OPNFV(Colorado) Compass4nfv installation instructions

Release draft (862d2ec)

OPNFV

August 17, 2016

ABSTRACT

This document describes how to install the Brahmaputra release of OPNFV when using Compass4nfv as a deployment tool covering it's limitations, dependencies and required system resources.

TWO

VERSION HISTORY

Date	Ver.	Author	Comment
2016-01-17	1.0.0	Justin chi (HUAWEI)	Rewritten for Compass4nfv B release
2015-12-16	0.0.2	Matthew Li (HUAWEI)	Minor changes & formatting
2015-09-12	0.0.1	Chen Shuai (HUAWEI)	First draft

COMPASS4NFV CONFIGURATION

This document describes providing guidelines on how to install and configure the Colorado release of OPNFV when using Compass as a deployment tool including required software and hardware configurations.

Installation and configuration of host OS, OpenStack, OpenDaylight, ONOS, Ceph etc. can be supported by Compass on Virtual nodes or Bare Metal nodes.

The audience of this document is assumed to have good knowledge in networking and Unix/Linux administration.

3.1 Preconditions

Before starting the installation of the Colorado release of OPNFV, some planning must be done.

3.1.1 Retrieving the installation ISO image

First of all, The installation ISO is needed for deploying your OPNFV environment, it included packages of Compass, OpenStack, OpenDaylight, ONOS and so on.

The stable release ISO can be retrieved via OPNFV software download page

The daily build ISO can be retrieved via OPNFV artifacts repository:

http://artifacts.opnfv.org/

NOTE: Search the keyword "compass4nfv/Colorado" to locate the ISO image.

E.g. compass4nfv/colorado/opnfv-2016-01-16_15-03-18.iso compass4nfv/colorado/opnfv-2016-01-16_15-03-18.properties

The name of iso image includes the time of iso building, you can get the daily ISO according the building time. The git url and sha1 of Compass4nfv are recorded in properties files, According these, the corresponding deployment scripts can be retrieved.

3.1.2 Getting the deployment scripts

To retrieve the repository of Compass4nfv on Jumphost use the following command:

- git clone https://gerrit.opnfv.org/gerrit/compass4nfv

NOTE: PLEASE DO NOT GIT CLONE COMPASS4NFV IN root DIRECTORY.

To get stable /colorado release, you can use the following command:

- git checkout colorado.1.0

If you don't have a Linux foundation user id, get it first by the url:

https://wiki.opnfv.org/developer/getting_started

If you want to use a daily release ISO, please checkout the corresponding sha1 to get the deployment scripts:

E.g. Git sha1 in file "opnfv-2016-01-16_15-03-18.properties" is d5a13ce7cc2ce89946d34b0402ecf33c1d291851

- git checkout d5a13ce7cc2ce89946d34b0402ecf33c1d291851

3.2 Setup Requirements

If you have only 1 Bare Metal server, Virtual deployment is recommended. if more than or equal 3 servers, the Bare Metal deployment is recommended. The minimum number of servers for Bare metal deployment is 3, 1 for JumpServer(Jumphost), 1 for controller, 1 for compute.

3.2.1 Jumphost Requirements

The Jumphost requirements are outlined below:

1. Ubuntu 14.04 (Pre-installed).
2. Root access.
3. libvirt virtualization support.
4. Minimum 2 NICs.
   - PXE installation Network (Receiving PXE request from nodes and providing OS provisioning)
   - IPMI Network (Nodes power control and set boot PXE first via IPMI interface)
   - External Network (Optional: Internet access)
5. 16 GB of RAM for a Bare Metal deployment, 64 GB of RAM for a Virtual deployment.
6. CPU cores: 32, Memory: 64 GB, Hard Disk: 500 GB, (Virtual Deloment needs 1 TB Hard Disk)

3.3 Bare Metal Node Requirements

Bare Metal nodes require:

1. IPMI enabled on OOB interface for power control.
2. BIOS boot priority should be PXE first then local hard disk.
3. Minimum 3 NICs.
   - PXE installation Network (Broadcasting PXE request)
   - IPMI Network (Receiving IPMI command from Jumphost)
   - External Network (OpenStack mgmt/external/storage/tenant network)

3.4 Network Requirements

Network requirements include:

1. No DHCP or TFTP server running on networks used by OPNFV.

2. 2-6 separate networks with connectivity between Jumphost and nodes.

