

How to install Contrail v2005 + CentOS 7.7

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How to install Contrail v2005 + CentOS 7.7

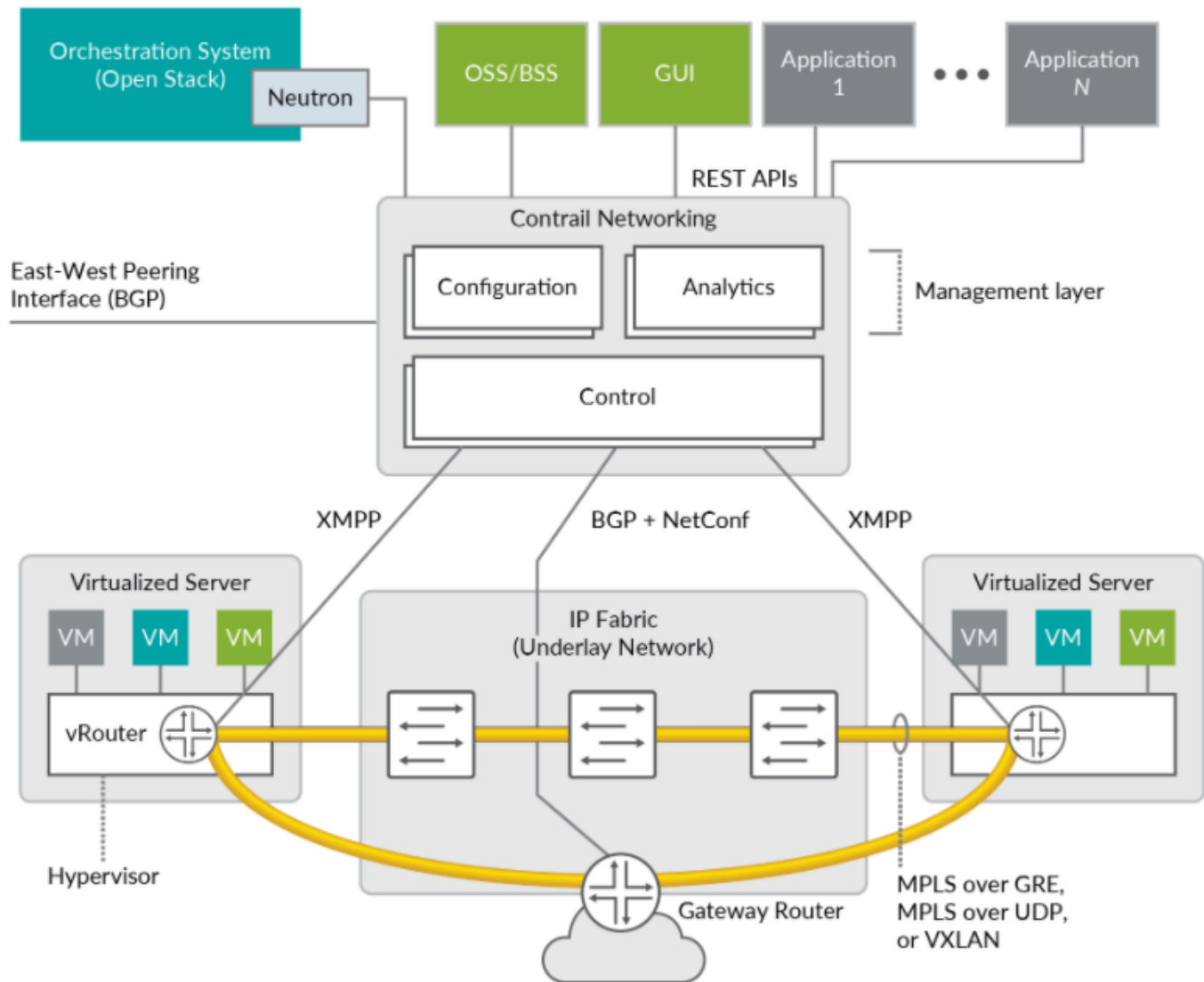
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0. Contrail Networking overview.

> **contrail-networking overview**

https://www.juniper.net/documentation/en_US/contrail19/topics/concept/understanding-contrail-networking-components.html

Figure 1: Contrail Networking Overview



1. 2 installation methods.

