Multi-node Setup of Openstack with OpenContrail

Step by Step Deployment Guide

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Document Version Control

Version Number	Author	Date	Reason for Change
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0.2	Shahid Shaik	29/10/2014	

1. Introduction

Multi-node setup typically serves for the purpose of better utilization of the hardware resources by deploying the controller and computer nodes in a distributed environment.

1.1 Document Purpose

The purpose of this document is to explain the installation steps to be followed for setting up Open Contrail with DevStack in multi node and to test/validate OpenStack integration with OpenContrail in multi node environment.

1.2 Setup Overview

There are two simple topologies in which DevStack with OpenContrail environment can be deployed.

1.2.1 Single Node

A single node setup where both Openstack controller and compute reside in a single physical host or VM.

1.2.2 Multi Node

Multi-node setup has one physical host or VM as controller/master node and one or more physical host or VMs as compute nodes. The controller node and one or more compute nodes needed to be connected to each other on an IP capable physical network. There is no specific physical network topology needed for this setup to work seamlessly.

1.3 System Requirements

- Linux distribution – Ubuntu 12.04
- Size – 4GB RAM

2. Multi-Node Environment Setup

The Multi Node setup can be deployed again in two ways. The models are explained below.

2.1 Setup Model-1

This model of deployment contains two nodes with all configured in one node and only compute services in another node. I.e. one physical host or VM running controller, compute services together and one physical host or VM running only compute services.

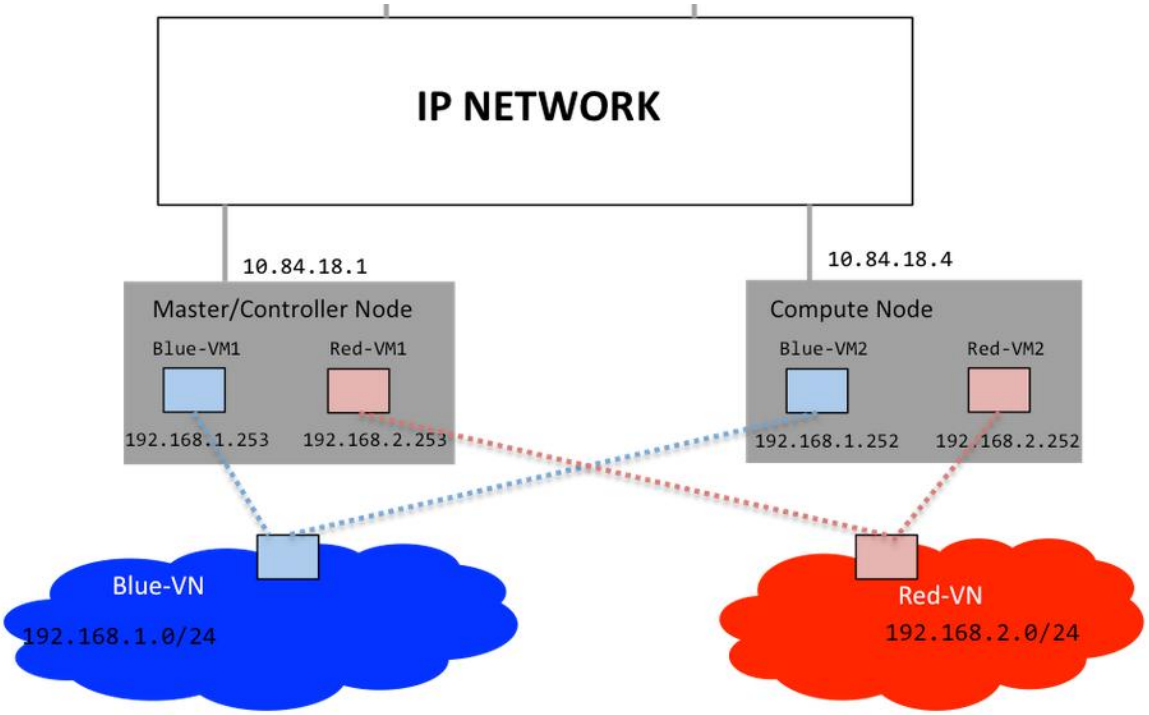


Figure 1All in One Node and Computer in another Node

2.1.1 Steps for Master/Controller Host

i. Login to Master or Controller host(VM or physical machine)

ii. Download contrail-installer

Git clone https://github.com/juniper/contrail-installer

iii. Edit localrc as shown below:

cd contrail-installer
cp samples/localrc-all localrc

iv. Run ./contrail.sh

The installer script is meant to install, configure OpenContrail either from source or prebuilt packages.

