

**Dell EMC Ready Bundle for
Red Hat OpenStack Platform
Software Deployment Guide
Version 10.1**



Dell EMC Converged Platforms and Solutions

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Notes, Cautions, and Warnings

-  A **Note** indicates important information that helps you make better use of your system.
-  A **Caution** indicates potential damage to hardware or loss of data if instructions are not followed.
-  A **Warning** indicates a potential for property damage, personal injury, or death.

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Chapter 1

Overview

Topics:

- [Summary](#)
- [Prerequisites](#)
- [Red Hat Subscriptions](#)

This guide provides information necessary to deploy the Dell EMC Ready Bundle for Red Hat OpenStack Platform.

- **Servers:**

- Dell EMC PowerEdge R640 servers with the Dell EMC PowerEdge H730 or H740 disk controllers
- Dell EMC PowerEdge R740xd servers with the Dell EMC PowerEdge Boot Optimized Storage Solution (BOSS) controller and the Dell EMC PowerEdge HBA330 disk controller
- Dell EMC PowerEdge FX with Dell EMC PowerEdge FC630 and Dell EMC PowerEdge FD332

- **Networking:**

- Dell Networking S3048-ON and S4048-ON switches

Summary

This guide provides a detailed set of instructions on how to deploy the Dell EMC Ready Bundle for Red Hat OpenStack Platform. The main topics described are:

- [Software Automation Deployment](#) on page 15 for **automated** deployment of:
 - Dell Dell EMC PowerEdge R-Series
 - Dell EMC PowerEdge FX
- [Software Manual Deployment](#) on page 23 for **manual** deployment of:
 - Dell Dell EMC PowerEdge R-Series
- [Overcloud Validation](#) on page 61

Several appendices provide file references, example files, and other helpful procedures.



Note: This document contains procedures for both automated and manual deployment. Each of these procedures has dependencies, including automation and other files that are required. Please see the *Dependencies* sections of [Software Automation Deployment](#) on page 15 and [Software Manual Deployment](#) on page 23, respectively, to understand the dependencies before you begin the procedures.

Prerequisites

The following prerequisites must be satisfied before proceeding with a Dell EMC Ready Bundle for Red Hat OpenStack Platform deployment:



Note: All nodes in the same roles must be of the same server models, with identical HDD, RAM, and NIC configurations. So, all Controller nodes must be identical to each other; all Compute nodes must be identical to each other; and so on. See the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Reference Architecture](#) for configuration options for each node role.

- Hardware racked and wired per the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Reference Architecture](#)
- Hardware configured as per the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Hardware Deployment Guide](#)
- Hardware is powered off after the hardware is configured per the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Hardware Deployment Guide](#)
- Internet access, including but not limited to, Red Hat's subscription manager service and repositories
- Valid Red Hat subscriptions
- Workstation used to to extract the *automated.tar.gz* file and begin building the collateral for the SAH node

Red Hat Subscriptions

Once all prerequisites have been met, you must determine the appropriate Red Hat subscription entitlements for each cluster node.

Determining Pool IDs

You must determine the pool ID to use for the Solution Admin Host (SAH) and each node in the cluster before proceeding with the installation. To determine the pool IDs, you must have an existing server that is registered to the Red Hat Hosted Services. This server must also be registered using the same credentials as the ones being used in this environment.

1. Once the server is correctly registered, execute the following command to see the available subscription pools.

```
# subscription-manager list --all --available
```

The command will output a list of available pools. Each section of information lists what the subscription provides, its pool ID, how many are available, the type of system it is for, as well as other information.

2. Determine the correct pool ID needed for this environment and take note of it.



Note: Pay close attention to the **System Type**. The System Type can be *Virtual* or *Physical*. If necessary you can use a physical license for a virtual node. However, you cannot use a virtual license for a physical node.

```
# subscription-manager list --all --available
```

[OUTPUT ABBREVIATED]

```
Subscription Name: Red Hat Cloud Infrastructure, Standard (8-sockets)
Provides:          Red Hat Beta
                  Red Hat OpenStack Beta
                  JBoss Enterprise Application Platform
                  Red Hat Software Collections (for RHEL Server)
                  Red Hat Enterprise Virtualization
                  Oracle Java (for RHEL Server)
                  Red Hat OpenStack
                  Red Hat Enterprise MRG Messaging
                  Red Hat Enterprise Linux Server
                  Red Hat Enterprise Linux High Availability (for RHEL
Server)
                  Red Hat Software Collections Beta (for RHEL Server)
                  Red Hat Enterprise Linux Load Balancer (for RHEL Server)
                  Red Hat CloudForms
SKU:               MCT2861
Pool ID:           aaaa111bbb222ccc333ddd444eee5556
Available:         7
Suggested:         1
Service Level:     Standard
Service Type:      L1-L3
Multi-Entitlement: No
Ends:              03/23/2017
System Type:       Physical
```

[OUTPUT ABBREVIATED]

The above output shows a subscription that contains the Red Hat OpenStack entitlement. The required entitlement types for each node are shown in [Table 1: Red Hat Subscription Entitlements](#) on page 13.

Table 1: Red Hat Subscription Entitlements

Node Role	Entitlement	System Type
Solution Admin Host	Red Hat Enterprise Linux Server	physical
Director Node	Red Hat OpenStack	virtual
Red Hat Storage Console VM	Red Hat Storage Console	physical (no virtual available at this time)
Controller Node	Red Hat OpenStack	physical
Compute Node	Red Hat OpenStack	physical

Node Role	Entitlement	System Type
Storage Node	Red Hat Ceph Storage	physical

Chapter

2

Software Automation Deployment

Topics:

- *[Before You Begin](#)*
- *[Dependencies](#)*
- *[Automation Configuration Files](#)*
- *[Preparing and Deploying the Solution Admin Host](#)*
- *[Deploying the Undercloud and the OpenStack Cluster](#)*
- *[Network Checks](#)*

This chapter describes the procedures used to deploy the Dell EMC Ready Bundle for Red Hat OpenStack Platform using an automation framework developed by Dell EMC and validated by Red Hat.

Before You Begin

This guide assumes that you have racked the servers and networking hardware, and completed power and network cabling, as per the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Reference Architecture Guide](#).

The high-level steps required to install the Dell EMC Ready Bundle for Red Hat OpenStack Platform using the automated installation procedures include:

1. Ensuring that your environment meets the [Prerequisites](#) on page 12
2. Ensuring that the [Dependencies](#) on page 16 are met
3. [Determining Pool IDs](#) on page 12
4. [Downloading and Extracting Automation Files](#) on page 16
5. [Preparing the Solution Admin Host Deployment](#) on page 17
6. [Deploying the SAH Node](#) on page 19
7. [Deploying the Undercloud and the OpenStack Cluster](#) on page 20

Dependencies

For customers performing a self-installation, these files are available upon request from Dell EMC. Please contact your account representative, or email openstack@dell.com for instructions.

Dell EMC Ready Bundle for Red Hat OpenStack Platform automated deployment dependencies include:

- [Downloading and Extracting Automation Files](#) on page 16
- The automated install also requires that you have a RHEL 7.4 ISO. It can be downloaded from the Red Hat Customer Portal here: https://access.redhat.com/downloads/content/69/ver=/rhel---7/7.4/x86_64/product-software

Automation Configuration Files

This chapter details obtaining the required configuration files.

Downloading and Extracting Automation Files

The following procedure installs the required configuration files and scripts used to build the collateral (*osp_ks.img*) to begin deploying the solution. This system must be a RHEL 7.4 system and is only used to build up the initial kickstart file. It will not be used again as it is a one-time use, and will not be allocated permanently in the customer's OpenStack deployment.

1. Log into your RHEL 7.4 system as user *root*.
2. Download the *JetPack-automation-10.1.tgz* file to the */root* directory.
3. Change the working directory to */root*.
4. Extract the tar file contents:

```
# tar -xvf JetPack-automation-10.1.tgz
```

5. Download or copy the ISO of the Red Hat Enterprise Linux Server 7.4 installation DVD to */root/rhel74.iso*.

Preparing and Deploying the Solution Admin Host

This topic describes preparing for, and performing, the Solution Admin Host (SAH) deployment.

- If you are using Dell EMC PowerEdge R-Series servers the Open Source Hardware Configuration Toolkit (OS-HCTK) must be run **only on the SAH**. See the [Dell EMC Ready Bundle for Red Hat OpenStack Platform PowerEdge R-Series Hardware Deployment Guide](#).
- If you are using Dell EMC PowerEdge FX servers the OS-HCTK must be run **on all nodes**. See the [Dell EMC Ready Bundle for Red Hat OpenStack Platform PowerEdge FX Hardware Deployment Guide](#).



Note: PowerEdge FX BIOS and RAID configuration is not enabled in version 10.1 of the Dell EMC Ready Bundle for Red Hat OpenStack Platform.

Preparing the Solution Admin Host Deployment



CAUTION: This operation will destroy all data on the Solution Admin Host, with no option for recovery.

1. Log in as your RHEL 7.4 system as the *root* user.
2. Change the working directory to */root/JetPack/src/deploy/osp_deployer/settings*.

```
cd ~/JetPack/src/deploy/osp_deployer/settings
```

3. Copy the settings files to stamp-specific files in different directories. Each architecture uses a specific set of sample settings files to which you can refer:

Dell EMC PowerEdge R-Series

- */root/JetPack/src/deploy/osp_deployer/settings/sample.ini*
- */root/JetPack/src/deploy/osp_deployer/settings/sample.properties*

Dell EMC PowerEdge FX

- */root/JetPack/src/deploy/osp_deployer/settings/sample-fx.ini*
- */root/JetPack/src/deploy/osp_deployer/settings/sample-fx.properties*

- a. If deploying a Dell EMC PowerEdge R-Series series hardware configuration:

- a. Copy the *sample.ini* and *sample.properties* files to stamp-specific files (e.g., *acme.ini* and *acme.properties*), and place them in the *~/* directory:

```
# cp ~/JetPack/src/deploy/osp_deployer/settings/sample.properties ~/acme.properties
# cp ~/JetPack/src/deploy/osp_deployer/settings/sample.ini ~/acme.ini
```

- b. If deploying a Dell EMC PowerEdge FX hardware configuration:

- a. Copy the *sample-fx.ini* and *sample-fx.properties* files to stamp-specific files (e.g., *acme.ini* and *acme.properties*), and place them in the *~/* directory:

```
# cp ~/JetPack/src/deploy/osp_deployer/settings/sample-fx.properties ~/acme.properties
# cp ~/JetPack/src/deploy/osp_deployer/settings/sample-fx.ini ~/acme.ini
```

4. Edit your hardware stamp's *.ini* and *.properties* files to match your hardware stamp documentation (i.e., a Solution Workbook). Use a text editor of your choice; our example uses *vi*:

```
# vi ~/acme.ini
```

5. Change the values in your stamp-specific *.ini* file to match your specific environment. You must supply a value for each *CHANGEME* token in the file. In addition, the IP addresses and the Subscription Manager Pool IDs must be changed to match your deployment. Each section will have a brief description of the attributes.



Note: Instance HA and Ephemeral storage selections must both be performed at installation time, as Dell EMC does not support changing these settings post-installation.

6. Edit the stamp-specific *.properties* file:

```
# vi ~/acme.properties
```

7. Change the values in your *.properties* file to match your specific environment. You must supply a value for IP addresses, host names, passwords, and interfaces. The storage OSDs/journals configuration should not be specified if the storage nodes are 14G servers with HBA330 controllers, but must be specified for all other storage node configurations.

a. Specify the following line for each Dell EMC PowerEdge R740xd storage node:

```
"os_volume_size_gb": "223",
```



Note: Additional nodes can be added to your stamp-specific *.properties* file if your environment contains more than that supported by the base architecture, as described in the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Architecture Guide](#).

The examples in this file are based on the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Reference Architecture Guide](#), and the installation scripts rely on the VLAN IDs as specified in this file. For example, the Private API VLAN ID is 140. So, all addresses on the Private API network must have 140 as the third octet (e.g., 192.168.**140**.114). [Table 2: VLAN IDs](#) on page 18 below lists the VLAN IDs.

Table 2: VLAN IDs

VLAN ID	Name
110	Management/Out of Band (OOB) Network (iDRAC)
120	Provisioning Network
130	Tenant Network
140	Private API Network
170	Storage Network
180	Storage Clustering Network
190	Public API Network
191	External Tenant Network (Used for floating IP addresses)
201-250	Internal Tenant Network



Note: The *anaconda_ip* is used for the initial installation of the SAH node, and requires an address that can access the Internet to obtain Red Hat software. The *anaconda_iface* must be a dedicated interface that is only used for this purpose, and is not used in any other part of the configuration.

a. Configure the Overcloud nodes' iDRACs to use either DHCP or statically-assigned IP addresses. A mix of these two choices is supported.

- a. Determine the service tag of the Overcloud nodes whose iDRAC is configured to use DHCP.
- b. Determine the IP addresses of the Overcloud nodes whose iDRAC is configured to use static IP addresses.
- c. When creating the automation *.properties* file:

- Add the following line to each node using DHCP, substituting the service tag for the node:

```
"service_tag": "<serviceTagHere>",
```

- Add the following line to each node using static IP addressing:

```
"idrac_ip": "<idracIpHere>",
```

Only `service_tag` or `idrac_ip` should be specified for each Overcloud node, not both.

The iDRACs using DHCP will be assigned an IP address from the management allocation pool specified in the `.ini` file. The parameters that specify the pool range are:

- `management_allocation_pool_start`
- `management_allocation_pool_end`

During deployment, the iDRACs using DHCP will be automatically assigned an IP address and discovered. The IP addresses assigned to the nodes can be seen:

- In `/var/lib/dhcpd/dhcpd.leases` on the SAH Node
- In `~/instackenv.json` on the Director Node
- By executing the following commands on the Director Node:

```
$ ironic node-list
$ ironic node-show <node_guid>
```

8. Update your python path:

```
# export PYTHONPATH=/usr/bin/python:/lib/python2.7:/lib/python2.7/\
site-packages:~/JetPack/src/deploy
```

9. You can install the SAH node using either of the following methods:

- Using a physical USB key (key must have 8GBs minimum of capacity):
 1. Plug your USB key into your RHEL 7.4 system.
 2. Run the setup script to prepare your USB key, passing in the USB device ID (`/dev/sdb` in the example below). This process can take up to 10 minutes to complete.



Note: Use full paths.

```
# cd ~/JetPack/src/deploy/setup
# python setup_usb_idrac.py -s /root/acme.ini -usb_key /dev/sdb
```

- Using an iDRAC virtual media image file. This requires your RHEL 7.4 system to have access to the iDRAC consoles to attach the image.

1. Run the setup script to generate an image file that can later be attached to the SAH node.



Note: Use full paths.

```
# cd ~/JetPack/src/deploy/setup
python setup_usb_idrac.py -s /root/acme.ini -idrac_vmedia_img
```

2. The output will be an image file generated in `~/osp_ks.img`.

Deploying the SAH Node

You can deploy the SAH node by one of two methods:


- Using a physical USB key generated above, plugged into the SAH node, or
- Using an iDRAC virtual media image generated above, made available using the **Map Removable Media** option on the iDRAC.

Proceed to [Presenting the Image to the RHEL OS Installation Process](#) on page 20.


Presenting the Image to the RHEL OS Installation Process

1. Attach the Red Hat Enterprise Linux Server 7.4 ISO as a virtual CD/DVD using the **Virtual Media -> Map CD/DVD** option.
2. Attach the `~/osp_ks.img` created above by using either of the following methods:
 - As a removable disk using the **Virtual Media -> Map Removable Disk** option, or
 - Plug in the USB key created above into the SAH.
3. Set the SAH node to boot from the virtual CD/DVD using the **Next Boot -> Virtual CD/DVD/ISO** option.
4. Boot the SAH node.
 - a. At the installation menu, select the **Install** option. *Do not press the [Enter] key.*
 - b. Press the **Tab** key.
 - c. Move the cursor to the end of the line that begins with `vmlinux.`
 - d. Append the following to the end of the line:

```
ks=hd:sdb:/osp-sah.ks
```

 **Note:** The device `sdb` can change, depending upon the quantity of disks being presented to the installation environment. These instructions assume that a single disk is presented. If otherwise, adjust accordingly.

5. Press the **[Enter]** key to start the installation.

 **Note:** It may take a few minutes before progress is seen on the screen. Press the **[ESC]** key at the memory check to speed up the process.

Deploying the Undercloud and the OpenStack Cluster

Now that the SAH node is installed you can deploy and validate the rest of the Dell EMC Ready Bundle for Red Hat OpenStack Platform nodes.

Deploying and Validating the Cluster

 **CAUTION:** This operation will destroy all data on the identified servers, with no option for recovery.

To deploy and validate the rest of the cluster:

1. Log in through the iDRAC console as `root`, or `ssh` into the SAH node.
2. Mount the USB media:

```
# mount /dev/sdb /mnt
```

3. Copy all the files locally:

```
# cp -rfv /mnt/* /root
```

4. Start a `tmux` session to avoid losing progress if the connection drops:

```
# tmux
```

5. There are some post-deployment validation options in the `[Bastion Settings]` group of the stamp-specific initialization file you should consider prior to deployment:
 - `run_sanity_test` - If set to `true` the `sanity_test.sh` script will be executed that will verify the basic functionality of your overcloud deployment.
 - `run_tempest` - If set to `true` the Tempest integration test suite will be executed against your overcloud deployment.



Note: Tempest requires that the sanity test must be run first so `run_sanity`, above, must also be set to `true`. For more information about Tempest please refer to the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Overcloud Validation Guide](#).

- `tempest_smoke_only` - If `run_tempest`, above, is set to `true` this option, which is set to `true` by default, will cause Tempest to run only a small subset of the test suite, where the tests are tagged as "smoke". If set to `false` the entire Tempest suite will be run, which can take an hour or more to complete.

6. Run the deployment by executing the `deployer.py` command:

```
# cd /root/JetPack/src/deploy/osp_deployer
# python deployer.py -s <path_to_settings_ini_file> [-undercloud_only]
[-overcloud_only] [-skip_rhscn_vm]
```

Optional arguments include:

- `-undercloud_only` = Reinstall **only** the Undercloud
- `-overcloud_only` = Reinstall **only** the Overcloud
- `-skip_rhscn_vm` = Do not reinstall the Red Hat Storage Console VM

7. For installation details, execute a `tail` command on the `/auto_results/deployer.log.xxx` file on the SAH node. For example:

```
# tail -f /auto_results/deployer.log.2017.04.17-09.09
```

8. If issues are discovered during the installation process:

- Identify the issue in the `deployer.log`
- Address the issue.
- Rerun the `python deployer.py` command above.

9. If the installation is successful, the `deployment_summary.log` file will display some useful information for accessing the Dell EMC Ready Bundle for Red Hat OpenStack Platform.

```
# cd /auto_results
# cat deployment_summary.log
```

The output will appear similar to this:

```
=====
### nodes ip information ###
### Controllers ###
mercury-controller-0 :
  - provisioning ip : 192.168.120.134
  - nova private ip : 192.168.140.22
  - nova public ip  : 192.168.190.32
  - storage ip      : 192.168.170.21
mercury-controller-1 :
  - provisioning ip : 192.168.120.128
  - nova private ip : 192.168.140.26
  - nova public ip  : 192.168.190.34
  - storage ip      : 192.168.170.26
mercury-controller-2 :
  - provisioning ip : 192.168.120.126
  - nova private ip : 192.168.140.23
  - nova public ip  : 192.168.190.33
  - storage ip      : 192.168.170.22
### Compute ###
mercury-compute-0 :
  - provisioning ip : 192.168.120.133
  - nova private ip : 192.168.140.25
  - storage ip      : 192.168.170.25
```

```

mercury-compute-1 :
- provisioning ip : 192.168.120.132
- nova private ip : 192.168.140.24
- storage ip      : 192.168.170.24
### Storage ###
mercury-cephstorage-0 :
- provisioning ip : 192.168.120.131
- storage cluster ip : 192.168.180.20
- storage ip        : 192.168.170.23
mercury-cephstorage-1 :
- provisioning ip : 192.168.120.127
- storage cluster ip : 192.168.180.21
- storage ip        : 192.168.170.27
=====
OverCloud Horizon      : http://192.168.190.31:5000/v2.0

OverCloud admin password : GbXkxG99KtxHtbmTVzMK9QnUv

```

Network Checks

The deployment process performs a series of network connectivity checks, from the following hosts:

- **SAH Node** — checks are run immediately when you run `deployer.py`
- **Director Node VM** — checks are run immediately when the node is deployed
- **Red Hat Storage Console VM** — checks are run immediately when the node is deployed



Note: If any of the checks fail the deployment will abort.

The network connectivity checks include:

- Ping the `public_api_gateway`
- Ping a Google DNS server (8.8.8.8)
- Ping the Google website (`www.google.com`)
- Execute `subscription-manager status`, which uses:
 - `subscription.rhsm.redhat.com` on port **443**
 - `cdn.redhat.com` on port **443**

Chapter

3

Software Manual Deployment

Topics:

- [*Before You Begin*](#)
- [*Dependencies*](#)
- [*Solution Admin Host Deployment*](#)
- [*Red Hat OpenStack Platform Director Node Deployment*](#)
- [*Red Hat Storage Console VM Deployment*](#)
- [*Provisioning the Nodes*](#)
- [*Red Hat Storage Console Configuration*](#)

This chapter describes the procedures used to deploy the Dell EMC Ready Bundle for Red Hat OpenStack Platform using a manual framework developed by Dell EMC.

Before You Begin

Deployment of the Dell EMC Ready Bundle for Red Hat OpenStack Platform on Dell EMC hardware begins with installation of the Solution Admin Host (SAH). Before proceeding to the SAH installation there are some prerequisites that must first be satisfied, such as obtaining Red Hat subscriptions and gathering of proxy information.

Dell EMC recommends that you first review this chapter to familiarize yourself with terms and concepts before proceeding. Another document that would be helpful to review and print out is the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Workbook](#). The workbook contains essential information that you will need as you proceed through this document.

To deploy the Dell EMC Ready Bundle for Red Hat OpenStack Platform, complete the following tasks:

1. [Determining Pool IDs](#) on page 12
2. [Solution Admin Host Deployment](#) on page 24
3. [Red Hat OpenStack Platform Director Node Deployment](#) on page 30
4. [Red Hat Storage Console VM Deployment](#) on page 35
5. [Provisioning the Nodes](#) on page 38
6. [Red Hat Storage Console Configuration](#) on page 59



Note: Performing all of these tasks is very complex, so please take your time and follow the steps closely.

Dependencies

For customers performing a self-installation, these files are available on request from Dell EMC. Please contact your account representative, or email openstack@dell.com for instructions.

Dell EMC Ready Bundle for Red Hat OpenStack Platform manual deployment dependencies include:

- [Solution Files](#) on page 66

Solution Admin Host Deployment

The SAH hosts at least two (2) virtual machines (VMs):

- **Red Hat OpenStack Platform Director Node** - Used for hosting Red Hat OpenStack Platform Director deployment software, configuring OpenStack, and deployment of OpenStack software to the Controller, Compute, and Storage nodes
- **Red Hat Storage Console VM** - Used for hosting the Red Hat Storage Console web-based management platform

Solution Admin Host Deployment Overview and Prerequisites

Installation of the Dell EMC Solution Admin Host begins with the installation of Red Hat Enterprise Linux Server 7.4. The `osp-sah.ks` kickstart file is provided to assist automation of this process. The installation process can be accomplished using different processes (CD-ROM, CD image, or via a PXE installation). Instructions for how to include the kickstart file are provided later in this document.