   - PXE installation Network

   - IPMI Network

   - Openstack mgmt Network*

   - Openstack external Network*

   - Openstack tenant Network*

   - Openstack storage Network*

3. Lights out OOB network access from Jumphost with IPMI node enabled (Bare Metal deployment only).

4. External network has Internet access, meaning a gateway and DNS availability.

The networks with(*) can be share one NIC(Default configuration) or use an exclusive NIC(Reconfigured in network.yml).

3.5 Execution Requirements (Bare Metal Only)

In order to execute a deployment, one must gather the following information:

1. IPMI IP addresses of the nodes.

2. IPMI login information for the nodes (user/pass).

3. MAC address of Control Plane / Provisioning interfaces of the Bare Metal nodes. ..

INSTALLATION GUIDE (BARE METAL DEPLOYMENT)

4.1 Nodes Configuration (Bare Metal Deployment)

The below file is the inventory template of deployment nodes:

"compass4nfv/deploy/conf/hardware_environment/huawei-pod1/[dha].yml"

You can write your own IPMI IP/User/Password/Mac address/roles reference to it.

- ipmiVer – IPMI interface version for deployment node support. IPMI 1.0 or IPMI 2.0 is available.

- ipmiIP – IPMI IP address for deployment node. Make sure it can access from Jumphost.

- ipmiUser – IPMI Username for deployment node.

- ipmiPass – IPMI Password for deployment node.

- mac – MAC Address of deployment node PXE NIC .

- name – Host name for deployment node after installation.

- roles – Components deployed.

Assignment of different roles to servers

E.g. Openstack only deployment roles setting

```
hosts:
  - name: host1
    roles:
      - controller
      - ha

  - name: host2
    roles:
      - compute
```

NOTE: IF YOU SELECT MUTIPLE NODES AS CONTROLLER, THE 'ha' role MUST BE SELECT, TOO.

E.g. Openstack and ceph deployment roles setting

```
hosts:
  - name: host1
    roles:
      - controller
      - ha
      - ceph-adm
      - ceph-mon
```

```
   - name: host2
     roles:
       - compute
       - ceph-osd
```

E.g. Openstack and ODL deployment roles setting

```
hosts:
  - name: host1
    roles:
       - controller
       - ha
       - odl

  - name: host2
    roles:
       - compute
```

E.g. Openstack and ONOS deployment roles setting

```
hosts:
  - name: host1
    roles:
       - controller
       - ha
       - onos

  - name: host2
    roles:
       - compute
```

4.2 Network Configuration (Bare Metal Deployment)

Before deployment, there are some network configuration to be checked based on your network topology. Compass4nfv network default configuration file is "compass4nfv/deploy/conf/network_cfg.yaml". You can write your own reference to it.