There are 2 methods

1.1 With 'instance.yml' , installing at a time.

- At this time, I am going to install Contrail with this method.
- Prerequisite: on all servers, please do CentOS 7.7 re-image and set ip and DNS, hostname properly. If you are done pre-requests, then only in "Contrail-command" server, everything will go on. (For details, please see below)

1.2. First, install "Contrail-command", then go to 'Contrail-command' web GUI, do the rest on GUI.

2. Check lists before going to install

2.1. server spec

- Please find below server spec required officially.
- My server's spec such as memory and CPU are poor. But no problem with installation and running.
- But one thing to mention, for the node "contrail-Controller", please enhance Physical memory at least to 32GB.

> [How to Install Contrail Command and Provision Your Contrail Cluster - TechLibrary - Juniper Networks](#)

Server Requirements

A Contrail Networking environment can include physical servers or VMs providing server functions, although we highly recommended using physical servers for scalability and availability reasons whenever possible.

Each server in a Contrail environment must have a minimum of:

- 64 GB memory.
- 300 GB hard drive.
- 4 CPU cores.
- At least one Ethernet port.

> my lab spec & server naming used.

Device (Host NAME)	Servers	MGMT IP	Internal IP	CPU	RAM	HDD
contrail-command(contrailcommand-221)	Eslim server #1	172.27.122.221 (enp5s0f0)	100.0.0.221(enp5s0f1)	8	16GB	150GB
contrail-Controller (controller-222)	EXSI VM	172.27.122.222 (ens32)	100.0.0.222 (ens33)	8	32GB	100GB
contrail-service-node (CSN-223)	Eslim server #2	172.27.122.223 (enp5s0f0)	100.0..0.223(enp5s0f1)	8	16GB	150GB
Compute 1 (compute1-224)	Eslim server #3	172.27.122.224 (enp5s0f0)	100.0.0.224(enp5s0f1)	8	16GB	150GB
Compute 2 (compute2-225)	Eslim server #4	172.27.122.225 (enp5s0f0)	100.0.0.225(enp5s0f1)	8	16GB	150GB
MX960		172.27.122.195 (fxp0)				
QFX5110		172.27.122.197 (em0)				

2.2. Contrail and CentOS version

- please check contrail version, you are going to install and CentOS, and Linux Kernel version
- in my installation "Contrail_v2005 + CentOS7.7", I didn't meet/upgrade linux kernel properly, but it works. Just to be aware of that.

> [Contrail Networking Supported Platforms List \(juniper.net\)](https://www.juniper.net/contrail-networking/supported-platforms)

Contrail Networking Supported Platforms List - Releases 20xx

Contrail Networking Release		2011	2008	2005 2005.1	2003 2003.1
DPDK Release		19.11	19.11	18.05.1	18.05.1
Orchestrator Platform					
OpenStack Queens	Ansible	x	CentOS 7.8—Linux Kernel Version 3.10.0-1127.13.1 Ansible version: 2.5.2 Docker version: 18.03.1-ce	CentOS 7.8—Linux Kernel Version 3.10.0-1127 Ansible version: 2.5.2 Docker version: 18.03.1-ce CentOS 7.7—Linux Kernel Version 3.10.0-1062.12.1 Ansible version: 2.5.2 Docker version: 18.03.1-ce	CentOS 7.7—Linux Kernel Version 3.10.0-1062.12.1 Ansible version: 2.5.2 Docker version: 18.03.1-ce
	Canonical OpenStack Queens	Ubuntu 18.04.5—Linux Kernel Version 4.15.0-126-generic MaaS Version: 2.4.2	Ubuntu 18.04.4—Linux Kernel Version 4.15.0-112-generic MaaS Version: 2.4.2	Ubuntu 18.04.4—Linux Kernel Version 4.15.0-104-generic MaaS Version: 2.4	Ubuntu 18.04.4—Linux Kernel Version 4.15.0-91-generic MaaS Version: 2.4
	Juju Charms	Ubuntu 18.04.5—Linux Kernel Version 4.15.0-126-generic MaaS Version: 2.4.2	x	x	x

> How to check Linux kernel version and upgrade.