This kickstart file performs the following steps when properly configured:

- Partitions the system
- Sets SELinux to *permissive* mode
- Disables `firewalld`, and uses `iptables`
- Disables NetworkManager
- Configures networking for the rest of the nodes, including:

- Bonding
- Bridges
- Static IP addresses
- Gateway
- Name resolution
- NTP service
- Registers the system using the Red Hat Subscription Manager


Additionally, there are some requirements that must be satisfied prior to installation of the OS:

- A Red Hat subscription
- Access to the Subscription Manager hosts

 **Note:** If your network configuration/firewall require them, you must provide the proxy values in order to access Red Hat's Subscription Manager servers.

The osp-sah.ks Kickstart File

The *JetPack-manual-10.1.tgz* archive file (see [File References](#) on page 65) contains the *osp-sah.ks* kickstart file, and must be customized for the environment into which it is being installed.

 **Note:** All edits that usually require changes are in the section marked **CHANGEME** and **END of CHANGEME**. Do not make other edits outside of these lines.

There are many changes that you will need to make, so a brief description of the SAH networks might help clarify the need for the variables in [Figure 1: Solution Admin Host Internal Network Fabric](#) on page 25.

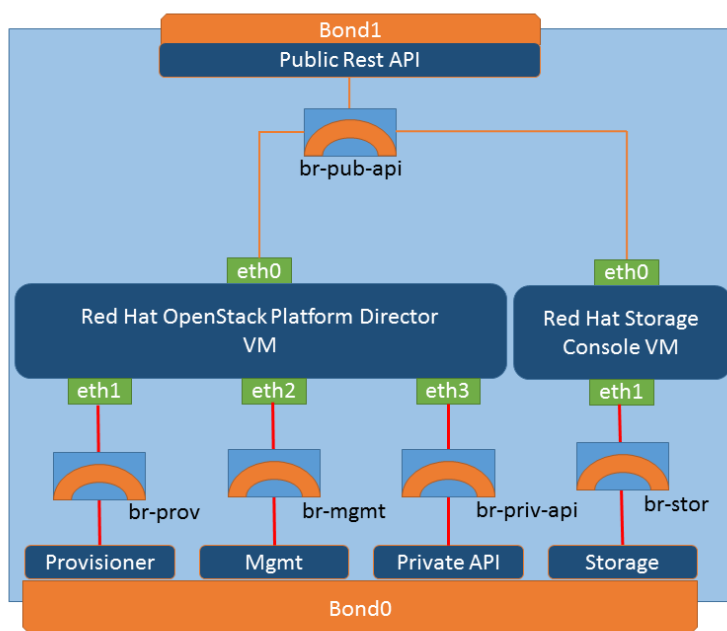


Figure 1: Solution Admin Host Internal Network Fabric

There are 4 network interface files, created during the OS installation, that are required by the SAH:

- ifcfg-em1
- ifcfg-em2
- ifcfg-plp1
- ifcfg-plp2



Note: The interfaces names (`ifcfg-em1`, `ifcfg-em2`, `ifcfg-plp1` and `ifcfg-plp2`) might be different on different system configurations, so these might need to change for your hardware configuration.

These are combined to build the bond interfaces (`bond0` and `bond1`). Interfaces `em1` and `plp1` (`internal_ifaces`) are combined to form `bond0` (`internal_bond_name`) which is used by both the provisioning and storage networks. Interfaces `em2` and `plp2` (`extern_ifaces`) are combined to form `bond1` (`extern_bond_name`). The other bond variables listed in the table are the `extern_boot_opts`, `extern_bond_opts`, `internal_boot_opts`, and `internal_bond_opts`. These four variables can be left as is unless your configuration requires their modification.

Four VLANs are created to segregate the provisioning, management, private API, and storage traffic across the internal network. For our example, we set the `prov_bond_name` to `bond0.120`, `mgmt_bond_name` to `bond0.110`, `priv_api_bond_name` to `bond0.140`, and `stor_bond_name` to `bond0.170`. The `prov_boot_opts`, `mgmt_boot_opts`, `priv_api_boot_opts`, and `stor_boot_opts` are set to "onboot none vlan". You must configure the values for these variables to match your configuration.

The SAH requires five bridges to allow network traffic to pass through the SAH to and from the VM instances. The `br_pub_api_boot_opts`, `br_prov_boot_opts`, `br_mgmt_boot_opts`, `br_priv_api_boot_opts`, and `br_stor_boot_opts` variables need to be updated to set the boot options, IP address and netmask. The `osp-sah.ks` kickstart file provides an example of the format required.

The SAH hosts an NTP server that is used to keep the time in sync on all nodes in the cluster. Set `prov_network` to the provisioning network IP address and `prov_netmask` to the provisioning network netmask for use by the NTP server.

To customize the kickstart file:

1. Extract the contents of the archive file using the `tar -zxvf` command or a Windows® archive utility (7zip, WinRAR, etc).
2. Extract the contents of the `dell-mgmt-node.tgz` file, where you will find the `osp-sah.ks` that you will change as described below.
3. Set the following variables:

Table 3: Kickstart File Variables

Variable	Description
<i>HostName</i>	The FQDN of the server, e.g., sah.acme.com.
<i>SystemPassword</i>	The root user password for the system.
<i>SubscriptionManagerUser</i>	The user credential when registering with Subscription Manager.
<i>SubscriptionManagerPassword</i>	The user password when registering with Subscription Manager.
<i>SubscriptionManagerPool</i>	The pool ID used when attaching the system to an entitlement.
<i>SubscriptionManagerProxy</i>	Optional proxy server to use when attaching the system to an entitlement.
<i>SubscriptionManagerProxyPort</i>	Optional port for the proxy server.
<i>SubscriptionManagerProxyUser</i>	Optional user name for the proxy server.
<i>SubscriptionManagerProxyPassword</i>	Optional password for the proxy server.
<i>Gateway</i>	The default gateway for the system.

Variable	Description
<i>NameServers</i>	A comma-separated list of nameserver IP addresses.
<i>NTPServers</i>	A comma-separated list of time servers. This can be IP addresses or FQDNs.
<i>TimeZone</i>	The time zone in which the system resides.
<i>anaconda_interface</i>	The public interface that allows connection to Red Hat Subscription services.
<i>extern_bond_name</i>	The name of the bond that provides access to the external network.
<i>extern_boot_opts</i>	The boot options for the bond on the external network. Typically, there is no need to change this variable.
<i>extern_bond_opts</i>	The bonding options for the bond on the external network. Typically, there is no need to change this variable.
<i>extern_ifaces</i>	A space delimited list of interface names to bond together for the bond on the external network.
<i>internal_bond_name</i>	The name of the bond that provides access for all internal networks.
<i>internal_boot_opts</i>	The boot options for the bond on the internal network. Typically, there is no need to change this variable.
<i>internal_bond_opts</i>	The bonding options for the bond on the internal network. Typically, there is no need to change this variable.
<i>internal_ifaces</i>	A space delimited list of interface names to bond together for the bond on the internal network.
<i>mgmt_bond_name</i>	The VLAN interface name for the management network.
<i>mgmt_boot_opts</i>	The boot options for the management VLAN interface. Typically, there is no need to change this variable.
<i>prov_bond_name</i>	The VLAN interface name for the provisioning network.
<i>prov_boot_opts</i>	The boot options for the provisioning VLAN interface. Typically, there is no need to change this variable.
<i>stor_bond_name</i>	The VLAN interface name for the storage network.
<i>stor_boot_opts</i>	The boot options for the storage VLAN interface. Typically, there is no need to change this variable.

Variable	Description
<i>pub_api_bond_name</i>	The VLAN interface name for the public API interface.
<i>pub_api_boot_opts</i>	The boot options for the public API VLAN interface. Typically, there is no need to change this variable.
<i>priv_api_bond_name</i>	The VLAN interface name for the private API interface.
<i>priv_api_boot_opts</i>	The boot options for the private API VLAN interface. Typically, there is no need to change this variable.
<i>br_mgmt_boot_opts</i>	The bonding options, IP address and netmask for the management bridge.
<i>br_prov_boot_opts</i>	The bonding options, IP address and netmask for the provisioning bridge.
<i>br_stor_boot_opts</i>	The bonding options, IP address and netmask for the storage bridge.
<i>br_pub_api_boot_opts</i>	The bonding options, IP address and netmask for the public API bridge.
<i>br_priv_api_boot_opts</i>	The bonding options, IP address and netmask for the private API bridge.
<i>prov_network</i>	The network IP address for the provisioning network for use by the NTP server.
<i>prov_netmask</i>	The netmask for the provisioning network for use by the NTP server.

Making the Kickstart File Available for Installation

This procedure places the kickstart file in the top level of a USB image and makes it available for installation. This is useful if you are using the iDRAC virtual media to install.



Note: The USB key must be formatted as *vfat* or *ext2*.

The following example performs these steps:

1. Creates a *ks* image
2. Mounts the image through a loopback device
3. Copies the *osp-sah.ks* file to the image
4. Unmounts the image from the system

The resulting image can be used as removable media for PXE boot or iDRAC. As this is an example, please refer to the man pages or the reference manual for further information on the commands.

There are several options for presenting the *osp-sah.ks* to the OS installation. Dell EMC recommends using one of two ways of preparing the image for inclusion into the installation process, prior to presenting it to the OS installation:

- [Preparing an Image File for use with iDRAC \(Option 1\)](#) on page 29
- [Preparing a USB Key for Physical Boot \(Option 2\)](#) on page 29

Preparing an Image File for use with iDRAC (Option 1)

1. From an existing RHEL 7.4 system, create a USB image:

```
mkfs.vfat -C ks_usb.img 1024
```

2. Mount the image:

```
mount -o loop ks_usb.img /mnt
```

3. Place the `osp-sah.ks` file into the image:

```
cp osp-sah.ks /mnt
```

4. Unmount the image:

```
sync; umount /mnt
```

Preparing a USB Key for Physical Boot (Option 2)

1. From an existing RHEL 7.4 system, format a USB key:

```
mkfs.ext3 /dev/sdb
```

2. Mount the USB key:

```
mount /dev/sdb /mnt
```

3. Place the `osp-sah.ks` file onto the USB key:

```
cp osp-sah.ks /mnt
```

4. Unmount the image:

```
sync; umount /mnt
```

Presenting the Image to the RHEL OS Installation Process

1. If you selected [Preparing an Image File for use with iDRAC \(Option 1\)](#) on page 29:

- a. Using the `ks_usb.img` image file created above, log into the iDRAC Web interface of the Solution Admin Host and launch a remote console.
- b. Under the *Virtual Media* tab, enable it and then select **Map CD/DVD**.
- c. Browse to the location of the Red Hat Enterprise Linux Server 7.4 installation media, and then select **Map Device**.
- d. Next, under the *Virtual Media* tab, select **Map Removable Disk**.
- e. Browse to the location of the `ks_usb.img` file, and then select **Map Device**.



Note: If only one physical hard disk is presented to the server, the device name presented to the installer should be `sdb`.

- f. Proceed to step 3 on page 30.


2. If you selected [Preparing a USB Key for Physical Boot \(Option 2\)](#) on page 29:


- a. Log into the iDRAC Web interface of the Solution Admin Host and launch a remote console.
- b. Under the *Virtual Media* tab, enable it and then select **Map CD/DVD**.
- c. Browse to the location of the Red Hat Enterprise Linux Server 7.4 installation media, and then select **Map Device**.
- d. Insert the USB key into a USB port on the Solution Admin Host.



Note: If only one physical hard disk is presented to the server, the device name presented to the installer should be `sdb`.

- e. Proceed to step 3 on page 30.
 3. Boot the Solution Admin Host:
 - a. Select **Next Boot**.
 - b. Select **Virtual CD/DVD/ISO**.
 - c. Select **OK** on the remote console screen.
 4. Power on the system:
 - a. At the Red Hat Enterprise Linux Server 7.4 installation menu, select the **Install** option. *Do not press the [Enter] key.*
 - b. Press the **[Tab]** key.
 - c. Move the cursor to the end of the line that begins with `vmlinux`.
 - d. Append the following to the end of the line:

 **Note:** The device `sdb` can change, depending upon the quantity of disks being presented to the installation environment. These instructions assume that a single disk is presented. If otherwise, adjust accordingly.
- ```
ks=hd:sdb:/osp-sah.ks
```
5. Press the **[Enter]** key to start the installation.
 

 **Note:** It may take a few minutes before progress is seen on the screen. Press the **[ESC]** key at the memory check to speed up the process.

## Next Steps

After the SAH is installed:

1. Copy the ISO of the **Red Hat Enterprise Linux Server 7.4 installation DVD** to the `/store/data/iso` directory. **Only RHEL 7.4 is supported.** This ISO is used to install the Red Hat OpenStack Platform Director Node and Red Hat Storage Console VM.
2. Set up the Director Node by following the procedures in [Red Hat OpenStack Platform Director Node Deployment](#) on page 30.

## Red Hat OpenStack Platform Director Node Deployment

The deployment of the Red Hat OpenStack Platform Director Node (Director Node) is performed using the `deploy-director-vm.sh` script. This script creates a kickstart file and then executes the `virt-install` command to install the system.

### The Director Node Kickstart file

The generated kickstart script performs the following steps:

- Partitions the system
- Sets SELinux to enforcing mode
- Configures `iptables` to ensure the following services can pass traffic:
  - HTTP
  - HTTPS
  - DNS
  - TFTP
  - TCP port 8140
- Configures networking, including:
  - Static IP addresses
  - Gateway

- Name resolution
- NTP time service
- Registers the system using the Red Hat Subscription Manager
- Installs the Red Hat OpenStack Platform Director installer

## Setup

To set up the Director Node deployment:

1. Log into the SAH node as the *root* user.
2. Ensure that a copy of the **Red Hat Enterprise Linux Server 7.4 Installation DVD** (RHEL 7.4 ISO) is in the `/store/data/iso` directory.
3. Download the *dell-mgmt-node* archive (zip or tgz) file and extract the contents of the archive file into the */root* directory as per the example below:

```
cd /root
tar zxvf /PATH/TO/FILE/dell-mgmt-node.tgz
```

## Configuration

To configure the Director Node deployment:

1. Edit the configuration file, named `director.cfg`, in the `/root/mgmt` directory.
2. Set the following variables in the `director.cfg` file:

**Table 4: Director Node Configuration Parameters**

| Parameter       | Description                                                                                                                                                               |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| rootpassword    | The root user password for the system.                                                                                                                                    |
| timezone        | The timezone the system is in.                                                                                                                                            |
| smuser          | The user credential when registering with Subscription Manager.                                                                                                           |
| smpassword      | The user password when registering with Subscription Manager. The password must be enclosed in single quotes if it contains certain special characters.                   |
| smpool          | Red Hat OpenStack Platform Director (Virtual Node) pool ID used when attaching the system to an entitlement.                                                              |
| smproxy         | Optional proxy server to use when deploying the Director Node. Format is <code>&lt;proxy address&gt;:&lt;proxy port&gt;</code> (e.g., <code>192.168.75.230:3128</code> ). |
| smproxyuser     | Optional user credential for the proxy server.                                                                                                                            |
| smproxypassword | Optional user password for the proxy server.                                                                                                                              |
| hostname        | The FQDN of the Director Node.                                                                                                                                            |
| gateway         | The default gateway for the system.                                                                                                                                       |
| nameserver      | A comma-separated list of nameserver IP addresses.                                                                                                                        |

| Parameter | Description                                                                                                                                                                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ntpserver | The SAH node's provisioning IP address. The SAH node is an NTP server, and will synchronize to the NTP servers specified in the SAH node's kickstart file.                                                                                                         |
| user      | The ID of an admin user to create to use for installing Red Hat OpenStack Platform Director. Default admin user is <i>stack</i> .                                                                                                                                  |
| password  | The password for the admin user.                                                                                                                                                                                                                                   |
| eth0      | This line specifies the IP address and network mask for the public API network. The line begins with <code>eth0</code> , followed by at least one space, the IP address of the VM on the public API network, another set of spaces, and then the network mask.     |
| eth1      | This line specifies the IP address and network mask for the provisioning network. The line begins with <code>eth1</code> , followed by at least one space, the IP address of the VM on the provisioning network, another set of spaces, and then the network mask. |
| eth2      | This line specifies the IP address and network mask for the management network. The line begins with <code>eth2</code> , followed by at least one space, the IP address of the VM on the management network, another set of spaces, and then the network mask.     |
| eth3      | This line specifies the IP address and network mask for the private API network. The line begins with <code>eth3</code> , followed by at least one space, the IP address of the VM on the private API network, another set of spaces, and then the network mask.   |

## Installing the Red Hat OpenStack Platform Director Node

To install the Director Node:

1. Invoke the `deploy-director-vm.sh` script.
  - a. Pass `director.cfg` as the first parameter.
  - b. Pass the full path to the Red Hat Enterprise Linux Server 7.4 Installation media as the second parameter.

```
./deploy-director-vm.sh director.cfg /store/data/iso/rhel74.iso
Starting install...
Retrieving file .treeinfo...
| 3.2 kB 00:00:00
Retrieving file vmlinuz...
| 7.9 MB 00:00:00
Retrieving file initrd.img...
| 64 MB 00:00:00
Creating storage file director.img
| 16 GB 00:00:00
```



```
Creating domain...
| 0 B 00:00:00
Domain installation still in progress. You can reconnect to
the console to complete the installation process.
```

The installation will begin, but no console will be displayed.

2. To display the console:

- a. Ensure that you are logged into a GUI environment.
- b. Open a terminal.
- c. Enter the following command:



**Note:** If you are connected to the Director Node using a Windows® system, you must install and configure an **Xwin Server** before executing `virt-viewer director` to see the output.

```
virt-viewer director
```

3. A console for the Director Node will open.
4. After the Director Node completes the installation, it will power itself off.
5. The power state of the Director Node can be viewed using the `virsh list --all` command:

```
Id Name State

2 director shut off
```

6. The Director Node can be started using the following command:

```
virsh start director
```

### Installing Red Hat OpenStack Platform Director

To install Red Hat OpenStack Platform Director:

1. Log into the Director Node using the user name and password specified in *director.cfg*.
2. Download the *dell-pilot.tgz* archive file. See [Solution Files](#) on page 66 for a list of solution files for the Dell EMC Ready Bundle for Red Hat OpenStack Platform.
3. Extract the contents of the *tar* archive file into the home directory of the user:

```
$ cd
$ tar xzvf /PATH/TO/FILE/dell-pilot.tgz
```

4. Subscribe to, and enable, RHOSP repositories (the use of `--proxy` is optional):

```
$ sudo ~/pilot/enable-repos.py [--proxy <proxy>]
```

Where:

- `proxy = 'http://<proxy_user>:<proxy_password>@<proxy_address>:<proxy_port>'`

Example:

```
sudo ~/pilot/enable-repos.py --proxy 'http:// \
proxyuser:password123@192.168.75.230:3128'
```

5. Edit the `~/pilot/undercloud.conf` configuration file.
6. Set the following variables in `undercloud.conf`:

Table 5: Undercloud Configuration Parameters

| Parameter           | Description                                                                                                                                                                                                                                                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| undercloud_hostname | Defines the fully-qualified host name for the Undercloud.                                                                                                                                                                                                                                                        |
| local_ip            | The IP address and prefix of the Director Node on the provisioning network in Classless Inter-Domain Routing (CIDR) format (xx.xx.xx.xx/yy). This must be the IP address used for <i>eth1</i> in <i>director.cfg</i> . The prefix used here must correspond to the netmask for <i>eth1</i> as well (usually 24). |
| network_gateway     | The network gateway for Neutron-managed Overcloud instances.                                                                                                                                                                                                                                                     |
| network_cidr        | The network and prefix in CIDR format for the Neutron managed network for Overcloud instances.                                                                                                                                                                                                                   |
| masquerade_network  | The network address and prefix of the Director Node on the provisioning network in CIDR format (xx.xx.xx.xx/yy). This must be the network used for <i>eth1</i> in <i>director.cfg</i> . The prefix used here must correspond to the netmask for <i>eth1</i> as well (usually 24).                                |
| dhcp_start          | The starting IP address on the provisioning network to use for OpenStack cloud nodes. <b>Note:</b> Ensure the IP address of the Director Node is not included.                                                                                                                                                   |
| dhcp_end            | The ending IP address on the provisioning network to use for OpenStack cloud nodes.                                                                                                                                                                                                                              |
| inspection_iprange  | An IP address range on the provisioning network to use during node inspection. <b>Note:</b> This should not overlap with the <i>dhcp_start/dhcp_end</i> range.                                                                                                                                                   |

7. Set the passwords, if desired, in the [auth] section; otherwise passwords will be randomly generated.



**Note:** The *undercloud\_heat\_encryption\_key* parameter **must** be either 16, 24, or 32 characters in length in order for Red Hat OpenStack Platform Director to successfully create a stack.

8. Determine the IP address of a DNS server for the Overcloud nodes to use.
9. Execute the following command:

```
$ ~/pilot/install-director.sh --dns <dns_ip> --sm_user \
 <subscription_manager_user> --sm_pwd <subscription_manager_pass> \
 [--sm_pool <subscription_manager_poolid>] [--proxy <proxy> \
 --nodes_pwd <overcloud_nodes_password>]
```

Where:

- *dns\_ip* = IP address of the DNS server
- *subscription\_manager\_user* = Red Hat Subscription Manager user, as specified in [Determining Pool IDs](#) on page 12

- `subscription_manager_pass` = Red Hat Subscription Manager user password, as specified in [Determining Pool IDs](#) on page 12
- `subscription_manager_poolid` = ID of the **Red Hat Ceph Storage** pool, as specified in [Determining Pool IDs](#) on page 12
- `proxy` = `'http://<proxy_user>:<proxy_password>@<proxy_address>:<proxy_port>'`
- `overcloud_nodes_password` = Root password for the Overcloud nodes

The Red Hat OpenStack Platform Director installation can take approximately 30 minutes to complete.



**Note:** The installation log is available at `~/pilot/install-director.log`.

## Using Red Hat OpenStack Platform Director

The Red Hat OpenStack Platform Director installer creates an `rc` file for using the CLI commands, and a file containing all passwords.

1. Before running any CLI commands, first `source` the `rc` file:

```
source ~/stackrc
```

2. All of the passwords are in the `undercloud-passwords.conf` file.

## Next Steps

After the Red Hat OpenStack Platform Director Node is installed:

1. Install the Red Hat Storage Console VM by following the procedures in [Red Hat Storage Console VM Deployment](#) on page 35.

## Red Hat Storage Console VM Deployment

The Red Hat Storage Console VM is deployed using the `deploy-rhscon-vm.py` script. This script creates a kickstart file and then executes the `virt-install` command to deploy the VM.



**Note:** The Red Hat Storage Console VM is supported for monitoring a Ceph Storage cluster only. No configuration options through the console are supported.

## The Red Hat Storage Console VM Kickstart File

The generated kickstart script performs the following steps:

- Partitions the system
- Sets SELinux to enforcing mode
- Configures `iptables` to run on the system and disables `firewalld`
- Configures networking, including:
  - Static IP addresses
  - Gateway
  - Name resolution
  - NTP time service
- Registers the system using the Red Hat Subscription Manager

## Setup

To set up the Red Hat Storage Console VM deployment:

1. Log into the SAH node as the `root` user.
2. Ensure that a copy of the **Red Hat Enterprise Linux Server 7.4 Installation DVD** (RHEL 7.4 ISO) is in the `/store/data/iso` directory.

