05 2015

Brocade VCS Plugin Deployment Guide

**In Mirantis OpenStack v6.0 Environment**

Copyright © 2012 Brocade Communications Systems, Inc. All Rights Reserved.

Brocade, the B-wing symbol, BigIron, DCX, Fabric OS, FastIron, NetIron, SAN Health, ServerIron, and TurboIron are registered trademarks, and Brocade Assurance, Brocade NET Health, Brocade One, CloudPlex, MLX, VCS, VDX, and When the Mission Is Critical, the Network Is Brocade are trademarks of Brocade Communications Systems, Inc., in the United States and/or in other countries. Other brands, products, or service names mentioned are or may be trademarks or service marks of their respective owners.

Notice: This document is for informational purposes only and does not set forth any warranty, expressed or implied, concerning any equipment, equipment feature, or service offered or to be offered by Brocade. Brocade reserves the right to make changes to this document at any time, without notice, and assumes no responsibility for its use. This informational document describes features that may not be currently available. Contact a Brocade sales office for information on feature and product availability. Export of technical data contained in this document may require an export license from the United States government.

The authors and Brocade Communications Systems, Inc. shall have no liability or responsibility to any person or entity with respect to any loss, cost, liability, or damages arising from the information contained in this book or the computer programs that accompany it.

The product described by this document may contain “open source” software covered by the GNU General Public License or other open source license agreements. To find out which open source software is included in Brocade products, view the licensing terms applicable to the open source software, and obtain a copy of the programming source code, please visit <http://www.brocade.com/support/oscd>.

# Preface

This document is a deployment guide for implementing a Brocade VCS Plugin, including the key features and options supported NOS device. It is written for technology decision-makers, architects, systems engineers, NOC engineers and other experts responsible for network upgrades and migration.

This document provides step-by-step examples to prepare, perform, and verify the deployment of a Brocade VCS Plugin. It is assumed that the reader is familiar with establishing console access and entering commands using the Brocade CLI.

## Overview

Brocade provides a network service to OpenStack community by providing plugin to communicate with VCS/VDX devices. This Plugin supports management of L2 network and L3 router on VCS/VDX devices. Plugin provides the services provided by OpenvSwitch to create the VLAN bridges on Compute Nodes. This plugin deploys VLAN configuration and AMPP (Automatic migration of Port Profiles) configurations in the VCS device.

SVI support will be implemented using Openstack [L3 extension API](http://docs.openstack.org/api/openstack-network/2.0/content/router_ext.html). The l3 service framework will be used to create the router, add the subnet to VLAN.

## Document History

**Date Version Description**

2015-05-07 1.0 Initial Release

# About Brocade

Brocade® (NASDAQ: BRCD) networking solutions help the world’s leading organizations transition smoothly to a world where applications and information reside anywhere. This vision is designed to deliver key business benefits such as unmatched simplicity, non-stop networking, application optimization, and investment protection.

Innovative Ethernet and storage networking solutions for datacenter, campus, and service provider networks help reduce complexity and cost while enabling virtualization and cloud computing to increase business agility.

To help ensure a complete solution, Brocade partners with world-class IT companies and provides comprehensive education, support, and professional services offerings. ([www.brocade.com](http://www.brocade.com/))

Table of Contents

[Brocade VCS Plugin Deployment Guide 1](#_Toc418787434)

[Preface 3](#_Toc418787435)

[Overview 3](#_Toc418787436)

[Document History 3](#_Toc418787437)

[About Brocade 3](#_Toc418787438)

[Network Topology 6](#_Toc418787439)

[Prerequisites 6](#_Toc418787440)

[Support Matrix 6](#_Toc418787441)

[APIs serviced by Brocade VCS L2 Plugin: 8](#_Toc418787442)

[Create\_Network 8](#_Toc418787443)

[Create\_Port 8](#_Toc418787444)

[Delete\_Network 8](#_Toc418787445)

[Delete\_Port 8](#_Toc418787446)

[APIs serviced by Brocade VCS L3 Plugin: 8](#_Toc418787447)

[Create\_router, Update\_router -> 8](#_Toc418787448)

[add\_interface\_to\_router -> 8](#_Toc418787449)

[Remove\_interface\_from\_router -> 8](#_Toc418787450)

[Delete\_router -> 8](#_Toc418787451)

[Master Node Configuration: 8](#_Toc418787452)

[Configuration Check – Brocade VCS Device Configurations: 9](#_Toc418787453)

[Eth0 Configurations: 10](#_Toc418787454)

[Eth2 Configurations: 10](#_Toc418787455)

[Eth3 Configurations: 11](#_Toc418787456)

[Other Brocade VCS Commands: 11](#_Toc418787457)

[Configuration Check – Brocade VCS Plugin code and ncclient: 13](#_Toc418787458)

[Configuration Check – Neutron Configuration Files: 13](#_Toc418787459)

[/etc/neutron/neutron.conf 13](#_Toc418787460)

[/etc/neutron/plugins/openvswitch/ovs\_neutron\_plugin.ini (Only on the compute nodes) 14](#_Toc418787461)

[/etc/neutron/plugins/ml2/ml2\_conf.ini 14](#_Toc418787462)

[ovs configuration 14](#_Toc418787463)

[SVI - L3 Networking driver. 16](#_Toc418787464)