The following figure shows the default network configuration.

```
+--+                              +--+      +--+
|  |                              |  |      |  |
|  |        +-----------+         |  |      |  |
|  +------+  Jumphost  +------+   |  |      |  |
|  |        +------+-----+      |  |      |  |
|  |               |             |  |      |  |
|  |               +-----------+  +-----+  |
|  |                             |  |      |  |
|  |        +-----------+         |  |      |  |
|  +------+    host1   +------+   |  |      |  |
|  |        +------+-----+      |  |      |  |
|  |               |             |  |      |  |
|  |               +-----------+  +-----+  |
|  |                             |  |      |  |
|  |        +-----------+         |  |      |  |
|  +------+    host2   +------+   |  |      |  |
|  |        +------+-----+      |  |      |  |
|  |               |             |  |      |  |
```

```
|   |              +-----------+  +-----+   |
|   |              |           |  |   |  |   |  |
|   |       +-----------+      |  |   |  |   |  |
|  +------+    host3   +------+ |  |   |  |   |  |
|   |      +------+-----+       |  |   |  |   |  |
|   |             |             |  |   |  |   |  |
|   |       +-----------+  +-----+   |
|   |                     |  |   |  |   |  |
|   |                     |  |   |  |   |  |
+-++                     ++-+   +-++
  ^                       ^        ^
  |                       |        |
  |                       |        |
+-+--------------------+  |        |
|     External Network |  |        |
+----------------------+  |        |
    +--------------------+---+     |
    |     IPMI Network       |     |
    +------------------------+     |
         +------------------------+-+
         | PXE(Installation) Network |
         +--------------------------+
```
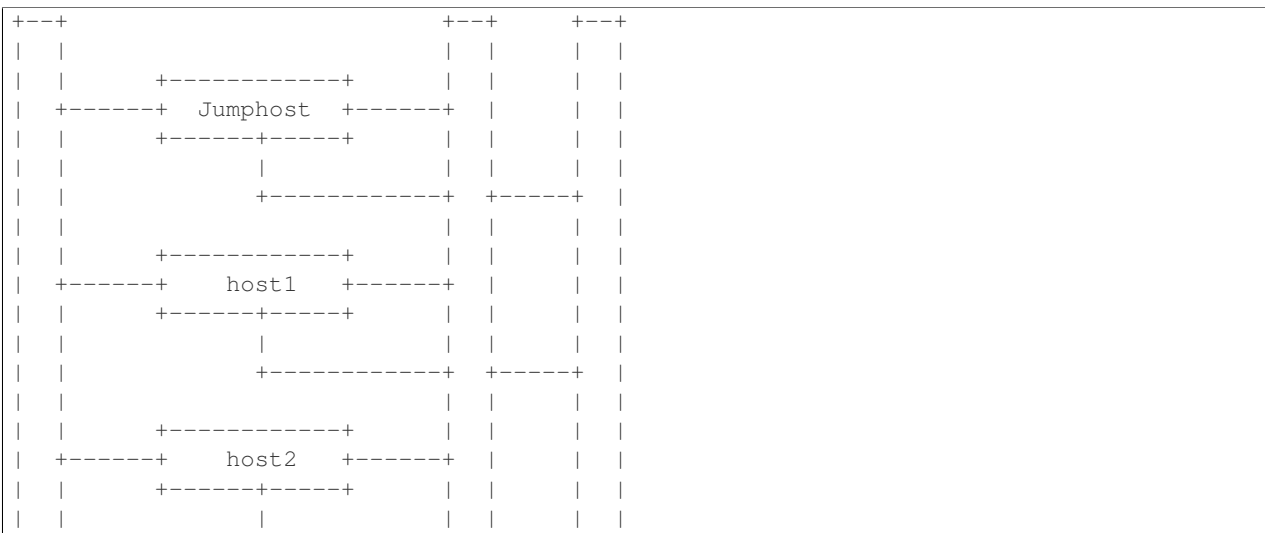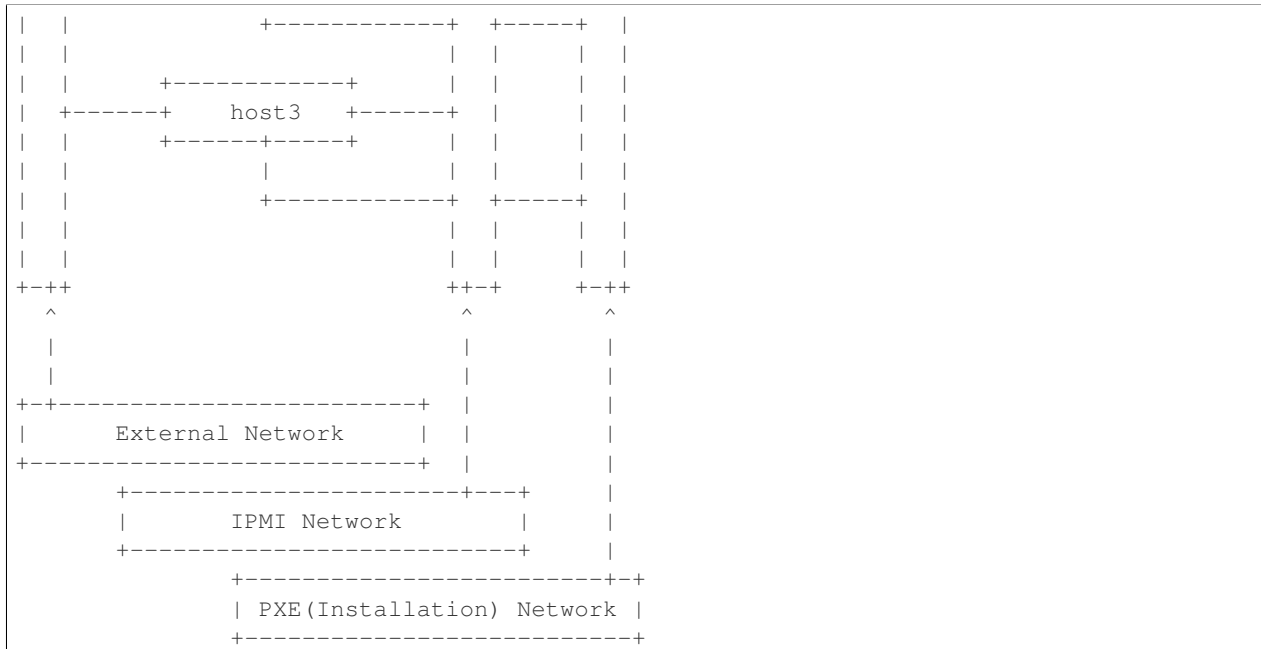
4.3 Start Deployment (Bare Metal Deployment)