v. Download Devstack

git clone –b stable/icehouse https://github.com/openstack-dev/devstack.git

vi. Edit localrc as shown below:

```
cd devstack
vi localrc

# CONTRAIL MULTI_NODE master
HOST_IP=<controller-ip>
SERVICE_HOST=$HOST_IP

PHYSICAL_INTERFACE=eth0

MULTI_HOST=True
Q_PLUGIN=opencontrail

STACK_DIR=$(cd $(dirname $0) && pwd)

# log all screen output to this directory
LOG_DIR=$STACK_DIR/log/screens
LOG=True
DEBUG=True
LOGFILE=$STACK_DIR/log/stack.log
LOGDAYS=1
SCREEN_DIR=$STACK_DIR/screens
disable_service n-net
enable_service q-svc
enable_service q-meta
enable_service neutron
enable_service rabbit

# not used by contrail
disable_service q-dhcp
disable_service q-l3
disable_service q-agt

DATABASE_PASSWORD=contrail123
RABBIT_PASSWORD=contrail123
SERVICE_TOKEN=contrail123
SERVICE_PASSWORD=contrail123
ADMIN_PASSWORD=contrail123


# repo proto is https or (default) ssh. Leave commented for ssh
# CONTRAIL_REPO_PROTO=https

# proto for openstack bits. Use HTTPS if git is firewalled
GIT_BASE=https://git.openstack.org
```

```
# use contrail VIF driver with NOVA
NOVA_VIF_DRIVER=nova_contrail_vif.contrailvif.VRouterVIFDriver

# may need the following for older trunk snapshot
# validate against
#/usr/lib/python2.7/dist-packages/neutron_plugin_contrail/plugins/opencontrail/
Q_PLUGIN_CLASS=neutron_plugin_contrail.plugins.opencontrail.contrail_plugin_core.Neut
ronPluginContrailCoreV2
```

vii. run ./stack.sh

2.1.2 Steps for Compute Host

i. Login to Compute host(VM or physical machine)

ii. Download contrail-installer

Git clone https://github.com/juniper/contrail-installer

iii. Edit localrc as shown below:

```
cd contrail-installer
cp samples/localrc-alllocalrc
INSTALL_PROFILE =COMPUTE
SERVICE_HOST=<controller -ip>
CONTROL_IP=<controller-ip>
```

iv. Run ./contrail.sh

The installer script is meant to install,configureOpenContrail either from source or pre-built packages.

v. Download Devstack

git clone –b stable/icehouse https://github.com/openstack-dev/devstack.git

vi. Edit localrc as shown below:

```
cd devstack
vi localrc

# change this to your master/controller node's ip
SERVICE_HOST=<controller-ip># control1

# the interface that contrail's vhost0 should take over
PHYSICAL_INTERFACE=eth0

Q_PLUGIN=opencontrail
STACK_DIR=$(cd $(dirname $0) && pwd)

# log all screen output to this directory
```

```
SCREEN_LOGDIR=$STACK_DIR/log/screens
LOG=True
DEBUG=True
LOGFILE=$STACK_DIR/log/stack.log
LOGDAYS=1

ENABLED_SERVICES=n-cpu,rabbit,g-api,neutron,n-novnc,n-xvnc

Q_USE_DEBUG_COMMAND=True
PHYSICAL_NETWORK=default
MYSQL_HOST=$SERVICE_HOST
RABBIT_HOST=$SERVICE_HOST
Q_HOST=$SERVICE_HOST
GLANCE_HOSTPORT=$SERVICE_HOST:9292

DATABASE_PASSWORD=contrail123
RABBIT_PASSWORD=contrail123
SERVICE_TOKEN=contrail123
SERVICE_PASSWORD=contrail123
ADMIN_PASSWORD=contrail123
DATABASE_TYPE=mysql

# repo proto is https or (default) ssh. Leave commented for ssh
# CONTRAIL_REPO_PROTO=https

# proto for openstack bits. Use HTTPS if git is firewalled
GIT_BASE=https://git.openstack.org

# use contrail VIF driver with NOVA
NOVA_VIF_DRIVER=nova_contrail_vif.contrailvif.VRouterVIFDriver
```

vii. run ./stack.sh

2.2 Setup Model-2

This model of deployment contains three nodes with one physical host or VM as controller/master node and one or more physical host or VMs as compute nodes

