[SK Telecom](http://www.sktelecom.com/)

**Helion OpenStack**

**Install Guide & Run Books**

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**INSTALL GUIDE**

# 1. 소개

## 1.1. 본 보고서의 내용 및 목표

본 문서는 Generic Manager 구축 프로젝트의 Helion OpenStack 설치 가이드 문서입니다.

## 1.2. 본 보고서의 범위

본 문서는 Helion OpenStack 4 를 대상으로 합니다.

## 1.3. 용어 정의 및 약어

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | 용어 | | 약어 | 정의 |
| 1 | Helion OpenStack | | HOS | HP 에서 제공 하는 OpenStack 배포판 제품 |
| 2 | Deploy node | |  | 배포를 위한 deploy Server |
| 3 | Controller Node | | Controller | 클라우드의 인증, DB 큐 등을 관리 하는 역할을 담당 하는 노드 |
| 4 | Compute Node | | Compute | 사용자의 VM 인스턴스를 실행 하는 컴퓨터 서비스를 제공 하는 노드 |
| 5 | Swift Node | | Swift | 사용자가 저장 하는 개체를 포함 하는 분산 스토리지 서비스를 제공 하는 노드 |
| 6 | 베어 메탈 설치 버전 | |  | Helion OpenStack 여러 개의 물리적 노드에 설치 Version |
| 7 | VM Version | | VM 버전 | VM 설치 Version |
| 8 | hLinux | |  | Helion OpenStack 을 지원 하기 위해 HP 개발한 OS |
| 9 | Helion Development Platform | | HDP | 클라우드 응용 프로그램 및 다양 한 서비스 제공을 위한 플랫폼 |
| 10 | Cloud Foundry | | CF | 오픈 소스 Platform as a Service 소프트웨어 |
| 11 | Application Lifecycle Service | | ALS | Cloud Foundry 기반 응용 프로그램 실행 관리 환경. |
| <<중간 생략>> | | 화면에는 다른 메시지가 표시 되는 단계는 생략표시 | | |
| {암호} | | 사용자의 암호를 입력 하는 것 | | |
| \ (백 슬래시) | |  | | |

## 1.4. 배포 버전

본 절차서에서 소개 하는 소프트웨어의 버전은 다음과 같습니다.

|  |  |  |  |
| --- | --- | --- | --- |
| No | 종 별 | 버전 | 비고 |
| 1 | Deployer Host OS | hLinux |  |
| 2 | Helion OpenStack | V4.0 |  |

## 1.5. Helion OpenStack 도입의 전제 조건

　Helion OpenStack을 Baremetal 설치 하기 위한 전제 조건입니다.

기타 필수정보는 다음 URL 참고

■ HP Helion OpenStack 4.0 Support Matrix

　 https://docs.hpcloud.com/hos-4.x/#helion/planning/hw\_support\_matrix.html#min\_hardware

# 2. 시스템 환경

이 문서에 수록된 내용은 아래 환경에 맞춰 작성되었습니다.

시스템 H/W 구성 및 호스트 이름,IP 주소 및 각 노드의 iLO IP 주소는 아래와 같습니다.

 [물리적인 서버 구성] - Total 7 nodes

## 2.1 시스템 구성 현황

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Server** | **Qtys** | **Model** | **Specification** | | | | **description** |
| **CPU** | **Memory** | **Disk** | **NIC** |
| **Deploy** | 0 |  |  |  |  |  | Controller 1 node와 함께 사용 |
| **Control nodes** | 3 | DL380G9 | 2.6GHz 14core \* 2CPU | 256GB | 300GB\*4ea |  |  |
| **Compute** | 4 | BL460G9 | 2.5GH 12core \* 2CPU | 256GB | 1.8TB\*4ea  300GB\*4ea | 10G \* 8 Port  1G \* 8 Port |  |
| **Total** | 7 |  |  |  |  |  |  |

## 2.2 Rack diagram

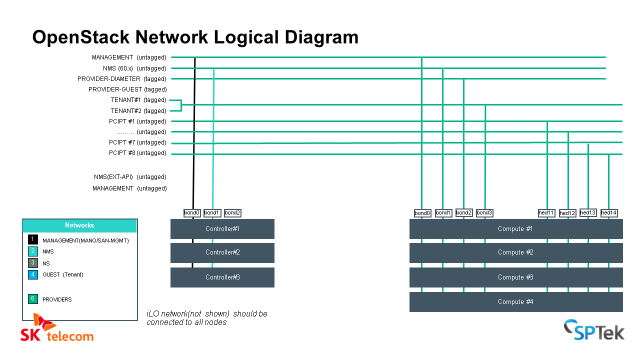
추후 작성 예정

## 2.3 시스템 ILO IP 구성현황

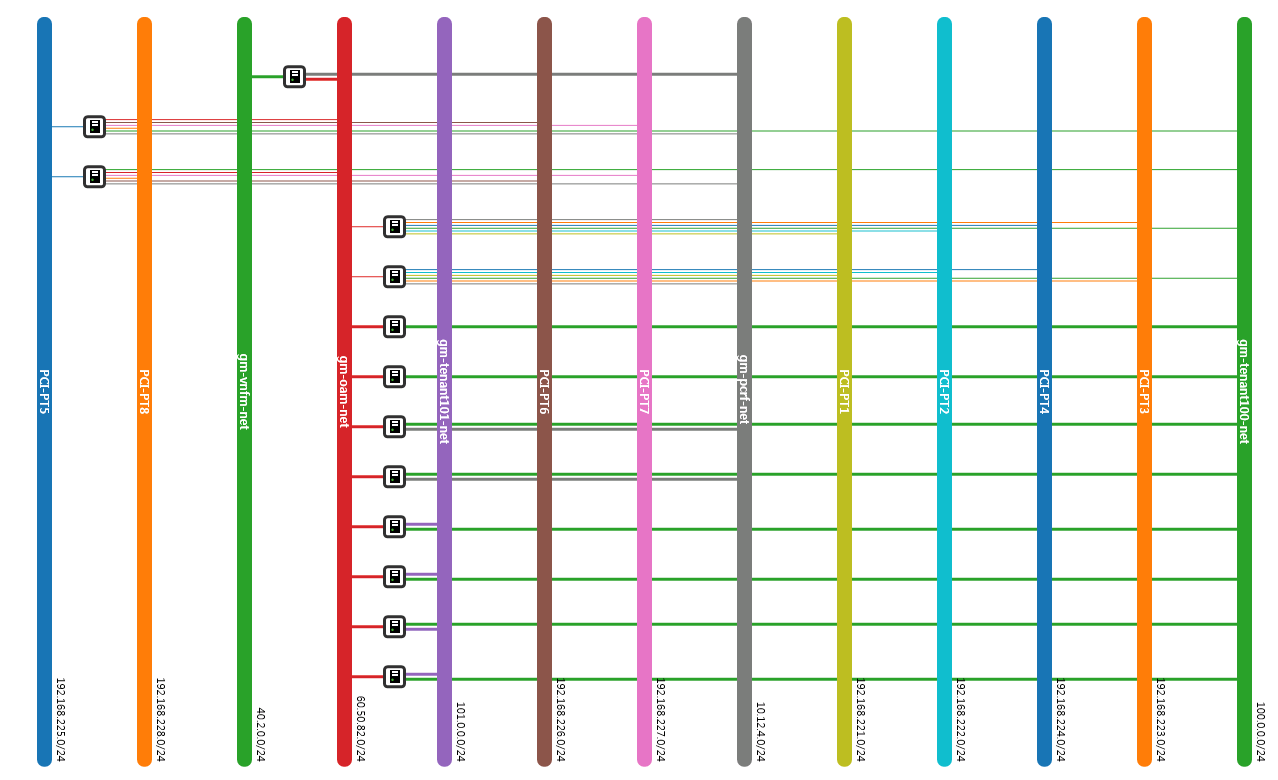
시스템 ILO/MGMT IP 구성현황은 다음과 같습니다.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **nodes** | **rack** | **IP address** | | | |
| **iLO** | **iLO id/Password** | **deploy** | **MGMT** |
| control0001(deploy) |  | 40.2.0.201 | admin/hpinvent | 40.2.0.11 | "94:18:82:6f:d2:14" |
| control0002 |  | 40.2.0.202 | admin/hpinvent | 40.2.0.12 | "94:18:82:71:87:2c" |
| control0003 |  | 40.2.0.203 | admin/hpinvent | 40.2.0.13 | "94:18:82:6f:e2:3c" |
| compute0001 |  | 40.2.0.210 | admin/hpinvent | 40.2.0.14 | "94:18:82:01:e1:94" |
| compute0002 |  | 40.2.0.211 | admin/hpinvent! | 40.2.0.15 | "94:18:82:01:e1:f4" |
| compute0003 |  | 40.2.0.213 | admin/hpinvent | 40.2.0.16 | "94:18:82:01:f1:54" |
| compute0004 |  | 40.2.0.214 | admin/hpinvent | 40.2.0.17 | "94:18:82:01:12:08" |