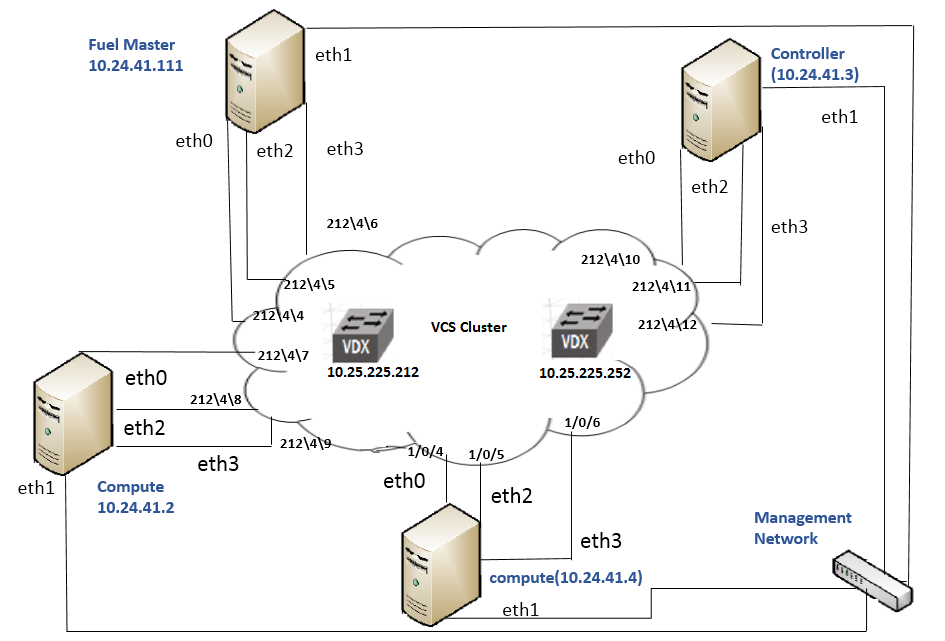
[Test Report 18](#_Toc418787465)

[Health Check Results 19](#_Toc418787466)

[Note : 21](#_Toc418787467)

[Support Details 21](#_Toc418787468)

# Network Topology



## Prerequisites

1. A user can download MOS version with or without purchasing a support contract (subscription) from Mirantis <http://software.mirantis.com/>
2. More details about System/Hardware requirements, recommended configurations and setting up the environment are available at <http://docs.mirantis.com/openstack/fuel/fuel-6.0/>

# Support Matrix

|  |  |
| --- | --- |
| **Environment** | **Description** |
| **Supported VCS Devices** | VDX6710, VDX6720, VDX6730  VDX8770,  VDX6740, VDX6740T |
| **Supported NOS Versions** | NOS4.0.x /NOS5.0.x |
| **Supported VCS Cluster Mode** | Logical Chassis |
| **Supported OS Platform** | Ubuntu 12.04 LTS |
| **Upstream OpenStack Versions** | 2014.2 (JUNO) |
| **VLAN Limit/Range** | 1 - 4096 |
| **Mirantis OpenStack Version** | 6.x |

# APIs serviced by Brocade VCS L2 Plugin:

List of API calls that are serviced by Brocade VCS plugin are –

Create\_Network **->** Using this API, Brocade Plugin will create a VLAN on VCS device

Create\_Port **->** Using this API, Brocade Plugin will create a Virtual machine on the compute node corresponding to the VLAN (selected network) on the VCS device

Delete\_Network **->** Using this API, Brocade Plugin will delete the VLAN on the VCS device corresponding to that Network

Delete\_Port **->** Using this API, Brocade Plugin will delete the Virtual machine on the compute node and clear the port association for the VLAN (selected network) on the VCS device

# APIs serviced by Brocade VCS L3 Plugin:

List of API calls that are serviced by Brocade VCS L3 plugin are –

Create\_router, Update\_router ->create\_router and update\_router methods will set the admin\_state state as down

add\_interface\_to\_router ->Openstack subnet\_id is provided in the request parameters. Using this API, Brocade Plugin will create ve interface and assign gateway ip of the subnet to the VCS device

Remove\_interface\_from\_router ->Using this API, Brocade Plugin will remove ve interface along with assigned gateway ip of the subnet from VCS device

Delete\_router ->This method is used to clean up the NETCONF, db connection and any caches.