In this example, the Linux kernel is verified on the Contrail Command server.

```
[root@ix-cn-ccmd-01 ~]# uname -a
Linux ix-cn-ccmd-01 3.10.0-1062.el7.x86_64 #1 SMP Wed Aug 7 18:08:02 UTC 2019 x86_64 x86_64 x86_64

[root@ix-cn-ccmd-01 ~]# ls
anaconda-ks.cfg  kernel-3.10.0-1062.12.1.el7.x86_64.rpm

[root@ix-cn-ccmd-01 ~]# rpm -ihv kernel-3.10.0-1062.12.1.el7.x86_64.rpm
warning: kernel-3.10.0-1062.12.1.el7.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID f4a80eb5: I
Preparing...                               ##### [100%]
Updating / installing...
 1:kernel-3.10.0-1062.12.1.el7             ##### [100%]

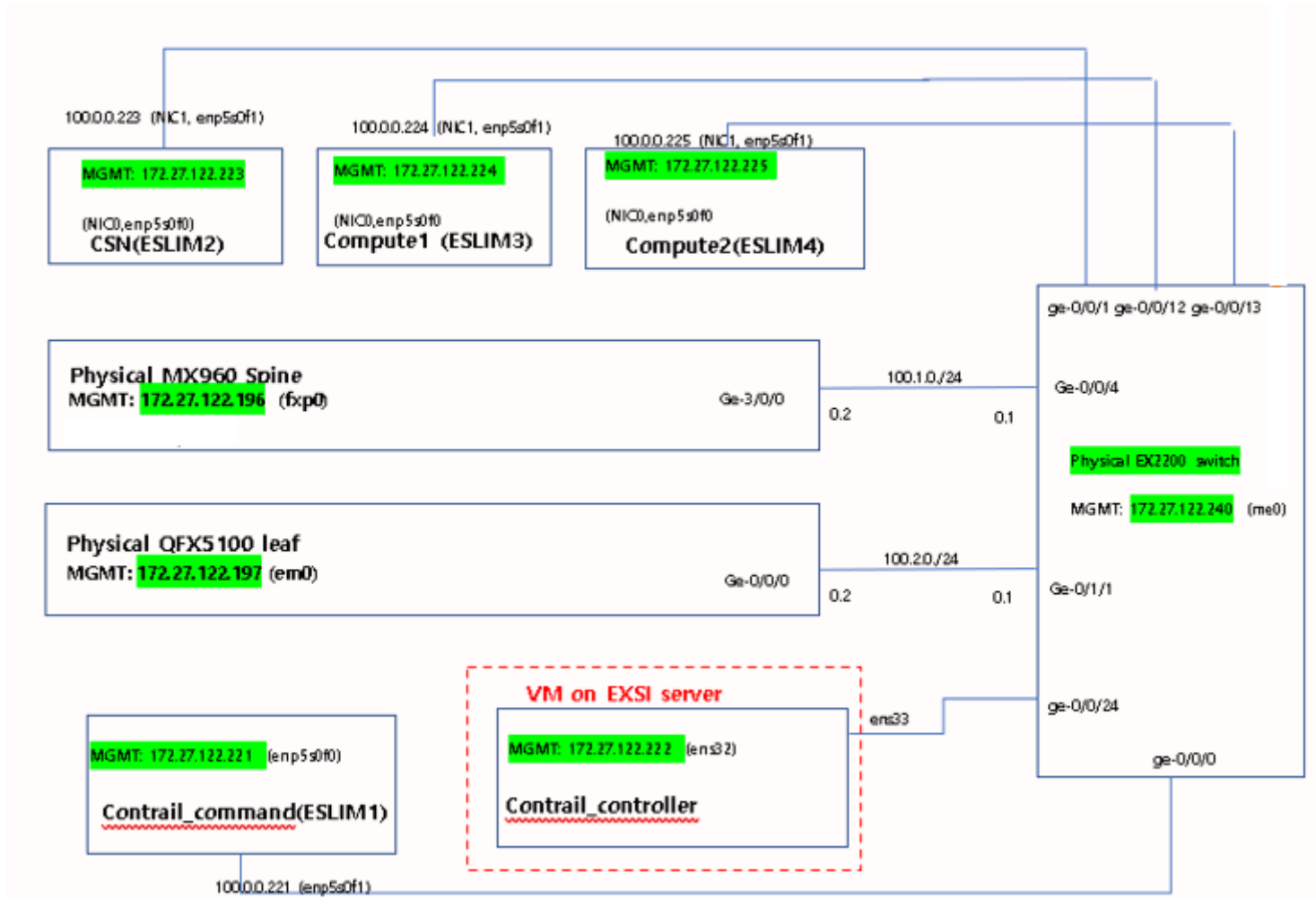
[root@ix-cn-ccmd-01 ~]# shutdown -r now
```