## 2.4 physical network diagram



## 2.5 logical network diagram



## 2.7 ip address assignment rule

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **usage** | **band** | **vlan mode** | **vlan name** | **NIC** | **mode** | **type** | **description** |
| **ILO-NET**  **MANAGEMENT-NET**  **MANO-NET** | 40.2.0.0/24 | Untagged |  | Bond0 | act-stb | 1G UTP | Installation for Helion (pxe boot, image deploy etc,)  Management Network for OpenStack API |
| **NMS-NET** | 60.50.82.0/24 | Untagged |  | Bond1 | act-stb | 1G UTP | Remote Management (Secure Gateway) |
| **PCRF-NET** | 10.12.4.0/24 | Untagged |  | Bond2 | act-stb | 1G UTP |  |
| **gm-tenant100-net** | 30.120.0.0/16 | tagged | 100 | Bond3 | act-stb | 1G UTP |  |
| **gm-tenant101-net** | 30.130.0.0/16 | tagged | 101 | Hed3 | act-stb | 1G UTP |  |
| **PCI-PT1~8** |  | Untagged |  | Hed21~28 |  | 10G FC | PCI-Passthrough |

# 3. 설치구성단계

설치구성 전체 작업 흐름을 다음과 같습니다.

 ■ Helion OpenStack 환경 소개

* Deploy node 구성

: Deployer에 hlinux 설치 및 설정

* deploy 배포

: 설치 관리자를 사용하여 배포 및 설치

* 동작 확인

: Heilon OpenStack 클라우드 환경의 동작 확인

■ Helion Development Platform 환경 소개

* Helion Development Platform 설치

: HDP 설치 관리자를 사용 하여 Helion OpenStack 위에 Helion Development Platform 설치

* Application Lifecycle Services 설치

: Helion Development Platform 메뉴 인터페이스에서 ALS 클러스터를 구성

* Database Service 설치

# 4. helion openstack설치환경 및 설치과정

## 4.1 Deploy node 설치정보 및 구성

|  |  |  |
| --- | --- | --- |
| 항목 | 내용 | 비고 |
| OS 버전 | Debian GNU\_linux4.4.21-1-amd64-hpelinux #hpelinux1) |  |
| Language | English |  |
| Location | UTC |  |
| Disk | Raid 1 |  |
| hostname | helion-cp1-hlm-m1-mgmt |  |
| user/password | stack/stack |  |
| IP 주소 설정 | stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ sudo ifconfig  bond0 Link encap:Ethernet HWaddr 94:18:82:6f:d2:14  inet addr:40.2.0.11 Bcast:40.2.0.255 Mask:255.255.255.0  inet6 addr: fe80::9618:82ff:fe6f:d214/64 Scope:Link  UP BROADCAST RUNNING MASTER MULTICAST MTU:1500 Metric:1  RX packets:32843375683 errors:0 dropped:18795858 overruns:0 frame:0  TX packets:31783935823 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:12013197063528 (10.9 TiB) TX bytes:12134803198300 (11.0 TiB)  bond1 Link encap:Ethernet HWaddr 94:18:82:6f:d2:15  inet addr:60.50.82.10 Bcast:60.50.82.255 Mask:255.255.255.0  inet6 addr: fe80::9618:82ff:fe6f:d215/64 Scope:Link  UP BROADCAST RUNNING MASTER MULTICAST MTU:1500 Metric:1  RX packets:106232479 errors:0 dropped:19275747 overruns:0 frame:0  TX packets:33672050 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:22249966215 (20.7 GiB) TX bytes:33544512897 (31.2 GiB)  bond2 Link encap:Ethernet HWaddr 94:18:82:6f:d2:16  inet6 addr: fe80::9618:82ff:fe6f:d216/64 Scope:Link  UP BROADCAST RUNNING MASTER MULTICAST MTU:1500 Metric:1  RX packets:27919643 errors:0 dropped:315426 overruns:0 frame:0  TX packets:13 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:1786925160 (1.6 GiB) TX bytes:1138 (1.1 KiB)  hed1 Link encap:Ethernet HWaddr 94:18:82:6f:d2:14  UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1  RX packets:32801687655 errors:0 dropped:259 overruns:0 frame:0  TX packets:31783935823 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:12010332076841 (10.9 TiB) TX bytes:12134803198300 (11.0 TiB)  Interrupt:16  hed2 Link encap:Ethernet HWaddr 94:18:82:6f:d2:15  UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1  RX packets:64838630 errors:0 dropped:0 overruns:0 frame:0  TX packets:33672050 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:19459124638 (18.1 GiB) TX bytes:33544512897 (31.2 GiB)  Interrupt:17  hed3 Link encap:Ethernet HWaddr 94:18:82:6f:d2:16  UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1  RX packets:13955253 errors:0 dropped:0 overruns:0 frame:0  TX packets:12 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:893170112 (851.7 MiB) TX bytes:1048 (1.0 KiB)  Interrupt:16  hed5 Link encap:Ethernet HWaddr 94:18:82:6f:d2:14  UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1  RX packets:41688028 errors:0 dropped:18795599 overruns:0 frame:0  TX packets:0 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:2864986687 (2.6 GiB) TX bytes:0 (0.0 B)  Interrupt:16  hed6 Link encap:Ethernet HWaddr 94:18:82:6f:d2:15  UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1  RX packets:41393849 errors:0 dropped:19275747 overruns:0 frame:0  TX packets:0 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:2790841577 (2.5 GiB) TX bytes:0 (0.0 B)  Interrupt:17  hed7 Link encap:Ethernet HWaddr 94:18:82:6f:d2:16  UP BROADCAST RUNNING SLAVE MULTICAST MTU:1500 Metric:1  RX packets:13964390 errors:0 dropped:315426 overruns:0 frame:0  TX packets:1 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1000  RX bytes:893755048 (852.3 MiB) TX bytes:90 (90.0 B)  Interrupt:16  lo Link encap:Local Loopback  inet addr:127.0.0.1 Mask:255.0.0.0  inet6 addr: ::1/128 Scope:Host  UP LOOPBACK RUNNING MTU:65536 Metric:1  RX packets:20112841098 errors:0 dropped:0 overruns:0 frame:0  TX packets:20112841098 errors:0 dropped:0 overruns:0 carrier:0  collisions:0 txqueuelen:1  RX bytes:4228449107166 (3.8 TiB) TX bytes:4228449107166 (3.8 TiB) | |

**Installing Lifecycle-manager**

Lifecycle manager는 cloud 패키지를 배포하여 설치할 수 있도록 installation script와 configuration file들을 포함하고 있습니다. Lifecycle manager를 보통 Controller node 0번에 설치하면 Deployer 서버가 별도로 필요 없으나, SK텔레콤(이하SKT) 환경에서는 별도의 Deployer 서버로 구성하였습니다.