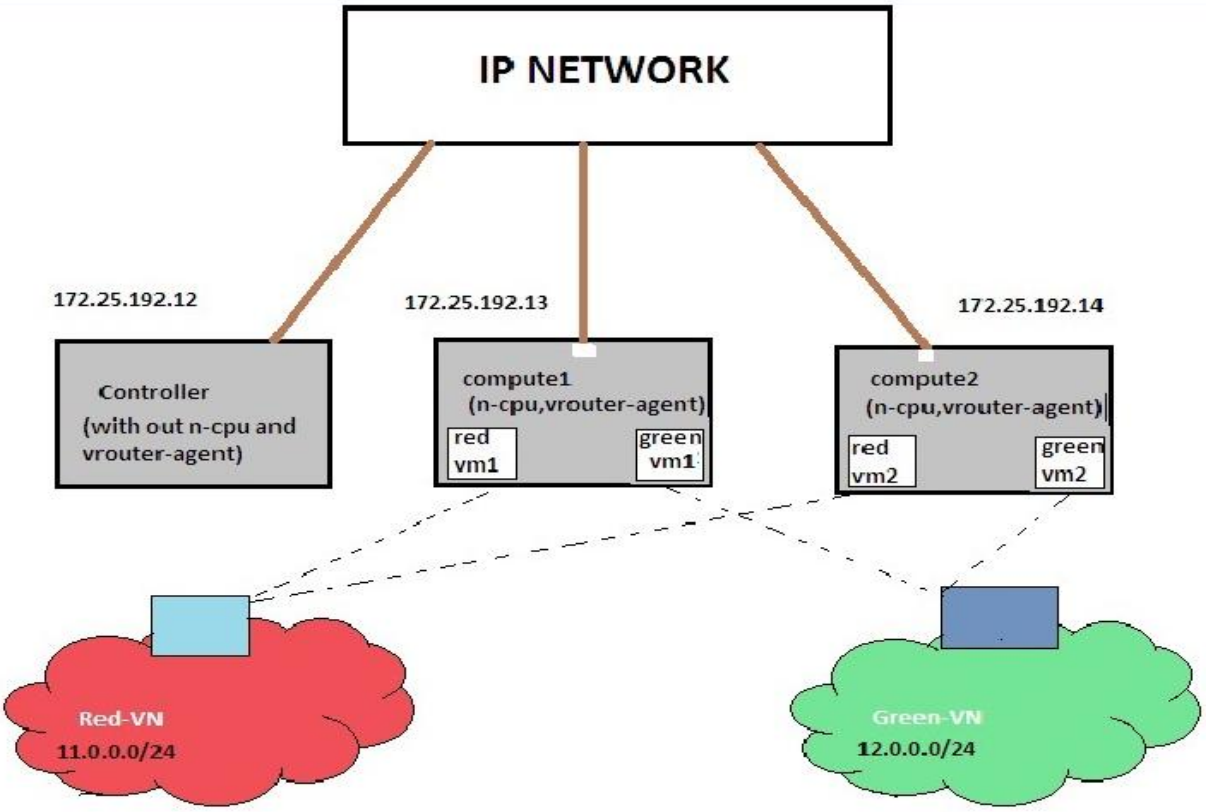


Figure 2Only Controller and two different computes

2.2.1 Steps for Master/Controller Host

i. Login to Master or Controller host(VM or physical machine)

ii. Download contrail-installer

Git clone https://github.com/juniper/contrail-installer

iii. Edit localrc as shown below:

cd contrail-installer
cp samples/localrc-all localrc
disable_service agent

iv. Run ./contrail.sh

The installer script is meant to install,configureOpenContrail either from source or pre-built packages.