After the server reboots, confirm that the kernel is updated.

```
[root@ix-cn-ccmd-01 ~]# uname -a
Linux ix-cn-ccmd-01 3.10.0-1062.12.1.el7.x86_64 #1 SMP Tue Feb 4 23:02:59 UTC 2020 x86_64 x86_64 x86_64
```

2.3. My Lab topo

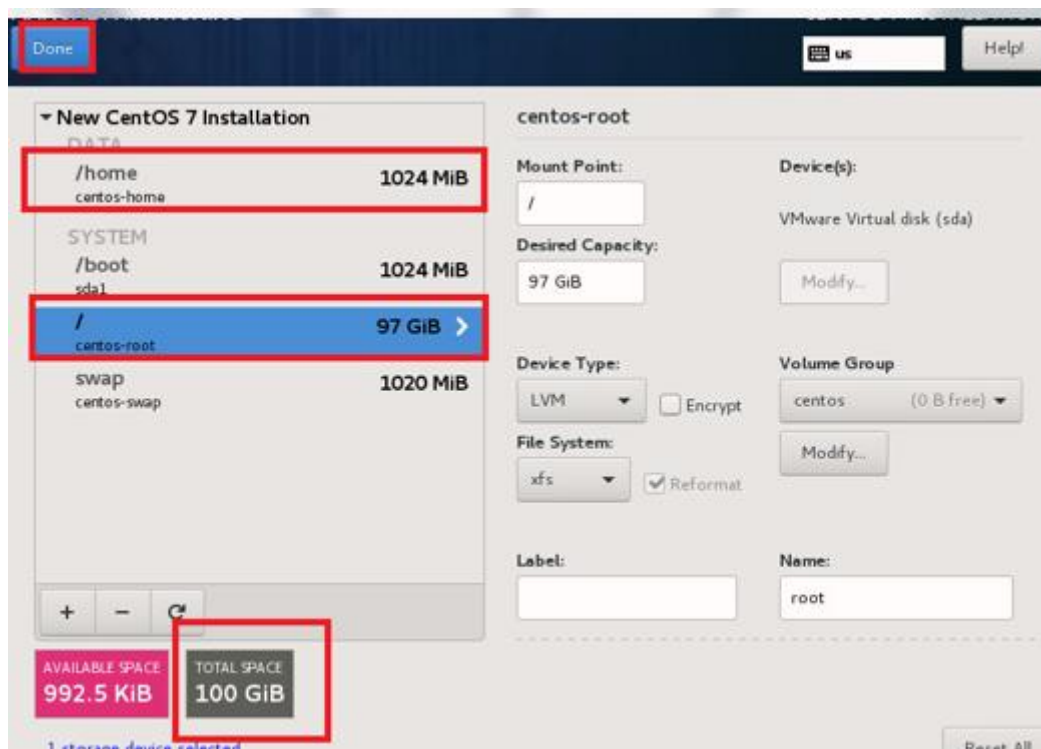
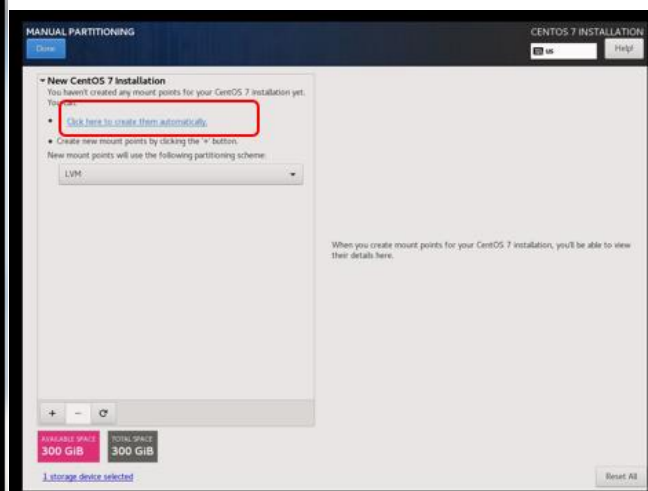
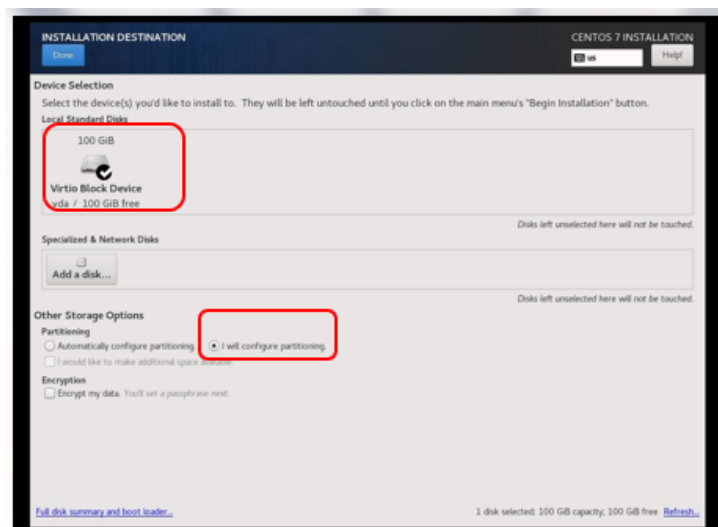
- For contrail installation, at least you need 2 ports.
=> port1 : MGMT , port 2 : internal port.
- port1 (MGMT) used to install and download overall installation files. So it must be internet/DNS reachable