1. HPE Helion Openstack.0 pkg Download 후 해당 이미지 ISO booting하여 hlinux 설치

Language / Location / Keyboard layout / IP / Subnet mask / Gateway / Username / Password / Timezone 설정 (user: stack / pw: stack)

1. Lifecycle manager(이하 Deployer)의 hlinux 설치가 끝나면 아래와 같이 설정

/etc/resolv.conf에 DNS nameserver 추가 및 환경변수 export LC\_ALL=C 설정 (환경변수는 ~stack/.bashrc or /etc/bash.bashrc에 추가할 수 있음)

**Configure and Run the Lifecycle-manager**

1. Lifecycle-manager에 접속하여 iso 파일을 특정 디렉토리에 복사한 후 cdrom mount 함 (stack user로 수행)

sudo mount Helion-OpenStack-version-number.iso /media/cdrom

1. tar 파일을 /media/cdrom/hos4.0.0/ 디렉토리에 풀 것

tar xvf /media/cdrom/hos/hos-2.0.0-20151022T082820Z.tar

1. 아래 script 수행하면 Deployer의 Local 디렉토리에 helion 디렉토리가 생성됨

~/hos-4.0.0/hos-init.bash

\*\*\* export HOS\_INIT\_AUTO=y

hos-init.bash 스크립트 수행 후 Deployer의 Local 디렉토리에 아래와 같이 디렉토리가 생성됨

helion/ Top level directory

helion/examples/ Directory contains the config input files of the example clouds

helion/my\_cloud/definition/ Directory contains the config input files

helion/my\_cloud/config/ Directory contains .j2 files which are symlinks to the /hos/ansible directory

helion/hos/ Directory contains files used by the installer

helion/tech-preview Directory contains the config input files of the tech-preview clouds

###### Config File 정리

1. control\_plane.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat control\_plane.yml

#

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#

---

product:

version: 2

control-planes:

- name: control-plane-1

control-plane-prefix: cp1

region-name: region1

failure-zones:

- AZ1

- AZ2

- AZ3

# configuration-data:

# - OCTAVIA-CONFIG-CP1

# - NEUTRON-CONFIG-CP1

common-service-components:

- logging-producer

- monasca-agent

- freezer-agent

- stunnel

- lifecycle-manager-target

clusters:

- name: controller

cluster-prefix: c1

server-role: CONTROLLER-ROLE

member-count: 3

allocation-policy: strict

service-components:

- lifecycle-manager

- ntp-server

# - swift-ring-builder

- mysql

- ip-cluster

- apache2

- keystone-api

- keystone-client

- rabbitmq

- glance-api

- glance-registry

- glance-client

- cinder-api

- cinder-scheduler

- cinder-volume

- cinder-backup

- cinder-client

- nova-api

- nova-scheduler

- nova-conductor

- nova-console-auth

- nova-novncproxy

- nova-client

- neutron-server

- neutron-ml2-plugin

# - neutron-vpn-agent

# - neutron-dhcp-agent

# - neutron-metadata-agent

# - neutron-openvswitch-agent

- neutron-client

# - octavia-api

# - octavia-health-manager

- horizon

# - swift-proxy

- memcached

# - swift-account

# - swift-container

# - swift-object

# - swift-client

- heat-api

- heat-api-cfn

- heat-api-cloudwatch

- heat-engine

- heat-client

- openstack-client

- ceilometer-api

- ceilometer-polling

- ceilometer-agent-notification

- ceilometer-common

- ceilometer-client

- zookeeper

- kafka

- vertica

- storm

- monasca-api

- monasca-persister

- monasca-notifier

- monasca-threshold

- monasca-client

- logging-server

- ops-console-web

- ops-console-monitor

- cmc-service

- freezer-api

- barbican-api

- barbican-client

- barbican-worker

# - designate-api

# - designate-central

# - designate-pool-manager

# - designate-zone-manager

# - designate-mdns

# - designate-client

# - powerdns

- name: compute-dpi

resource-prefix: comp-pts

server-role: COMPUTE-DPI-ROLE

allocation-policy: any

min-count: 0

service-components:

- ntp-client

- nova-compute

- nova-compute-kvm

- nova-client

- neutron-l3-agent

- neutron-dhcp-agent

- neutron-metadata-agent

- neutron-openvswitch-agent

- neutron-sriov-nic-agent

- neutron-lbaasv2-agent

- name: compute-spb

resource-prefix: comp-spb

server-role: COMPUTE-SPBSDE-ROLE

allocation-policy: any

min-count: 0

service-components:

- ntp-client

- nova-compute

- nova-compute-kvm

- nova-client

- neutron-l3-agent

- neutron-dhcp-agent

- neutron-metadata-agent

- neutron-openvswitch-agent

# - neutron-sriov-nic-agent

# - neutron-lbaasv2-agent

3. disks\_compute.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat disks\_compute.yml

#

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#

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#

---

product:

version: 2

disk-models:

- name: COMPUTE-DISKS

# Disk model to be used for compute nodes

# /dev/sda\_root is used as a volume group for /, /var/log and /var/crash

# sda\_root is a templated value to align with whatever partition is really used

# This value is checked in os config and replaced by the partition actually used

# on sda e.g. sda1 or sda5

# /dev/sdb is used as a volume group for /var/lib (for VM storage)

# Additional discs can be added to either volume group

volume-groups:

- name: hlm-vg

physical-volumes:

- /dev/sda\_root

logical-volumes:

# The policy is not to consume 100% of the space of each volume group.

# 5% should be left free for snapshots and to allow for some flexibility.

- name: root

size: 95%

fstype: ext4

mount: /

mkfs-opts: -O large\_file

# - name: vg-comp

# # this VG is dedicated to Nova Compute to keep VM IOPS off the OS disk

# physical-volumes:

# - /dev/sdb

# logical-volumes:

# - name: compute

# size: 95%

# mount: /var/lib/nova

# fstype: ext4

# mkfs-opts: -O large\_file

4. disks\_controller\_600GB.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat disks\_controller\_

cat: disks\_controller\_: No such file or directory

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat disks\_controller\_600GB.yml

#

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#

---

product:

version: 2

disk-models:

- name: CONTROLLER-600GB-DISKS

# This example is based on using a single 600GB disk for a volume

# group that contains all file systems on a controller with 64GB

# of memory. This represents a mimimal HOS system with very

# Limited capacity

#

# Additional disks can be added to the 'physical-volumes' section.

#

# If the available capacity of your servers is more that 600GB you

# should consider using the "CONTROLLER-1TB-DISKS" disk-model

# in disks\_controller\_1TB.yml instead. To use this alternative model

# you need to edit the CONTROLLER-ROLE sections of server\_roles.yml

#

volume-groups:

- name: hlm-vg

physical-volumes:

# NOTE: 'sda\_root' is a templated value. This value is checked in

# os-config and replaced by the partition actually used on sda

#e.g. sda1 or sda5

- /dev/sda\_root

# Add any additional disks for the volume group here

# -/dev/sdx

# -/dev/sdy

logical-volumes:

# The policy is not to consume 100% of the space of each volume group.

# 5% should be left free for snapshots and to allow for some flexibility.

- name: root

size: 10%

fstype: ext4

mount: /

# Reserved space for kernel crash dumps

# Should evaluate to a value that is slightly larger that

# the memory size of your server

- name: crash

size: 11%

mount: /var/crash

fstype: ext4

mkfs-opts: -O large\_file

# Local Log files.

- name: log

size: 13%

mount: /var/log

fstype: ext4

mkfs-opts: -O large\_file

# Mysql Database. All persistent state from OpenStack services

# is saved here. Although the individual objects are small the

# accumulated data can grow over time

- name: mysql

size: 10%

mount: /var/lib/mysql

fstype: ext4

mkfs-opts: -O large\_file

consumer:

name: mysql

# Rabbitmq works mostly in memory, but needs to be able to persist

# messages to disc under high load. This area should evaluate to a value

# that is slightly larger than the memory size of your server

- name: rabbitmq

size: 4%

mount: /var/lib/rabbitmq

fstype: ext4

mkfs-opts: -O large\_file

consumer:

name: rabbitmq

rabbitmq\_env: home

# Database storage for event monitoring (Monasca). Events are generally

# small data objects.

- name: vertica

size: 13%

mount: /var/vertica

fstype: ext4

mkfs-opts: -O large\_file

consumer:

name: vertica

# Messaging system for monitoring.

- name: kafka

size: 11%

mount: /var/kafka

fstype: ext4

mkfs-opts: -O large\_file

consumer:

name: kafka

# Data storage for centralized logging. This holds log entries from all

# servers in the cloud and hence can require a lot of disk space.

- name: elasticsearch

size: 21%

mount: /var/lib/elasticsearch

fstype: ext4

# Zookeeper is used to provide cluster co-ordination in the monitoring

# system. Although not a high user of disc space we have seen issues

# with zookeeper snapshots filling up filesystems so we keep it in its

# own space for stability.

- name: zookeeper

size: 1%

mount: /var/lib/zookeeper

fstype: ext4

consumer:

name: os

# Glance cache: if a logical volume with consumer usage 'glance-cache'

# is defined Glance caching will be enabled. The logical volume can be

# part of an existing volume group or a dedicated volume group.

# - name: glance-vg

# physical-volumes:

# - /dev/sdx

# logical-volumes:

# - name: glance-cache

# size: 95%

# mount: /var/lib/glance/cache

# fstype: ext4

# mkfs-opts: -O large\_file

# consumer:

# name: glance-api

# usage: glance-cache

# Audit: Audit logs can consume significant disc space. If you

# are enabling audit then it is recommended that you use a dedicated

# disc.

# - name: audit-vg

# physical-volumes:

# - /dev/sdz

# logical-volumes:

# - name: audit

# size: 95%

# mount: /var/audit

# fstype: ext4

# mkfs-opts: -O large\_file

# Additional disk group defined for Swift

# device-groups:

# - name: swiftobj

# devices:

# - name: /dev/sdb

# - name: /dev/sdc

# Add any additional disks for swift here

# -name: /dev/sdd

# -name: /dev/sde

# consumer:

# name: swift

# attrs:

# rings:

# - account

# - container

# - object-0

5. firewall\_rules.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat firewall\_rules.yml

#

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#

---

product:

version: 2

#

# HOS will create firewall rules to enable the required access for

# all of the deployed services. Use this section to define any

# additional access.

#

# Each group of rules can be applied to one or more network groups

# Examples are given for ping and ssh

#

# Names of rules, (e.g. "PING") are arbitrary and have no special significance

#

firewall-rules:

- name: SSH

# network-groups is a list of all the network group names

# that the rules apply to

network-groups:

- MANAGEMENT

- NMS

# - PROVIDER-NMS

rules:

- type: allow

# range of remote addresses in CIDR format that this

# rule applies to

remote-ip-prefix: 0.0.0.0/0

port-range-min: 22

port-range-max: 22

# protocol must be one of: null, tcp, udp or icmp

protocol: tcp

- name: PING

network-groups:

- MANAGEMENT

- NMS

# - PROVIDER-NMS

- PROVIDER-PCRF

- PROVIDER-GUEST

- PROVIDER-PCIPT1

- PROVIDER-PCIPT2

- PROVIDER-PCIPT3

- PROVIDER-PCIPT4

rules:

# open ICMP echo request (ping)

- type: allow

remote-ip-prefix: 0.0.0.0/0

# icmp type

port-range-min: 8

# icmp code

port-range-max: 0

protocol: icmp

- name: ZABBIX-AGENT

# network-groups is a list of all the network group names

# that the rules apply to

network-groups:

- MANAGEMENT

#- NMS

#- PROVIDER-NMS

rules:

- type: allow

# range of remote addresses in CIDR format that this

# rule applies to

remote-ip-prefix: 0.0.0.0/0

port-range-min: 10050

port-range-max: 10050

# protocol must be one of: null, tcp, udp or icmp

protocol: tcp

6. net\_interfaces.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat net\_interfaces.yml

#

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#

---

product:

version: 2

interface-models:

# These examples uses hed3 and hed4 as a bonded

# pair for all networks on all three server roles

#

# Edit the device names and bond options

# to match your environment

#

- name: CONTROLLER-INTERFACES

network-interfaces:

- name: BOND0

device:

name: bond0

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed1

provider: linux

devices:

- name: hed1

- name: hed5

network-groups:

- MANAGEMENT

- name: BOND1

device:

name: bond1

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed2

provider: linux

devices:

- name: hed2

- name: hed6

forced-network-groups:

- NMS

- name: BOND2

device:

name: bond2

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed3

provider: linux

devices:

- name: hed3

- name: hed7

forced-network-groups:

- PROVIDER-PCRF

- name: COMPUTE-DPI-INTERFACES

network-interfaces:

- name: BOND0

device:

name: bond0

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed1

provider: linux

devices:

- name: hed1

- name: hed5

network-groups:

- MANAGEMENT

- name: BOND1

device:

name: bond1

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed2

provider: linux

devices:

- name: hed2

- name: hed6

forced-network-groups:

- NMS

- name: BOND2

device:

name: bond2

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed3

provider: linux

devices:

- name: hed3

- name: hed7

network-groups:

- PROVIDER-PCRF

- name: BOND3

device:

name: bond3

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed4

provider: linux

devices:

- name: hed4

- name: hed8

network-groups:

- PROVIDER-GUEST

# - name: BOND4

# device:

# name: bond4

# bond-data:

# options:

# mode: active-backup

# miimon: 200

# primary: hed9

# provider: linux

# devices:

# - name: hed9

# - name: hed10

# network-groups:

# - PROVIDER-SIP

# - name: BOND5

# device:

# name: bond5

# bond-data:

# options:

# mode: active-backup

# miimon: 200

# primary: hed11

# provider: linux

# devices:

# - name: hed11

# - name: hed12

# network-groups:

# - PROVIDER-SIP-IPSEC

#

# To be used

#

# - name: BOND6

# device:

# name: bond6

# bond-data:

# options:

# mode: active-backup

# miimon: 200

# primary: hed13

# provider: linux

# devices:

# - name: hed13

# - name: hed14

# network-groups:

# - PROVIDER-NONE

- name: HETH21

device:

name: hed21

pci-pt: true

network-groups:

- PROVIDER-PCIPT1

- name: HETH22

device:

name: hed22

pci-pt: true

network-groups:

- PROVIDER-PCIPT2

- name: HETH23

device:

name: hed23

pci-pt: true

network-groups:

- PROVIDER-PCIPT3

- name: HETH24

device:

name: hed24

pci-pt: true

network-groups:

- PROVIDER-PCIPT4

- name: HETH25

device:

name: hed25

pci-pt: true

network-groups:

- PROVIDER-PCIPT5

- name: HETH26

device:

name: hed26

pci-pt: true

network-groups:

- PROVIDER-PCIPT6

- name: HETH27

device:

name: hed27

pci-pt: true

network-groups:

- PROVIDER-PCIPT7

- name: HETH28

device:

name: hed28

pci-pt: true

network-groups:

- PROVIDER-PCIPT8

- name: COMPUTE-SPBSDE-INTERFACES

network-interfaces:

- name: BOND0

device:

name: bond0

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed1

provider: linux

devices:

- name: hed1

- name: hed5

network-groups:

- MANAGEMENT

- name: BOND1

device:

name: bond1

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed2

provider: linux

devices:

- name: hed2

- name: hed6

forced-network-groups:

- NMS

- name: BOND2

device:

name: bond2

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed3

provider: linux

devices:

- name: hed3

- name: hed7

network-groups:

- PROVIDER-PCRF

- name: BOND3

device:

name: bond3

bond-data:

options:

mode: active-backup

miimon: 200

primary: hed4

provider: linux

devices:

- name: hed4

- name: hed8

network-groups:

- PROVIDER-GUEST

7. network\_groups.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat network\_groups.yml

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#

---

product:

version: 2

network-groups:

#

# External API

#

# This is the network group that users will use to

# access the public API endpoints of your cloud

#

- name: NMS

hostname-suffix: extapi

routes:

- default

tags:

- neutron.networks.vlan:

provider-physical-network: physnet2

load-balancers:

- provider: ip-cluster

name: extlb

# If external-name is set then public urls in keystone

# will use this name instead of the IP address

#You must either set this to a name that can be resolved in your network

# or comment out this line to use IP addresses

#external-name:

roles:

- public

tls-components:

- default

cert-file: sktgm-public-cert

# This is the name of the certificate that will be used on load balancer.

# Replace this with name of file in "~helion/my\_cloud/config/tls/certs/".

# This is the certificate that matches your setting for external-name

#

# Note that it is also possible to have per service certificates:

#

# cert-file:

# default: my-public-cert

# horizon: my-horizon-cert

# nova-api: my-nova-cert

#

# The configuration-processor will also create a request templates for each

# named certificates under

# "info/cert\_reqs/"

#

# And this will be of the form

#

# info/cert\_reqs/my-public-cert

# info/cert\_reqs/my-horizon-cert

# info/cert\_reqs/my-nova-cert

#

# These request templates contain the subject Alt-names that

# the certificates need. A customer can add to this template

# before generating their Certificate Signing Request (CSR).

# They would then send the CSR to their CA to be signed and

# receive the certificate, which can then be dropped into

# "config/tls/certs".

#

# When you bring in your own certificate you may want to bring

# in the trust chains (or CA certificate) for this certificate.

# This is usually not required if the CA is a public signer that

# gets bundled by the system. However, we suggest you include it

# into HOS anyway by copying the file into the directory

# "config/cacerts/".

# Note that the file extension should be .crt or it will not

# be processed by HOS.

#

mtu: 1500

# External VM

#

# This is the network group that will be used to provide

# external access to VMs (via floating IP Addresses)

#

# - name: EXTERNAL-VM

# tags:

# - neutron.l3\_agent.external\_network\_bridge

# mtu: 1500

#

# Management

#

# This is the network group that will be used to for

# management traffic within the cloud.

#

# The interface used by this group will be presented

# to Neutron as physnet1, and used by provider VLANS

#

- name: MANAGEMENT

hostname-suffix: mgmt

hostname: true

tls-component-endpoints:

# The following service endpoint is behind TLS

- barbican-api

component-endpoints:

- default

# routes:

# - default

# - OCTAVIA-MGMT-NET

load-balancers:

- provider: ip-cluster

name: lb

tls-components:

- default

components:

# These services do not currently support TLS

- vertica

- rabbitmq

- mysql

- nova-metadata

roles:

- internal

- admin

cert-file: sktgm-internal-cert

# The helion-internal-cert is a reserved name and

# this certificate will be autogenerated. Customer

# can bring in their own cert with a different name

# and follow the process described for the external

# loadbalancer configuration above. See under

# my-public-cert. It is important to use the request

# template generated by the config processor as there

# are more Subject Alt-name entries for the internal

# certificate than the external certificate.

tags:

- neutron.networks.vlan:

provider-physical-network: physnet1

# Uncomment the following line to accommodate a 1550 MTU for the GUEST network group

mtu: 1500

#

# NMS

#

# - name: NMS

# routes:

# - default

#

# NFS

#

# - name: NFS

# mtu: 1500

#

# PROVIDER-NMS

#

# - name: PROVIDER-NMS

# routes:

# - default

# tags:

# - neutron.networks.vlan:

# provider-physical-network: physnet2

#

# PROVIDER-DIAMETER

#

- name: PROVIDER-PCRF

tags:

- neutron.networks.vlan:

provider-physical-network: physnet3

mtu: 1500

#

# PROVIDER-GUEST

#

# This is the network group that will be used to provide

# private networks to VMs

#

- name: PROVIDER-GUEST

#hostname-suffix: guest

tags:

- neutron.networks.vlan:

provider-physical-network: physnet4

tenant-vlan-id-range: "100:101"

# mtu: 1500

#

# PROVIDER-PCIPTX

#

- name: PROVIDER-PCIPT1

tags:

- neutron.networks.vlan:

provider-physical-network: physnet21

- name: PROVIDER-PCIPT2

tags:

- neutron.networks.vlan:

provider-physical-network: physnet22

- name: PROVIDER-PCIPT3

tags:

- neutron.networks.vlan:

provider-physical-network: physnet23

- name: PROVIDER-PCIPT4

tags:

- neutron.networks.vlan:

provider-physical-network: physnet24

- name: PROVIDER-PCIPT5

tags:

- neutron.networks.vlan:

provider-physical-network: physnet25

- name: PROVIDER-PCIPT6

tags:

- neutron.networks.vlan:

provider-physical-network: physnet26

- name: PROVIDER-PCIPT7

tags:

- neutron.networks.vlan:

provider-physical-network: physnet27

- name: PROVIDER-PCIPT8

tags:

- neutron.networks.vlan:

provider-physical-network: physnet28

8. networks.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat networks.yml

#

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#

---

product:

version: 2

networks:

#

# This example uses the following networks

#

# Network CIDR VLAN

# ------- ---- ----

# Management 30.40.1.0/24 202 (untagged)

#

# Notes:

# 1. Defined as part of Neutron configuration

#

# Modify these values to match your environment

#

- name: MANAGEMENT-NET

tagged-vlan: false

cidr: 40.2.0.0/24

gateway-ip: 40.2.0.1

network-group: MANAGEMENT

addresses:

- 40.2.0.10-40.2.0.17

- name: NMS-NET

tagged-vlan: false

cidr: 60.50.82.0/24

gateway-ip: 60.50.82.1

network-group: NMS

addresses:

- 60.50.82.10-60.50.82.17

# - name: PROVIDER-NMS-NET

# vlanid: 200

# tagged-vlan: false

# cidr: 60.30.135.128/25

# gateway-ip: 60.30.135.249

# network-group: PROVIDER-NMS

# addresses:

## - 60.30.135.163-60.30.135.163

# - 60.30.135.133-60.30.135.139

# - 60.30.135.153-60.30.135.163

# - 60.30.135.176-60.30.135.176

# - name: PROVIDER-NMS-NET

# tagged-vlan: false

# network-group: PROVIDER-NMS

- name: PROVIDER-PCRF-NET

tagged-vlan: false

network-group: PROVIDER-PCRF

- name: PROVIDER-GUEST-NET

tagged-vlan: false

network-group: PROVIDER-GUEST

- name: PROVIDER-PCIPT1-NET

tagged-vlan: false

network-group: PROVIDER-PCIPT1

- name: PROVIDER-PCIPT2-NET

tagged-vlan: false

network-group: PROVIDER-PCIPT2

- name: PROVIDER-PCIPT3-NET

tagged-vlan: false

network-group: PROVIDER-PCIPT3

- name: PROVIDER-PCIPT4-NET

tagged-vlan: false

network-group: PROVIDER-PCIPT4

- name: PROVIDER-PCIPT5-NET

tagged-vlan: false

network-group: PROVIDER-PCIPT5

- name: PROVIDER-PCIPT6-NET

tagged-vlan: false

network-group: PROVIDER-PCIPT6

- name: PROVIDER-PCIPT7-NET

tagged-vlan: false

network-group: PROVIDER-PCIPT7

- name: PROVIDER-PCIPT8-NET

tagged-vlan: false

network-group: PROVIDER-PCIPT8

9. nic\_mappings.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat nic\_mappings.yml

#

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#

---

product:

version: 2

# nic-mappings are used to ensure that the device name used by the

# operating system always maps to the same physical device.

# A nic-mapping is associated to a server in the server definition.

# The logical-name specified here can be used as a device name in

# the network interface-models definitions.

#

# - name user-defined name for each mapping

# physical-ports list of ports for this mapping

# - logical-name device name to be used by the operating system

# type physical port type

# bus-address bus address of the physical device

#

# Notes:

# - The PCI bus addresses are examples. You will need to determine

# the values pertinent to your servers. These can be found with the

# the `lspci` command or from the server BIOS

# - enclose the bus address in quotation marks so yaml does not

# misinterpret the embedded colon (:) characters

# - simple-port is the only currently supported port type

# - choosing a new device name prefix (e.g. 'eth' -> 'hed') will

# help prevent remapping errors

nic-mappings:

- name: CONTROLLER-NIC-MAPPING

physical-ports:

- logical-name: hed1

type: simple-port

bus-address: "0000:02:00.0"

- logical-name: hed2

type: simple-port

bus-address: "0000:02:00.1"

- logical-name: hed3

type: simple-port

bus-address: "0000:02:00.2"

- logical-name: hed4

type: simple-port

bus-address: "0000:02:00.3"

- logical-name: hed5

type: simple-port

bus-address: "0000:04:00.0"

- logical-name: hed6

type: simple-port

bus-address: "0000:04:00.1"

- logical-name: hed7

type: simple-port

bus-address: "0000:04:00.2"