v. Download Devstack

git clone –b stable/icehouse https://github.com/openstack-dev/devstack.git

vi. Edit localrc as shown below:

```
cd devstack
vi localrc

# CONTRAIL MULTI_NODE master
HOST_IP=<controller-ip>
SERVICE_HOST=$HOST_IP

PHYSICAL_INTERFACE=eth0

MULTI_HOST=True
Q_PLUGIN=opencontrail

STACK_DIR=$(cd $(dirname $0) && pwd)

# log all screen output to this directory
LOG_DIR=$STACK_DIR/log/screens
LOG=True
DEBUG=True
LOGFILE=$STACK_DIR/log/stack.log
LOGDAYS=1
SCREEN_DIR=$STACK_DIR/screens
disable_service n-net
disable_service n-cpu
enable_service q-svc
enable_service q-meta
enable_service neutron
enable_service rabbit

# not used by contrail
disable_service q-dhcp
disable_service q-l3
disable_service q-agt

DATABASE_PASSWORD=contrail123
RABBIT_PASSWORD=contrail123
SERVICE_TOKEN=contrail123
SERVICE_PASSWORD=contrail123
ADMIN_PASSWORD=contrail123


# repo proto is https or (default) ssh. Leave commented for ssh
# CONTRAIL_REPO_PROTO=https

# proto for openstack bits. Use HTTPS if git is firewalled
GIT_BASE=https://git.openstack.org

# use contrail VIF driver with NOVA
```

NOVA_VIF_DRIVER=nova_contrail_vif.contrailvif.VRouterVIFDriver

may need the following for older trunk snapshot
validate against
#/usr/lib/python2.7/dist-packages/neutron_plugin_contrail/plugins/opencontrail/
Q_PLUGIN_CLASS=neutron_plugin_contrail.plugins.opencontrail.contrail_plugin_core.NeutronPluginContrailCoreV2

vii. run ./stack.sh

viii. Edit /etc/nova/nova.conf file

vncserver_proxyclient_address = <controller-ip>
vncserver_listen = 0.0.0.0

ix. Restart nova services in screen –x stack

2.2.2 Steps for Compute Host

i. Login to Compute host(VM or physical machine)

ii. Download contrail-installer

git clone https://github.com/juniper/contrail-installer

iii. Edit localrc as shown below:

cd contrail-installer
cp samples/localrc-all localrc
INSTALL_PROFILE =COMPUTE
SERVICE_HOST=<controller-ip>
CONTROL_IP=<controller-ip>
enable_service agent

iv. Run ./contrail.sh

The installer script is meant to install,configureOpenContrail either from source or pre-built packages.

v. Download Devstack

git clone –b stable/icehouse https://github.com/openstack-dev/devstack.git

vi. Edit localrc as shown below:

cd devstack
vi localrc

# change this to your master/controller node's ip
SERVICE_HOST=<controller-ip># control1

```
# the interface that contrail's vhost0 should take over
PHYSICAL_INTERFACE=eth0

Q_PLUGIN=opencontrail
STACK_DIR=$(cd $(dirname $0) && pwd)

# log all screen output to this directory
SCREEN_LOGDIR=$STACK_DIR/log/screens
LOG=True
DEBUG=True
LOGFILE=$STACK_DIR/log/stack.log
LOGDAYS=1

ENABLED_SERVICES=n-cpu,rabbit,g-api,neutron,n-novnc,n-xvnc

Q_USE_DEBUG_COMMAND=True
PHYSICAL_NETWORK=default

MYSQL_HOST=$SERVICE_HOST
RABBIT_HOST=$SERVICE_HOST
Q_HOST=$SERVICE_HOST
GLANCE_HOSTPORT=$SERVICE_HOST:9292

DATABASE_PASSWORD=contrail123
RABBIT_PASSWORD=contrail123
SERVICE_TOKEN=contrail123
SERVICE_PASSWORD=contrail123
ADMIN_PASSWORD=contrail123
DATABASE_TYPE=mysql

# repo proto is https or (default) ssh. Leave commented for ssh
# CONTRAIL_REPO_PROTO=https

# proto for openstack bits. Use HTTPS if git is firewalled
GIT_BASE=https://git.openstack.org

# use contrail VIF driver with NOVA
NOVA_VIF_DRIVER=nova_contrail_vif.contrailvif.VRouterVIFDriver
```

vii. run ./stack.sh

viii. Edit /etc/libvirt/qemu.conf file

```
uncomment the below lines
vnc_listen = "0.0.0.0"
spice_listen = "0.0.0.0"
remote_display_port_min = 5900
remote_display_port_max = 65535
```