1. Set PXE/Installation NIC for Jumphost. (set eth1 E.g.)

```
export INSTALL_NIC=eth1
```

2.Set OS version and OpenStack version for deployment nodes.

Compass4nfv Colorado supports three OS version based openstack mitaka.

Ubuntu 14.04 mitaka:

```
export OS_VERSION=trusty
export OPENSTACK_VERSION=mitaka
```

Ubuntu 16.04 mitaka:

```
export OS_VERSION=xenial
export OPENSTACK_VERSION=mitaka_xenial
```

Centos 7 mitaka:

```
export OS_VERSION=centos7
export OPENSTACK_VERSION=mitaka
```

3. Set ISO image that you want to deploy

```
export ISO_URL=file:///${YOUR_OWN}/compass.iso
or
export ISO_URL=http://artifacts.opnfv.org/compass4nfv/colorado/opnfv-colorado.1.0.iso
```

4. Run `deploy.sh` with inventory and network configuration

```
./deploy.sh --dha ${YOUR_OWN}/dha.yml --network ${YOUR_OWN}/network.yml
```

E.g.

1. nosdn-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/hardware_environment/huawei-pod1/os-nosdn-nofeature-ha.yml \
    --network ./deploy/conf/hardware_environment/huawei-pod1/network.yml
```

2. ocl-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/hardware_environment/huawei-pod1/os-ocl-nofeature-ha.yml \
    --network ./deploy/conf/hardware_environment/huawei-pod1/network_ocl.yml
```

3. odl_l2-moon scenario deploy sample

```
 ./deploy.sh \
     --dha ./deploy/conf/hardware_environment/huawei-pod1/os-odl_l2-moon-ha.yml \
     --network ./deploy/conf/hardware_environment/huawei-pod1/network.yml

4. odl_l2-nofeature scenario deploy template
```

```
./deploy.sh \
    --dha ./deploy/conf/hardware_environment/huawei-pod1/os-odl_l2-nofeature-ha.yml \
    --network ./deploy/conf/hardware_environment/huawei-pod1/network.yml
```

5. odl_l3-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/hardware_environment/huawei-pod1/os-odl_l3-nofeature-ha.yml \
    --network ./deploy/conf/hardware_environment/huawei-pod1/network.yml
```

6. onos-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/hardware_environment/huawei-pod1/os-onos-nofeature-ha.yml \
    --network ./deploy/conf/hardware_environment/huawei-pod1/network_onos.yml
```

7. onos-sfc deploy scenario sample

```
./deploy.sh \
    --dha ./deploy/conf/hardware_environment/huawei-pod1/os-onos-sfc-ha.yml \
    --network ./deploy/conf/hardware_environment/huawei-pod1/network_onos.yml
```

INSTALLATION GUIDE (VIRTUAL DEPLOYMENT)

5.1 Nodes Configuration (Virtual Deployment)

The below file is the inventory template of deployment nodes:

"compass4nfv/deploy/conf/vm_environment/huawei-virtual1/network.yml"

You can write your own address/roles reference to it.

- name – Host name for deployment node after installation.

- roles – Components deployed.

Assignment of different roles to servers

E.g. Openstack only deployment roles setting

```
hosts:
  - name: host1
    roles:
      - controller
      - ha

  - name: host2
    roles:
      - compute
```

NOTE: IF YOU SELECT MUTIPLE NODES AS CONTROLLER, THE 'ha' role MUST BE SELECT, TOO.