- logical-name: hed8

type: simple-port

bus-address: "0000:04:00.3"

- logical-name: hed9

type: simple-port

bus-address: "0000:0b:00.0"

- logical-name: hed10

type: simple-port

bus-address: "0000:0b:00.1"

- logical-name: hed11

type: simple-port

bus-address: "0000:0b:00.2"

- logical-name: hed12

type: simple-port

bus-address: "0000:0b:00.3"

# - logical-name: hed13

# type: simple-port

# bus-address: "0000:84:00.0"

# - logical-name: hed14

# type: simple-port

# bus-address: "0000:84:00.1"

# - logical-name: hed15

# type: simple-port

# bus-address: "0000:84:00.2"

# - logical-name: hed16

# type: simple-port

# bus-address: "0000:84:00.3"

- name: COMPUTE-SPDSDE-NIC-MAPPING

physical-ports:

- logical-name: hed1

type: simple-port

bus-address: "0000:02:00.0"

- logical-name: hed2

type: simple-port

bus-address: "0000:02:00.1"

- logical-name: hed3

type: simple-port

bus-address: "0000:02:00.2"

- logical-name: hed4

type: simple-port

bus-address: "0000:02:00.3"

- logical-name: hed5

type: simple-port

bus-address: "0000:04:00.0"

- logical-name: hed6

type: simple-port

bus-address: "0000:04:00.1"

- logical-name: hed7

type: simple-port

bus-address: "0000:04:00.2"

- logical-name: hed8

type: simple-port

bus-address: "0000:04:00.3"

- logical-name: hed9

type: simple-port

bus-address: "0000:0b:00.0"

- logical-name: hed10

type: simple-port

bus-address: "0000:0b:00.1"

- logical-name: hed11

type: simple-port

bus-address: "0000:0b:00.2"

- logical-name: hed12

type: simple-port

bus-address: "0000:0b:00.3"

- name: COMPUTE-DPI-NIC-MAPPING

physical-ports:

- logical-name: hed1

type: simple-port

bus-address: "0000:02:00.0"

- logical-name: hed2

type: simple-port

bus-address: "0000:02:00.1"

- logical-name: hed3

type: simple-port

bus-address: "0000:02:00.2"

- logical-name: hed4

type: simple-port

bus-address: "0000:02:00.3"

- logical-name: hed5

type: simple-port

bus-address: "0000:04:00.0"

- logical-name: hed6

type: simple-port

bus-address: "0000:04:00.1"

- logical-name: hed7

type: simple-port

bus-address: "0000:04:00.2"

- logical-name: hed8

type: simple-port

bus-address: "0000:04:00.3"

- logical-name: hed9

type: simple-port

bus-address: "0000:08:00.0"

- logical-name: hed10

type: simple-port

bus-address: "0000:08:00.1"

- logical-name: hed11

type: simple-port

bus-address: "0000:08:00.2"

- logical-name: hed12

type: simple-port

bus-address: "0000:08:00.3"

- logical-name: hed21

type: simple-port

bus-address: "0000:05:00.0"

nic-device-type: "8086:10fb"

- logical-name: hed22

type: simple-port

bus-address: "0000:05:00.1"

nic-device-type: "8086:10fb"

- logical-name: hed23

type: simple-port

bus-address: "0000:0b:00.0"

nic-device-type: "8086:10fb"

- logical-name: hed24

type: simple-port

bus-address: "0000:0b:00.1"

nic-device-type: "8086:10fb"

- logical-name: hed25

type: simple-port

bus-address: "0000:88:00.0"

nic-device-type: "8086:10fb"

- logical-name: hed26

type: simple-port

bus-address: "0000:88:00.1"

nic-device-type: "8086:10fb"

- logical-name: hed27

type: simple-port

bus-address: "0000:84:00.0"

nic-device-type: "8086:10fb"

- logical-name: hed28

type: simple-port

bus-address: "0000:84:00.1"

nic-device-type: "8086:10fb"

14. server\_groups.yml

---

product:

version: 2

server-groups:

#

# Server Groups provide a mechanism for organizing servers

# into a hierarchy that reflected the physical topology.

#

# When allocating a server the configuration processor

# will search down the hierarchy from the list of server

# groups identified as the failure-zones for the control

# plane until it finds an available server of the requested

# role. If the allocation policy is "strict" servers are

# allocated from different failure-zones.

#

# When determining which network from a network group to

# associate with a server the configuration processor will

# search up the hierarchy from the server group containing the

# server until it finds a network in the required network

# group.

#

#

# In this example there is only one network in each network

# group and so we put all networks in the top level server

# group. Below this we create server groups for three

# failure zones, within which servers are grouped by racks.

#

# Note: the association of servers to server groups is part

# of the server definition (servers.yml)

#

#

# At the top of the tree we have a server groups for

# networks that can reach all servers

#

- name: CLOUD

server-groups:

- AZ1

- AZ2

- AZ3

networks:

- MANAGEMENT-NET

- NMS-NET

- NFS-NET

- PROVIDER-DIAMETER-NET

- PROVIDER-GUEST-NET

- PROVIDER-SIP-NET

- PROVIDER-SIP-IPSEC-NET

- PROVIDER-RTP-NET

- PROVIDER-RTP2-NET

- PROVIDER-DPDK-NET

#

# Create a group for each failure zone

#

- name: AZ1

server-groups:

- RACK1

- name: AZ2

server-groups:

- RACK2

- name: AZ3

server-groups:

- RACK3

#

# Create a group for each rack

#

- name: RACK1

- name: RACK2

- name: RACK3

15. server\_roles.yml

#

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#

---

product:

version: 2

server-roles:

- name: LIFECYCLE-MANAGER-ROLE

interface-model: LIFECYCLE-MANAGER-INTERFACES

disk-model: LIFECYCLE-MANAGER-DISKS

- name: MTRMON-ROLE

interface-model: MTRMON-INTERFACES

disk-model: MTRMON-DISKS

- name: CONTROLLER-ROLE

interface-model: CONTROLLER-INTERFACES

disk-model: CONTROLLER-DISKS

- name: COMPUTE-ROLE

interface-model: COMPUTE-INTERFACES

disk-model: COMPUTE-DISKS

- name: PAAS-COMPUTE-ROLE

interface-model: PAAS-COMPUTE-INTERFACES

disk-model: COMPUTE-DISKS

- name: OSD-ROLE

interface-model: OSD-INTERFACES

disk-model: OSD-DISKS

- name: CEPH-MON-ROLE

interface-model: CEPH-MON-INTERFACES

disk-model: CEPH-MON-DISKS

- name: SWPACO-ROLE

interface-model: SWPACO-INTERFACES

disk-model: SWIFT-PACO-DISKS

10. servers.yml

stack@helion-cp1-c1-m1-mgmt:~/helion/my\_cloud/definition/data$ cat servers.yml

#

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#

---

product:

version: 2

baremetal:

# NOTE: These values need to be changed to match your environment.

# Define the network range that contains the ip-addr values for

# the individual servers listed below.

subnet: 40.2.0.0

netmask: 255.255.255.0

servers:

# NOTE: Addresses of servers need to be changed to match your environment.

#

# Add additional servers as required

#

# Controllers

- id: controller1

ip-addr: 40.2.0.11

role: CONTROLLER-ROLE

server-group: RACK1

nic-mapping: CONTROLLER-NIC-MAPPING

mac-addr: "94:18:82:6f:d2:14"

ilo-ip: 40.2.0.201

ilo-password: hpinvent

ilo-user: admin

- id: controller2

ip-addr: 40.2.0.12

role: CONTROLLER-ROLE

server-group: RACK2

nic-mapping: CONTROLLER-NIC-MAPPING

mac-addr: "94:18:82:71:87:2c"

# mac-addr: "3c:a8:2a:e7:3a:a8"

ilo-ip: 40.2.0.202

ilo-password: hpinvent

ilo-user: admin

- id: controller3

ip-addr: 40.2.0.13

role: CONTROLLER-ROLE

server-group: RACK3

nic-mapping: CONTROLLER-NIC-MAPPING

mac-addr: "94:18:82:6f:e2:3c"