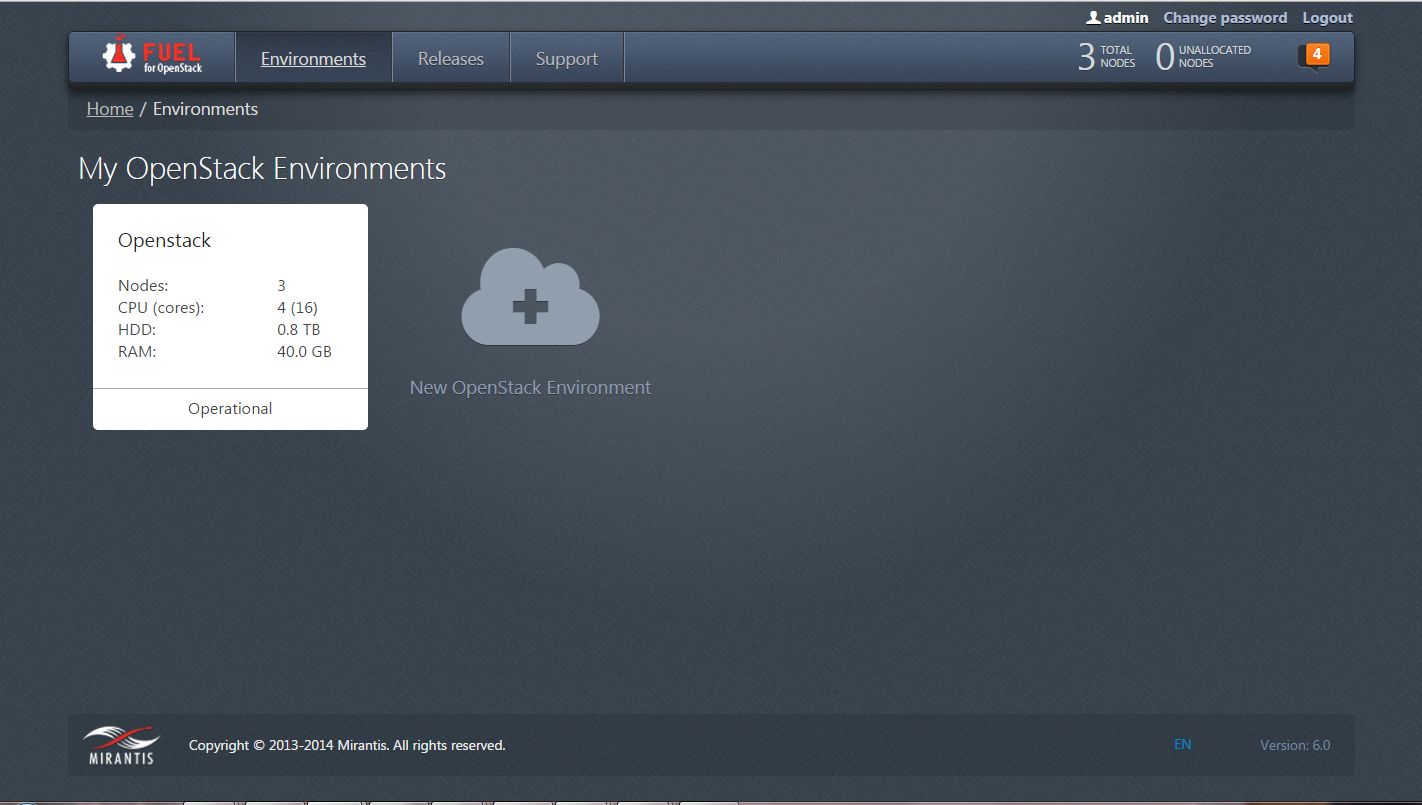
# Master Node Configuration:

Master Node is the primary node, which manages all the Controller and Compute nodes and is responsible for

* Deploying the OS (Operating System) in the Controller and Compute nodes using PXE boot
* Deploying the Controller and Compute node configuration easily through Fuel UI
* Checking the status of the Controller and Compute nodes regularly

OpenStack deployment is made easier through intuitive UI called Fuel UI which is hosted in the Master Node. Fuel UI can also provide options for Network settings, Health Check and Logs tracking. Below are the step by step procedures for configuration and troubleshooting Controller and Compute nodes using Fuel UI.

1. Create Environment – click on the ‘New OpenStack Environment’ cloud icon. Environment can be able to Reset or Delete using ‘Actions’ tab



# Configuration Check – Brocade VCS Device Configurations:

Login to the switch 10.25.225.212 with username and password as admin/password.

Associate the vlan in the interfaces as follows,

VDX device connection to Fuel Master Node:

sw0(config)# interface TenGigabitEthernet 212/4/4

sw0(conf-if-te-212/4/4)# switchport  
sw0(conf-if-te-212/4/4)# switchport mode access

sw0(conf-if-te-212/4/4)# switchport access vlan 100

sw0(conf-if-te-212/4/4)#no shutdown

sw0(conf-if-te-212/4/4)#exit

sw0(config)# interface TenGigabitEthernet 212/4/5

sw0(conf-if-te-212/4/5)# switchport

sw0(conf-if-te-212/4/5)#switchport mode trunk  
sw0(conf-if-te-212/4/5)# switchport trunk allowed vlan add 101-102

sw0(conf-if-te-212/4/5)# switchport trunk tag native-vlan

sw0(conf-if-te-212/4/5)#no shutdown

sw0(conf-if-te-212/4/5)#exit

sw0(config)#interface TenGigabitEthernet 212/4/6

sw0(conf-if-te-212/4/6)#port-profile-port

sw0(conf-if-te-212/4/6)#no shutdown

sw0(conf-if-te-212/4/6)#exit

VDX device connection to Slave Node 1:

sw0(config)# interface TenGigabitEthernet 212/4/10

sw0(conf-if-te-212/4/10)# switchport  
sw0(conf-if-te-212/4/10)# switchport mode access

sw0(conf-if-te-212/4/10)# switchport access vlan 100

sw0(conf-if-te-212/4/10)#no shutdown

sw0(conf-if-te-212/4/10)#exit

sw0(config)# interface TenGigabitEthernet 212/4/11

sw0(conf-if-te-212/4/11)# switchport

sw0(conf-if-te-212/4/11)#switchport mode trunk  
sw0(conf-if-te-212/4/11)# switchport trunk allowed vlan add 101-102

sw0(conf-if-te-212/4/11)# switchport trunk tag native-vlan

sw0(conf-if-te-212/4/11)#no shutdown

sw0(conf-if-te-212/4/11)#exit

sw0(config)#interface TenGigabitEthernet 212/4/12

sw0(conf-if-te-212/4/12)#port-profile-port

sw0(conf-if-te-212/4/12)#no shutdown

sw0(conf-if-te-212/4/12)#exit

VDX device connection to Slave Node 2:

sw0(config)# interface TenGigabitEthernet 212/4/7

sw0(conf-if-te-212/4/7)# switchport  
sw0(conf-if-te-212/4/7)# switchport mode access