- When all servers are re-imaged with CentOS7.7, Disk size 100GB required.
- you don't need much size /home directory. I set to 1GB. For the rest, I set to all /root and /swap if your physical memory size is small.
- Earlier, I commented to "enhance contrail-controller memory to 32GB". Installing with 16GB on "Contrail-controller" server, it's ok. But after installation done, you may face Cassandra DB container restarting issue due to a lack of memory.

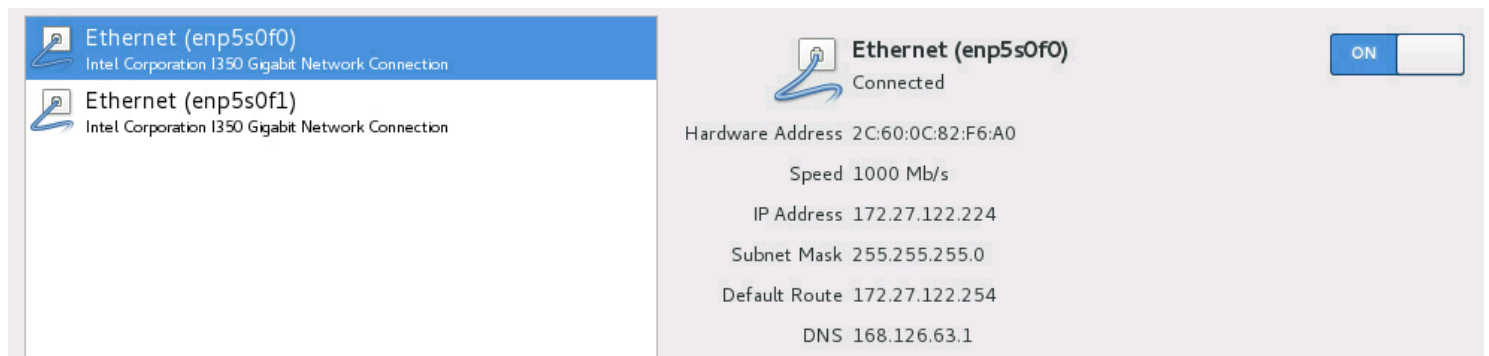
> Key points at CentOS installatoin.