Several steps in this document use files to configure the environment. See [File References](#) on page 65 for a list of required files.



**Note:** Installation of these files should have been completed earlier in [Red Hat OpenStack Platform Director Node Deployment](#) on page 30.

## Configuration

To configure the Red Hat Storage Console VM deployment:

1. Edit the `rhscon.cfg` configuration file, in the `/root/mgmt` directory.
2. Set the following variables in `rhscon.cfg`:

**Table 6: Red Hat Storage Console VM Configuration Variables**

| Parameter       | Description                                                                                                                                                                                                                |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| rootpassword    | The root user password for the Red Hat Storage Console VM.                                                                                                                                                                 |
| timezone        | The timezone in which the Red Hat Storage Console VM is located.                                                                                                                                                           |
| smuser          | The user credential when registering with Subscription Manager.                                                                                                                                                            |
| smpassword      | The user password when registering with Subscription Manager. The password must be enclosed in single quotes if it contains certain special characters.                                                                    |
| smpool          | The pool ID used when attaching the Red Hat Storage Console VM to an entitlement.                                                                                                                                          |
| smproxy         | Optional proxy server to use when deploying the Director Node. Format is <code>&lt;proxy address&gt;:&lt;proxy port&gt;</code> (e.g., <code>192.168.75.230:3128</code> ).                                                  |
| smproxyuser     | Optional user credential for the proxy server.                                                                                                                                                                             |
| smproxypassword | Optional user password for the proxy server.                                                                                                                                                                               |
| hostname        | The FQDN of the Red Hat Storage Console VM.                                                                                                                                                                                |
| gateway         | The default gateway for the Red Hat Storage Console VM.                                                                                                                                                                    |
| nameserver      | A comma-separated list of nameserver IP addresses.                                                                                                                                                                         |
| ntpserver       | The SAH node's provisioning IP address.                                                                                                                                                                                    |
| eth0            | This line specifies the IP address and network mask for the public API network. The line begins with <code>eth0</code> , followed by at least one space, the IP address, another set of spaces, and then the network mask. |

| Parameter | Description                                                                                                                                                                                                             |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| eth1      | This line specifies the IP address and network mask for the storage network. The line begins with <code>eth1</code> , followed by at least one space, the IP address, another set of spaces, and then the network mask. |

## Deploying the Red Hat Storage Console VM

To deploy the Red Hat Storage Console VM:

1. Invoke the `deploy-rhscon-vm.py` script.

- a. Pass `rhscon.cfg` as the first parameter.
- b. Pass the **full path to the Red Hat Enterprise Linux Server 7.4 Installation media** as the second option.

```
./deploy-rhscon-vm.py rhscon.cfg /store/data/iso/rhel74.iso

Retrieving file .treeinfo... | 2.1 kB 00:00:00
Retrieving file vmlinuz... | 5.1 MB 00:00:00
Retrieving file initrd.img... | 43 MB 00:00:00
Creating domain... | 0 B 00:00:00
Domain installation still in progress. You can reconnect to
the console to complete the installation process.
```

The installation begins, but no Linux console is displayed.

2. To display the Linux console:

- a. Ensure you are logged into a GUI environment.
- b. Open a terminal.
- c. Enter the following command:



**Note:** If you are connected to the Red Hat OpenStack Platform Director Node using a Windows® system, you need to install **Xwin Server** before executing `virt-viewer rhscon`.

```
virt-viewer rhscon
```

3. A console for the Red Hat Storage Console VM will open.
4. After the Red Hat Storage Console VM completes the installation, it will power itself off.
5. The power state of the Red Hat Storage Console VM can be viewed using the following command:

```
virsh list --all
```

You will see output similar to the following:

| Id | Name   | State    |
|----|--------|----------|
| 2  | rhscon | shut off |

6. You can start the Red Hat Storage Console VM by entering the following command:

```
virsh start rhscon
```

## Next Steps

After the Red Hat Storage Console VM is installed:

1. Provision the Controller, Compute, and Storage nodes by following the procedures in [Provisioning the Nodes](#) on page 38.
2. Configure the Red Hat Storage Console by following the procedures in [Red Hat Storage Console Configuration](#) on page 59.

## Provisioning the Nodes

This topic describes provisioning the Dell EMC Ready Bundle for Red Hat OpenStack Platform cluster nodes. The following procedures are discussed in the order in which they are to be performed:

1. [Configuring Networking](#) on page 38
2. [Configure iDRAC DHCP Server](#) on page 40
3. [Node Discovery](#) on page 41
4. [Launch Node Introspection](#) on page 42
5. [Assigning Node Roles](#) on page 42
6. [Configuring Node Interfaces](#) on page 44
7. [Configuring Dell Storage](#) on page 49
8. [Configuring Red Hat Ceph Storage](#) on page 51
9. [Configuring Local Ephemeral Storage](#) on page 53
10. [Configuring the Overcloud Domain Name](#) on page 53
11. [Deploying the Overcloud](#) on page 54
12. [Scripted HA Installation \(Optional\)](#) on page 55
13. [Registering Overcloud Nodes with CDN](#) on page 56
14. [Troubleshooting Node Provisioning](#) on page 58

## Configuring Networking

To configure network environment parameters:

1. On the Red Hat OpenStack Platform Director node, navigate to the `~/pilot/templates/` directory.
2. Open the `network-environment.yaml` file in an editor.
3. For deployments with the Dell EMC PowerEdge FX platform, these three lines need to be updated:

```
OS::TripleO::Compute::Net::SoftwareConfig: ./nic-configs/compute.yaml
OS::TripleO::Controller::Net::SoftwareConfig: ./nic-configs/
controller.yaml
OS::TripleO::CephStorage::Net::SoftwareConfig: ./nic-configs/ceph-
storage.yaml
```

to:

```
OS::TripleO::Compute::Net::SoftwareConfig: ./nic-configs-fx/compute.yaml
OS::TripleO::Controller::Net::SoftwareConfig: ./nic-configs-fx/
controller.yaml
OS::TripleO::CephStorage::Net::SoftwareConfig: ./nic-configs-fx/ceph-
storage.yaml
```

4. Search for the term, `CHANGEME`, to go to the lines in which changes can be made.
5. Make changes, as required, to the parameters listed in [Table 7: network-environment.yaml File Parameters](#) on page 39.



**Note:** Each parameter has a default value, which may or may not require a change depending upon your environment.

**Table 7: network-environment.yaml File Parameters**

| Parameter Name             | Default Value                                               | Description                                                                                                                           |
|----------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| ManagementNetCidr          | 192.168.110.0/24                                            | CIDR block for the Management network                                                                                                 |
| InternalApiNetCidr         | 192.168.140.0/24                                            | CIDR block for the Private API network.                                                                                               |
| TenantNetCidr              | 192.168.130.0/24                                            | CIDR block for the Tenant network. For future support of Generic Routing Encapsulation (GRE) or VXLAN networks.                       |
| StorageNetCidr             | 192.168.170.0/24                                            | CIDR block for the Storage network.                                                                                                   |
| StorageMgmtNetCidr         | 192.168.180.0/24                                            | CIDR block for the Storage Clustering network.                                                                                        |
| ExternalNetCidr            | 192.168.190.0/24                                            | CIDR block for the External network.                                                                                                  |
| ManagementAllocationPools  | [ { 'start': '192.168.110.10', 'end': '192.168.110.149' } ] | IP address range on the Management network for use by the iDRAC DHCP server.                                                          |
| InternalApiAllocationPools | [ { 'start': '192.168.140.20', 'end': '192.168.140.200' } ] | IP address range for the Private API network. <sup>1</sup>                                                                            |
| TenantAllocationPools      | [ { 'start': '192.168.130.20', 'end': '192.168.130.200' } ] | IP address range for the Tenant network. Not used unless you wish to configure Generic Routing Encapsulation (GRE) or VXLAN networks. |
| StorageAllocationPools     | [ { 'start': '192.168.170.20', 'end': '192.168.170.200' } ] | IP address range for the Storage network.                                                                                             |
| StorageMgmtAllocationPools | [ { 'start': '192.168.180.20', 'end': '192.168.180.200' } ] | IP address range for the Storage Clustering. network                                                                                  |
| ExternalAllocationPools    | [ { 'start': '192.168.190.20', 'end': '192.168.190.120' } ] | IP address range for the External network. <sup>2</sup>                                                                               |

<sup>1</sup> To avoid IP address conflicts that could result in nodes not being provisioned, ensure that the Director Node's Internal API network interface resides outside the *InternalApiAllocationPools* parameter range of 192.168.140.40 - 192.168.140.200.

<sup>2</sup> Similarly, ensure that the Director Node's External Network interface resides outside the *ExternalAllocationPools* parameter range of 192.168.190.20 - 192.168.190.120.

| Parameter Name                | Default Value                                                    | Description                                                                                                 |
|-------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| ExternalInterfaceDefaultRoute | 192.168.190.1                                                    | Router gateway on the External network.                                                                     |
| ManagementNetworkGateway      | 192.168.110.1                                                    | The IP address of the gateway on the Management network.                                                    |
| ProvisioningNetworkGateway    | 192.168.120.1                                                    | The IP address of the gateway on the Provisioning network, which allows access to the Management network.   |
| ControlPlaneDefaultRoute      | 192.168.120.13                                                   | Router gateway on the provisioning network (or Undercloud IP address).                                      |
| ControlPlaneSubnetCidr        | 24                                                               | CIDR of the control plane network.                                                                          |
| EC2MetadataIp                 | 192.168.120.13                                                   | IP address of the Undercloud.                                                                               |
| DnsServers                    | [ "8.8.8.8", "8.8.4.4" ]                                         | DNS servers for the Overcloud nodes to use (maximum 2). <sup>3</sup>                                        |
| InternalApiNetworkVlanID      | 140                                                              | VLAN ID of the Private API network.                                                                         |
| StorageNetworkVlanID          | 170                                                              | VLAN ID of the Storage network.                                                                             |
| StorageMgmtNetworkVlanID      | 180                                                              | VLAN ID of the Storage Clustering network.                                                                  |
| TenantNetworkVlanID           | 130                                                              | VLAN ID of the Tenant network. For future support of Generic Routing Encapsulation (GRE) or VXLAN networks. |
| ExternalNetworkVlanID         | 190                                                              | VLAN ID of the External network.                                                                            |
| BondInterfaceOptions          | "802.3ad miimon=100<br>xmit_hash_policy=layer3+4<br>lacp_rate=1" | Bonding mode for all nodes. <sup>4</sup>                                                                    |
| NeutronExternalNetworkBridge  | " "                                                              | Empty string for External VLAN, or <i>br-ex</i> if on the native VLAN.                                      |

## Configure iDRAC DHCP Server

To configure the DHCP server that the iDRACs use:

1. Execute the following command, passing in the IP address of the SAH on the provisioning network:

```
$ cd ~/pilot
./config_idrac_dhcp.py <SAH_provisioning_IP>
```

<sup>3</sup> This list should include the DNS server passed to the `install-director.sh` command.

<sup>4</sup> If you wish to use different bonding modes for different roles, delete the *BondInterfaceOptions*, and specify the bonding options per role type in the *nic-configs* files.





**Note:** The DHCP server is only used for iDRACs configured to use DHCP

2. Enter the *root* password for the SAH node when prompted.

## Node Discovery

To discover the nodes in the cluster:

1. Log into the Director Node using the user name and password specified in *director.cfg*.
2. Determine the node iDRAC IP address(es) to scan on the management network.



**Note:** If one or more iDRACs are configured to use DHCP, then the `ManagementAllocationPool` range specified in *network-environment.yaml* must be discovered.



**Note:** If one or more iDRACs are configured to use static IP addresses, then each of the iDRACs' static IP addresses must be discovered.



**Note:** The IP address(es) should only include nodes that you wish to provision. It should not include other nodes, such as the SAH.

3. Navigate to the *discover\_nodes* subdirectory:

```
$ cd ~/pilot/discover_nodes
```

4. Discover the nodes using a range of IP addresses, a space-separated list of IP addresses, or a CIDR block, the iDRAC user and the iDRAC password. For example:

```
$./discover_nodes.py x.x.x.x-y.y.y.y -u root -p calvin \
> ~/instackenv.json
```

```
$./discover_nodes.py x.x.x.x x.x.x.y x.x.x.z -u root -p calvin \
> ~/instackenv.json
```

```
$./discover_nodes.py x.x.x.0/24 -u root -p calvin \
> ~/instackenv.json
```

- a. Optional arguments include:

- `-h, --help` — Display help for *discover\_nodes.py*
- `-u USERNAME, --u USERNAME` — Specify the iDRAC access user name. Default = *root*.
- `-p PASSWORD, --p PASSWORD` — Specify the iDRAC access user password Default = *calvin*.
- `-n {1,10,25,40,50,100}, --nics {1,10,25,40,50,100}` — Specify the link speed of the provisioning network interfaces in gigabits per second (Gbps). Default = 1.

5. When discovery is complete, examine *~/instackenv.json* to verify that it contains an entry for every cluster node to be provisioned, and no other nodes:

```
$ less ~/instackenv.json
```

- a. If *discover\_nodes.py* cannot identify a provisioning network interface for a node(s), the node's entry in *~/instackenv.json* will indicate that; the value for its `mac` attribute will be `"FIXME"` and rerun *discover\_nodes*.

- a. Ensure that the interface(s) are up and provisioned correctly.
- b. Then rerun *discover\_nodes.py*.

6. Perform initial iDRACs configuration. This includes setting the appropriate NIC port to PXE boot for provisioning, as well as performing other basic iDRAC configuration.

- a. Change to the *pilot* directory:

```
$ cd ~/pilot
```

- b. If you do not want to change the root password on any of the Overcloud nodes, and all NICs in the Overcloud nodes are in RA-compliant slots, execute the following command:

```
$./config_idracs.py
```

- c. If you want to change the root password on the iDRACs, or the slot that the NICs on one or more of the Overcloud nodes are in, execute the following command **for each node**:

```
$./config_idrac.py [-c <root_password>] [-p <fqdd_of_pxe_nic_port>] \
<idrac_ip_or_node_service_tag>
```



**Note:** If the Overcloud nodes' configurations need to be changed, then the nodes will be rebooted. This can take some time.

7. Load the discovered nodes into Red Hat OpenStack Platform Director:

```
$. ~/stackrc
$ ~/pilot/import_nodes.py
```

8. Power off the nodes and set them to PXE boot:

```
$ ~/pilot/prep_overcloud_nodes.py
```

### Launch Node Introspection

To launch introspection of the nodes:

1. Execute the following command:

```
$ ~/pilot/introspect_nodes.py
```

Out-of-band introspection is performed by default. Alternately, you can use in-band introspection by passing the `-i` argument to the `introspect_nodes.py` command.



**Note:** In-band node introspection can take approximately 10 minutes to complete.

### Assigning Node Roles

Before deployment, nodes are assigned the roles that they will perform. This in turn causes the appropriate BIOS and RAID configuration to occur on the nodes prior to provisioning.

[Table 8: RAID Mappings](#) on page 42 lists and describes RAID setting profiles that will be created by the `assign_role` command:

**Table 8: RAID Mappings**

| Menu Choice                           | BIOS/RAID Setting                        |
|---------------------------------------|------------------------------------------|
| OpenStack Infrastructure (Controller) | OpenStack Controller, RAID10             |
| OpenStack Compute                     | OpenStack Compute, RAID10                |
| OpenStack Storage                     | OpenStack Storage, No RAID configuration |



**Note:** Dell EMC PowerEdge R740xd Storage nodes are available in chassis options that support different drive configurations:

- **3.5" Drive Configuration** — Twelve (12) OSD drives in the front, four (4) OSD drives in the midplane, and four (4) journaling SSDs in the flex bays
- **2.5" Drive Configuration** — Twenty four (24) OSD drives in the front, four (4) OSD drives in the midplane, and four (4) OSD drives in the flex bays

To assign the roles to the nodes in Red Hat OpenStack Platform Director:

1. Make a list of the IP addresses of the iDRAC interfaces on all nodes.
2. Decide what role each node will perform. Node roles include:

- controller
- compute
- storage



**Note:** You must assign the *controller* role to three (3) or more nodes. You must also assign the *storage* role to three (3) or more nodes.

3. Log into the Director Node.
4. Navigate to the `~/pilot` directory:

```
cd ~/pilot
```

5. For each node, run the following command:

- a. For Compute and Controller nodes:

```
./assign_role.py <ip_mac_service_tag> <role_index>
```

- b. For Storage nodes:

```
./assign_role.py <ip_mac_service_tag> <role_index> -o 223
```

- c. Required arguments include:

- `ip_mac_service_tag` — IP address of the iDRAC, MAC address of the interface on the provisioning network, or service tag of the node
- `-o, --os-volume-size-gb` (Required for Storage nodes only) — The size of the volume on which to install the OS, in GB (default is `NONE`, but Storage nodes require 223 GB)
- `role_index` — Role that the node will play, with an optional index that indicates placement order in the rack; choices are `controller[-<index>]`, `compute[-<index>]`, and `storage[-<index>]`



**Note:** If the `role_index` argument is used, the `--node_placement` argument **MUST** be included with the `deploy-overcloud.py` command.

For example, to place a given node role on a specific server, specify the node role with an index number as follows. This example places the *controller-0* role on the server *192.168.110.125*:

```
~/pilot/assign_role.py 192.168.110.125 controller-0
```

- d. Optional arguments include:

- `-h, --help` — Display help for `assign_role.py`
- `-m, --model-properties` — File that defines Dell EMC system model properties, including the FQDD (Fully Qualified Device Descriptor) of the network interface from which to PXE boot
- `-f, --flavor-settings` — File that contains flavor settings
- `-n, --node-definition` — Node definition template file that defines the node being assigned
- `-s, --skip-raid-config` — Do not perform RAID configuration
- The indices must start at 0 for each role, and must increment by 1 for each node in that role. For example, *controller-0*, *controller-1*, *controller-2*, *compute-0*, *compute-1*, etc. Node placement is performed **for all nodes or none**; if you specify an index for one node, you must specify indices for all nodes.



**Note:** When assigning the role of *storage* to a node, the output will display the size of the OS drive. This is an indicator to the admin that the assignment was correct.

The `assign_role.py` command can take some time to complete, since it may require a reboot.

### Benign BIOS Warnings

Upon running the `assign_role.py` command, you will encounter some BIOS warnings specific to the hardware generation (13G or 14G) in your Dell EMC Ready Bundle for Red Hat OpenStack Platform environment. These warnings are harmless, and can be safely ignored.

For 14G servers, the following warning will appear:

```
WARNING:assign_role:Disregarding unknown BIOS settings RtIdSetting,
QpiSpeed, ProcExecuteDisable
```

For 13G servers, the following warning will appear:

```
WARNING:assign_role:Disregarding unknown BIOS settings
CpuInterconnectBusSpeed
```



**Note:** For both 13G and 14G nodes, the `InternalSdCard` setting will also be listed as unknown if the servers do not have internal SD card slots.

These warnings are displayed because of the following BIOS changes:

- `RtIdSetting` was removed in 14G servers, as it is not supported.
- `ProcExecuteDisable` was deprecated in 14G servers.
- `QpiSpeed` in 13G was renamed to `CpuInterconnectBusSpeed` in 14G.

## Configuring Node Interfaces

At a high level, configuring nodes network interfaces in the Dell EMC Ready Bundle for Red Hat OpenStack Platform consists of editing a small set of YAML files so that their networking parameters conform to your environment.

The following sections present the networking information you can change:

- [Configuring Networking](#) on page 38
- [Controller Node Bond and VLAN Parameters](#) on page 44
- [Compute Node Bond and VLAN Parameters](#) on page 45
- [Storage Node Bond and VLAN Parameters](#) on page 46

### Controller Node Bond and VLAN Parameters

To configure Controller node bond and VLAN parameters:

1. On the Red Hat OpenStack Platform Director Node:
  - a. For Dell EMC PowerEdge R-Series, navigate to the `~/pilot/templates/nic-configs` directory.
  - b. For Dell EMC PowerEdge FX, navigate to the `~/pilot/templates/nic-configs-fx` directory.
2. Open the `controller.yaml` file in an editor.
3. Search for the term, `CHANGEME`, to go to the lines in which changes can be made.
4. Make changes, as required, to the parameters listed in [Table 9: controller.yaml File Parameters](#) on page 45.



**Note:** Each parameter has a default value, which may or may not require a change depending upon your environment.

**Table 9: controller.yaml File Parameters**

| Parameter Name              | Default Value | Description                                                                    |
|-----------------------------|---------------|--------------------------------------------------------------------------------|
| BondInterfaceOptions        | " "           | Interface bonding mode. For example, lacp=active and/or bond_mode=balance-slb. |
| Provisioning Interface Name | em3           | Name of the provisioning network interface.                                    |
| bond0                       | em1           | First interface to include in bond0.                                           |
|                             | p3p1          | Second interface to include in bond0.                                          |
| bond1                       | em2           | First interface to include in bond1.                                           |
|                             | p3p2          | Second interface to include in bond1.                                          |



**Note:** If BondInterfaceOptions is not set then the default BondInterfaceOptions in network\_environment.yaml are used.

The Controller NIC template assumes that the iDRACs are on the Management network, so a route between the Management network and Provisioning network is created. If the iDRACs are on the Provisioning network, then no routing is required and you must perform the following procedure to remove the associated route.

1. Remove the route that references the *ManagementNetCidr* parameter from the `routes:` section, indicated by the ***bold italicized*** example below:

```
routes:
-
 ip_netmask: 169.254.169.254/32
 next_hop: {get_param: EC2MetadataIp}
 # The following route is used to route from the provisioning
 # network to the management network. If the iDRACs are on the
 # provisioning network, then remove this route.
-
 ip_netmask: {get_param: ManagementNetCidr}
 next_hop: {get_param: ProvisioningNetworkGateway}
```

### Compute Node Bond and VLAN Parameters

To configure Compute node bond and VLAN parameters:

1. On the Red Hat OpenStack Platform Director Node:
  - a. For Dell EMC PowerEdge R-Series, navigate to the `~/pilot/templates/nic-configs` directory.
  - b. For Dell EMC PowerEdge FX, navigate to the `~/pilot/templates/nic-configs-fx` directory.
2. Open the `compute.yaml` file in an editor.
3. Search for the term, *CHANGEME*, to go to the lines in which changes can be made.
4. Make changes, as required, to the parameters listed in [Table 10: compute.yaml File Parameters](#) on page 46.



**Note:** Each parameter has a default value, which may or may not require a change depending upon your environment.

**Table 10: compute.yaml File Parameters**

| Parameter Name              | Default Value | Description                                                                    |
|-----------------------------|---------------|--------------------------------------------------------------------------------|
| BondInterfaceOptions        | " "           | Interface bonding mode. For example, lacp=active and/or bond_mode=balance-slb. |
| Provisioning Interface Name | em3           | Name of the provisioning network interface.                                    |
| bond0                       | em1           | First interface to include in bond0.                                           |
|                             | p3p1          | Second interface to include in bond0.                                          |
| bond1                       | em2           | First interface to include in bond1.                                           |
|                             | p3p2          | Second interface to include in bond1.                                          |



**Note:** If BondInterfaceOptions is not set then the default BondInterfaceOptions in network\_environment.yaml are used.