sw0(conf-if-te-212/4/7)# switchport access vlan 100

sw0(conf-if-te-212/4/7)#no shutdown

sw0(conf-if-te-212/4/7)#exit

sw0(config)# interface TenGigabitEthernet 212/4/8

sw0(conf-if-te-212/4/8)# switchport

sw0(conf-if-te-212/4/8)#switchport mode trunk  
sw0(conf-if-te-212/4/8)# switchport trunk allowed vlan add 101-102

sw0(conf-if-te-212/4/8)# switchport trunk tag native-vlan

sw0(conf-if-te-212/4/8)#no shutdown

sw0(conf-if-te-212/4/8)#exit

sw0(config)#interface TenGigabitEthernet 212/4/9

sw0(conf-if-te-212/4/9)#port-profile-port

sw0(conf-if-te-212/4/9)#no shutdown

sw0(conf-if-te-212/4/9)#exit

## Eth0 Configurations:

VCS ports which are connected to eth0 (Admin PXE) of the servers should be configured with Access mode configurations as below –verify it by the command

sw0#show running-config interface TenGigabitEthernet 212/4/4

interface TenGigabitEthernet 212/4/4

fabric isl enable

fabric trunk enable

switchport

switchport mode access

switchport access vlan 100

spanning-tree shutdown

no shutdown

## Eth2 Configurations:

VCS ports which are connected to eth2 (Private, Management and Storage networks) of the servers should be configured with Trunk mode configurations as below – verify it by the command

sw0#show running-config interface TenGigabitEthernet 212/4/5

interface TenGigabitEthernet 212/4/5

fabric isl enable

fabric trunk enable

switchport

switchport mode trunk

switchport trunk allowed vlan add 101-102

switchport trunk tag native-vlan

spanning-tree shutdown

no shutdown

## Eth3 Configurations:

VCS ports which are connected to eth3 of the servers should be configured with Profile mode and this is the Brocade plugin’s functionality- verify it by the command

sw0#show running-config interface TenGigabitEthernet 212/4/6

interface TenGigabitEthernet 212/4/6

fabric isl enable

fabric trunk enable

port-profile-port

no shutdown

## Other Brocade VCS Commands:

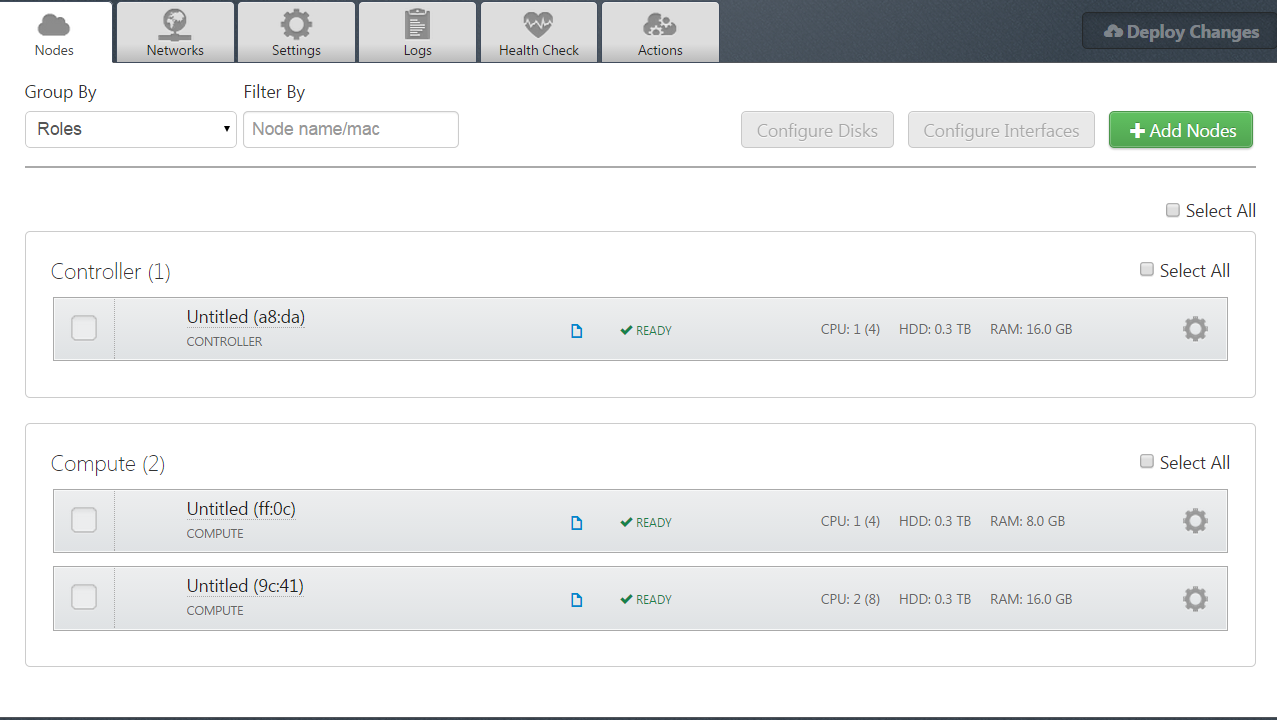
Below are the VCS commands to verify the VLAN and Port Profile configurations