# mac-addr: "3c:a8:2a:e7:44:2c"

ilo-ip: 40.2.0.203

ilo-password: hpinvent

ilo-user: admin

- id: compute1

ip-addr: 40.2.0.14

role: COMPUTE-DPI-ROLE

server-group: RACK1

nic-mapping: COMPUTE-DPI-NIC-MAPPING

mac-addr: "94:18:82:01:e1:94"

# mac-addr: "28:80:23:b8:a0:98"

ilo-ip: 40.2.0.210

ilo-password: hpinvent

ilo-user: admin

- id: compute2

ip-addr: 40.2.0.15

role: COMPUTE-DPI-ROLE

server-group: RACK1

nic-mapping: COMPUTE-DPI-NIC-MAPPING

mac-addr: "94:18:82:01:e1:f4"

# mac-addr: "3c:a8:2a:e4:fe:54"

ilo-ip: 40.2.0.211

ilo-password: hpinvent

ilo-user: admin

- id: compute3

ip-addr: 40.2.0.16

role: COMPUTE-SPBSDE-ROLE

server-group: RACK1

nic-mapping: COMPUTE-SPDSDE-NIC-MAPPING

mac-addr: "94:18:82:01:f1:54"

# mac-addr: "3c:a8:2a:e6:d7:28"

ilo-ip: 40.2.0.213

ilo-password: hpinvent

ilo-user: admin

- id: compute4

ip-addr: 40.2.0.17

role: COMPUTE-SPBSDE-ROLE

server-group: RACK1

nic-mapping: COMPUTE-SPDSDE-NIC-MAPPING

mac-addr: "94:18:82:01:12:08"

# mac-addr: "3c:a8:2a:e4:f9:64"

ilo-ip: 40.2.0.214

ilo-password: hpinvent

ilo-user: admin

## 4.2 helion openstack installation

#### Support Hardware Configuration

Storage interconnects/Protocols

* 1Gb or 10Gb Ethernet

#### Notes about Performance

다음과 같은 Cloud 환경을 구성할 것을 권장합니다.

* Control plane node에서 높은 I/O Performance를 위해 Array controller는 Cache controller를 가져야 하며 Raid5로 구성하는 것을 권장합니다.
* Compute node에서는 I/O Performance는 가상머신 start-up 성능에 영향을 미칠 것이며, Storage array에 cache controller 사용을 권장합니다.

#### Recommended Minimum hardware requirements for a KVM model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Node Type** | **Role name** | **Required Number** | **Server Hardware** | **Minimum Requirements and Recommendations** |
| Dedicated lifecycle manager (optional, the default configuration uses the first controller node as the lifecycle manager) | Lifecycle-manager | 1 | Disk | 8GB |
| Memory | 1GB |
| Network | Options:  ◾1 x 1 GB with PXE Support  ◾2 x 1 GB or 2 x 10 GB  or  ◾2 x 1 GB or 2 x 10 GB (with one PXE enabled NIC) |
| CPU | 8 CPU (64-bit) cores total (can be Intel or AMD) |
| Control Plance | Controller | 3 | Disk | ◾1 x 512 GB (minimum) - operating system drive  ◾2 x 512 GB (minimum) - Data drive |
| Memory | 32 GB |
| Network | Options:  ◾1 x 1 GB with PXE Support  ◾2 x 1 GB or 2 x 10 GB  or  ◾2 x 1 GB or 2 x10 GB (with one PXE enabled NIC) |
| CPU | 8 CPU (64-bit) cores total (can be Intel or AMD) |
| Compute | Compute | 1-100 | Disk | 2 X 512 GB (minimum) |
| Memory | 32 GB (memory must be sized based on the VM instances hosted on the Compute node) |
| Network | Options:  ◾1 x 1 GB with PXE Support  ◾2 x 1 GB or 2 x 10 GB  or  ◾2 x 1 GB or 2 x 10 GB (with one PXE enabled NIC) |
| CPU | 8 CPU (64-bit) cores total (can be Intel or AMD) with hardware virtualization support. The CPU cores must be sized based on the VM instances hosted by the Compute node. |
| Block Storage (Optional) | VSA or OSD  (Ceph) | 0 or 3 (which will provide the recommended redundancy) | Disk | 3 X 512 GB (minimum) See Pre-Install Checklist - VSA for more details. |
| Memory | 32 GB |
| Network | Options:  ◾1 x 1 GB with PXE Support  ◾2 x 1 GB or 2 x 10 GB  or  ◾2 x 1 GB or 2 x10 GB (with one PXE enabled NIC) |
| CPU | 8 CPU (64-bit) cores total (can be Intel or AMD) |

#### Guest os support

**KVM환경에서는 아래와 같이 Guest OS를 지원합니다.**

|  |  |  |
| --- | --- | --- |
| **OS** | **Verified** | **Certified** |
| Windows Server 2008 |  | Yes |
| Windows Server 2008 R2 |  | Yes |
| Windows Server 2012 |  | Yes |
| Windows Server 2012 R2 |  | Yes |
| CentOS 6.7 | Yes |  |
| CentOS 7.1 | Yes |  |
| CoreOS - Stable | Yes |  |
| Debian 7.9 | Yes |  |
| Debian 8.2 | Yes |  |
| RHEL 6.7 | Yes |  |
| RHEL 7.1 | Yes |  |
| RHEL Atomic | Yes |  |
| SLES 11 SP4 | Yes |  |
| SLES 12 | Yes |  |
| Ubuntu 14.04 | Yes |  |

#### Using Git for Configuration Management

HPE Helion Openstack의 Local git repository는 구성 변경 사항을 추적하는 데 사용되며, Congifuration Processor(CP)는 이 저장소를 사용합니다. 여기에 Configuration history가 저장되어 쉽게 이전 configuration으로 rollback을 할 수도 있습니다. Git repository는 lifecycle-manager에 설치됩니다.

Initialization on a new deployment

Lifecycle-manager에서 git repository는 ~/hellion 디렉토리 밑에 준비가 되며, lifecycle-manager provisioning은 자동으로 hlm-init-deployer 스크립트를 실행하며 이 스크립트는ansible-playbook -i hosts/localhost git-00-initialise.yml을 불러오게 되어 있습니다.

~/hellion 디렉토리는 아래와 같은 구조로 되어 있습니다.

| **directory** | **Description** |
| --- | --- |
| **hos** | 이 디렉토리는 ~/hellion 디렉토리 내용에 대응하는 upstream source를 갖고 있습니다. HPE에서 다운로드한 모든 source code를 release한 것입니다. 즉, end user에 의해 customization되지 않은 것입니다. |
| **site** | 이 디렉토리는 host의 copy본으로서 당신의 configuration 변경분을 반영합니다. |
| **ansible** | 이 디렉토리는 Configuration Process에 의해 생성된 변수가 정의되어 있습니다. 그리고 어떤 서버가 어떤 역할을 수행하는지verb\_hosts 파일에 포함되어 있습니다. 이러한 준비된 deployment playbook은 이 output을 수행하고 ~/scratch 디렉토리에 ansible playbook이 다양한 변수와 함께 포함되어 있습니다. 또한 main deployment playbook이 정상적으로 수행되었는지 ~/scratch/ansible/next/hos/ansible 에 들어있습니다. |
| **cp-persistent** | 이 디렉토리는 CP(Configuration Processor)를 유지하는데 필요한 지속상태를 포함하고 있습니다. 이 상태는 거의 ip주소 할당과 특정 서버 role 할당입니다. 일부 operation 절차가 이곳에 포함되어 있을 수 있습니다. (예를 들어 용도 변경을 위한 서비스 retiring) |
| **staging-ansible** | 가장 최근 commit이 ansible branch에 추가됩니다. |
| **staging-cp-persistent** | 가장 최근 commit이 cp-persistent에 추가됩니다. |

Updating any configuration, including the default configuration

Configuration update를 위해 꼭 필요한 과정입니다.