### Storage Node Bond and VLAN Parameters

To configure Storage node bond and VLAN parameters:

- On the Red Hat OpenStack Platform Director Node:
  - For Dell EMC PowerEdge R-Series, navigate to the `~/pilot/templates/nic-configs` directory.
  - For Dell EMC PowerEdge FX, navigate to the `~/pilot/templates/nic-configs-fx` directory.
- Open the `ceph-storage.yaml` file in an editor.
- Search for the term, *CHANGEME*, to go to the lines in which changes can be made.
- Make changes, as required, to the parameters listed in [Table 11: ceph-storage.yaml File Parameters](#) on page 46.



**Note:** Each parameter has a default value, which may or may not require a change depending upon your environment.

**Table 11: ceph-storage.yaml File Parameters**

| Parameter Name              | Default Value | Description                                                                    |
|-----------------------------|---------------|--------------------------------------------------------------------------------|
| BondInterfaceOptions        | " "           | Interface bonding mode. For example, lacp=active and/or bond_mode=balance-slb. |
| Provisioning Interface Name | em3           | Name of the provisioning network interface.                                    |
| bond0                       | em1           | First interface to include in bond0.                                           |
|                             | p2p1          | Second interface to include in bond0.                                          |
| bond1                       | em2           | First interface to include in bond1.                                           |

| Parameter Name | Default Value | Description                           |
|----------------|---------------|---------------------------------------|
|                | p2p2          | Second interface to include in bond1. |



**Note:** If BondInterfaceOptions is not set then the default BondInterfaceOptions in `network_environment.yaml` are used.

### Static IP Addresses (Optional)

By default, IP addresses are assigned to the networks using DHCP. This will result in a somewhat random assignment of IP addresses to nodes. You can optionally override this default behavior by configuring static IP addresses for the Overcloud nodes on the networks.

The selected IP addresses must lie outside the allocation pools defined in `network-environment.yaml`, and must not conflict with IP addresses assigned to networking equipment or servers on the networks, such as:

- SAH
- Director Node
- Red Hat Storage Console VM
- etc.

To configure static IP addresses for the Overcloud nodes:

1. On the Red Hat OpenStack Platform Director Node, navigate to the `~/pilot/templates/` directory.
2. Open the `static-ip-environment.yaml` file in an editor.
3. Search for the term, `CHANGEME`, to go to the lines where you can change the nodes' static IP addresses.
4. Make changes, as required, to the parameters listed in [Table 12: static-ip-environment.yaml File Parameters](#) on page 47.
5. Save the file.



**Note:** IP addresses are assigned to the nodes in the order listed in [Table 12: static-ip-environment.yaml File Parameters](#) on page 47. For example, controller0 is assigned the address 192.168.140.21 on the Private API network; controller1 is assigned 192.168.140.22, etc.

**Table 12: static-ip-environment.yaml File Parameters**

| Parameter Name       | Default Values                                     | Description                                             |
|----------------------|----------------------------------------------------|---------------------------------------------------------|
| <b>ControllerIPs</b> |                                                    |                                                         |
| tenant               | 192.168.130.21<br>192.168.130.22<br>192.168.130.23 | Controller Node IP addresses on the Tenant network      |
| internal_api         | 192.168.140.21<br>192.168.140.22<br>192.168.140.23 | Controller node IP addresses on the Private API network |
| storage              | 192.168.170.21<br>192.168.170.22<br>192.168.170.23 | Controller node IP addresses on the Storage network     |

| Parameter Name        | Default Values                                     | Description                                                              |
|-----------------------|----------------------------------------------------|--------------------------------------------------------------------------|
| external              | 192.168.190.21<br>192.168.190.22<br>192.168.190.23 | Controller node IP addresses on the External network                     |
| <b>NovaComputeIPs</b> |                                                    |                                                                          |
| tenant                | 192.168.130.31<br>192.168.130.32<br>192.168.130.33 | Compute node IP addresses on the Tenant network                          |
| internal_api          | 192.168.140.31<br>192.168.140.32<br>192.168.140.33 | Compute node IP addresses on the Private API network                     |
| storage               | 192.168.170.31<br>192.168.170.32<br>192.168.170.33 | Compute node IP addresses on the Storage network                         |
| <b>CephStorageIPs</b> |                                                    |                                                                          |
| storage               | 192.168.170.76<br>192.168.170.77<br>192.168.170.78 | Red Hat Ceph Storage node IP addresses on the Storage network            |
| storage_mgmt          | 192.168.180.76<br>192.168.180.77<br>192.168.180.78 | Red Hat Ceph Storage node IP addresses on the Storage Clustering network |

You can now proceed to [Static Virtual IP Addresses \(Optional\)](#) on page 48.

### Static Virtual IP Addresses (Optional)

Virtual IP Addresses (VIPs) are used to provide IP addresses for OpenStack services on Controller nodes. Assigning a static VIP to a service enables clients to contact an OpenStack service on a Controller node by using that VIP, without knowledge of which Controller node they are communicating. This provides high availability, so that if a Controller node goes down clients can still contact the VIP. Their requests are sent to an active Controller node.

To configure static VIPs for the Controller nodes:

1. On the Red Hat OpenStack Platform Director Node, navigate to the `~/pilot/templates/` directory.
2. Open the `static-vip-environment.yaml` file in an editor.
3. Search for the term, `CHANGEME`, to go to the lines where you can change the static virtual IP addresses.
4. Make changes, as required, to the parameters listed in [Table 13: static-vip-environment.yaml File Parameters](#) on page 49.
5. Save the file.



Table 13: static-vip-environment.yaml File Parameters

| Parameter Name        | Default Value   | Description                                                                                                                                                                                                                                                                                                |
|-----------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| redis                 | 192.168.140.251 | VIP for the <code>redis</code> service on the Private API network. This address must reside outside the <code>InternalApiAllocationPools</code> range specified in <i>network-environment.yaml</i> .                                                                                                       |
| ControlPlaneIP        | 192.168.120.250 | VIP on the Provisioning network. This address must reside outside the <code>dhcp_start/dhcp_end</code> range specified in <i>undercloud.conf</i> .                                                                                                                                                         |
| InternalApiNetworkVip | 192.168.140.250 | VIP on the Private API network. This address must reside outside the <code>InternalApiAllocationPools</code> range specified in <i>network-environment.yaml</i> .                                                                                                                                          |
| ExternalNetworkVip    | 192.168.190.250 | VIP on the Public API network. This address must reside outside the <code>ExternalAllocationPools</code> range specified in <i>network-environment.yaml</i> .                                                                                                                                              |
| StorageNetworkVip     | 192.168.170.250 | VIP on the Storage network. This address must reside outside the <code>StorageAllocationPools</code> range specified in <i>network-environment.yaml</i> .                                                                                                                                                  |
| StorageMgmtNetworkVip | 192.168.120.249 | VIP on the Provisioning network. The Storage Clustering network is not connected to the Controller nodes, so the VIP for this network must be mapped to the Provisioning network.<br><br>This address must reside outside the <code>dhcp_start/dhcp_end</code> range specified in <i>undercloud.conf</i> . |

You can now proceed to [Configuring Dell Storage](#) on page 49.

## Configuring Dell Storage

SC Series storage servers can be integrated into the Dell EMC Ready Bundle for Red Hat OpenStack Platform as backends for OpenStack Block Storage (Cinder). This topic describes the following prerequisites and required parameters:

- [SC Series Configuration \(Optional\)](#) on page 50

### SC Series Configuration (Optional)

These options apply if the Dell Storage SC Series is included in the Dell EMC Ready Bundle for Red Hat OpenStack Platform as one of the Cinder backends. Requirements for Dell Storage SC Series Configuration include:

- Dell Storage Center(s) with Dell Storage Enterprise Manager Platform.
- Documents and software can be downloaded from <https://portal.compellent.com/>.
- The Dell Storage SC Series is configured with the Dell Storage Enterprise Manager Node, according to the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Reference Architecture](#).
- The Dell Storage Enterprise Manager Node should have access to the Storage Network VLAN and External Network. The Controller nodes will use the Storage Network VLAN to access the Dell Storage Enterprise Manager Node for management of volumes and snapshots.
- Dell Storage Center should have access to the Storage Network VLAN. The Compute nodes must have access to the Dell Storage SC Series through the Dell Storage Center iSCSI ports in order for the iSCSI driver on that node to interact with the volumes associated with Virtual Machines hosted by that node.
- Dell Storage Center Front-End Connectivity Mode should be configured to use virtual port mode.



**Note:** For more information about the OpenStack driver configuration or post-deployment configuration, refer to the [OpenStack Volume Driver Documentation](#).

To configure the Dell Storage SC Series as storage backend(s) along with Red Hat Ceph Storage, see:

- [Single SC Series Backend](#) on page 50
- [Multiple SC Series Backends](#) on page 50

### Single SC Series Backend

To configure a single Dell Storage SC Series server as a storage backend along with Red Hat Ceph Storage:

1. On the Director Node, open the `~/pilot/templates/dell-cinder-backends.yaml` file in a text editor
2. Change any applicable values listed in [Table 14: SC Series Parameters](#) on page 51.

### Multiple SC Series Backends

To configure multiple Dell Storage SC Series servers as storage backends along with Red Hat Ceph Storage:

1. On the Director Node, open the `~/pilot/templates/dell-cinder-backends.yaml` file in a text editor.
2. Make a copy of the configuration section for each Dell Storage SC Series backend.
3. Change any applicable parameter values for the backends as listed in [Table 14: SC Series Parameters](#) on page 51.
  - a. Assign a unique section name for each backend (e.g., `dellsc1`, `dellsc2`, etc.).
  - b. Assign a unique name for the `volume_backend_name`.
  - c. List the section names in the `cinder_user_enabled_backends` array with the other enabled Dell Storage SC Series backends.

The configuration example below is for two Dell Storage SC Series backend arrays:

```
...
#DELLSC
#Backend1
dellsc1/volume_backend_name:
value: dellsc1
dellsc1/volume_driver:
value:
cinder.volume.drivers.dell.dell_storagecenter_iscsi.DellStorageCenterISCSIDriver
dellsc1/san_ip:
```

```

...
#Backend2
dellsc1/volume_backend_name:
value: dellsc2
dellsc1/volume_driver:
value:
cinder.volume.drivers.dell.dell_storagecenter_iscsi.DellStorageCenterISCSIDriver
dellsc1/san_ip:
...
#DELLSC-END
...
cinder_user_enabled_backends: [..., 'dellsc1', 'dellsc1']

```

## SC Series Configuration Parameters

SC Series configuration parameters include:

**Table 14: SC Series Parameters**

| Parameter Name               | Description                                                             |
|------------------------------|-------------------------------------------------------------------------|
| dellsc_san_ip                | String containing Enterprise Manager IP address                         |
| dellsc_san_login             | String containing Enterprise Manager login ID                           |
| dellsc_san_password          | String containing Enterprise Manager password                           |
| dellsc_iscsi_ip_address      | String containing virtual port iSCSI IP address                         |
| dellsc_iscsi_port            | String containing iSCSI API port                                        |
| dellsc_sc_ssn                | String containing the Storage Center serial numbers to use              |
| dellsc_sc_api_port           | String containing Enterprise Manager API port                           |
| dellsc_server_folder         | String containing server folder in which to place new server definition |
| dellsc_volume_folder         | String containing volume folder in which to place new volume            |
| cinder_user_enabled_backends | Array of strings containing enabled backends. List valid backends only  |



**Note:** For more information about using Dell Storage SC Series in a Red Hat OpenStack Platform Overcloud, see <https://access.redhat.com/documentation/en/red-hat-openstack-platform/8/dell-storage-center-back-end-guide/dell-storage-center-back-end-guide>.

## Configuring Red Hat Ceph Storage

Red Hat Ceph Storage interacts with physical or logical storage volumes via Object Storage Devices (OSDs). This topic describes how multiple OSDs are configured across the Red Hat Ceph Storage nodes.

Every OSD has an associated data device (where the data is stored) and a journal where write operations are staged prior to the data being committed to the data device. The data and journal may be collocated on the same physical drive, or the journal may be located on a separate drive (such as an SSD) to optimize write performance.

If deploying to 14G storage nodes that have an HBA330, then the Ceph Storage OSD configuration is automatically generated as follows:

- If the storage nodes have a mix of spinning drives and SSDs then the SSDs will be used as journaling devices, and the spinning drives will be used as OSDs. The spinning drives/OSDs will be evenly distributed among the SSDs/journals.

- If the storage nodes have all spinning drives or all SSDs then the journals will be collocated with the OSDs, so no drives will be dedicated to journals.

If deploying to 13G or 14G storage nodes that have other configurations then the Ceph Storage OSD configuration must be manually specified as described in the following two sections.

Some points to consider:


- The RHOSP Controllers are configured to be highly available (HA).
- The RHOSP Storage back end is configured to use Red Hat Ceph Storage via the RBD client library.
- Red Hat Ceph Storage pools will be created for RHOSP images and volumes.
- All node access will be controlled via the `cephx` authentication protocol.

Red Hat Ceph Storage Configuration Parameters

If the storage nodes are 14G with an HBA330, then skip to [OSD Configuration Parameters](#) on page 52.

To configure Red Hat Ceph Storage parameters for 13G storage nodes or 14G storage nodes that do not have an HBA330:

1. On the Red Hat OpenStack Platform Director node, navigate to the `~/pilot/templates/` directory.
2. Open the `dell-environment.yaml` file in an editor.
3. Search for the term, *CHANGE ME*, to go to the lines in which changes can be made.
4. Make changes, as required, to the parameters listed in [Table 15: dell-environment.yaml File Parameters](#) on page 52.

 **Note:** Each parameter has a default value, which may or may not require a change depending upon your environment.


 **CAUTION:** YAML files are highly sensitive to whitespace. If you edit them, be sure to follow the files' whitespace formats precisely.

Table 15: dell-environment.yaml File Parameters

| Parameter                   | Default Value                                                | Description                                    |
|-----------------------------|--------------------------------------------------------------|------------------------------------------------|
| ceph::profile::params::osds | See <a href="#">OSD Configuration Parameters</a> on page 52. | List of drives to be used as OSDs and journals |

OSD Configuration Parameters

If the storage nodes are 14G with an HBA330, then skip to [Automatic OSD Configuration Generation Review](#) on page 53.

[Table 16: OSD Configuration Parameters](#) on page 53 displays the default Dell EMC Ready Bundle for Red Hat OpenStack Platform's OSDs layout for 13G hardware. If your configuration differs from that displayed below, modify the `osds` parameter in the `dell-environment.yaml` file according to the guidance contained within the file's comments.

For the 3.5" drive configuration, the data is stored on HDDs and the journals are located on high-speed SSDs. Because the journals are relatively small (10 GB), multiple journals can be located on the same physical drive. That way, multiple OSDs share access to the same journal device. For the 2.5" drive configuration, each OSD's data and journal are collocated, and no dedicated journal devices are used.

**Table 16: OSD Configuration Parameters**

| OSD Host                        | Journal Device | Data Devices                                                                                                                                                                                                                                   |
|---------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.5" Dell EMC PowerEdge R730xd  | /dev/sda       | /dev/sdd, /dev/sde, /dev/sdf, /dev/sdg                                                                                                                                                                                                         |
|                                 | /dev/sdb       | /dev/sdh, /dev/sdi, /dev/sdj, /dev/sdk                                                                                                                                                                                                         |
|                                 | /dev/sdc       | /dev/sdl, /dev/sdm, /dev/sdn, /dev/sdo                                                                                                                                                                                                         |
| 2.5 " Dell EMC PowerEdge R730xd | N/A            | /dev/sda, /dev/sdb, /dev/sdc, /dev/sdd, /dev/sde, /dev/sdf, /dev/sdg, /dev/sdh, /dev/sdi, /dev/sdj, /dev/sdk, /dev/sdl, /dev/sdm, /dev/sdn, /dev/sdo, /dev/sdp, /dev/sdq, /dev/sdr, /dev/sds, /dev/sdt, /dev/sdu, /dev/sdv, /dev/sdw, /dev/sdx |



**CAUTION:** Any existing data on the drives will be destroyed upon Overcloud deployment.

### Automatic OSD Configuration Generation Review

If the storage nodes are 14G with an HBA330 then the Red Hat Ceph Storage OSD configuration is automatically generated and placed in `ceph-osd-config.yaml`. Review this file and ensure that the configuration is correct for your deployment before continuing.

## Configuring Local Ephemeral Storage

Every VM created in OpenStack has a virtual disk that the operating system is installed upon. Ephemeral Storage refers to this OS disk and where it is stored. An ephemeral disk is created when a VM is created, and destroyed when a VM is destroyed.

By default the Dell EMC Ready Bundle for Red Hat OpenStack Platform stores ephemeral disks in Red Hat Ceph Storage. You can store the ephemeral disk on the Compute Node that hosts the VM; this concept is known as Local Ephemeral Storage.

### Local Ephemeral Storage Configuration Parameters

To configure the Dell EMC Ready Bundle for Red Hat OpenStack Platform to use local ephemeral storage instead of Red Hat Ceph Storage:

1. Open the `~/pilot/templates/dell-environment.yaml` file in an editor.
2. Change the `NovaEnableRbdBackend` parameter from `true` to `false`.
3. Save the file.



**Note:** Local ephemeral storage currently supports the `images_type` values `rbd` (shared storage like Red Hat Ceph Storage) or `default` (local Compute node storage). If you choose `default`, then the Instance HA feature is not supported.

You can now proceed to [Configuring the Overcloud Domain Name](#) on page 53.

## Configuring the Overcloud Domain Name



**Note:** This procedure is optional. If not configured, then a default domain name of `localdomain` will be used.

To configure the domain name for Overcloud nodes:

1. Edit the `~/pilot/templates/dell-environment.yaml` file.
2. Search for the `CloudDomain` parameter.
3. Change the value of the `CloudDomain` parameter to the domain name you want to use for the Overcloud.
4. Save the file.

You can now proceed to [Deploying the Overcloud](#) on page 54.

## Deploying the Overcloud


Once you have completed editing the environment and nodes networking YAML configuration files, you can begin deploying the Overcloud.

To deploy the Overcloud:

1. Remove all removable media, such as USB drives.
2. Log onto the Red Hat OpenStack Platform Director node using the user name and password specified in *director.cfg*.
3. Deploy the Overcloud by executing the following command (optional arguments are enclosed in square brackets):

```
$ cd ~/pilot
$./deploy-overcloud.py [-h][--controllers <NUM_CONTROLLERS>] \
 --computes <NUM_COMPUTES> --storage <NUM_STORAGE> \
 --vlans <VLAN_RANGE> [--ntp <SAH_PROVISIONING_IP>] \
 [--timeout <MINUTES>] [--overcloud_name <OVERCLOUD_NAME>] \
 [--enable_dellsc] [--disable_rbd] [--static_ips] [--static_vips] \
 [--node_placement] [--debug]
```

Where:

- **<VLAN\_RANGE>** of the format: <startingVlanNumber>:<endingVlanNumber>. For example, `--vlans 201:219`.
  - The number of Controller nodes defaults to 3. If you have configured a different number of Controller nodes using `assign_role`, then be sure to pass the `--controllers` option and specify the number configured. See [Assigning Node Roles](#) on page 42.
  - If you specify 2 for the number of Compute nodes, then you must have assigned the `compute` role using the `assign_role.py` command to two or more nodes.
  - If you specify 3 for the number of Storage nodes, then you must have assigned the `storage` role using the `assign_role.py` command to three or more nodes.
  - You can specify an NTP time server by adding `--ntp <SAH_PROVISIONING_IP>` (the SAH node's provisioning IP address) to the `deploy-overcloud.py` command. If you do not specify a time server, then it will default to `0.centos.pool.ntp.org`.
  - You can specify a deployment timeout by adding `--timeout <MINUTES>` to the `deploy-overcloud.py` command. If you do not specify a timeout, then it will default to *120 minutes*.
  - You can specify the name of the Overcloud by adding `--overcloud_name <OVERCLOUD_NAME>` to the `deploy-overcloud.py` command. Node names will be prepended with the Overcloud name and a dash.
    - For example, if your Overcloud is named *rack42*, then the first Controller node will be named *rack42-controller-0*. If you do not specify an Overcloud name, then the name will default to *overcloud*. In this case, the first Controller node will be named *overcloud-controller-0*.
-  **Note:** This enables you to distinguish Overcloud hostnames as belonging to one of multiple Overcloud deployments in the node subscription section of the Red Hat customer portal.
- You can specify if you are using SC Series as storage backends for OpenStack Block Storage (Cinder) by adding `--enable_dellsc` to the `deploy-overcloud.py` command.
  - You can disable Cinder from using Ceph Storage RBD as a backend by adding `--disable_rbd` to the `deploy-overcloud.py` command. This switch can be used in conjunction with `--enable_dellsc`; if neither is used, then LVM storage will be used.
  - You can specify the assignment of Overcloud nodes' static IP addresses, as described in [Static IP Addresses \(Optional\)](#) on page 47, by adding `--static_ips` to the `deploy-overcloud.py` command.

- You can specify the assignment of Overcloud nodes' static VIP addresses, as described in [Static Virtual IP Addresses \(Optional\)](#) on page 48 , by adding `--static_vips` to the `deploy-overcloud.py` command.
- You can specify node placement, as described in [Assigning Node Roles](#) on page 42, by adding `--node_placement` to the `deploy-overcloud.py` command.
- You can obtain debug-level logging by adding `--debug` to the `deploy-overcloud.py` command.



**Note:** The `deploy-overcloud.py` command will take some time to complete, since it is installing all of the nodes in the OpenStack cluster. It can take approximately 60-120 minutes to complete depending on the options used above.

4. Once the Overcloud has been successfully deployed, use the `agent_fencing.sh` command to enable fencing, which allows the system to detect and correct problematic nodes in the Overcloud. It can also be used to disable fencing. The syntax is:

```
$ agent_fencing.sh <idrac_user> <idrac_password> < [enable | disable] >
```

- a. Example to enable fencing:

```
$ ~/pilot/agent_fencing.sh root calvin enable
```

- b. Example to disable fencing:

```
$ ~/pilot/agent_fencing.sh root calvin disable
```

5. To view the current status of fencing:

- a. Log onto the Red Hat OpenStack Platform Director node using the user name and password specified in `director.cfg`.
- b. SSH into a controller node:

```
$ ssh cntl0
```

- c. Execute the following command:

```
$ sudo pcs status
```

- d. Example output from `pcs status` after fencing has been enabled follows:

```
$ sudo pcs status
...
controller-1-ipmi (stonith:fence_ipmilan): Started controller-2
controller-0-ipmi (stonith:fence_ipmilan): Started controller-1
controller-2-ipmi (stonith:fence_ipmilan): Started controller-0
...
```

You can now proceed to [Scripted HA Installation \(Optional\)](#) on page 55.

## Scripted HA Installation (Optional)

The `install-instanceHA.py` script aids the installation and configuration of Instance HA.



**Note:** Fencing must be enabled.

To install Instance HA via the `install-instanceHA.py` script:

1. Login into the Director Node using the user name and password specified in `director.cfg`.
2. Execute the following commands:

```
$ cd ~/pilot
$./install-instanceHA.py
```



You can now proceed to [Registering Overcloud Nodes with CDN](#) on page 56.