E.g. Openstack and ceph deployment roles setting

```
hosts:
  - name: host1
    roles:
      - controller
      - ha
      - ceph-adm
      - ceph-mon

  - name: host2
    roles:
      - compute
      - ceph-osd
```

E.g. Openstack and ODL deployment roles setting

```
hosts:
  - name: host1
    roles:
      - controller
      - ha
      - odl

  - name: host2
    roles:
      - compute
```
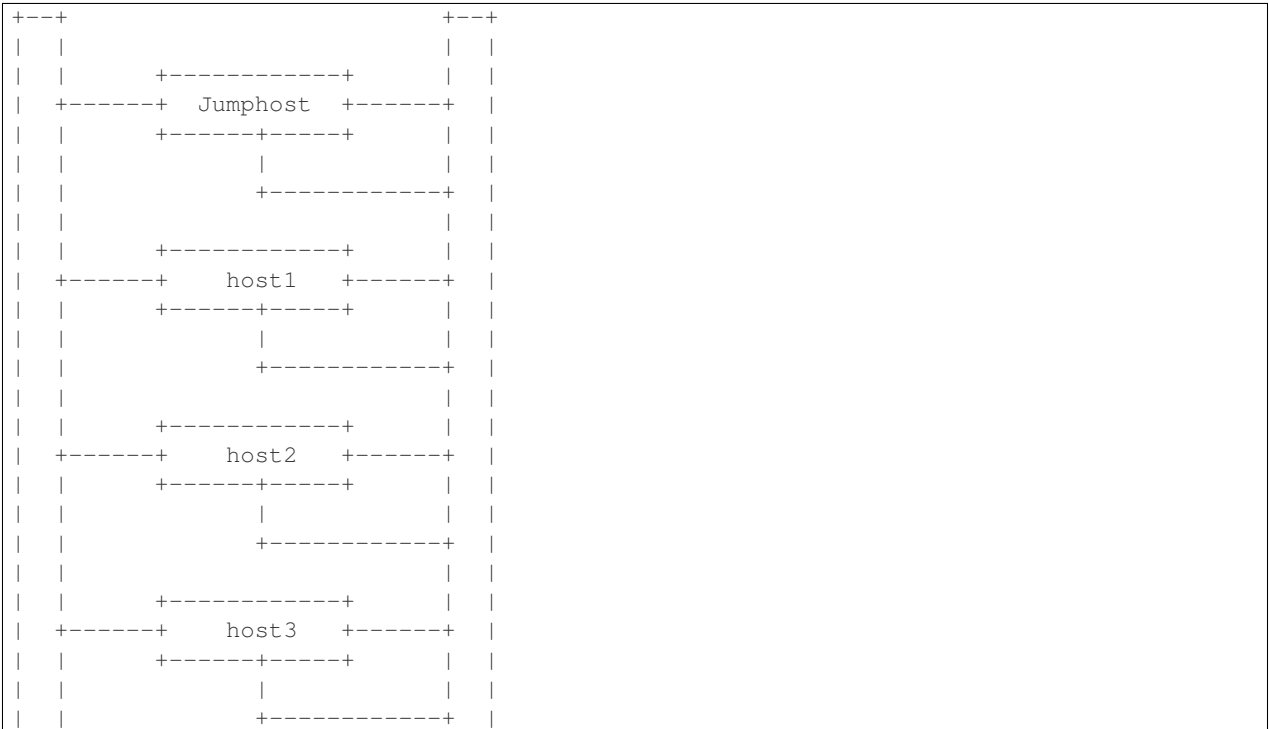
E.g. Openstack and ONOS deployment roles setting

```
hosts:
  - name: host1
    roles:
      - controller
      - ha
      - onos

  - name: host2
    roles:
      - compute
```
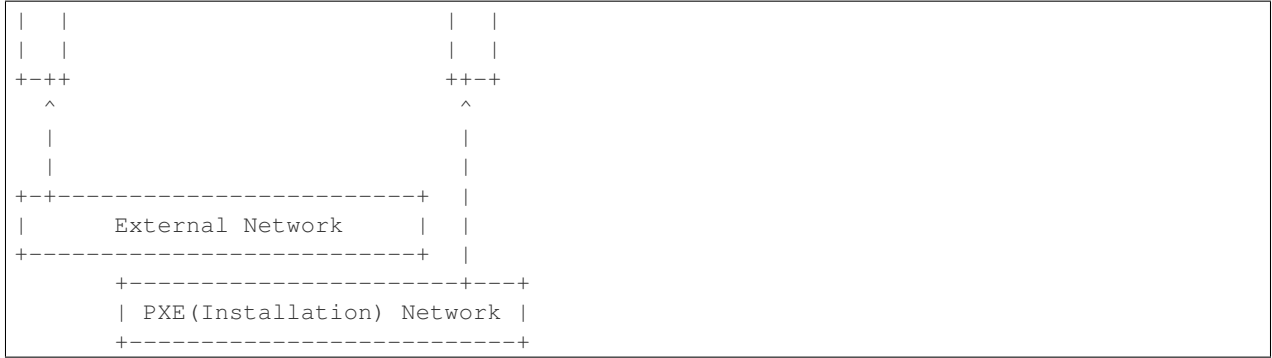
5.2 Network Configuration (Virtual Deployment)

Before deployment, there are some network configuration to be checked based on your network topology. Compass4nfv network default configuration file is "compass4nfv/deploy/conf/network_cfg.yaml". You can write your own reference to it.