**Disk

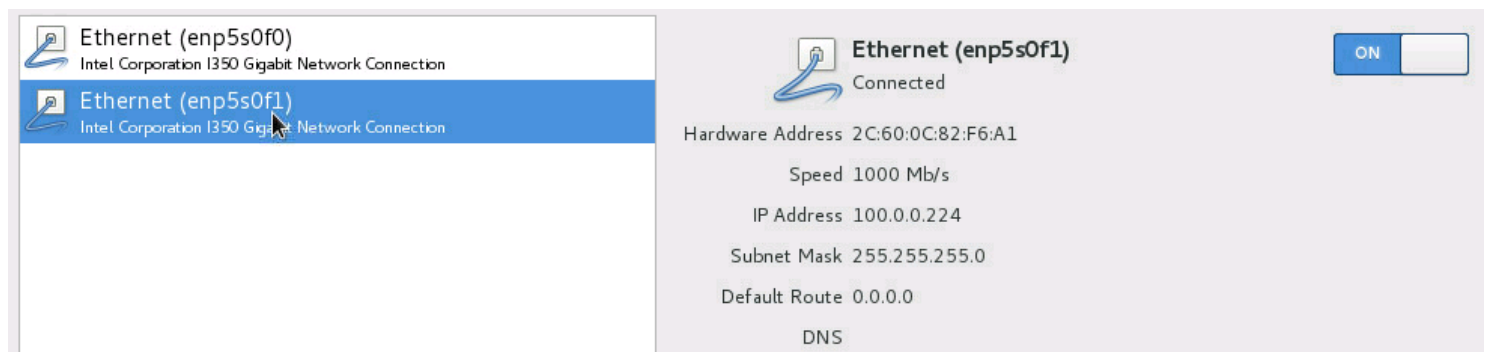


** Network

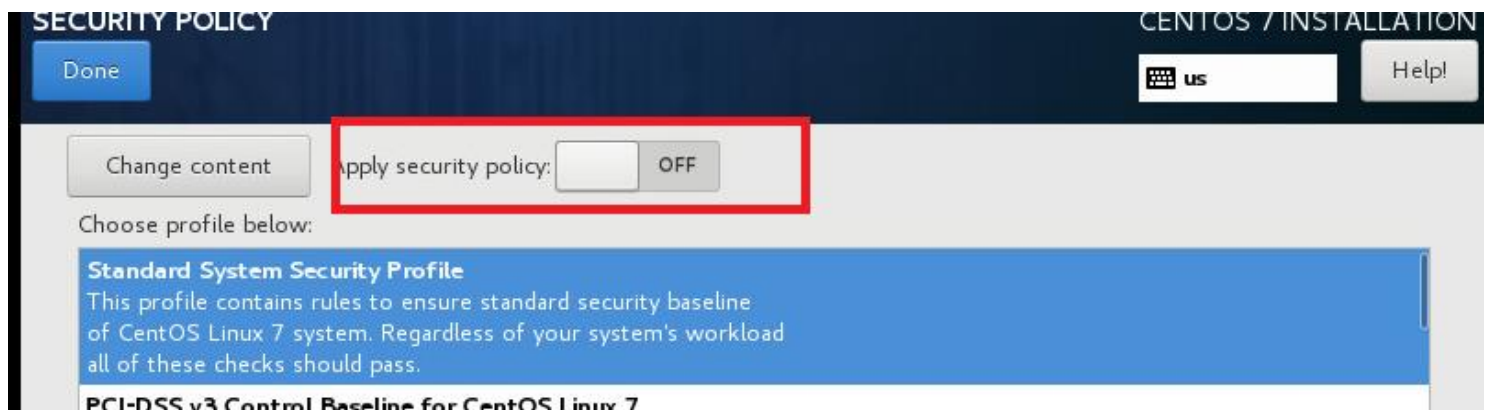
- For MGMT interface, please set fixed static IP, gateway, DNS properly.