## Registering Overcloud Nodes with CDN

If your environment requires the ability to update the Overcloud nodes' software packages, you must first register them with the Red Hat Content Delivery Network (CDN). Overcloud nodes include:

- Controller Nodes
- Compute Nodes
- Red Hat Ceph Storage Nodes

The RHEL repositories listed in [Table 17: Overcloud Nodes CDN Registration Parameters](#) on page 56 are those necessary for updating the RPMs that are installed on the nodes, if required in your environment. Although permissible, you do not need to modify the repository values.

### Registering Overcloud Nodes

To register the Overcloud nodes:

1. Edit the `~/pilot/subscription.json` file, changing any applicable values listed in [Table 17: Overcloud Nodes CDN Registration Parameters](#) on page 56.
  - a. If you would rather not put CDN and/or proxy credentials into the JSON file, you can alternatively pass them in on the command line. See [Passing CDN and Proxy Credentials via the Command Line](#) on page 58.
  - b. If you are using a proxy, be sure to remove the leading underscore from `"_proxy_credentials"` in the `~/pilot/subscription.json` file. See [Example subscription.json File](#) on page 57.

**Table 17: Overcloud Nodes CDN Registration Parameters**

| Parameter                   | Value                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CDN Credentials</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>cdn_username</code>   | CDN username                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>cdn_password</code>   | CDN password                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Proxy Credentials</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>proxy_url</code>      | Proxy hostname:port                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <code>proxy_username</code> | Proxy username                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <code>proxy_password</code> | Proxy password                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Roles</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>control</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <code>pool_ids</code>       | Pool ID (requires a Red Hat OpenStack Platform subscription)                                                                                                                                                                                                                                                                                                                                                                                               |
| <code>repos</code>          | RHEL repositories: <ul style="list-style-type: none"> <li>• <code>rhel-7-server-rpms</code></li> <li>• <code>rhel-7-server-extras-rpms</code></li> <li>• <code>rhel-ha-for-rhel-7-server-rpms</code></li> <li>• <code>rhel-7-server-openstack-10-rpms</code></li> <li>• <code>rhel-7-server-openstack-10-devtools-rpms</code></li> <li>• <code>rhel-7-server-rhceph-2-mon-rpms</code></li> <li>• <code>rhel-7-server-rhceph-2-tools-rpms</code></li> </ul> |



| Parameter           | Value                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>compute</b>      |                                                                                                                                                                                                                                                                                                                                                                                                            |
| pool_ids            | Pool ID (requires a Red Hat OpenStack Platform subscription)                                                                                                                                                                                                                                                                                                                                               |
| repos               | RHEL repositories: <ul style="list-style-type: none"> <li>• rhel-7-server-rpms</li> <li>• rhel-7-server-extras-rpms</li> <li>• rhel-ha-for-rhel-7-server-rpms</li> <li>• rhel-7-server-openstack-10-rpms</li> <li>• rhel-7-server-openstack-10-devtools-rpms</li> <li>• rhel-7-server-rhceph-2-mon-rpms</li> <li>• rhel-7-server-rhceph-2-tools-rpms</li> </ul>                                            |
| <b>ceph-storage</b> |                                                                                                                                                                                                                                                                                                                                                                                                            |
| pool_ids            | Pool ID (requires a Red Hat OpenStack Platform subscription and a Red Hat Ceph Storage subscription)                                                                                                                                                                                                                                                                                                       |
| repos               | RHEL repositories: <ul style="list-style-type: none"> <li>• rhel-7-server-rpms</li> <li>• rhel-7-server-extras-rpms</li> <li>• rhel-ha-for-rhel-7-server-rpms</li> <li>• rhel-7-server-openstack-10-rpms</li> <li>• rhel-7-server-openstack-10-devtools-rpms</li> <li>• rhel-7-server-rhceph-2-mon-rpms</li> <li>• rhel-7-server-rhceph-2-osd-rpms</li> <li>• rhel-7-server-rhceph-2-tools-rpms</li> </ul> |

2. Navigate to the `~/pilot` directory:

```
cd ~/pilot
```

3. Register the Overcloud nodes by executing the following command:

```
./register_overcloud.py
```

#### Example subscription.json File

```
{
 "cdn_credentials": {
 "cdn_username": "CHANGE_ME_username",
 "cdn_password": "CHANGE_ME_password"
 },
 "_comment": ["If using a proxy, remove the leading underscore from",
 "_proxy_credentials below and fill in the following proxy",
 "information."],
 "_proxy_credentials": {
 "proxy_url": "CHANGE_ME_hostname:CHANGE_ME_port",
 "proxy_username": "CHANGE_ME_username",
 "proxy_password": "CHANGE_ME_password"
 },
 "roles": {
 "control": {
 "pool_ids": ["CHANGE_ME_openstack_pool_id"],
 "repos": ["rhel-7-server-rpms",
```

```

 "rhel-7-server-extras-rpms",
 "rhel-ha-for-rhel-7-server-rpms",
 "rhel-7-server-openstack-10-rpms",
 "rhel-7-server-openstack-10-devtools-rpms",
 "rhel-7-server-rhceph-2-mon-rpms",
 "rhel-7-server-rhceph-2-tools-rpms"]
 },
 "compute": {
 "pool_ids": ["CHANGE_ME_openstack_pool_id"],
 "repos": ["rhel-7-server-rpms",
 "rhel-7-server-extras-rpms",
 "rhel-ha-for-rhel-7-server-rpms",
 "rhel-7-server-openstack-10-rpms",
 "rhel-7-server-openstack-10-devtools-rpms",
 "rhel-7-server-rhceph-2-mon-rpms",
 "rhel-7-server-rhceph-2-tools-rpms"]
 },
 "ceph-storage": {
 "pool_ids": ["CHANGE_ME_openstack_pool_id",
 "CHANGE_ME_ceph_pool_id"],
 "repos": ["rhel-7-server-rpms",
 "rhel-7-server-extras-rpms",
 "rhel-ha-for-rhel-7-server-rpms",
 "rhel-7-server-openstack-10-rpms",
 "rhel-7-server-openstack-10-devtools-rpms",
 "rhel-7-server-rhceph-2-mon-rpms",
 "rhel-7-server-rhceph-2-osd-rpms",
 "rhel-7-server-rhceph-2-tools-rpms"]
 }
}
}
}

```

### Passing CDN and Proxy Credentials via the Command Line

To pass CDN and/or proxy credentials via the command line:

1. Navigate to the ~/pilot directory:

```
cd ~/pilot
```

2. Register the Overcloud nodes by executing the following command:

```
./register_overcloud.py
```

- a. Optional arguments to register\_overcloud.py include:

- --cdn\_username <username>
- --cdn\_password <password>
- --proxy\_url <host>:<port>
- --proxy\_username <username>
- --proxy\_password <password>


### Troubleshooting Node Provisioning

If you encounter difficulties during the node provisioning process, you can find troubleshooting tips and information at:

- [https://access.redhat.com/documentation/en-us/red\\_hat\\_openstack\\_platform/10/html/director\\_installation\\_and\\_usage/chap-troubleshooting\\_director\\_issues](https://access.redhat.com/documentation/en-us/red_hat_openstack_platform/10/html/director_installation_and_usage/chap-troubleshooting_director_issues)

## Red Hat Storage Console Configuration

This topic provides instructions for configuring the Red Hat Storage Console to integrate with Red Hat Ceph Storage in the Overcloud.

 **Note:** The Red Hat Storage Console VM is supported for monitoring a Ceph Storage cluster only. No configuration options through the console are supported.

### Configuring the Red Hat Storage Console

The Red Hat Storage Console is the management and monitoring service for Red Hat Ceph Storage. This section describes how to configure the Red Hat Storage Console running on the Red Hat Storage Console VM to integrate with the Red Hat Ceph Storage in the Overcloud.

#### Configuring the Red Hat Storage Console VM and Overcloud Ceph Storage Nodes

To configure the Red Hat Storage Console VM and Overcloud Ceph Storage nodes:

1. Log onto the Director Node as the *admin\_user*, or the user as configured in [Table 4: Director Node Configuration Parameters](#) on page 31 and change into the pilot directory:

```
cd ~/pilot
```

2. Execute the `config_rhscon.py` script:

```
./config_rhscon.py <rhscon_node_ip> <root_password>
```

The `config_rhscon.py` script performs three functions:

- Performs the Red Hat Storage Console server configuration as described in [Red Hat Storage Console Server Configuration](#).
- Installs the Red Hat Storage Console agent on the Overcloud nodes as described in [Installing and Configuring the Red Hat Storage Console Agent](#).
- Configures the Red Hat Storage Console server on Controller 0 as described in [Calamari Server Installation](#).


3. To access the Red Hat Storage Console:


- a. Navigate to the following URL in a Web browser:

```
http://<storage_console_hostname>/skyring
```


- b. Enter the default username/password of *admin/admin*, and then click on the **Log in** button.

See [Red Hat Storage Console Web Interface Login](#) for more information.

 **Note:** The web browser will be redirected to another port (10443), which is the actual port used by the Red Hat Storage Console.

 **Note:** Best practice is to change the default administrator password upon first login. See [Changing User Password](#) for instructions.

4. Follow the procedure described in [Importing Cluster](#) to import the Overcloud Red Hat Ceph Storage cluster.

 **CAUTION:** The monitor host running the Red Hat Storage Console server is on Controller 0. When selecting the monitor host, ensure that you select **Controller 0**.



---

# Chapter

# 4

---

## Overcloud Validation

---

### Topics:

- [\*Tempest Testing Configuration\*](#)
- [\*Running Tempest Tests and Post-run Cleanup\*](#)

This chapter provides instructions for configuring and running the Tempest test suite to validate the Dell EMC Ready Bundle for Red Hat OpenStack Platform.

## Tempest Testing Configuration

To configure Tempest on the Director Node:

1. Create OpenStack networks for use by Tempest by:
  - a. SSH into the Director Node as the user defined during the Red Hat OpenStack Platform Director installation process.
  - b. Execute the procedure in [Creating Neutron Networks in the Overcloud](#) on page 70.
  - c. Add an additional route from the Director Node to the public network, created in step 1b above, so Tempest can communicate with instances created by tests.

```
$ sudo ip route add [public_network_ip]/24 dev [interface_name]
```

For example:

```
$ sudo ip route add 192.168.191.0/24 dev eth4
```

2. Check that the *heat\_stack\_owner* and *swiftoperator* roles exists in your Overcloud:

```
$ source ~/overcloudrc
$ openstack role list
```

| ID                               | Name             |
|----------------------------------|------------------|
| 6226a517204846d1a26d15aae1af208f | swiftoperator    |
| 7c7eb03955e545dd86bbfeb73692738b | heat_stack_owner |

If the roles do not exist, create them:

```
$ openstack role create heat_stack_owner
$ openstack role create swiftoperator
```

3. Set up a *tempest* directory in your stack user's home directory and install a local version of the Tempest suite:

```
$ mkdir ~/tempest
$ cd ~/tempest
$ /usr/share/openstack-tempest-*/tools/configure-tempest-directory
```

This creates a local version of the Tempest tool set. After the Overcloud creation process completed, the director created a file named `~/tempest-deployer-input.conf`. This file provides a set of Tempest configuration options relevant to your Overcloud.

4. Again SSH into the Director Node. Change directory to the *tempest* install directory:

```
$ cd ~/tempest
```

5. Configure the Tempest instance for the environment.

- a. The following Tempest configuration script (`~/tempest/tools/config_tempest.py`) can be used to generate the required `tempest.conf` file.



**Note:** Be sure to use the Virtual IP address (VIP) of the Keystone endpoint. The syntax below overrides the command syntax from the Red Hat documentation.

```
$ tools/config_tempest.py --create --deployer-input ~/tempest-
deployerinput.conf service_available.swift False \
service_available.sahara False service_available.aodh
```

```
True object-storage-feature-enabled.discoverability False \
network-feature-enabled.ipv6_subnet_attributes False identity.uri
[keystone_endpoint] identity.admin_username [os_admin_username] \
identity.admin_password [os_admin_password] identity.admin_tenant_name
[admin_tenant_name]
```

For example:

```
$ tools/config_tempest.py --create --deployer-input ~/tempest-
deployerinput.conf service_available.swift False \
service_available.sahara False service_available.aodh
True object-storage-feature-enabled.discoverability False \
network-feature-enabled.ipv6_subnet_attributes False identity.uri
http://10.148.44.200:5000/v2.0 identity.admin_username admin \
identity.admin_password my_password identity.admin_tenant_name admin
```

6. It is also recommended that you create a skip file that tells Tempest what tests you do NOT want to run. By default the Mistral, and Heat Integration plugins are installed, but are not configured. By adding both of these sets of tests to the skip file you avoid running many tests that will fail without first configuring the services and configuring Tempest for these service tests. To create a skip\_file:

```
vi ~/tempest/etc/skip_file
```

and add the following lines to it and save it:

```
-heat_integrationtests\.*
-mistral_tempest_tests\.*
```

Then when executing a Tempest run you will add the argument `--skip-file ~/tempest/etc/skip_file` and the tests in the skip file will NOT be executed.

7. Initialize the Tempest cleanup utility by executing the following command.



**Note:** Prior to running Tempest you must initialize the cleanup utility, which will capture the existing state of your OpenStack deployment prior to running any tests. This will allow the cleanup utility to restore your deployment to where it was prior to running Tempest, should any failed tests leave data behind.

```
$ cd ~/tempest
$ tempest cleanup --init-saved-state
```

This will create a file named `~/tempest/saved_state.json`. You can edit the file and remove the *admin*, *demo*, and *alt\_demo* tenants and users, as the cleanup utility has logic that handles these particular users and tenants.

## Running Tempest Tests and Post-run Cleanup

To run Tempest tests:

1. To run the full suite of Tempest tests use following command:

```
$ tools/run-tests.sh --concurrency=4 --skip-file ~/tempest/etc/skip_file
```



**Note:** The full Tempest test suite might take hours. Alternatively, run part of the tests using the `'*smoke'` option.

```
$ tools/run-tests.sh --concurrency=4 --skip-file ~/tempest/etc/skip_file
'*smoke'
```

Each test runs against the Overcloud, and the subsequent output displays each test and its result. You can see more information about each test in the `tempest.log` file generated in the same directory. For example, the output might show the following failed test:

```
{2} tempest.api.compute.servers.test_servers.
ServersTestJSON.test_create_specify_keypair [18.305114s] ... FAILED
```

2. Once the Tempest run is complete you can use the cleanup utility to delete any objects left over by Tempest.

- a. Execute the cleanup utility in *dry-run* mode, which creates a file named *dry\_run.json*. This file contains all of the objects that will be deleted when you run the cleanup utility in *standard mode*.

```
$ cd ~/tempest
$ tempest cleanup --dry-run
```

- b. Review *dry\_run.json* and be sure that you intend to delete all the objects listed prior to running the tool in *standard mode*.
- c. Execute the cleanup utility in *standard mode* to permanently delete the objects contained in *dry\_run.json*:

```
$ cd ~/tempest
$ tempest cleanup
```

At this point your deployment should have deleted any objects left behind by Tempest.



**Note:** Full documentation for the cleanup utility can be found at <http://docs.openstack.org/developer/tempest/cleanup.html>.

Please refer to `/usr/share/openstack-tempest-liberty/README.rpm` on your Director Node for additional information about the Tempest installation package.

In addition to this document complete documentation for Tempest can be found at <http://docs.openstack.org/developer/tempest/>.

Tempest source code and additional technical information can be found on Github at <https://github.com/redhat-openstack/tempest>.



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# Appendix

# A

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## File References

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### Topics:

- [Solution Files](#)

This appendix lists documents and script archives that are required to install and deploy the Dell EMC Ready Bundle for Red Hat OpenStack Platform. Please contact your Dell EMC representative for copies if required.

## Solution Files

Dell EMC Ready Bundle for Red Hat OpenStack Platform files include:

- *JetPack-manual-10.1.tgz* — Contains all manual deployment solution scripts
- *JetPack-automation-10.1.tgz* — Contains all automation deployment solution scripts
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform Documentation Index*
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform Dell EMC PowerEdge R-Series Architecture Guide*
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform PowerEdge FX Architecture Guide*
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform Dell EMC PowerEdge R-Series Hardware Deployment Guide*
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform PowerEdge FX Hardware Deployment Guide*
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform Software Deployment Guide*
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform Adding and Removing Compute and Storage Nodes Guide*
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform Workbook*
- *Dell EMC Ready Bundle for Red Hat OpenStack Platform Release Notes*

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# Appendix

# B

---

## Updating RPMs on Version Locked Nodes

---

### Topics:

- [Updating the RPMs](#)

At a high level, updating RPMs on a version locked node (Red Hat OpenStack Platform Director Node or Red Hat Storage Console VM):

1. Identifies the RPMs that need to be updated.
2. Removes them from the version lock list on that node.
3. Updates the RPMs.
4. Adds the updated RPMs back into the version lock list.

This topic provides detailed information to perform those steps.

## Updating the RPMs

To update the RPMs:

 **Note:** All of the following commands should be run as the **root** user.

1. Produce a list of RPMs that are version locked on a node:


- a. Login to a node.
- b. Execute the following command to produce a list of RPMs that are version locked:

```
yum versionlock list
```

2. Identify the RPMs to be updated from the output of the above command.

3. Remove the selected RPMs from the version lock list:

- a. Execute the following command, substituting *VLockListEntry* with an RPM name from the output of the `versionlock list` command above:

 **Note:** The *VLockListEntry* must **exactly** match an RPM name in the output of the `yum versionlock list` command.

```
yum versionlock delete VLockListEntry
```

- b. Repeat for each RPM.

4. Update each of the selected RPMs:

- a. Execute the following command for an RPM, substituting *RPMNameWithoutVersion* with the name of the RPM **without** the version number:

```
yum update RPMNameWithoutVersion
```

- b. Repeat for each subsequent RPM

5. Add each of the selected RPMs back into the version lock list:

- a. Execute the following command, again substituting *RPMNameWithoutVersion* with the name of the RPM **without** the version number:

```
yum versionlock add RPMNameWithoutVersion
```

---

# Appendix

## C

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### OpenStack Operations Functional Test (Optional)

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#### Topics:

- [\*Creating Neutron Networks in the Overcloud\*](#)
- [\*Manual RHOSP Test\*](#)
- [\*Scripted RHOSP Sanity Test\*](#)

This is an optional section. It includes instructions for creating the networks and testing a majority of your RHOSP environment using Glance configured with Red Hat Ceph Storage, SC Series, or any backend. These command line instructions are working examples that are found on the OpenStack website ([http://docs.openstack.org/juno/install-guide/install/apt/content/neutron\\_initial-tenant-network.html](http://docs.openstack.org/juno/install-guide/install/apt/content/neutron_initial-tenant-network.html)).

## Creating Neutron Networks in the Overcloud


The following example commands create the required tenant and public networks, and their network interfaces. You must complete them prior to creating instances and volumes, and testing of the functional operations of OpenStack.

 **Note:** The following commands and those in the following section should be executed on the Director Node.

1. Log into the Director Node using the user name and password specified when creating the node and source the *overcloudrc* file, or the name of the stack defined when deploying the overcloud :


```
cd ~/
source overcloudrc
```

2. Create the tenant network by executing the following commands:

 **Note:** Replace *tenant\_network\_name* with your desired values. (e.g., `neutron net-create tenant_net --shared`).


```
neutron net-create <tenant_network_name> --shared
```

3. Create the tenant subnet on the tenant network:

 **Note:** Replace *tenant\_network\_name*, *vlan\_network*, *vlan\_name* and *vlan\_gateway* with your desired values (e.g., `neutron subnet-create tenant_net 192.168.201.0/24 --name tenant_201`).

```
neutron subnet-create <tenant_network_name> <vlan_network> \
--name <vlan_name>
```

4. Create the router:

 **Note:** Replace *tenant\_router* with your desired values (e.g., `neutron router-create tenant_201_router`).

```
neutron router-create <tenant_router>
```


5. Before you add the tenant network interface, you will need the subnets ID. Execute the following command to display them:

```
neutron net-list
```

The displayed output will be similar to the following (example truncated for brevity):


| id                                   | name              | subnets  | ... |
|--------------------------------------|-------------------|----------|-----|
| 52411536-ec43-402f-9736-4cabdc8c875d | tenant_net        | 7329d413 | ... |
| 0af01763-539e-41c7-ac32-abbaa62ee575 | HA network tenant | bdae0b72 | ... |

6. Add the tenant network interface between the router and the tenant network:

 **Note:** Replace *tenant\_router* and *subnets\_id* with your desired values (e.g., `neutron router-interface-add tenant_201_router 7329d413-ac23-56cf-8867-133b5ff8fc12`).


```
neutron router-interface-add <tenant_router> <subnets_id>
```

7. Create the external network by executing the following commands:

 **Note:** Replace *external\_network\_name* and *external\_vlan\_id* with your desired value. (e.g., `neutron net-create public --router:external --provider:network_type vlan --provider:physical_network physext --provider:segmentation_id 191`).


```
neutron net-create <external_network_name> --router:external \
--provider:network_type vlan --provider:physical_network physext \
--provider:segmentation_id <external_vlan_id>
```

8. Create the external subnet with floating IP addresses on the external network:

 **Note:** Replace *external\_subnet\_name*, *start\_ip*, *end\_ip*, *external\_network\_name*, *external\_vlan\_network* and *external\_gateway* with your desired values (e.g., `neutron subnet-create --name external_sub --allocation-pool start=192.168.191.2,end=192.168.191.30 --disable-dhcp --gateway 192.168.191.254 public 192.168.191.0/24`).

```
neutron subnet-create --name <external_subnet_name> \
--allocation-pool start=<start_ip>,end=<end_ip> \
--disable-dhcp --gateway <gateway_ip> <external_network_name>
<external_vlan_network>
```

9. Set the external network gateway for the router:

 **Note:** Replace *tenant\_router\_name* with the router name *external\_network\_name* with the external network name (e.g., `neutron router-gateway-set tenant_201_router public`).

```
neutron router-gateway-set <tenant_router_name> <external_network_name>
```

## Manual RHOSP Test

This example uses the Cirros image to test high-level functional operations of OpenStack.

1. Log into the Director Node using the user name and password specified when creating the node.
2. Download the Cirros image:

```
wget http://download.cirros-cloud.net/0.3.3/cirros-0.3.3-x86_64-disk.img
```

3. Source your Overcloud credentials:

```
cd ~/
source <overcloud_name>rc
```

4. Create and upload the Glance image:

```
openstack image create --disk-format <format> \
--container-format <format> --public --file <file_path>
```

For example:

```
openstack image create --disk-format qcow2 \
--container-format bare --public --file cirros-0.3.3-x86_64-disk.img
```

5. List available images to verify that your image was uploaded successfully:

```
openstack image list
```

6. To view more detailed information about an image, use the identifier of the image from the output of the `openstack image list` command above:

```
openstack image show <id>
```

7. Launch an instance using the boot image that you uploaded:

- a. Get the ID of the flavor you will use:

```
nova flavor-list
```

- b. Get the image ID:

```
nova image-list
```

- c. Get the tenant network ID:

```
nova network-list
```

- d. Generate a key pair. The command below generates a new key pair; if you try using an existing key pair in the command, it fails.



**Note:** `MY_KEY.pem` is an output file created by the `nova keypair-add` command, and will be used later.

```
nova keypair-add <key_name> > MY_KEY.pem
```

- e. Create an instance using the `nova boot` command.