#show vlan brief

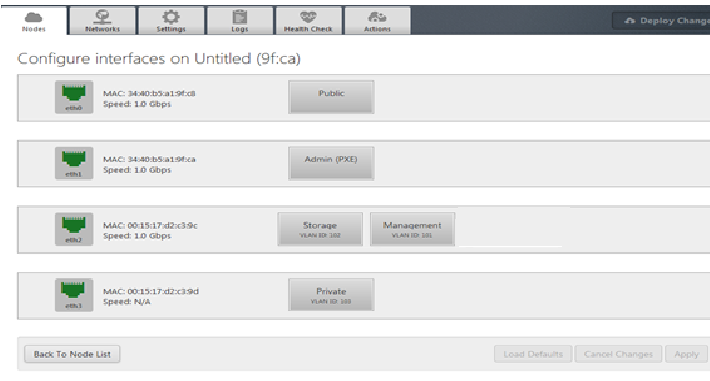
#show port-profile status

#show mac-address-table

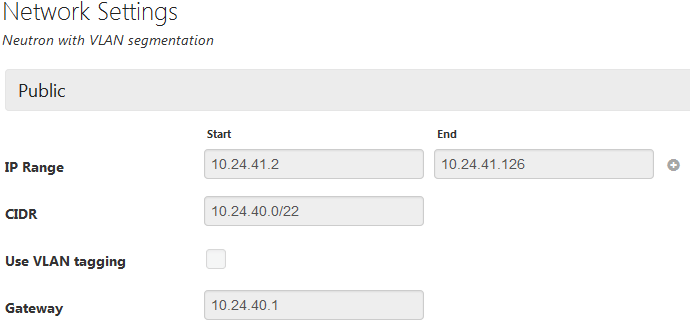
1. Make sure nodes are detected in Master Node. Click on ‘Add Nodes’, to assign the Roles to the discovered nodes.

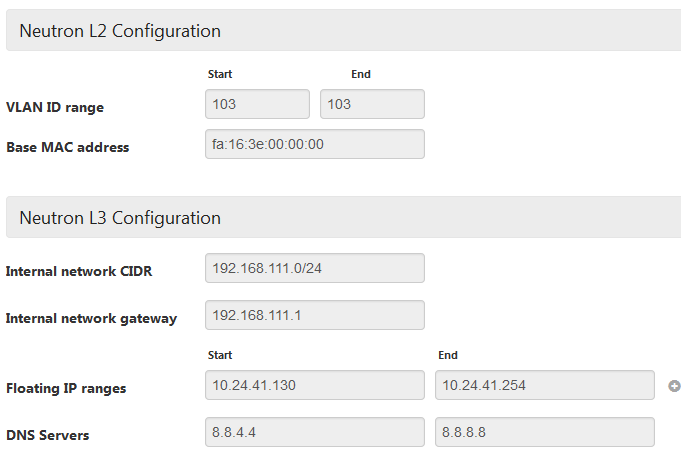


1. Public, Admin, Private, Storage and Management networks can be associated to their respective Ethernet interfaces using ‘Configure Interfaces’ option.

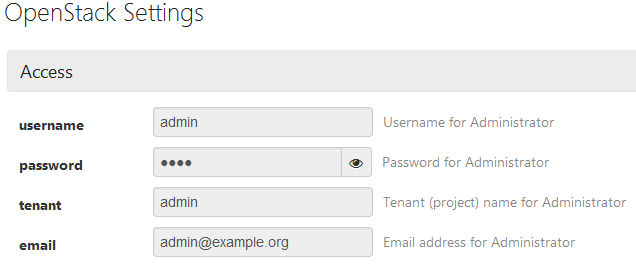
****

1. Verify Networks tab is populated with correct values

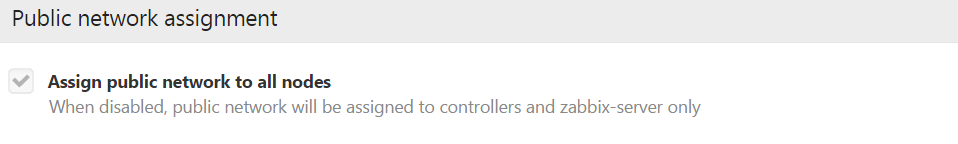




1. Horizon credentials can be configured in Master node as –



1. Public network can be assigned to all node as



1. Click on ‘Deploy Changes’ button

# Configuration Check – Brocade VCS Plugin code and ncclient:

1. Verify the presence of Brocade VCS ML2 plugin code at location /usr/lib/python2.7/dist-packages/neutron/plugins/ml2/drivers/brocade and compare the files with Ice House upstream.

Make sure the below code is available at nosdriver.py file

**/usr/lib/python2.7/dist-packages/neutron/plugins/ml2/drivers/brocade/nos/nosdriver.py**

1. On the controller node, install the netconf client (ncclient) which is required to communicate with the Brocade VCS cluster

# apt-get install git

# git clone <https://code.grnet.gr/git/ncclient>

# cd ncclient && python setup.py install

# Configuration Check – Neutron Configuration Files:

Make sure below mentioned configurations are done in respective configuration files in Controller and Compute nodes

## /etc/neutron/neutron.conf

[database]

connection = mysql://neutron:password@192.168.0.3:3306/neutron\_ml2?read\_timeout=60

## /etc/neutron/plugins/openvswitch/ovs\_neutron\_plugin.ini (Only on the compute nodes)

[ovs]

tenant\_network\_type = vlan

network\_vlan\_ranges =physnet1:400:600

integration\_bridge = br-int

bridge\_mappings =physnet1:br-eth3

## /etc/neutron/plugins/ml2/ml2\_conf.ini

[ml2]

tenant\_network\_types = vlan,flat,local

type\_drivers = vlan,flat,local

mechanism\_drivers = openvswitch,brocade

[ml2\_brocade]