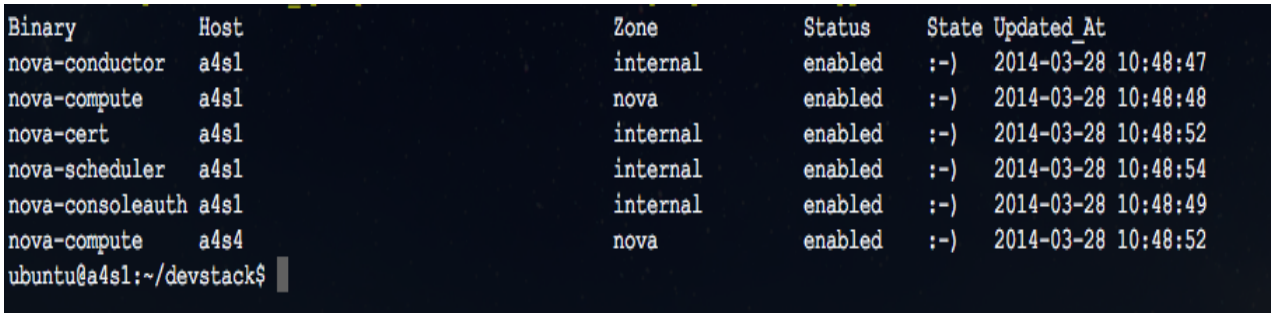
ix. Edit /etc/nova/nova.conf file

vncserver_proxyclient_address = <compute-ip>
vncserver_listen = 0.0.0.0

x. Restart the nova services in screen –x stack.

3. Verify the installation

Once the stack.sh has completed its execution successfully, you can check to make sure the services show smiley faces and not XXX with 'nova-manage service list' command on each node of your setup.



Now you have OpenContrail with latest release of Openstack running in your environment. You can access the Openstack horizon dashboard of this version using http://<IP-Address-of-Master-Node>.

4. Testing the setup

4.1 Test Setup Model-1

All in one node and only compute in another node.

a) Test Case: Environment setup for controller node before running stack

Test steps	Expected Result
1.localrc of contrail-installer having the environment variables specific to FullMode installation of contrail and controller as SERVICE_HOST	INSTALL_PROFILE need to be set to ALL,SERVICE_HOST=localhost
2.invoke contrail-installer in build mode using ./contrail.sh build	Dependencies w.r.t full mode need to get installed.Stage in .stage.txt must be set to 'Build'
3.invoke contrail-installer in install mode using ./contrail.sh install	contrail modules need to get installed .Stage in .stage.txt must be set to 'install'
4.invoke contrail-installer in configure mode using ./contrail.sh configure	configuration files must get created at /etc/contrail.
5.start contrail-installer using ./contrail.sh start	All the services must get started and apiserver should be running
6.set Q_PLUGIN=opencontrail in localrc of openstack	In localrc of openstack, Q_PLUGIN need to be opencontrail
7.Set MULTI_HOST to True	In localrc of openstack, MULTI_HOST=True
8.localrc of openstack having the environment variables specific to FullMode installation of openstack	The environment variables with values specific to FullMode has to be present in localrc file of openstack.Localrc of openstack need to have disable_service n-net
9.run stack.sh	All the openstack services must get started
10.verify openstack dashboard	dashboard must be available
11.check for the available computes using nova host-list	After the compute is up,it need to be shown in the available hostlist

b) Test Case: Environment setup for compute node before running stack

Test steps	Expected Result
1.localrc of contrail-installer having the environment variables specific to ComputeMode installation of contrail and controller as SERVICE_HOST	INSTALL_PROFILE need to be set to COMPUTE ,SERVICE_HOST=controller ip
2.invoke contrail-installer in build mode using ./contrail.sh build	Dependencies w.r.t compute mode need to get installed.Stage in .stage.txt must be set to 'Build'
3.invoke contrail-installer in install mode using ./contrail.sh install	contrail modules need to get installed .Stage in .stage.txt must be set to 'install'
4.invoke contrail-installer in configure mode using ./contrail.sh configure	configuration files must get created at /etc/contrail.
5.Start contrail-installer using ./contrail.sh start	Agent must get started
6.set Q_PLUGIN=opencontrail in localrc of openstack	In localrc of openstack, Q_PLUGIN need to be opencontrail
7.localrc of openstack having the environment variables specific to ComputeMode installation of openstack and controller as SERVICE_HOST	The environment variables with values specific to ComputeMode has to be present in localrc file of openstack.Localrc of openstack need to have ENABLED_SERVICES=n-cpu,rabbit,g-api,neutron,n-novnc,n-xvnc
8.run stack.sh	Specified openstack services must get started