**Note:** Change the *IDs* to your IDs from Steps 7a-c, and the *nameofinstance* and the *key\_name* from Step 7c:

```
nova boot --flavor <flavor_id> --key_name <key_name> \
--image <imageid> --nic <net-id=<tenantNetID> <nameofinstance>
```

For example:

```
nova boot --flavor 2 --key_name key_name \
--image 0bde34f6-fba6-4174-a3ea-ff2a7918de2e \
--nic net-id=52411536-ec43-402f-9736-4cabdc8c875d cirros-test
```

- f. List the instance you created:

```
nova list
```

8. If you have multiple backends, create a Cinder volume type for each backend. Get the `<volume_backend_name>` from the `/etc/cinder/cinder.conf` file on the Controller node.

```
cinder type-create <type_name>
cinder type-key <type_name> set
volume_backend_name=<volume_backend_name>
```

For example:

```
cinder type-create rbd_backend
cinder type-key rbd_backend set volume_backend_name=tripleo_ceph

cinder type-create dellsc_backend
cinder type-key dellsc_backend set volume_backend_name=dellsc
```

9. Create a new volume to test the Cinder volumes:





**Note:** If you have multiple backends defined, you must append the optional arguments `--volume-type <type-name>` from Step 7 to the command below.

```
cinder create --display-name <name> <sizeinGB>
```

For example:

```
cinder create --display-name vol_test1 1
```

a. List the Cinder volumes:

```
cinder list
```

b. Attach the volume to the instance, specifying the server ID and the volume ID.



**Note:** Replace the `server_id` with the ID returned from the `nova list` command, and replace the `volume_id` with the ID returned from the `cinder list` command, from the previous steps.

```
nova volume-attach <server_id> <volume_id> <device>
```

For example:

```
nova volume-attach 84c6e57d-a6b1-44b6-81eb-fcb36afd31b5 \
573e024d-5235-49ce-8332-be1576d323f8 /dev/vdb
```

## 10. Access the instance.

a. Find the active Controller by executing the following commands from the Director Node:

```
cd ~/
source stackrc
nova list (make note of the controllers ips)
ssh heat-admin@<controller ip>
sudo -i
pcs cluster status
```

The displayed output will be similar to the following:

```
Cluster name: tripleo_cluster
Last updated: Wed Apr 6 20:48:10 2016
Last change: Mon Apr 4 18:49:20 2016 by root via cibadmin on overcloud-
controller-1
Stack: corosync
Current DC: overcloud-controller-1 (version 1.1.13-10.el7_2.2-44eb2dd) -
partition with quorum
3 nodes and 112 resources configured
```

b. Initiate an SSH session to the active Controller, as **heat-admin**.

c. Find the instances by executing the following command:

```
sudo -i
ip netns
```

The displayed output will be similar to the following:

```
qrouter-21eba0b0-b849-4083-ac40-44b794744e9f
qdhcp-f4a2c88f-1bc9-4785-b070-cc82d7c334f4
```

- d. Access an instance namespace by executing the following command:

```
ip netns exec <namespace> bash
```

For example:

```
ip netns exec qdhcp-f4a2c88f-1bc9-4785-b070-cc82d7c334f4 bash
```

- e. Verify that the namespace is the desired tenant network, by executing the following command:

```
ip a
```

The displayed output will be similar to the following:

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
19: tap05a22fb4-4f: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc
noqueue state UNKNOWN
link/ether fa:16:3e:99:b9:88 brd ff:ff:ff:ff:ff:ff
inet 192.168.201.2/24 brd 192.168.201.255 scope global tap05a22fb4-4f ->
Tenant network
valid_lft forever preferred_lft forever
inet6 fe80::f816:3eff:fe99:b988/64 scope link
valid_lft forever preferred_lft forever
```

- f. Ping the IP address of the instance.  
g. SSH into the instance, as **cirros**, using the keypair generated above:

```
ssh -i MY_KEY.pem cirros@<ip>
```

## 11. Format the drive and access it.

- a. List storage devices:

```
fdisk -l
```

- b. Format the drive:

```
mkfs.ext3 /dev/vdb
```

- c. Mount the device, access it, and then unmount it:

```
mkdir ~/mydrive
mount /dev/vdb ~/mydrive
cd ~/mydrive
touch helloworld.txt
ls
umount ~/mydrive
```

## Scripted RHOSP Sanity Test

As an alternative to manually testing your deployment script, we provide `sanity_test.sh`, which tests all of the basic functionality outlined in [Creating Neutron Networks in the Overcloud](#) on page 70 and [Manual RHOSP Test](#) on page 71.

To run the sanity test script:

1. Log into the Director Node using the user name and password specified when creating the node.
2. Review the `pilot/deployment-validation/sanity.ini` file, and then modify the parameters as appropriate for your environment.



**Note:** The sanity test generates the public/private SSH key pair using the name specified in `sanity.ini` in the `sanity_key_name` parameter. The public key is named `~/<sanity_key_name>.pub`, and the private key is named `~/<sanity_key_name>`.

3. From your home directory, execute the `sanity_test.sh` script:

```
cd ~/
./pilot/deployment-validation/sanity_test.sh
```

4. If you wish to clean the environment once the `sanity_test.sh` script has run successfully:

```
cd ~/
./pilot/deployment-validation/sanity_test.sh clean
```



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# Appendix

# D

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## Solution Validation Overview

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### Topics:

- [Solution Validation Hardware](#)
- [Solution Validation Tools and Certifications](#)
- [Tempest Results](#)
- [Test Results from Deployment Validation Santiy](#)

Validation of the complete solution is based on the hardware in the Solution Bundle, as defined in the [Dell EMC Ready Bundle for Red Hat OpenStack Platform PowerEdge R-Series Architecture Guide](#), the JetPack software, and utilizes several tools to ensure the functionality of the solution. In addition, the Solution, once validated, is listed by the OpenStack Foundation (<https://www.openstack.org/marketplace/distros/distribution/emc/dell-emc-ready-bundle-for-red-hat-openstack>) as a Certified Solution.

## Solution Validation Hardware

Hardware components used in the solution include:

- Node 1: Dell EMC PowerEdge R640 Solution Admin Host with the Red Hat OpenStack Platform Director and the Red Hat Storage Console Installed
- Nodes 2 - 4: Dell EMC PowerEdge R640 OpenStack Controllers
- Nodes 5 - 7 Dell EMC PowerEdge R640 Nova Compute Nodes
- Nodes 8 - 10: Dell EMC PowerEdge R740xd Storage Nodes
- Dell Networking S3048-ON Switch
- Dell Networking S4048-ON Switch
- Dell Networking S4048-ON Switch

## Solution Validation Tools and Certifications

The tools used to validate the deployed solution include:

- OpenStack Tempest Test Suite
- Deployment Scripted RHOSP Sanity Test
- Solution RefStack submission <https://refstack.openstack.org/#/results/d1df0e3d-fcec-4968-86b2-ff1244326bad> for OpenStack Powered Compute

The certification listing of the Solution is listed on the OpenStack Marketplace at:

- <https://www.openstack.org/marketplace/distros/distribution/emc/dell-emc-ready-bundle-for-red-hat-openstack>

## Tempest Results

Results of a full Tempest run:

```
Ran: 2032 tests in 3282.597 sec.
- Passed: 1804
- Skipped: 210
- Expected Fail: 0
- Unexpected Success: 0
- Failed: 18
```

Failures are summarized in the [Dell EMC Ready Bundle for Red Hat OpenStack Platform Release Notes](#).

## Test Results from Deployment Validation Santiy

Results of a complete run of the Deployment Scripted RHOSP Sanity Test:

```
2017-10-13 14:20:13: INFO: ###Appendix-C Openstack Operations Functional
Test ###
2017-10-13 14:20:13: INFO: ### Random init stuff
2017-10-13 14:20:13: INFO: ### Collecting SSH keys... ###
2017-10-13 14:20:13: INFO: Executing: /home/osp_admin/pilot/
update_ssh_config.py
2017-10-13 14:20:17: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:20:17: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:20:17: INFO: ### PCS Status
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.
```

```

Cluster name: tripleo_cluster
Stack: corosync
Current DC: mhtr18blk-controller-1 (version 1.1.16-12.el7_4.2-94ff4df) -
partition with quorum
Last updated: Fri Oct 13 18:20:17 2017
Last change: Fri Oct 13 16:06:52 2017 by root via cibadmin on mhtr18blk-
controller-2

3 nodes configured
22 resources configured

Online: [mhtr18blk-controller-0 mhtr18blk-controller-1 mhtr18blk-
controller-2]

Full list of resources:

ip-192.168.140.211 (ocf::heartbeat:IPaddr2): Started mhtr18blk-controller-0
Clone Set: haproxy-clone [haproxy]
Started: [mhtr18blk-controller-0 mhtr18blk-controller-1 mhtr18blk-
controller-2]
Master/Slave Set: galera-master [galera]
Masters: [mhtr18blk-controller-0 mhtr18blk-controller-1 mhtr18blk-
controller-2]
ip-192.168.120.211 (ocf::heartbeat:IPaddr2): Started mhtr18blk-controller-1
ip-192.168.120.210 (ocf::heartbeat:IPaddr2): Started mhtr18blk-controller-2
ip-192.168.140.210 (ocf::heartbeat:IPaddr2): Started mhtr18blk-controller-0
Clone Set: rabbitmq-clone [rabbitmq]
Started: [mhtr18blk-controller-0 mhtr18blk-controller-1 mhtr18blk-
controller-2]
ip-192.168.170.210 (ocf::heartbeat:IPaddr2): Started mhtr18blk-controller-1
Master/Slave Set: redis-master [redis]
Masters: [mhtr18blk-controller-1]
Slaves: [mhtr18blk-controller-0 mhtr18blk-controller-2]
ip-100.84.122.62 (ocf::heartbeat:IPaddr2): Started mhtr18blk-controller-2
openstack-cinder-volume (systemd:openstack-cinder-volume): Started
mhtr18blk-controller-0
mhtr18blk-controller-0-ipmi (stonith:fence_ipmilan): Started
mhtr18blk-controller-1-ipmi (stonith:fence_ipmilan): Started
mhtr18blk-controller-2-ipmi (stonith:fence_ipmilan): Started
Daemon Status:
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

2017-10-13 14:20:18: INFO: ###Ensure db and rabbit services are in the
active state
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

rabbitmq 78093 0.0 0.0 44728 732 ? S 15:34 0:00 /usr/
lib64/erlang/erts-7.3.1.3/bin/epmd -daemon
root 97942 0.0 0.0 11636 1352 ? Ss 15:38 0:00 sh -
c /usr/sbin/rabbitmq-server > /var/log/rabbitmq/startup_log 2> /var/log/
rabbitmq/startup_err
root 97950 0.0 0.0 11636 1436 ? S 15:38 0:00 /bin/sh /
usr/sbin/rabbitmq-server
root 97972 0.0 0.0 86120 2312 ? S 15:38 0:00 su
rabbitmq -s /bin/sh -c /usr/lib/rabbitmq/bin/rabbitmq-server
rabbitmq 97974 0.0 0.0 9516 1452 ? Ss 15:38 0:00 /bin/sh -
e /usr/lib/rabbitmq/bin/rabbitmq-server

```

```

rabbitmq 98240 12.1 0.2 22607776 587808 ? Sl 15:38 19:40 /usr/
lib64/erlang/erts-7.3.1.3/bin/beam.smp -W w -A 768 -K true -P 1048576
-K true -B i -- -root /usr/lib64/erlang -progname erl -- -home /
var/lib/rabbitmq -- -pa /usr/lib/rabbitmq/lib/rabbitmq_server-3.6.3/
ebin -noshell -noinput -s rabbit boot -sname rabbit@mhtr18blk-
controller-2 -boot start_sasl -config /etc/rabbitmq/rabbitmq -kernel
inet_default_connect_options [{nodelay,true},{raw,6,18,<<5000:64/native>>}]
-kernel inet_default_listen_options [{raw,6,18,<<5000:64/native>>}] -
kernel inet_default_connect_options [{nodelay,true}] -rabbit tcp_listeners
[{"192.168.140.11",5672}] -sasl errlog_type error -sasl sasl_error_logger
false -rabbit error_logger {file,"/var/log/rabbitmq/rabbit@mhtr18blk-
controller-2.log"} -rabbit sasl_error_logger {file,"/var/log/rabbitmq/
rabbit@mhtr18blk-controller-2-sasl.log"} -rabbit enabled_plugins_file
"/etc/rabbitmq/enabled_plugins" -rabbit plugins_dir "/usr/lib/rabbitmq/
lib/rabbitmq_server-3.6.3/plugins" -rabbit plugins_expand_dir "/var/lib/
rabbitmq/mnesia/rabbit@mhtr18blk-controller-2-plugins-expand" -os_mon
start_cpu_sup false -os_mon start_disksup false -os_mon start_memsup false
-mnesia dir "/var/lib/rabbitmq/mnesia/rabbit@mhtr18blk-controller-2"
rabbitmq 99235 0.0 0.0 11544 448 ? Ss 15:38 0:00
inet_gethost 4
rabbitmq 99237 0.0 0.0 13668 656 ? S 15:38 0:00
inet_gethost 4
root 918767 0.0 0.0 115516 1860 ? S 18:20 0:00 /bin/sh /
usr/lib/ocf/resource.d/heartbeat/rabbitmq-cluster monitor
root 918798 0.0 0.0 11636 1436 ? S 18:20 0:00 /bin/sh /
usr/sbin/rabbitmqctl cluster_status
root 918809 0.0 0.0 86120 2308 ? S 18:20 0:00 su
rabbitmq -s /bin/sh -c /usr/lib/rabbitmq/bin/rabbitmqctl 'cluster_status'
rabbitmq 918810 31.0 0.0 4085264 70388 ? Ssl 18:20 0:00 /usr/
lib64/erlang/erts-7.3.1.3/bin/beam.smp -B -- -root /usr/lib64/erlang -
progname erl -- -home /var/lib/rabbitmq -- -pa /usr/lib/rabbitmq/lib/
rabbitmq_server-3.6.3/ebin -noshell -noinput -hidden -boot start_clean -sasl
errlog_type error -mnesia dir "/var/lib/rabbitmq/mnesia/rabbit@mhtr18blk-
controller-2" -s rabbit_control_main -nodename rabbit@mhtr18blk-controller-2
-extra cluster_status
rabbitmq 918967 0.0 0.0 4143452 60016 ? Ssl 18:20 0:00 /usr/
lib64/erlang/erts-7.3.1.3/bin/beam.smp -- -root /usr/lib64/erlang -progname
erl -- -home /var/lib/rabbitmq -- -sname epmd-starter-815754527 -proto_dist
"inet_tcp" -noshell -eval halt().
heat-ad+ 919052 0.0 0.0 113128 1512 ? Ss 18:20 0:00 bash -c
sudo ps aux | grep rabbit
heat-ad+ 919060 0.0 0.0 112664 940 ? S 18:20 0:00 grep
rabbit
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

root 93950 1 0 15:37 ? 00:00:00 /bin/sh /usr/bin/
mysqld_safe --defaults-file=/etc/my.cnf --pid-file=/var/run/mysql/mysqld.pid
--socket=/var/lib/mysql/mysql.sock --datadir=/var/lib/mysql --log-error=/
var/log/mysqld.log --user=mysql --open-files-limit=16384 --wsrep-cluster-
address=gcomm://
mysql 94902 93950 0 15:37 ? 00:00:42 /usr/libexec/mysqld
--defaults-file=/etc/my.cnf --basedir=/usr --datadir=/var/lib/mysql
--plugin-dir=/usr/lib64/mysql/plugin --user=mysql --wsrep-provider=/
usr/lib64/galera/libgalera_smm.so --wsrep-cluster-address=gcomm:// --
log-error=/var/log/mysqld.log --open-files-limit=16384 --pid-file=/var/
run/mysql/mysqld.pid --socket=/var/lib/mysql/mysql.sock --port=3306 --
wsrep_start_position=00000000-0000-0000-0000-000000000000:-1
heat-ad+ 919087 919071 0 18:20 ? 00:00:00 bash -c ps -ef | grep
mysqld
heat-ad+ 919095 919087 0 18:20 ? 00:00:00 grep mysqld
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

```



```

heat-ad+ 919212 919168 0 18:20 ? 00:00:00 bash -c ps -ef | grep
mariadb
heat-ad+ 919270 919212 0 18:20 ? 00:00:00 grep mariadb
2017-10-13 14:20:18: INFO: ### CREATION MODE
2017-10-13 14:20:18: INFO: ### Getting unique names
2017-10-13 14:20:18: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:20:18: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:20:19: INFO: Generating sanityrc file.
2017-10-13 14:20:19: INFO: ### Setting up new project sanity1
2017-10-13 14:20:19: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:20:19: INFO: ### sourcing ~/MHTR18BLKrc
No tenant with a name or ID of 'sanity1' exists.
2017-10-13 14:20:20: INFO: Executing: openstack project create sanity1
+-----+
| Field | Value |
+-----+
description	None
enabled	True
id	26c77ele763b4fecbc1833b9284e4986
name	sanity1
+-----+	
2017-10-13 14:20:21: INFO: Executing: openstack user create --project	
sanity1 --password <<PASSWORD>> --email someone@somewhere.com sanity1	
+-----+	
Field	Value
+-----+	
email	someone@somewhere.com
enabled	True
id	4442207de58448938694bdbc7b764cf4
name	sanity1
project_id	26c77ele763b4fecbc1833b9284e4986
username	sanity1
+-----+	
2017-10-13 14:20:21: INFO: ### Creating the Networks ####	
2017-10-13 14:20:21: INFO: setting admin scope with: ~/MHTR18BLKrc.	
2017-10-13 14:20:21: INFO: ### sourcing ~/MHTR18BLKrc	
2017-10-13 14:20:22: INFO: Executing: openstack network create --share	
tenant_net1	
+-----+	
Field	Value
+-----+	
admin_state_up	UP
availability_zone_hints	
availability_zones	
created_at	2017-10-13T18:20:23Z
description	
headers	
id	e8e22aaf-0ee9-4c82-a295-f02788e97e8f
ipv4_address_scope	None
ipv6_address_scope	None
mtu	1496
name	tenant_net1
port_security_enabled	True
project_id	4790c5b2d4c64f6e9d6c367bc0b8b069
project_id	4790c5b2d4c64f6e9d6c367bc0b8b069
provider:network_type	vlan
provider:physical_network	physint
provider:segmentation_id	237
qos_policy_id	None
revision_number	3
router:external	Internal
shared	True
status	ACTIVE
subnets	

```

| tags                                                                                                                                                                                                                                                                                                   | [ ]                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| updated_at                                                                                                                                                                                                                                                                                             | 2017-10-13T18:20:23Z                                 |
| 2017-10-13 14:20:24: INFO: Executing: neutron subnet-create tenant_net1 192.168.201.0/24 --name tenant_2011<br>Created a new subnet:                                                                                                                                                                   |                                                      |
| Field                                                                                                                                                                                                                                                                                                  | Value                                                |
| allocation_pools                                                                                                                                                                                                                                                                                       | {"start": "192.168.201.2", "end": "192.168.201.254"} |
| cidr                                                                                                                                                                                                                                                                                                   | 192.168.201.0/24                                     |
| created_at                                                                                                                                                                                                                                                                                             | 2017-10-13T18:20:25Z                                 |
| description                                                                                                                                                                                                                                                                                            |                                                      |
| dns_nameservers                                                                                                                                                                                                                                                                                        |                                                      |
| enable_dhcp                                                                                                                                                                                                                                                                                            | True                                                 |
| gateway_ip                                                                                                                                                                                                                                                                                             | 192.168.201.1                                        |
| host_routes                                                                                                                                                                                                                                                                                            |                                                      |
| id                                                                                                                                                                                                                                                                                                     | c8057c7b-777f-4f5d-bfe8-7d227da6c960                 |
| ip_version                                                                                                                                                                                                                                                                                             | 4                                                    |
| ipv6_address_mode                                                                                                                                                                                                                                                                                      |                                                      |
| ipv6_ra_mode                                                                                                                                                                                                                                                                                           |                                                      |
| name                                                                                                                                                                                                                                                                                                   | tenant_2011                                          |
| network_id                                                                                                                                                                                                                                                                                             | e8e22aaf-0ee9-4c82-a295-f02788e97e8f                 |
| project_id                                                                                                                                                                                                                                                                                             | 4790c5b2d4c64f6e9d6c367bc0b8b069                     |
| revision_number                                                                                                                                                                                                                                                                                        | 2                                                    |
| service_types                                                                                                                                                                                                                                                                                          |                                                      |
| subnetpool_id                                                                                                                                                                                                                                                                                          |                                                      |
| tenant_id                                                                                                                                                                                                                                                                                              | 4790c5b2d4c64f6e9d6c367bc0b8b069                     |
| updated_at                                                                                                                                                                                                                                                                                             | 2017-10-13T18:20:25Z                                 |
| 2017-10-13 14:20:26: INFO: Executing: neutron router-create tenant_201_router1<br>Created a new router:                                                                                                                                                                                                |                                                      |
| Field                                                                                                                                                                                                                                                                                                  | Value                                                |
| admin_state_up                                                                                                                                                                                                                                                                                         | True                                                 |
| availability_zone_hints                                                                                                                                                                                                                                                                                |                                                      |
| availability_zones                                                                                                                                                                                                                                                                                     |                                                      |
| created_at                                                                                                                                                                                                                                                                                             | 2017-10-13T18:20:26Z                                 |
| description                                                                                                                                                                                                                                                                                            |                                                      |
| distributed                                                                                                                                                                                                                                                                                            | False                                                |
| external_gateway_info                                                                                                                                                                                                                                                                                  |                                                      |
| flavor_id                                                                                                                                                                                                                                                                                              |                                                      |
| ha                                                                                                                                                                                                                                                                                                     | True                                                 |
| id                                                                                                                                                                                                                                                                                                     | 5adcd390-b199-43cf-a32d-a708bcb1fb50                 |
| name                                                                                                                                                                                                                                                                                                   | tenant_201_router1                                   |
| project_id                                                                                                                                                                                                                                                                                             | 4790c5b2d4c64f6e9d6c367bc0b8b069                     |
| revision_number                                                                                                                                                                                                                                                                                        | 3                                                    |
| routes                                                                                                                                                                                                                                                                                                 |                                                      |
| status                                                                                                                                                                                                                                                                                                 | ACTIVE                                               |
| tenant_id                                                                                                                                                                                                                                                                                              | 4790c5b2d4c64f6e9d6c367bc0b8b069                     |
| updated_at                                                                                                                                                                                                                                                                                             | 2017-10-13T18:20:26Z                                 |
| 2017-10-13 14:20:29: INFO: Executing: neutron router-interface-add tenant_201_router1 c8057c7b-777f-4f5d-bfe8-7d227da6c960<br>Added interface 7e458d5e-7c68-4607-8f32-64470d6d0359 to router tenant_201_router1.                                                                                       |                                                      |
| 2017-10-13 14:20:30: INFO: Executing: ssh -o StrictHostKeyChecking=no -o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-admin@192.168.120.138 sudo grep network_vlan_ranges /etc/neutron/plugin.ini<br>Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known hosts. |                                                      |