#VCS cluster credential

username = admin

password = password

address = 10.25.225.133

ostype = NOS

physical\_networks = physnet1

## ovs configuration

Make sure ovs-vsctl lists the required bridge configurations as below -

root@node-18:~# ovs-vsctl show

583bdc4f-52d0-493a-8d51-a613a4da6c9a

Bridge "br-eth2"

Port "br-eth2"

Interface "br-eth2"

type: internal

Port "br-eth2--br-storage"

tag: 102

Interface "br-eth2--br-storage"

type: patch

options: {peer="br-storage--br-eth2"}

Port "br-eth2--br-mgmt"

tag: 101

Interface "br-eth2--br-mgmt"

type: patch

options: {peer="br-mgmt--br-eth2"}

Port "eth2"

Interface "eth2"

Port "br-eth2--br-prv"

Interface "br-eth2--br-prv"

type: patch

options: {peer="br-prv--br-eth2"}

Bridge br-mgmt

Port "br-mgmt--br-eth2"

Interface "br-mgmt--br-eth2"

type: patch

options: {peer="br-eth2--br-mgmt"}

Port br-mgmt

Interface br-mgmt

type: internal

Bridge "br-eth0"

Port "br-eth0"

Interface "br-eth0"

type: internal

Port "br-eth0--br-ex"

trunks: [0]

Interface "br-eth0--br-ex"

type: patch

options: {peer="br-ex--br-eth0"}

Port "eth0"

Interface "eth0"

Bridge "br-eth1"

Port "br-eth1--br-fw-admin"

trunks: [0]

Interface "br-eth1--br-fw-admin"

type: patch

options: {peer="br-fw-admin--br-eth1"}

Port "eth1"

Interface "eth1"

Port "br-eth1"

Interface "br-eth1"

type: internal

Bridge br-ex

Port "br-ex--br-eth0"

trunks: [0]

Interface "br-ex--br-eth0"

type: patch

options: {peer="br-eth0--br-ex"}

Port br-ex

Interface br-ex

type: internal

Port "qg-83437e93-e0"

Interface "qg-83437e93-e0"

type: internal

Port phy-br-ex

Interface phy-br-ex

Bridge br-int

Port "int-br-eth3"

Interface "int-br-eth3"

Port int-br-prv

Interface int-br-prv

Port br-int

Interface br-int

type: internal

Port int-br-ex

Interface int-br-ex

Port "tap373e4404-77"

tag: 6

Interface "tap373e4404-77"

type: internal

Bridge br-storage

Port br-storage

Interface br-storage

type: internal

Port "br-storage--br-eth2"

Interface "br-storage--br-eth2"

type: patch

options: {peer="br-eth2--br-storage"}

Bridge br-prv

Port phy-br-prv

Interface phy-br-prv

Port "br-prv--br-eth2"

Interface "br-prv--br-eth2"

type: patch

options: {peer="br-eth2--br-prv"}

Port br-prv

Interface br-prv

type: internal

Bridge br-fw-admin

Port "br-fw-admin--br-eth1"

trunks: [0]

Interface "br-fw-admin--br-eth1"

type: patch

options: {peer="br-eth1--br-fw-admin"}

Port br-fw-admin

Interface br-fw-admin

type: internal

Bridge "br-eth3"

Port "phy-br-eth3"

Interface "phy-br-eth3"

Port "eth3"

Interface "eth3"

Port "br-eth3"

Interface "br-eth3"

type: internal

ovs\_version: "1.10.1"

# SVI - L3 Networking driver.

This section describes how SVI feature can be leveraged to provide internetworking between networks configured using OpenStack.

Edit /etc/neutron/neutron.conf

service\_plugins = neutron.services.l3\_router.brocade.l3\_router\_plugin.BrocadeSVIPlugin

A new field has been added to the existing fields in brocade.ini file.

Add the below configuration in both /etc/neutron/plugins/ml2/ml2\_conf.ini and /etc/neutron/plugins/ml2/ml2\_conf\_brocade.ini

rbridge\_id = <rbridge id of vcs device>

This field indicates the Rbridge on which the SVI interfaces would get created.