1. Check out the site

git checkout site

1. Yaml file 수정하거나 configuration 변경을 포함한 파일 반영을 위해 아래와 같이 수행
2. Commit

git add -A

git commit -m "your commit message goes here in quotes"

만약, single file을 git repository에 추가하고 싶으면 아래와 같이 수행하면 됨

git add PATH\_TO\_FILE

예를 들어 server.yml 파일내용을 수정하여 commit할 경우에는 아래와 같이 수행

git add ~/helion/my\_cloud/definition/data/servers.yml

1. configuration processor 수행

cd ~/helion/hos/ansible

ansible-playbook -i hosts/localhost config-processor-run.yml

1. Ready the deployment area

ansible-playbook -i hosts/localhost ready-deployment.yml

1. deployment playbooks 수행

cd ~/scratch/ansible/next/hos/ansible

ansible-playbook -i hosts/verb\_hosts site.yml

Configure Your Environment

Ceph 구성환경에 맞게 Configuration file 적용합니다. (아래 Ceph Configuration 참조)

**Edit Your Ceph Environment Input Files (option)**

1. Deployer에 접속
2. Configuration file 설정 (ceph 설정파일 선택)

cp -r ~/helion/examples/entry-scale-ceph/\* ~/helion/my\_cloud/definition/

1. ~/helion/my\_cloud/definition/data/disks\_osd.yml 파일 수정

# Copyright 2015 Hewlett-Packard Development Company, L.P

---

product:

version: 2

disk-models:

- name: OSD-DISKS

# /dev/sda1 is used as a Volume Group for /, /var/log, and /var/crash

volume-groups:

- name: hlm-vg

physical-volumes:

- /dev/sda\_root

logical-volumes:

- name: root

size: 20%

fstype: ext4

mount: /

- name: LV\_LOG

size: 40%

mount: /var/log

fstype: ext4

mkfs-opts: -O large\_file

- name: LV\_CRASH

size: 20%

mount: /var/crash

fstype: ext4

mkfs-opts: -O large\_file

consumer:

name: os

# Additional disk group defined for OSD

# If available, you can add additional disks to the "devices" list.

# Only list disks that are present at deployment time.

device-groups:

- name: ceph-osd-data-and-journal-0

devices:

- name: /dev/sdb

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-1

devices:

- name: /dev/sdc

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-2

devices:

- name: /dev/sdd

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-3

devices:

- name: /dev/sde

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-4

devices:

- name: /dev/sdf

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-5

devices:

- name: /dev/sdg

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-6

devices:

- name: /dev/sdh

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-7

devices:

- name: /dev/sdi

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-8

devices:

- name: /dev/sdj

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-9

devices:

- name: /dev/sdk

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-10

devices:

- name: /dev/sdl

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-11

devices:

- name: /dev/sdm

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-12

devices:

- name: /dev/sdn

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-13

devices:

- name: /dev/sdo

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-14

devices:

- name: /dev/sdp

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-15

devices:

- name: /dev/sdq

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-16

devices:

- name: /dev/sdr

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-17

devices:

- name: /dev/sds

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-18

devices:

- name: /dev/sdt

consumer:

name: ceph

attrs:

usage: data

- name: ceph-osd-data-and-journal-19

devices:

- name: /dev/sdu

consumer:

name: ceph

attrs:

usage: data

[OPTIONAL] 필요 시 ~/helion/my\_cloud/config/ceph/settings.yml 수정 (default value로도 동작함)

1. Configuration 파일 적용

cd ~/helion/hos/ansible

git add –A

git commit –m “<commit message>”

provision your baremetal nodes

**Part One : Deploy Cobbler**

1. ILO망을 통해 서로 연결된 노드들의 power status 확인

cd ~/helion/hos/ansible

ansible-playbook -i hosts/localhost bm-power-status.yml

1. Cobbler deploy를 위한 아래 playbook 실행

cd ~/helion/hos/ansible

ansible-playbook -i hosts/localhost cobbler-deploy.yml

**Part Two : Image the Nodes**

1. 모든 노드의 부팅옵션에서 Network boot를 상위 옵션으로 설정하고 리부팅하면 network 부팅이 되면서 설치가 진행되고 다시 power-off됨.
2. 다시 부팅옵션에서 hard disk로 설정하면 리부팅되면서 ssh 접속되는지 확인하는 작업 진행됨.

reimage command :

cd ~/helion/hos/ansible

ansible-playbook -i hosts/localhost bm-reimage.yml

아래 명령어를 통해 netboot-enable 상태 확인 가능함.

sudo cobbler system find --netboot-enabled=1

0r sudo cobbler system list > list (확인)

deploy the cloud

[Prerequisite] 해당 Config파일을 먼저 사전에 설정합니다.

- control\_plane.yml

- server\_roles.yml

- net\_interfaces.yml

- disks\_lifecycle-manager.yml

- servers.yml

**1) control\_plane.yml 파일에 아래부분 수정 및 확인**

Contoller 노드에 lifecycle-manager role 삭제 후 Deployer노드쪽에 아래와 같이 추가

# added for dedicated deployer

#

- name: cluster0

cluster-prefix: hlm

server-role: LIFECYCLE-MANAGER-ROLE

member-count: 1

allocation-policy: strict

service-components:

- lifecycle-manager

**2) server\_roles.yml에도 아래와 같이 추가**

product:

version: 2

server-roles:

- name: LIFECYCLE-MANAGER-ROLE

interface-model: LIFECYCLE-MANAGER-INTERFACES

disk-model: LIFECYCLE-MANAGER-DISKS

**3) net\_interfaces.yml**

product:

version: 2

interface-models:

# These examples uses nic2port1 and nic3port1 as a bonded

# pair for all networks on all three server roles

#

# Edit the device names and bond options

# to match your environment

#

- name: LIFECYCLE-MANAGER-INTERFACES

network-interfaces:

- name: nic1port2

device:

name: nic1port2

network-groups:

- HLM

- name: BOND0

device:

name: bond0

bond-data:

options:

mode: active-backup

miimon: 200

primary: nic2port1

provider: linux

devices:

- name: nic2port1

- name: nic3port1

network-groups:

- MANAGEMENT

**4) disks\_lifecycle\_manager.yml**

---

product:

version: 2

disk-models:

- name: LIFECYCLE-MANAGER-DISKS

# Disk model to be used for lifecycle manager nodes

# /dev/sda\_root is used as a volume group for /, /var/log and /var/crash

# sda\_root is a templated value to align with whatever partition is really used

# This value is checked in os config and replaced by the partition actually used

# on sda e.g. sda1 or sda5

volume-groups:

- name: hlm-vg

physical-volumes:

- /dev/sda\_root

logical-volumes:

# The policy is not to consume 100% of the space of each volume group.

# 5% should be left free for snapshots and to allow for some flexibility.

- name: root

size: 80%

fstype: ext4

mount: /

- name: crash

size: 15%

mount: /var/crash

fstype: ext4

mkfs-opts: -O large\_file

consumer:

name: os

**5) servers.yml**

#Lifecycle-manager

- id: lifecycle-manager

ip-addr: 192.168.34.20

role: LIFECYCLE-MANAGER-ROLE

server-group: RACK1

nic-mapping: HP\_DL\_8PORT

# ipmi information is not needed

위의 환경파일에 설정 한 후 아래와 같이 진행합니다.

1. 아래 playbook을 이용하여 deployment dir 생성:

cd ~/helion/hos/ansible

ansible-playbook -i hosts/localhost ready-deployment.yml

1. site.yml playbook 수행 :

cd ~/scratch/ansible/next/hos/ansible

ansible-playbook -i hosts/verb\_hosts site.yml -e elasticsearch\_cluster\_name=sktlog

1. Network이 정상적인지 각 controller 노드에서 /etc/hosts 파일의 모든 호스트에 대해 ping 명령어 수행하여 확인

run the configuration processor

Configuration 파일 설정을 한 후에 아래와 같이 configuration processor를 수행합니다.

cd ~/helion/hos/ansible

ansible-playbook -i hosts/localhost config-processor-run.yml

Deploy the cloud

Configuration 파일 설정을 한 후에 아래와 같이 배포 준비 작업을 수행합니다.

cd ~/helion/hos/ansible

ansible-playbook -i hosts/localhost ready-deployment.yml

Run the playbook

배포 준비를 완료 후 Playbook을 실행하여 실제 설치를 진행합니다.

cd ~/scratch/ansible/next/hos/ansible

ansible-playbook -i hosts/verb\_hosts site.yml