```
#network_vlan_ranges =
network_vlan_ranges =physint:201:250,physext
2017-10-13 14:20:32: INFO: Executing: neutron net-create public --
router:external --provider:network_type vlan --provider:physical_network
physext --provider:segmentation_id 1223
Created a new network:
```

| Field                     | Value                                |
|---------------------------|--------------------------------------|
| admin_state_up            | True                                 |
| availability_zone_hints   |                                      |
| availability_zones        |                                      |
| created_at                | 2017-10-13T18:20:32Z                 |
| description               |                                      |
| id                        | 46cc68f3-0ee2-4ae1-8ee0-60ef6d89c0e6 |
| ipv4_address_scope        |                                      |
| ipv6_address_scope        |                                      |
| is_default                | False                                |
| mtu                       | 1496                                 |
| name                      | public                               |
| port_security_enabled     | True                                 |
| project_id                | 4790c5b2d4c64f6e9d6c367bc0b8b069     |
| provider:network_type     | vlan                                 |
| provider:physical_network | physext                              |
| provider:segmentation_id  | 1223                                 |
| qos_policy_id             |                                      |
| revision_number           | 4                                    |
| router:external           | True                                 |
| shared                    | False                                |
| status                    | ACTIVE                               |
| subnets                   |                                      |
| tags                      |                                      |
| tenant_id                 | 4790c5b2d4c64f6e9d6c367bc0b8b069     |
| updated_at                | 2017-10-13T18:20:32Z                 |

```
2017-10-13 14:20:32: INFO: Executing: neutron subnet-create --name
external_sub --allocation-pool start=100.84.122.71,end=100.84.122.104 --
gateway 100.84.122.65 --disable-dhcp public 100.84.122.64/26
Created a new subnet:
```

| Field             | Value                                               |
|-------------------|-----------------------------------------------------|
| allocation_pools  | {"start": "100.84.122.71", "end": "100.84.122.104"} |
| cidr              | 100.84.122.64/26                                    |
| created_at        | 2017-10-13T18:20:33Z                                |
| description       |                                                     |
| dns_nameservers   |                                                     |
| enable_dhcp       | False                                               |
| gateway_ip        | 100.84.122.65                                       |
| host_routes       |                                                     |
| id                | 957798ec-ec62-435f-a7a7-7bd749cb5d6f                |
| ip_version        | 4                                                   |
| ipv6_address_mode |                                                     |
| ipv6_ra_mode      |                                                     |
| name              | external_sub                                        |
| network_id        | 46cc68f3-0ee2-4ae1-8ee0-60ef6d89c0e6                |
| project_id        | 4790c5b2d4c64f6e9d6c367bc0b8b069                    |
| revision_number   | 2                                                   |
| service_types     |                                                     |
| subnetpool_id     |                                                     |
| tenant_id         | 4790c5b2d4c64f6e9d6c367bc0b8b069                    |
| updated_at        | 2017-10-13T18:20:33Z                                |

```
2017-10-13 14:20:33: INFO: Executing: openstack network list
```

```
+-----+
+-----+
| ID | Subnets | Name |
+-----+
+-----+
| 46cc68f3-0ee2-4ae1-8ee0-60ef6d89c0e6 | public |
| 76ad3e74-7171-4a4f-9d80-4d452d469f14 | HA network tenant |
4790c5b2d4c64f6e9d6c367bc0b8b069 | c235034a-4403-4624-87c0-82ee742527ef |
| e8e22aaf-0ee9-4c82-a295-f02788e97e8f | tenant_net1 |
| c8057c7b-777f-4f5d-bfe8-7d227da6c960 |
+-----+
+-----+
+-----+
2017-10-13 14:20:34: INFO: Executing: openstack router list
+-----+
+-----+
| ID | Distributed | HA | Project | Name | Status | State |
+-----+
| 5adcd390-b199-43cf-a32d-a708bcb1fb50 | False | True | 4790c5b2d4c64f6e9d6c367bc0b8b069 | tenant_201_router1 | ACTIVE | UP |
+-----+
+-----+
2017-10-13 14:20:35: INFO: Executing: neutron router-gateway-set
tenant_201_router1 public
Set gateway for router tenant_201_router1
2017-10-13 14:20:37: INFO: Setting tenant scope.
2017-10-13 14:20:39: INFO: ### Creating a Security Group ####
2017-10-13 14:20:39: INFO: Executing: neutron security-group-create
sanity_security_group
Created a new security_group:
+-----+
+-----+
| Field | Value |
+-----+
+-----+
| created_at | 2017-10-13T18:20:39Z |
+-----+
| description |
```

```

| id | 429d26ae-d018-41c8-9331-debd33bebbff

| name | sanity_security_group

| project_id | 26c77ele763b4fecbc1833b9284e4986

| revision_number | 1

| security_group_rules | { "remote_group_id": null, "direction":
"egress", "protocol": null, "description": null, "ethertype": "IPv4",
"remote_ip_prefix": null, "port_range_max": null, "updated_at":
"2017-10-13T18:20:39Z", "security_group_id": "429d26ae-d018-41c8-9331-
debd33bebbff", "port_range_min": null, "revision_number": 1,
"tenant_id": "26c77ele763b4fecbc1833b9284e4986", "created_at":
"2017-10-13T18:20:39Z", "project_id": "26c77ele763b4fecbc1833b9284e4986",
"id": "laaldef6-9405-4b60-bf71-65cc4499859f"} |
| { "remote_group_id": null, "direction":
"egress", "protocol": null, "description": null, "ethertype": "IPv6",
"remote_ip_prefix": null, "port_range_max": null, "updated_at":
"2017-10-13T18:20:39Z", "security_group_id": "429d26ae-d018-41c8-9331-
debd33bebbff", "port_range_min": null, "revision_number": 1, "tenant_id":
"26c77ele763b4fecbc1833b9284e4986", "created_at": "2017-10-13T18:20:39Z",
"project_id": "26c77ele763b4fecbc1833b9284e4986", "id": "fc6fe44a-
c8de-4cd3-9cf2-aal3ae770259"} |
| tenant_id | 26c77ele763b4fecbc1833b9284e4986

| updated_at | 2017-10-13T18:20:39Z

+-----+
+-----+
+
2017-10-13 14:20:39: INFO: Executing: neutron security-group-rule-create
--direction ingress --ethertype IPv4 --protocol icmp --remote-ip-prefix
0.0.0.0/0 sanity_security_group

```

Created a new security\_group\_rule:

| Field             | Value                                |
|-------------------|--------------------------------------|
| created_at        | 2017-10-13T18:20:40Z                 |
| description       |                                      |
| direction         | ingress                              |
| ethertype         | IPv4                                 |
| id                | 282502a2-c60a-4e7d-b05d-2c079a5aeb0d |
| port_range_max    |                                      |
| port_range_min    |                                      |
| project_id        | 26c77ele763b4fecbc1833b9284e4986     |
| protocol          | icmp                                 |
| remote_group_id   |                                      |
| remote_ip_prefix  | 0.0.0.0/0                            |
| revision_number   | 1                                    |
| security_group_id | 429d26ae-d018-41c8-9331-debd33bebbff |
| tenant_id         | 26c77ele763b4fecbc1833b9284e4986     |
| updated_at        | 2017-10-13T18:20:40Z                 |

2017-10-13 14:20:40: INFO: Executing: neutron security-group-rule-create --direction egress --ethertype IPv4 --protocol icmp --remote-ip-prefix 0.0.0.0/0 sanity\_security\_group

Created a new security\_group\_rule:

| Field             | Value                                |
|-------------------|--------------------------------------|
| created_at        | 2017-10-13T18:20:41Z                 |
| description       |                                      |
| direction         | egress                               |
| ethertype         | IPv4                                 |
| id                | 2638d18f-9dd4-414b-988e-34de3f77a76e |
| port_range_max    |                                      |
| port_range_min    |                                      |
| project_id        | 26c77ele763b4fecbc1833b9284e4986     |
| protocol          | icmp                                 |
| remote_group_id   |                                      |
| remote_ip_prefix  | 0.0.0.0/0                            |
| revision_number   | 1                                    |
| security_group_id | 429d26ae-d018-41c8-9331-debd33bebbff |
| tenant_id         | 26c77ele763b4fecbc1833b9284e4986     |
| updated_at        | 2017-10-13T18:20:41Z                 |

2017-10-13 14:20:41: INFO: Executing: neutron security-group-rule-create --direction ingress --ethertype IPv4 --protocol tcp --port-range-min 1 --port-range-max 65535 --remote-ip-prefix 0.0.0.0/0 sanity\_security\_group

Created a new security\_group\_rule:

| Field             | Value                                |
|-------------------|--------------------------------------|
| created_at        | 2017-10-13T18:20:41Z                 |
| description       |                                      |
| direction         | ingress                              |
| ethertype         | IPv4                                 |
| id                | aaa2e0b0-f8ad-4f4f-ae25-a60cbb187af7 |
| port_range_max    | 65535                                |
| port_range_min    | 1                                    |
| project_id        | 26c77ele763b4fecbc1833b9284e4986     |
| protocol          | tcp                                  |
| remote_group_id   |                                      |
| remote_ip_prefix  | 0.0.0.0/0                            |
| revision_number   | 1                                    |
| security_group_id | 429d26ae-d018-41c8-9331-debd33bebbff |
| tenant_id         | 26c77ele763b4fecbc1833b9284e4986     |

|            |                      |
|------------|----------------------|
| updated_at | 2017-10-13T18:20:41Z |
|------------|----------------------|

2017-10-13 14:20:41: INFO: Executing: neutron security-group-rule-create --direction egress --ethertype IPv4 --protocol tcp --port-range-min 1 --port-range-max 65535 --remote-ip-prefix 0.0.0.0/0 sanity\_security\_group  
Created a new security\_group\_rule:

| Field             | Value                                |
|-------------------|--------------------------------------|
| created_at        | 2017-10-13T18:20:42Z                 |
| description       |                                      |
| direction         | egress                               |
| ethertype         | IPv4                                 |
| id                | c8627ddc-8100-4f11-8c30-40ace0d787b0 |
| port_range_max    | 65535                                |
| port_range_min    | 1                                    |
| project_id        | 26c77e1e763b4fecbc1833b9284e4986     |
| protocol          | tcp                                  |
| remote_group_id   |                                      |
| remote_ip_prefix  | 0.0.0.0/0                            |
| revision_number   | 1                                    |
| security_group_id | 429d26ae-d018-41c8-9331-debd33bebbff |
| tenant_id         | 26c77e1e763b4fecbc1833b9284e4986     |
| updated_at        | 2017-10-13T18:20:42Z                 |

2017-10-13 14:20:42: INFO: Executing: neutron security-group-rule-create --direction ingress --ethertype IPv4 --protocol udp --port-range-min 1 --port-range-max 65535 --remote-ip-prefix 0.0.0.0/0 sanity\_security\_group  
Created a new security\_group\_rule:

| Field             | Value                                |
|-------------------|--------------------------------------|
| created_at        | 2017-10-13T18:20:43Z                 |
| description       |                                      |
| direction         | ingress                              |
| ethertype         | IPv4                                 |
| id                | 96b5be98-091d-48cc-a7db-9386fc753306 |
| port_range_max    | 65535                                |
| port_range_min    | 1                                    |
| project_id        | 26c77e1e763b4fecbc1833b9284e4986     |
| protocol          | udp                                  |
| remote_group_id   |                                      |
| remote_ip_prefix  | 0.0.0.0/0                            |
| revision_number   | 1                                    |
| security_group_id | 429d26ae-d018-41c8-9331-debd33bebbff |
| tenant_id         | 26c77e1e763b4fecbc1833b9284e4986     |
| updated_at        | 2017-10-13T18:20:43Z                 |

2017-10-13 14:20:43: INFO: Executing: neutron security-group-rule-create --direction egress --ethertype IPv4 --protocol udp --port-range-min 1 --port-range-max 65535 --remote-ip-prefix 0.0.0.0/0 sanity\_security\_group  
Created a new security\_group\_rule:

| Field          | Value                                |
|----------------|--------------------------------------|
| created_at     | 2017-10-13T18:20:43Z                 |
| description    |                                      |
| direction      | egress                               |
| ethertype      | IPv4                                 |
| id             | f096278f-928c-4c0c-b90b-0af8775f110a |
| port_range_max | 65535                                |
| port_range_min | 1                                    |
| project_id     | 26c77e1e763b4fecbc1833b9284e4986     |
| protocol       | udp                                  |

```
| remote_group_id |
| remote_ip_prefix | 0.0.0.0/0
| revision_number | 1
| security_group_id | 429d26ae-d018-41c8-9331-debd33bebbff
| tenant_id | 26c77e1e763b4fecbc1833b9284e4986
| updated_at | 2017-10-13T18:20:43Z
+-----+
2017-10-13 14:20:43: INFO: ### Setting up glance
2017-10-13 14:20:43: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:20:43: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:20:48: INFO: Executing: wget http://download.cirros-
cloud.net/0.3.3/cirros-0.3.3-x86_64-disk.img
--2017-10-13 14:20:48-- http://download.cirros-cloud.net/0.3.3/
cirros-0.3.3-x86_64-disk.img
Resolving download.cirros-cloud.net (download.cirros-cloud.net)...
 64.90.42.85, 2607:f298:6:a036::bd6:a72a
Connecting to download.cirros-cloud.net (download.cirros-cloud.net)|
64.90.42.85|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 13200896 (13M) [text/plain]
Saving to: ^~cirros-0.3.3-x86_64-disk.img^~
 0K 0% 255K 50s
 50K 0% 518K 37s
 ...
 ...
 12850K 100%
 6.36M=5.3s

2017-10-13 14:20:54 (2.37 MB/s) - ^~cirros-0.3.3-x86_64-disk.img^~ saved
[13200896/13200896]

2017-10-13 14:20:55: INFO: Executing: openstack image create --disk-format
qcow2 --container-format bare --file cirros-0.3.3-x86_64-disk.img cirros --
public
+-----+
+
+
| Field | Value
+-----+
+
+
| checksum | 133eae9fb1c98f45894a4e60d8736619
+-----+
+
+
| container_format | bare
+-----+
+
+
| created_at | 2017-10-13T18:20:56Z
+-----+
+
+
| disk_format | qcow2
+-----+
+
+
| file | /v2/images/90dc3459-e253-49a5-b5fe-e403ce231110/file
```



```

| id | 90dc3459-e253-49a5-b5fe-e403ce231110
|
| min_disk | 0
|
| min_ram | 0
|
| name | cirros
|
| owner | 4790c5b2d4c64f6e9d6c367bc0b8b069
|
| properties | direct_url='rbd://de4de876-b026-11e7-9a09-525400a5b196/
images/90dc3459-e253-49a5-b5fe-e403ce231110/snap', locations='[{u'url':
u'rbd://de4de876-b026-11e7-9a09-525400a5b196/images/90dc3459-e253-49a5-
b5fe-e403ce231110/snap', u'metadata': {}}]}'
| protected | False
|
| schema | /v2/schemas/image
|
| size | 13200896
|
| status | active
|
| tags |
|
| updated_at | 2017-10-13T18:20:57Z
|
| virtual_size | None
|
| visibility | public
|
+-----+
+-----+
+
2017-10-13 14:20:58: INFO: Executing: openstack image list
+-----+-----+-----+
| ID | Name | Status |

```

```

+-----+-----+-----+
| 90dc3459-e253-49a5-b5fe-e403ce231110 | cirros | active |
+-----+-----+-----+
2017-10-13 14:20:59: INFO: ### Setup Nova
2017-10-13 14:21:00: INFO: Executing: openstack flavor create --ram 2048 --
vcpus 1 --disk 20 sanity_flavor
+-----+-----+
| Field | Value |
+-----+-----+
OS-FLV-DISABLED:disabled	False
OS-FLV-EXT-DATA:ephemeral	0
disk	20
id	3e2ad0a4-f094-457d-81ec-1f83a9a7f44d
name	sanity_flavor
os-flavor-access:is_public	True
properties	
ram	2048
rxtx_factor	1.0
swap	
vcpus	1
+-----+-----+	
2017-10-13 14:21:01: INFO: Setting tenant scope.	
2017-10-13 14:21:01: INFO: creating keypair sanity	
Generating public/private rsa key pair.	
Your identification has been saved in /home/osp_admin/sanity.	
Your public key has been saved in /home/osp_admin/sanity.pub.	
The key fingerprint is:	
SHA256:kfQhn/uqx7XJ/nJgxVGCxhg2rNnLtctr6DSUZgAAfBA	
osp_admin@director.mhtrl8blk.dfr	
The key's randomart image is:	
+---[RSA 2048]---+	
.E+... o.=+	
. . o *o++ ..	
. +++ . . .	
oo.o. o	
S.*o o	
+o.=	
.o*.=	
.+oO .	
.+ooo=.	
+---[SHA256]-----+	
2017-10-13 14:21:01: INFO: loading sanity keypair into nova	
2017-10-13 14:21:05: INFO: ### Initiating build of instances...	
2017-10-13 14:21:05: INFO: Executing: nova boot --security-groups	
sanity_security_group --flavor sanity_flavor --key-name sanity --image	
90dc3459-e253-49a5-b5fe-e403ce231110 --nic net-id=e8e22aaf-0ee9-4c82-a295-	
f02788e97e8f cirros_test_1	
+-----+	
+-----+-----+-----+	
Property	Value
+-----+-----+	
OS-DCF:diskConfig	MANUAL
OS-EXT-AZ:availability_zone	
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 | RC7ECQKnjrsJ
| config_drive |
| created | 2017-10-13T18:21:08Z
| description | -
| flavor | sanity_flavor (3e2ad0a4-
f094-457d-81ec-1f83a9a7f44d) |
| hostId |
| id | 625b1245-445e-43d0-
b4ae-74a925cd95d0 |
| image | cirros (90dc3459-e253-49a5-b5fe-
e403ce231110) |
| key_name | sanity
| locked | False
| metadata | {}
| name | cirros_test_1
| os-extended-volumes:volumes_attached | []
| progress | 0
| security_groups | sanity_security_group
| status | BUILD
| tags | []
| tenant_id | 26c77e1e763b4fecbc1833b9284e4986
| updated | 2017-10-13T18:21:08Z
| user_id | 4442207de58448938694bdbd7b764cf4
+-----+
+-----+
2017-10-13 14:21:09: INFO: Executing: nova boot --security-groups
sanity_security_group --flavor sanity_flavor --key-name sanity --image
90dc3459-e253-49a5-b5fe-e403ce231110 --nic net-id=e8e22aaf-0ee9-4c82-a295-
f02788e97e8f cirros_test_2
+-----+
+-----+
| Property | Value
+-----+
+-----+
| OS-DCF:diskConfig | MANUAL
| OS-EXT-AZ:availability_zone |

```

|                                      |                                                      |
|--------------------------------------|------------------------------------------------------|
| 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                            | WKuE3wedfV49                                         |
| config_drive                         |                                                      |
| created                              | 2017-10-13T18:21:12Z                                 |
| description                          | -                                                    |
| flavor                               | sanity_flavor (3e2ad0a4-f094-457d-81ec-1f83a9a7f44d) |
| hostId                               |                                                      |
| id                                   | c18f6d9e-8a51-49e5-bca7-95f44774798e                 |
| image                                | cirros (90dc3459-e253-49a5-b5fe-e403ce231110)        |
| key_name                             | sanity                                               |
| locked                               | False                                                |
| metadata                             | {}                                                   |
| name                                 | cirros_test_2                                        |
| os-extended-volumes:volumes_attached | []                                                   |
| progress                             | 0                                                    |
| security_groups                      | sanity_security_group                                |
| status                               | BUILD                                                |
| tags                                 | []                                                   |
| tenant_id                            | 26c77e1e763b4fecbc1833b9284e4986                     |
| updated                              | 2017-10-13T18:21:12Z                                 |
| user_id                              | 4442207de58448938694bdbd7b764cf4                     |

```

+-----+
+-----+
2017-10-13 14:21:12: INFO: Executing: nova boot --security-groups
sanity_security_group --flavor sanity_flavor --key-name sanity --image
90dc3459-e253-49a5-b5fe-e403ce231110 --nic net-id=e8e22aaf-0ee9-4c82-a295-
f02788e97e8f cirros_test_3
+-----+
+-----+

```

| Property | Value |
|----------|-------|
|----------|-------|

```

+-----+
+-----+
| OS-DCF:diskConfig | MANUAL |
| OS-EXT-AZ:availability_zone |
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	8K3gdcEgALZn
config_drive	
created	2017-10-13T18:21:16Z
description	-
flavor	sanity_flavor (3e2ad0a4-
f094-457d-81ec-1f83a9a7f44d)	
hostId	
id	
836c1fbb-3ca3-4e13-966f-856622d1c9b5	
image	cirros (90dc3459-e253-49a5-b5fe-
e403ce231110)	
key_name	sanity
locked	False
metadata	{}
name	cirros_test_3
os-extended-volumes:volumes_attached	[]
progress	0
security_groups	sanity_security_group
status	BUILD
tags	[]
tenant_id	26c77e1e763b4fecbc1833b9284e4986
updated	2017-10-13T18:21:16Z
user_id	4442207de58448938694bdbd7b764cf4
+-----+
+-----+
2017-10-13 14:21:17: INFO: Executing: nova boot --security-groups
sanity_security_group --flavor sanity_flavor --key-name sanity --image

```

```

90dc3459-e253-49a5-b5fe-e403ce231110 --nic net-id=e8e22aaf-0ee9-4c82-a295-
f02788e97e8f cirros_test_4
+-----+
+-----+
| Property | Value
+-----+
| OS-DCF:diskConfig | MANUAL
| OS-EXT-AZ:availability_zone |
| 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 | 8zeMCA7jWjA2
| config_drive |
| created | 2017-10-13T18:21:20Z
| description | -
| flavor | sanity_flavor (3e2ad0a4-
f094-457d-81ec-1f83a9a7f44d) |
| hostId |
| id | ff93e1a4-
ea01-4c7b-8952-0cebfb3f9ff4
| image | cirros (90dc3459-e253-49a5-b5fe-
e403ce231110)
| key_name | sanity
| locked | False
| metadata | {}
| name | cirros_test_4
| os-extended-volumes:volumes_attached | []
| progress | 0
| security_groups | sanity_security_group
| status | BUILD
| tags | []
| tenant_id | 26c77e1e763b4fecbc1833b9284e4986
| updated | 2017-10-13T18:21:20Z

```

```

| user_id | 4442207de58448938694bdbd7b764cf4
+-----+
+-----+
2017-10-13 14:21:20: INFO: Executing: nova boot --security-groups
sanity_security_group --flavor sanity_flavor --key-name sanity --image
90dc3459-e253-49a5-b5fe-e403ce231110 --nic net-id=e8e22aaf-0ee9-4c82-a295-
f02788e97e8f cirros_test_5
+-----+
+-----+
| Property | Value
+-----+
+-----+
| OS-DCF:diskConfig | MANUAL
| OS-EXT-AZ:availability_zone |
| 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 | UffoJW46qE4d
| config_drive |
| created | 2017-10-13T18:21:23Z
| description | -
| flavor | sanity_flavor (3e2ad0a4-
f094-457d-81ec-1f83a9a7f44d) |
| hostId |
| id | fde7800f-ebdd-44b1-af41-
e164ddff8715 |
| image | cirros (90dc3459-e253-49a5-b5fe-
e403ce231110) |
| key_name | sanity
| locked | False
| metadata | {}
| name | cirros_test_5
| os-extended-volumes:volumes_attached | []
| progress | 0
| security_groups | sanity_security_group
| status | BUILD

```

