c6954b2 | | fa:16:3e:82:34:0d | {"subnet_id": "4d176229-3207-4e5e-b1eb-b638accf59f5", "ip_address": "172.24.4.226"} |

| fa8efa4b-434d-4dbf-956e-423f431059cc | sriov.lan1.4010 | fa:16:3e:42:fc:c9 | {"subnet_id": "fefb9dda-d6e6-43b6-af59-db6f747a7440", "ip_address": "10.34.31.221"} |

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

5. Launch an instance using the following command:

[root@rhops2 ~(keystone_admin)]# nova boot --flavor Infoblox-VM-4010 --image IB-VM-4010

--nic port-id=86a8baa1-0184-46a6-a761-9f4558a66006 --nic

port-id=fa8efa4b-434d-4dbf-956e-423f431059cc --nic

port-id=2ee3079a-79ea-4c82-8fee-037abebb8171 --nic

port-id=5b6d6231-52e7-4048-9a1a-da5106b167a4 DDI-VM-4010

Installing Infoblox VM Image on Openstack with SRIOV

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```
+-----------------------------------+--------------------------------------------------+
| Property | Value |
+-----------------------------------+--------------------------------------------------+
```

| OS-DCF:diskConfig | MANUAL |

| OS-EXT-AZ:availability_zone | |

| OS-EXT-SRV-ATTR:host | - |

| OS-EXT-SRV-ATTR:hypervisor_hostname | - |

| OS-EXT-SRV-ATTR:instance_name | instance-0000000e |

| OS-EXT-STS:power_state | 0 |

| OS-EXT-STS:task_state | scheduling |

| OS-EXT-STS:vm_state | building |

| OS-SRV-USG:launched_at | - |

| OS-SRV-USG:terminated_at | - |

| accessIPv4 | |

| accessIPv6 | |

| adminPass | tjY5xVsAkmJB |

| config_drive | |

| created | 2016-02-02T02:22:28Z |

| flavor | Infoblox-VM-4010 (2e425be7-dc58-4a01-8c57-f862c60559a0) |

| hostId | |

| id | 4c2fb9dd-fbe2-42db-9174-56cfa2449068 |

| image | IB-VM-4010 (13e32e67-d6a0-4225-a127-64472c4cdb64) |

| key_name | - |

| metadata | {} |

| name | DDI-VM-4010 |

| os-extended-volumes:volumes_attached | [] |

| progress | 0 |

| security_groups | default |

| status | BUILD |

| tenant_id | d57f8170a21a4f5f970fb7a72f3202a6 |

| updated | 2016-02-02T02:22:28Z |

| user_id | 57770ecc6ca4457d83eb670055de8228 |

+----------------------------------+---+

6. Go back to the GUI and confirm if the image boots up without any errors.

7. Go to **"Project"** -> **Instances**.

For Reporting and Blocks tools members, the **Instance Security Groups** must be set to **Permissive**.

8. For console access to the instance, go to **"DDI-VM-4010"** -> **Console**.

Connected (unencrypted) to: QEMU (Instance-0000000e)   Send CtrlAltDel

```
Disconnect NOW if you have not been expressly authorized to use this system.
login:

Disconnect NOW if you have not been expressly authorized to use this system.
login:

Disconnect NOW if you have not been expressly authorized to use this system.
login: admin
password:

               Infoblox NIOS Release 7.2.5-314173 (64bit)
        Copyright (c) 1999-2015 Infoblox Inc. All Rights Reserved.

                   type 'help' for more information


Infoblox > show version
Version : 7.2.5-314173
SN      : DDB92F4CE2FBDB42917456CFA2449068
Hotfix  : N/A
Infoblox > _
```