- For internal interface, I set private 100.0.0/24



** Security policy : you don't need to set it.

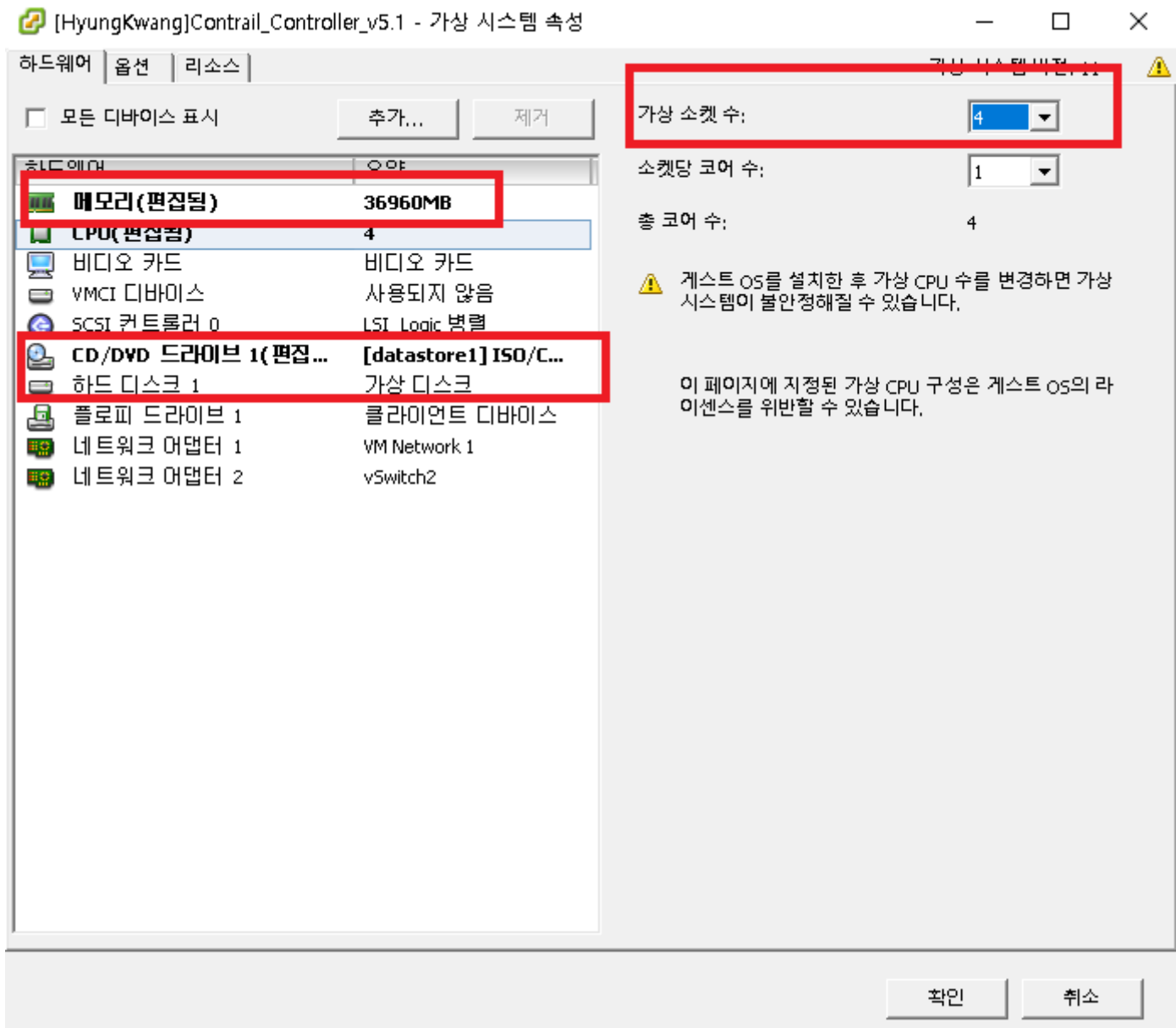


While installing Contrail, Contrail set security policy to permissive. So Security policy of CentOS, you don't need to set.

```
2021-01-18 07:08:51,219 p=54 u=root | TASK [instance : set selinux to permissive] *****
2021-01-18 07:18:59,967 p=54 u=root | TASK [instance : set firewall service name] *****
2021-01-18 07:19:01,965 p=54 u=root | TASK [instance : stop and disable firewall service] *****
```

**** EXSI server VM “Contrail-controller”**

I’ve assigned 36GB of memory and the number of CPU socket 4.