```

| tags | []
| tenant_id | 26c77ele763b4fecbc1833b9284e4986
| updated | 2017-10-13T18:21:23Z
| user_id | 4442207de58448938694bdbd7b764cf4
+-----+
+-----+
2017-10-13 14:21:24: INFO: ### Waiting for the instances to be built...
2017-10-13 14:21:32: INFO: ### Instances are successfully built
2017-10-13 14:21:32: INFO: Executing: nova list
+-----+
+-----+
+-----+
| ID | Name | Status | Task State |
| Power State | Networks | | |
+-----+
+-----+
| 625b1245-445e-43d0-b4ae-74a925cd95d0 | cirros_test_1 | ACTIVE | -
| Running | tenant_net1=192.168.201.8 |
| c18f6d9e-8a51-49e5-bca7-95f44774798e | cirros_test_2 | ACTIVE | -
| Running | tenant_net1=192.168.201.5 |
| 836clfbb-3ca3-4e13-966f-856622dlc9b5 | cirros_test_3 | ACTIVE | -
| Running | tenant_net1=192.168.201.10 |
| ff93e1a4-ea01-4c7b-8952-0cebfb3f9ff4 | cirros_test_4 | ACTIVE | -
| Running | tenant_net1=192.168.201.14 |
| fde7800f-ebdd-44b1-af41-e164ddff8715 | cirros_test_5 | ACTIVE | -
| Running | tenant_net1=192.168.201.7 |
+-----+
+-----+
2017-10-13 14:21:33: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:21:33: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:21:34: INFO: Setting tenant scope.
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.128' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

2017-10-13 14:21:37: INFO: ### Pinging 192.168.201.7 from netns qdhcp-
e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:37: INFO: Executing: ssh -o StrictHostKeyChecking=no
-o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.133 sudo ip netns exec qdhcp-e8e22aaf-0ee9-4c82-a295-
f02788e97e8f ping -c 1 -w 5 192.168.201.7
Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

PING 192.168.201.7 (192.168.201.7) 56(84) bytes of data.
64 bytes from 192.168.201.7: icmp_seq=1 ttl=64 time=0.227 ms

--- 192.168.201.7 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.227/0.227/0.227/0.000 ms
2017-10-13 14:21:37: INFO: ### Successfully pinged 192.168.201.7 from netns
qdhcp-e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:37: INFO: Allocating floating IP
2017-10-13 14:21:39: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:21:39: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:21:39: INFO: Setting tenant scope.

```



```

2017-10-13 14:21:39: INFO: Executing: neutron floatingip-associate
db9c0bb6-0ebc-4676-90ac-8870981cf741 cel60385-8e28-4d3a-b894-d37055ddabd1
Associated floating IP db9c0bb6-0ebc-4676-90ac-8870981cf741
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.128' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

2017-10-13 14:21:41: INFO: ### Pinging 192.168.201.14 from netns qdhcp-
e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:41: INFO: Executing: ssh -o StrictHostKeyChecking=no
-o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.133 sudo ip netns exec qdhcp-e8e22aaf-0ee9-4c82-a295-
f02788e97e8f ping -c 1 -w 5 192.168.201.14
Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

PING 192.168.201.14 (192.168.201.14) 56(84) bytes of data.
64 bytes from 192.168.201.14: icmp_seq=1 ttl=64 time=0.599 ms

--- 192.168.201.14 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.599/0.599/0.599/0.000 ms
2017-10-13 14:21:41: INFO: ### Successfully pinged 192.168.201.14 from netns
qdhcp-e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:41: INFO: Allocating floating IP
2017-10-13 14:21:43: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:21:43: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:21:43: INFO: Setting tenant scope.
2017-10-13 14:21:43: INFO: Executing: neutron floatingip-associate
013f86a5-20f7-4bf3-b28b-62011f72bab4 28ec9e01-2210-402f-9013-f92b752ddf9c
Associated floating IP 013f86a5-20f7-4bf3-b28b-62011f72bab4
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.128' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

2017-10-13 14:21:46: INFO: ### Pinging 192.168.201.10 from netns qdhcp-
e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:46: INFO: Executing: ssh -o StrictHostKeyChecking=no
-o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.133 sudo ip netns exec qdhcp-e8e22aaf-0ee9-4c82-a295-
f02788e97e8f ping -c 1 -w 5 192.168.201.10
Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

PING 192.168.201.10 (192.168.201.10) 56(84) bytes of data.
64 bytes from 192.168.201.10: icmp_seq=1 ttl=64 time=1.11 ms

--- 192.168.201.10 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.119/1.119/1.119/0.000 ms
2017-10-13 14:21:46: INFO: ### Successfully pinged 192.168.201.10 from netns
qdhcp-e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:46: INFO: Allocating floating IP
2017-10-13 14:21:48: INFO: setting admin scope with: ~/MHTR18BLKrc.

```

```

2017-10-13 14:21:48: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:21:48: INFO: Setting tenant scope.
2017-10-13 14:21:48: INFO: Executing: neutron floatingip-associate
 9e679f7d-591e-45f3-9565-51b240ad9f23 ca3ac3de-46f6-4468-9717-78c6ac6f2415
Associated floating IP 9e679f7d-591e-45f3-9565-51b240ad9f23
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.128' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

2017-10-13 14:21:50: INFO: ### Pinging 192.168.201.5 from netns qdhcp-
e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:50: INFO: Executing: ssh -o StrictHostKeyChecking=no
 -o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.133 sudo ip netns exec qdhcp-e8e22aaf-0ee9-4c82-a295-
f02788e97e8f ping -c 1 -w 5 192.168.201.5
Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

PING 192.168.201.5 (192.168.201.5) 56(84) bytes of data.
64 bytes from 192.168.201.5: icmp_seq=1 ttl=64 time=0.446 ms

--- 192.168.201.5 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.446/0.446/0.446/0.000 ms
2017-10-13 14:21:50: INFO: ### Successfully pinged 192.168.201.5 from netns
 qdhcp-e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:50: INFO: Allocating floating IP
2017-10-13 14:21:52: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:21:52: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:21:53: INFO: Setting tenant scope.
2017-10-13 14:21:53: INFO: Executing: neutron floatingip-associate
 6723b319-3926-4050-a712-34bbf9d2ffc1 b333704f-4bf5-48c5-bebf-e94d3e713db3
Associated floating IP 6723b319-3926-4050-a712-34bbf9d2ffc1
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.128' (ECDSA) to the list of known
hosts.

Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

2017-10-13 14:21:54: INFO: ### Pinging 192.168.201.8 from netns qdhcp-
e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133
2017-10-13 14:21:54: INFO: Executing: ssh -o StrictHostKeyChecking=no
 -o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.133 sudo ip netns exec qdhcp-e8e22aaf-0ee9-4c82-a295-
f02788e97e8f ping -c 1 -w 5 192.168.201.8
Warning: Permanently added '192.168.120.133' (ECDSA) to the list of known
hosts.

PING 192.168.201.8 (192.168.201.8) 56(84) bytes of data.
64 bytes from 192.168.201.8: icmp_seq=1 ttl=64 time=0.606 ms

--- 192.168.201.8 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.606/0.606/0.606/0.000 ms
2017-10-13 14:21:55: INFO: ### Successfully pinged 192.168.201.8 from netns
 qdhcp-e8e22aaf-0ee9-4c82-a295-f02788e97e8f on controller 192.168.120.133

```

```

2017-10-13 14:21:55: INFO: Allocating floating IP
2017-10-13 14:21:57: INFO: setting admin scope with: ~/MHTR18BLKrc.
2017-10-13 14:21:57: INFO: ### sourcing ~/MHTR18BLKrc
2017-10-13 14:21:57: INFO: Setting tenant scope.
2017-10-13 14:21:57: INFO: Executing: neutron floatingip-associate
bdd66e64-299c-4d8c-bd68-4ce467526aeb 40987052-eddf-4595-9bba-aldf9602948f
Associated floating IP bdd66e64-299c-4d8c-bd68-4ce467526aeb
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

2017-10-13 14:22:02: INFO: ### Pinging 100.84.122.72 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
2017-10-13 14:22:02: INFO: Executing: ssh -o StrictHostKeyChecking=no
-o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.138 sudo ip netns exec qrouter-5adcd390-b199-43cf-a32d-
a708bcb1fb50 ping -c 1 -w 5 100.84.122.72
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

PING 100.84.122.72 (100.84.122.72) 56(84) bytes of data.
64 bytes from 100.84.122.72: icmp_seq=1 ttl=64 time=0.615 ms

--- 100.84.122.72 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.615/0.615/0.615/0.000 ms
2017-10-13 14:22:02: INFO: ### Successfully pinged 100.84.122.72 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

2017-10-13 14:22:02: INFO: ### Pinging 100.84.122.82 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
2017-10-13 14:22:02: INFO: Executing: ssh -o StrictHostKeyChecking=no
-o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.138 sudo ip netns exec qrouter-5adcd390-b199-43cf-a32d-
a708bcb1fb50 ping -c 1 -w 5 100.84.122.82
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

PING 100.84.122.82 (100.84.122.82) 56(84) bytes of data.
64 bytes from 100.84.122.82: icmp_seq=1 ttl=64 time=0.704 ms

--- 100.84.122.82 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.704/0.704/0.704/0.000 ms
2017-10-13 14:22:03: INFO: ### Successfully pinged 100.84.122.82 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

2017-10-13 14:22:03: INFO: ### Pinging 100.84.122.73 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
2017-10-13 14:22:03: INFO: Executing: ssh -o StrictHostKeyChecking=no
-o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.138 sudo ip netns exec qrouter-5adcd390-b199-43cf-a32d-
a708bcb1fb50 ping -c 1 -w 5 100.84.122.73
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

PING 100.84.122.73 (100.84.122.73) 56(84) bytes of data.
64 bytes from 100.84.122.73: icmp_seq=1 ttl=64 time=0.869 ms

--- 100.84.122.73 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms

```

```

rtt min/avg/max/mdev = 0.869/0.869/0.869/0.000 ms
2017-10-13 14:22:03: INFO: ### Successfully pinged 100.84.122.73 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

2017-10-13 14:22:03: INFO: ### Pinging 100.84.122.75 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
2017-10-13 14:22:03: INFO: Executing: ssh -o StrictHostKeyChecking=no
-o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.138 sudo ip netns exec qrouter-5adcd390-b199-43cf-a32d-
a708bcb1fb50 ping -c 1 -w 5 100.84.122.75
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

PING 100.84.122.75 (100.84.122.75) 56(84) bytes of data.
64 bytes from 100.84.122.75: icmp_seq=1 ttl=64 time=0.615 ms

--- 100.84.122.75 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.615/0.615/0.615/0.000 ms
2017-10-13 14:22:04: INFO: ### Successfully pinged 100.84.122.75 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

2017-10-13 14:22:04: INFO: ### Pinging 100.84.122.71 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
2017-10-13 14:22:04: INFO: Executing: ssh -o StrictHostKeyChecking=no
-o UserKnownHostsFile=/dev/null -o KbdInteractiveDevices=no heat-
admin@192.168.120.138 sudo ip netns exec qrouter-5adcd390-b199-43cf-a32d-
a708bcb1fb50 ping -c 1 -w 5 100.84.122.71
Warning: Permanently added '192.168.120.138' (ECDSA) to the list of known
hosts.

PING 100.84.122.71 (100.84.122.71) 56(84) bytes of data.
64 bytes from 100.84.122.71: icmp_seq=1 ttl=64 time=0.635 ms

--- 100.84.122.71 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.635/0.635/0.635/0.000 ms
2017-10-13 14:22:04: INFO: ### Successfully pinged 100.84.122.71 from netns
qrouter-5adcd390-b199-43cf-a32d-a708bcb1fb50 on controller 192.168.120.138
2017-10-13 14:22:04: INFO: ### Cinder test
2017-10-13 14:22:04: INFO: Setting tenant scope.
2017-10-13 14:22:04: INFO: Executing: cinder list
+-----+
| ID | Status | Name | Size | Volume Type | Bootable | Attached to |
+-----+
+-----+
2017-10-13 14:22:06: INFO: ### Kicking off volume creation...
2017-10-13 14:22:09: INFO: ### Creating volume volume_test_5
2017-10-13 14:22:09: INFO: Executing: cinder type-list
+-----+
+-----+
| ID | Name | Description |
+-----+
+-----+
| c57d99f2-00de-42c8-a5cd-41011182704c | rbd_backend | - | True
|
+-----+
+-----+

```

```
2017-10-13 14:22:09: INFO: Executing: cinder create --display-name
volume_test_5 1 --volume-type=rbd_backend
```

| Property                     | Value                                |
|------------------------------|--------------------------------------|
| attachments                  | []                                   |
| availability_zone            | nova                                 |
| bootable                     | false                                |
| consistencygroup_id          | None                                 |
| created_at                   | 2017-10-13T18:22:10.000000           |
| description                  | None                                 |
| encrypted                    | False                                |
| id                           | c48d7ace-808d-4d4e-8643-5b2d2fabff36 |
| metadata                     | {}                                   |
| multiattach                  | False                                |
| name                         | volume_test_5                        |
| os-vol-tenant-attr:tenant_id | 26c77ele763b4fecbc1833b9284e4986     |
| replication_status           | disabled                             |
| size                         | 1                                    |
| snapshot_id                  | None                                 |
| source_volid                 | None                                 |
| status                       | creating                             |
| updated_at                   | 2017-10-13T18:22:10.000000           |
| user_id                      | 4442207de58448938694bdbd7b764cf4     |
| volume_type                  | rbd_backend                          |

```
2017-10-13 14:22:11: INFO: ### Creating volume volume_test_4
2017-10-13 14:22:11: INFO: Executing: cinder type-list
```

| ID                                   | Name        | Description |
|--------------------------------------|-------------|-------------|
| Is_Public                            |             |             |
| c57d99f2-00de-42c8-a5cd-41011182704c | rbd_backend | -           |
|                                      |             | True        |

```
2017-10-13 14:22:11: INFO: Executing: cinder create --display-name
volume_test_4 1 --volume-type=rbd_backend
```

| Property                     | Value                                 |
|------------------------------|---------------------------------------|
| attachments                  | []                                    |
| availability_zone            | nova                                  |
| bootable                     | false                                 |
| consistencygroup_id          | None                                  |
| created_at                   | 2017-10-13T18:22:12.000000            |
| description                  | None                                  |
| encrypted                    | False                                 |
| id                           | 79bbbed71-6941-4610-9031-39ed2946d2fc |
| metadata                     | {}                                    |
| multiattach                  | False                                 |
| name                         | volume_test_4                         |
| os-vol-tenant-attr:tenant_id | 26c77ele763b4fecbc1833b9284e4986      |
| replication_status           | disabled                              |
| size                         | 1                                     |
| snapshot_id                  | None                                  |
| source_volid                 | None                                  |
| status                       | available                             |
| updated_at                   | 2017-10-13T18:22:12.000000            |
| user_id                      | 4442207de58448938694bdbd7b764cf4      |
| volume_type                  | rbd_backend                           |

```

2017-10-13 14:22:14: INFO: ### Creating volume volume_test_3
2017-10-13 14:22:14: INFO: Executing: cinder type-list
+-----+
+-----+
| ID | Name | Description |
| Is_Public | | |
+-----+
+-----+
| c57d99f2-00de-42c8-a5cd-41011182704c | rbd_backend | - | True
| | | |
+-----+
+-----+
2017-10-13 14:22:14: INFO: Executing: cinder create --display-name
volume_test_3 1 --volume-type=rbd_backend
+-----+
+-----+
| Property | Value |
+-----+
attachments	[]
availability_zone	nova
bootable	false
consistencygroup_id	None
created_at	2017-10-13T18:22:15.000000
description	None
encrypted	False
id	79d0ce2b-ef49-4640-8d45-96f88ecd1a32
metadata	{}
multiattach	False
name	volume_test_3
os-vol-tenant-attr:tenant_id	26c77e1e763b4fecbc1833b9284e4986
replication_status	disabled
size	1
snapshot_id	None
source_volid	None
status	creating
updated_at	2017-10-13T18:22:15.000000
user_id	4442207de58448938694bdbd7b764cf4
volume_type	rbd_backend
+-----+	
2017-10-13 14:22:16: INFO: ### Creating volume volume_test_2	
2017-10-13 14:22:16: INFO: Executing: cinder type-list	
+-----+	
+-----+	
ID	Name
Is_Public	
+-----+	
+-----+	
c57d99f2-00de-42c8-a5cd-41011182704c	rbd_backend
+-----+	
+-----+	
2017-10-13 14:22:17: INFO: Executing: cinder create --display-name	
volume_test_2 1 --volume-type=rbd_backend	
+-----+	
+-----+	
Property	Value
+-----+	
attachments	[]
availability_zone	nova
bootable	false
consistencygroup_id	None
created_at	2017-10-13T18:22:18.000000
description	None
encrypted	False
id	4c17b29d-d866-4d5f-a40c-7e8031ec07c4
metadata	{}

```

```

multiattach False
name volume_test_2
os-vol-tenant-attr:tenant_id 26c77ele763b4fecbc1833b9284e4986
replication_status disabled
size 1
snapshot_id None
source_volid None
status creating
updated_at None
user_id 4442207de58448938694bdbd7b764cf4
volume_type rbd_backend
+-----+
2017-10-13 14:22:19: INFO: ### Creating volume volume_test_1
2017-10-13 14:22:19: INFO: Executing: cinder type-list
+-----+
+-----+
| ID | Name | Description |
+-----+
| Is_Public |
+-----+
| c57d99f2-00de-42c8-a5cd-41011182704c | rbd_backend | - | True
+-----+
+-----+
2017-10-13 14:22:19: INFO: Executing: cinder create --display-name
volume_test_1 1 --volume-type=rbd_backend
+-----+
+-----+
| Property | Value |
+-----+
+-----+
attachments	[]
availability_zone	nova
bootable	false
consistencygroup_id	None
created_at	2017-10-13T18:22:21.000000
description	None
encrypted	False
id	866f999b-2099-4932-a27a-c3f762dc9c41
metadata	{}
multiattach	False
name	volume_test_1
os-vol-tenant-attr:tenant_id	26c77ele763b4fecbc1833b9284e4986
replication_status	disabled
size	1
snapshot_id	None
source_volid	None
status	creating
updated_at	2017-10-13T18:22:21.000000
user_id	4442207de58448938694bdbd7b764cf4
volume_type	rbd_backend
+-----+	
+-----+	
2017-10-13 14:22:21: INFO: Executing: cinder list	
+-----+	
+-----+	
ID	Status
+-----+	
Volume Type	Bootable
+-----+	
+-----+	
4c17b29d-d866-4d5f-a40c-7e8031ec07c4	available
rbd_backend	false
79bbbed71-6941-4610-9031-39ed2946d2fc	available
rbd_backend	false
79d0ce2b-ef49-4640-8d45-96f88ecd1a32	available
rbd_backend	false

```

```

866f999b-2099-4932-a27a-c3f762dc9c41	available	volume_test_1	1
rbd_backend	false		
c48d7ace-808d-4d4e-8643-5b2d2fabff36	available	volume_test_5	1
rbd_backend	false		
+-----+-----+-----+-----+			
+-----+-----+-----+-----+			
2017-10-13 14:22:22: INFO: ### Waiting for volumes status to change to			
available...			
2017-10-13 14:22:22: INFO: ### Attaching volumes to instances...			
2017-10-13 14:22:25: INFO: Executing: nova volume-attach fde7800f-ebdd-44b1-			
af41-e164ddff8715 c48d7ace-808d-4d4e-8643-5b2d2fabff36 /dev/vdb			
+-----+-----+-----+-----+			
Property	Value		
+-----+-----+-----+-----+			
device	/dev/vdb		
id	c48d7ace-808d-4d4e-8643-5b2d2fabff36		
serverId	fde7800f-ebdd-44b1-af41-e164ddff8715		
volumeId	c48d7ace-808d-4d4e-8643-5b2d2fabff36		
+-----+-----+-----+-----+			
2017-10-13 14:22:27: INFO: Volume volume_test_5 attached to cirros_test_5.			
ssh in and verify			
2017-10-13 14:22:27: INFO: Executing: nova volume-attach ff93ela4-			
ea01-4c7b-8952-0cebfb3f9ff4 79bbbed71-6941-4610-9031-39ed2946d2fc /dev/vdb			
+-----+-----+-----+-----+			
Property	Value		
+-----+-----+-----+-----+			
device	/dev/vdb		
id	79bbbed71-6941-4610-9031-39ed2946d2fc		
serverId	ff93ela4-ea01-4c7b-8952-0cebfb3f9ff4		
volumeId	79bbbed71-6941-4610-9031-39ed2946d2fc		
+-----+-----+-----+-----+			
2017-10-13 14:22:30: INFO: Volume volume_test_4 attached to cirros_test_4.			
ssh in and verify			
2017-10-13 14:22:31: INFO: Executing: nova volume-attach			
836clfbb-3ca3-4e13-966f-856622d1c9b5 79d0ce2b-ef49-4640-8d45-96f88ecd1a32 /			
dev/vdb			
+-----+-----+-----+-----+			
Property	Value		
+-----+-----+-----+-----+			
device	/dev/vdb		
id	79d0ce2b-ef49-4640-8d45-96f88ecd1a32		
serverId	836clfbb-3ca3-4e13-966f-856622d1c9b5		
volumeId	79d0ce2b-ef49-4640-8d45-96f88ecd1a32		
+-----+-----+-----+-----+			
2017-10-13 14:22:32: INFO: Volume volume_test_3 attached to cirros_test_3.			
ssh in and verify			
2017-10-13 14:22:33: INFO: Executing: nova volume-attach c18f6d9e-8a51-49e5-			
bca7-95f44774798e 4c17b29d-d866-4d5f-a40c-7e8031ec07c4 /dev/vdb			
+-----+-----+-----+-----+			
Property	Value		
+-----+-----+-----+-----+			
device	/dev/vdb		
id	4c17b29d-d866-4d5f-a40c-7e8031ec07c4		
serverId	c18f6d9e-8a51-49e5-bca7-95f44774798e		
volumeId	4c17b29d-d866-4d5f-a40c-7e8031ec07c4		
+-----+-----+-----+-----+			
2017-10-13 14:22:35: INFO: Volume volume_test_2 attached to cirros_test_2.			
ssh in and verify			
2017-10-13 14:22:35: INFO: Executing: nova volume-attach 625b1245-445e-43d0-			
b4ae-74a925cd95d0 866f999b-2099-4932-a27a-c3f762dc9c41 /dev/vdb			
+-----+-----+-----+-----+			
Property	Value		
+-----+-----+-----+-----+			
device	/dev/vdb		

```



```

id	866f999b-2099-4932-a27a-c3f762dc9c41
serverId	625b1245-445e-43d0-b4ae-74a925cd95d0
volumeId	866f999b-2099-4932-a27a-c3f762dc9c41
+-----+
2017-10-13 14:22:39: INFO: Volume volume_test_1 attached to cirros_test_1.
ssh in and verify
2017-10-13 14:22:39: INFO: ### RadosGW test
2017-10-13 14:22:39: INFO: Setting tenant scope.
2017-10-13 14:22:39: INFO: Executing: swift post sanity_container_1
2017-10-13 14:22:39: INFO: Executing: swift list
sanity_container_1
2017-10-13 14:22:39: INFO: Executing: swift upload sanity_container_1
test_file
test_file
2017-10-13 14:22:40: INFO: Executing: swift list sanity_container_1
test_file
2017-10-13 14:22:41: INFO: #####VALIDATION SUCCESS#####
2017-10-13 14:22:41: INFO: ##### Done #####

```



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# Appendix

# E

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## References

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### Topics:

- [To Learn More](#)

Additional information can be obtained at <http://www.dell.com/en-us/work/learn/openstack-cloud> or by e-mailing [openstack@dell.com](mailto:openstack@dell.com).

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