c) Test Case: launch VM's

Test steps	Expected Result
1.create network	network must get created
2.Launch a virtual machine instance	virtual machine must get created and VM must get properly launched with IP

d) Test Case :Ping between VM's

Test steps	Expected Result
1.create network	network must get created
2.Launch two virtual machine instances	virtual machines must get created and VM's must get properly launched with IP
3..ping between the VM's.	packets need to get transfeered between the VM's

4.2 Test Setup Model-1

Only Controller in one node and two computes in two different nodes.

e) Test Case: Environment setup for controller node before running stack

Test steps	Expected Result
1.localrc of contrail-installer having the environment variables specific to FullMode installation of contrail and controller as SERVICE_HOST. Agent must be disabled.	INSTALL_PROFILE need to be set to ALL,SERVICE_HOST=localhost.Add disable_service agent
2.invoke contrail-installer in build mode using ./contrail.sh build	Dependencies w.r.t full mode need to get installed.Stage in .stage.txt must be set to 'Build'
3.invoke contrail-installer in install mode using ./contrail.sh install	contrail modules need to get installed .Stage in .stage.txt must be set to 'install'
4.invoke contrail-installer in configure mode using ./contrail.sh configure	configuration files must get created at /etc/contrail.
5.start contrail-installer using ./contrail.sh start	All the services must get started and apiserver should be running.Agent should not be running,vhost0 must not get created.
6.set Q_PLUGIN=opencontrail in localrc of openstack	In localrc of openstack, Q_PLUGIN need to be opencontrail
7.Set MULTI_HOST to True	In localrc of openstack, MULTI_HOST=True
8.localrc of openstack having the environment variables specific to FullMode installation of openstack(except n-cpu)	The environment variables with values specific to FullMode has to be present in localrc file of openstack.Localrc of openstack need to have disable_service n-net enable_service q-svc enable_service q-meta

	enable_service neutron disable_service n-cpu disable_service q-agt disable_service q-dhcp disable_service q-l3
9.run stack.sh	All the openstack services must get started,except n-cpu service.
10.verify openstack dashboard	dashboard must be available
11.check for the available computes using nova host-list	After the compute is up,it need to be shown in the available hostlist

f) Test Case: Environment setup for compute node before running stack

Test steps	Expected Result
1.localrc of contrail-installer having the environment variables specific to ComputeMode installation of contrail and controller as SERVICE_HOST.Agent must be enabled.	INSTALL_PROFILE need to be set to COMPUTE ,SERVICE_HOST=controller ip.Add enable_service agent.
2.invoke contrail-installer in build mode using ./contrail.sh build	Dependencies w.r.t compute mode need to get installed.Stage in .stage.txt must be set to 'Build'
3.invoke contrail-installer in install mode using ./contrail.sh install	contrail modules need to get installed .Stage in .stage.txt must be set to 'install'
4.invoke contrail-installer in configure mode using ./contrail.sh configure	configuration files must get created at /etc/contrail.
5.Start contrail-installer using ./contrail.sh start	Agent must be running,vhost0 must get created.
6.set Q_PLUGIN=opencontrail in localrc of openstack	In localrc of openstack, Q_PLUGIN need to be opencontrail
7.localrc of openstack having the environment variables specific to ComputeMode installation of openstack and controller as SERVICE_HOST	The environment variables with values specific to ComputeMode has to be present in localrc file of openstack.Localrc of openstack need to have ENABLED_SERVICES=n-cpu,rabbit,g-api,neutron,n-novnc,n-xvnc
8.run stack.sh	Specified openstack services must get started

g) Test Case: launch VM's

Test steps	Expected Result
1.create network	network must get created
2.Launch a virtual machine instance	virtual machine must get created and VM must get properly launched with IP

h) Test Case: ping between VM's

Test steps	Expected Result
1.create network	network must get created
2.Launch two virtual machine instances	virtual machines must get created and VM's must get properly launched with IP
3..ping between the VM's.	packets need to get transfeered between the VM's

5. Review inputs

S. No.	Juniper Comments	Date Received	TCS Updates	Status
1				
2				

End of Document