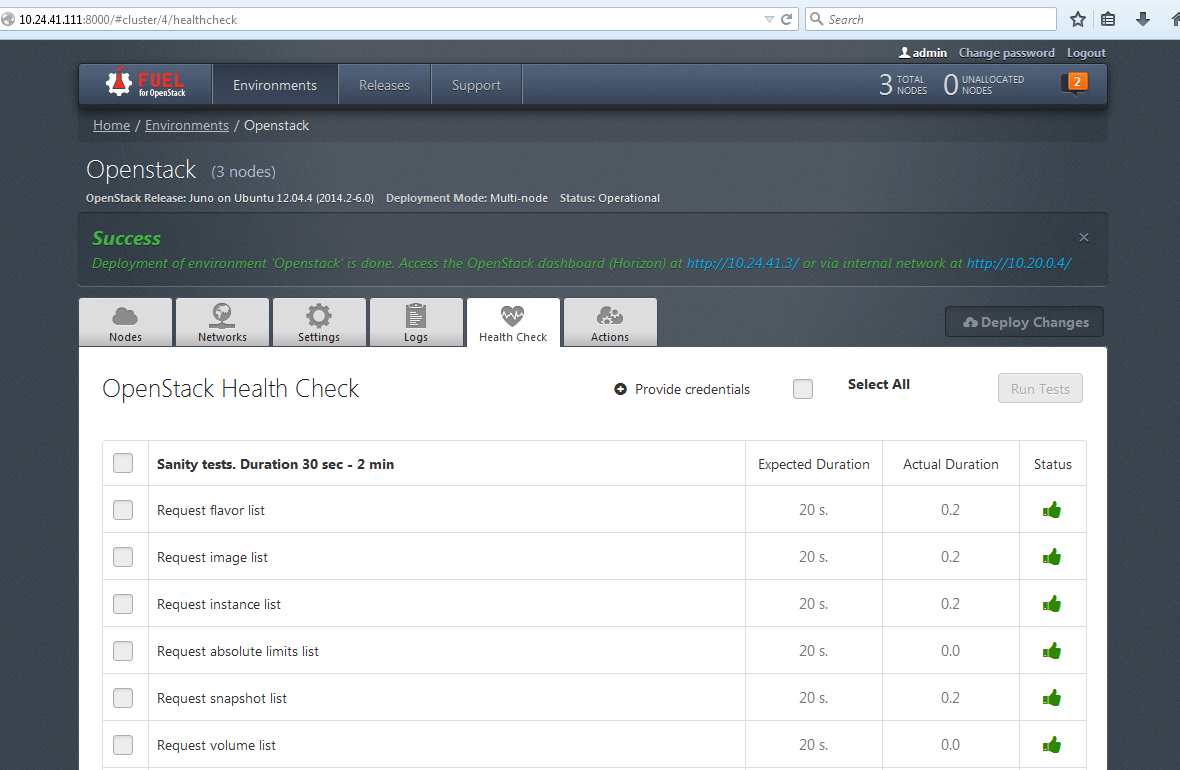
# Test Report

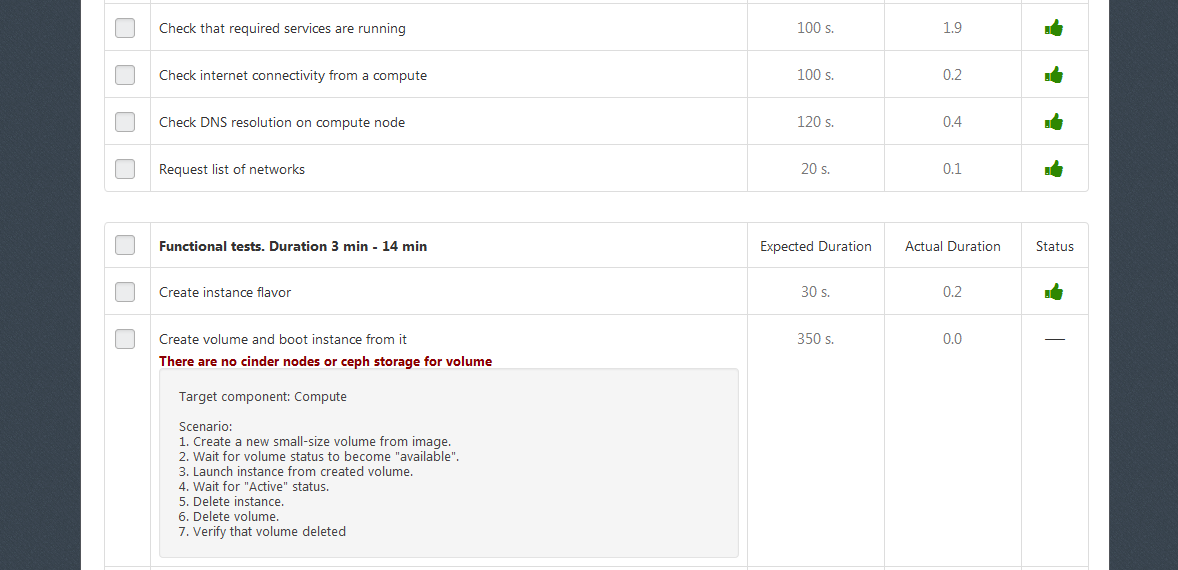
Below are the functionality test cases that are tested as part of Brocade VCS Plugin in the Mirantis OpenStack Environment.