The following figure shows the default network configuration.

```
+--+                            +--+
|  |                            |  |
|  |       +-----------+        |  |
|  +------+  Jumphost  +------+  |
|  |       +------+----+        |  |
|  |              |             |  |
|  |              +-----------+ |
|  |                            |  |
|  |       +-----------+        |  |
|  +------+    host1   +------+  |
|  |       +------+----+        |  |
|  |              |             |  |
|  |              +-----------+ |
|  |                            |  |
|  |       +-----------+        |  |
|  +------+    host2   +------+  |
|  |       +------+----+        |  |
|  |              |             |  |
|  |              +-----------+ |
|  |                            |  |
|  |       +-----------+        |  |
|  +------+    host3   +------+  |
|  |       +------+----+        |  |
|  |              |             |  |
|  |              +-----------+ |
```

```
|   |                            |   |
|   |                            |   |
+-++                            ++-+
  ^                              ^
  |                              |
  |                              |
+-+------------------------+     |
|      External Network    |     |
+--------------------------+     |
        +--------------------+---+
        | PXE(Installation) Network |
        +--------------------------+
```

5.3 Start Deployment (Virtual Deployment)

1. Set OS version and OpenStack version for deployment nodes.

   Compass4nfv Colorado supports three OS version based openstack mitaka.

Ubuntu 14.04 mitaka:

```
export OS_VERSION=trusty
export OPENSTACK_VERSION=mitaka
```

Ubuntu 16.04 mitaka:

```
export OS_VERSION=xenial
export OPENSTACK_VERSION=mitaka_xenial
```

Centos 7 mitaka:

```
export OS_VERSION=centos7
export OPENSTACK_VERSION=mitaka
```

2. Set ISO image that you want to deploy

```
export ISO_URL=file:///${YOUR_OWN}/compass.iso
or
export ISO_URL=http://artifacts.opnfv.org/compass4nfv/colorado/opnfv-colorado.1.0.iso
```

3. Run `deploy.sh` with inventory and network configuration

```
./deploy.sh --dha ${YOUR_OWN}/dha.yml --network ${YOUR_OWN}/network.yml
```

E.g.

1. nosdn-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/vm_environment/os-nosdn-nofeature-ha.yml \
    --network ./deploy/conf/vm_environment/huawei-virtual1/network.yml
```

2. ocl-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/vm_environment/os-ocl-nofeature-ha.yml \
    --network ./deploy/conf/vm_environment/huawei-virtual1/network_ocl.yml
```

3. odl_l2-moon scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/vm_environment/os-odl_l2-moon-ha.yml \
    --network ./deploy/conf/vm_environment/huawei-virtual1/network.yml
```

4. odl_l2-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/vm_environment/os-odl_l2-nofeature-ha.yml \
    --network ./deploy/conf/vm_environment/huawei-virtual1/network.yml
```

5. odl_l3-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/vm_environment/os-odl_l3-nofeature-ha.yml \
    --network ./deploy/conf/vm_environment/huawei-virtual1/network.yml
```

6. onos-nofeature scenario deploy sample

```
./deploy.sh \
    --dha ./deploy/conf/vm_environment/os-onos-nofeature-ha.yml \
    --network ./deploy/conf/vm_environment/huawei-virtual1/network_onos.yml
```

7. onos-sfc deploy scenario sample

```
./deploy.sh \
    --dha ./deploy/conf/vm_environment/os-onos-sfc-ha.yml \
    --network ./deploy/conf/vm_environment/huawei-virtual1/network_onos.yml
```

CHAPTER

SIX

REFERENCES

6.1 OPNFV

OPNFV Home Page

OPNFV Genesis project page

OPNFV Compass4nfv project page

6.2 OpenStack

OpenStack Liberty Release artifacts

OpenStack documentation

6.3 OpenDaylight

OpenDaylight artifacts

6.4 ONOS

ONOS artifacts

6.5 Compass

Compass Home Page