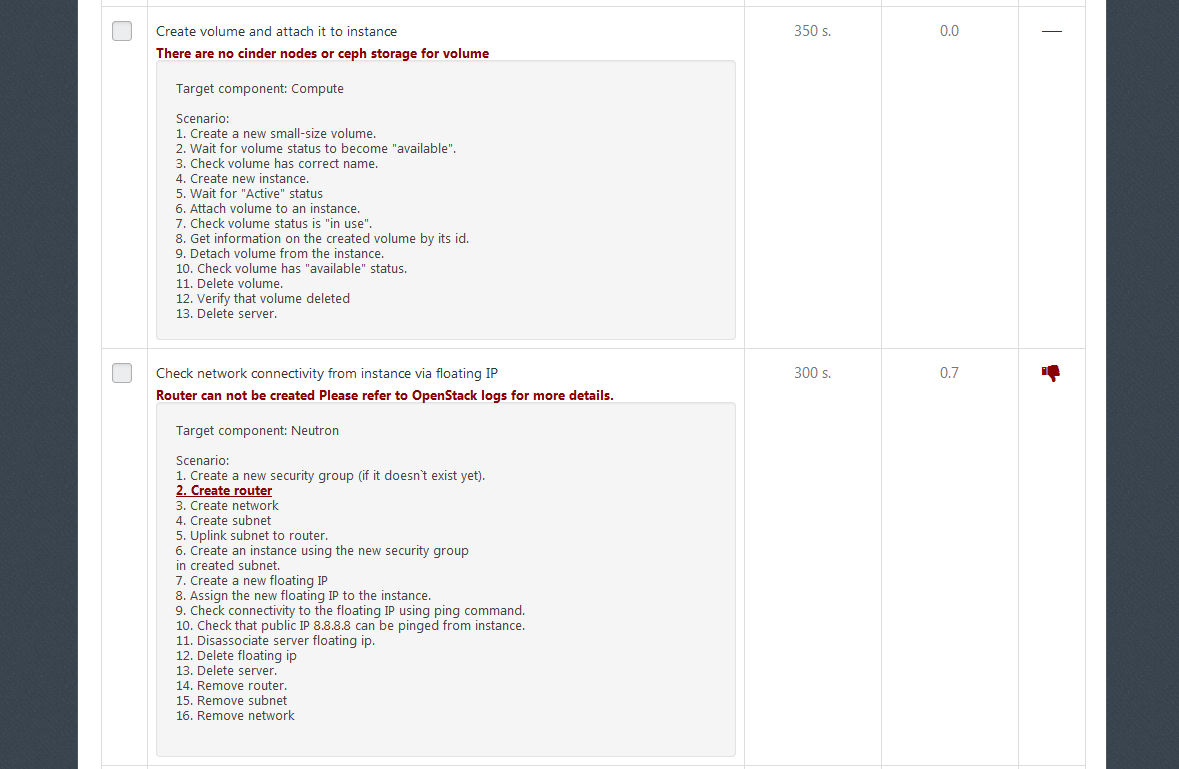


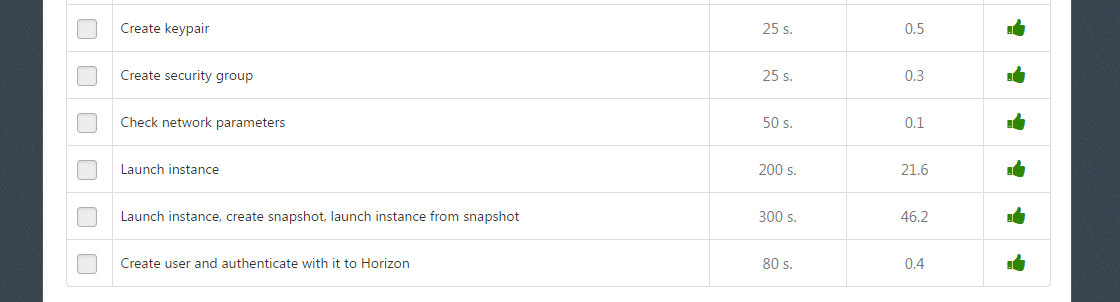
# Health Check Results

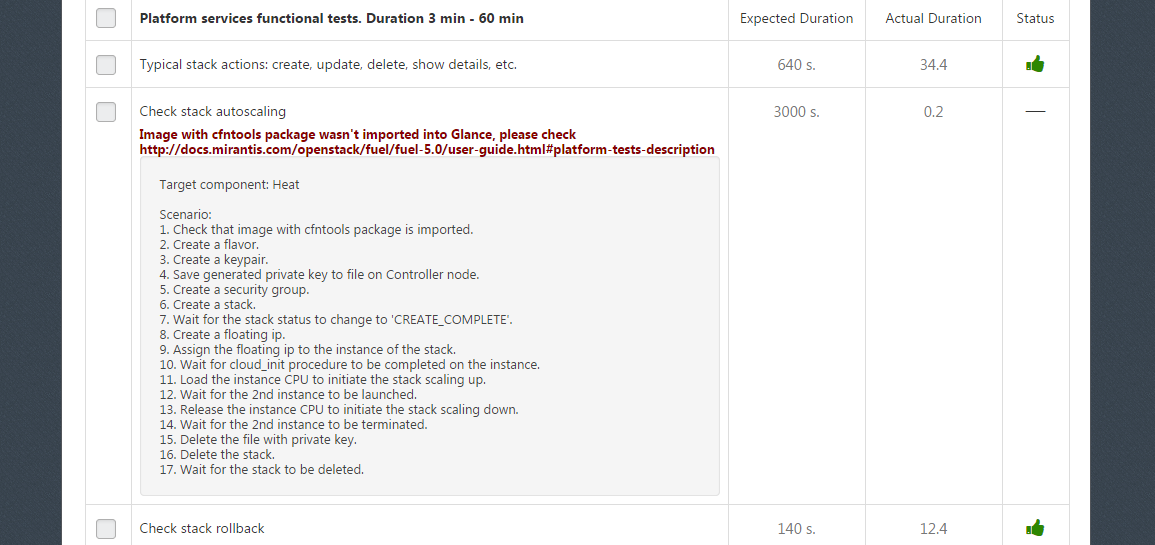
Health Check has been run after configuring the Brocade VCS Plugin in the Mirantis Open Stack environment and below are the snapshots -











# Note :

Neutron network creation process might hang some times with netconf client timeout expiration error. Please refer the defect in the below location for more details <https://bugs.launchpad.net/neutron/+bug/1395976>

# Support Details

Customers with valid Mirantis support contracts can contact Mirantis for any Open Stack related issues and Brocade for any VDX/NOS and Plug-in related issues.

Below are the valid Brocade support contacts-

**Brocade Contact:** <https://www.brocade.com/service-support/index.html>

**Brocade Direct Support SLA:** <http://www.brocade.com/services-support/support-plans/direct-support/index.page>