3.3. After CentOS7.7 installation done, please check the version.

- if you installed Mimi image, SSH gets installed by default. telnet and ftp are not installed. At this stage telnet and FTP are not required.
- Check OS version and check DNS server with ping test which you set during installation.

```
[root@controller-222 ~]# cat /etc/redhat-release
CentOS Linux release 7.7.1908 (Core)
```

```
[root@CSN-223 ~]# cat /etc/resolv.conf
nameserver 168.126.63.1
```

3.4. Setting : ***Very Very important***

- common things to all server about interface setting.
- for 2nd interface, please check if it's set to "no -> yes"

```
[root@compute01 ~]# cat /etc/sysconfig/network-scripts/ifcfg-enp5s0f0
TYPE="Ethernet"
PROXY_METHOD="none"
BROWSER_ONLY="no"
BOOTPROTO="static"
IPADDR="100.123.1.211"
NETMASK="255.255.0.0"
GATEWAY="100.123.0.1"
DNS1=100.123.0.16
DEFROUTE="yes"
NAME="eth0"
DEVICE="eth0"
ONBOOT="yes" ←=====
ZONE=public
```

> if you change ONBOOT=NO -> YES, please restart network.
#systemctl restart network

**** very important****

> /etc/hosts, the settings are different from "contrail_command" server and others. Just look carefully and compare how are they different.

- if you don't set /etc/hosts files properly, your installation will fail.

> on Contrail_Command server

```
[root@contrailcommand-221 ~]# cat /etc/hosts ←=====
127.0.0.1    localhost localhost.localdomain localhost4 localhost4.localdomain4
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6
```

```
[root@contrailcommand-221 ~]# hostname
contrailcommand-221.juniper.net ←=====
```

> on Controller, CSN, Compute1, Compute2 server :

```
[root@controller-222 ~]# cat /etc/hosts ←=====
127.0.0.1    localhost localhost.localdomain localhost4 localhost4.localdomain4
100.0.0.222  controller-222.juniper.net controller-222
100.0.0.223  CSN-223.juniper.net CSN-223
```

```
100.0.0.224 compute1-224.juniper.net compute1-224
100.0.0.225 compute2-225.juniper.net compute2-225
172.27.122.225 compute2-225.juniper.net compute2-225
172.27.122.222 controller-222.juniper.net controller-222
172.27.122.223 CSN-223.juniper.net CSN-223
172.27.122.224 compute1-224.juniper.net compute1-224
```

```
[root@controller-222 ~]# cat /etc/hostname
localhost.localdomain ←=====
```

> After changing /etc/hosts, do restart

```
[root@localhost ~]# shutdown -r 0
```

> After all servers boot-up, go to "Contrail_command" server , and do SSH & key copy on to all Servers.
And do ssh login test if you can log-in without password.

```
[root@contrailcommand-221 ~]# ssh-keygen -t rsa
[root@contrailcommand-221 ~]# ssh-copy-id -i /root/.ssh/id_rsa.pub 172.27.122.222
[root@contrailcommand-221 ~]# ssh-copy-id -i /root/.ssh/id_rsa.pub 172.27.122.223
[root@contrailcommand-221 ~]# ssh-copy-id -i /root/.ssh/id_rsa.pub 172.27.122.224
[root@contrailcommand-221 ~]# ssh-copy-id -i /root/.ssh/id_rsa.pub 172.27.122.225
[root@contrailcommand-221 ~]# ssh-copy-id -i /root/.ssh/id_rsa.pub 172.27.122.222
[root@contrailcommand-221 ~]# ssh 172.27.122.222
[root@contrail-cluster ~]# exit
```

4. Contrail Installation

4.1. Obtain user_name and password for hub.juniper.net

- Please refer to below, how to obtain user_name/password for hub.juniper.net.
(You must request user_name and password for 'contrail version 2005.62')

https://www.juniper.net/documentation/en_US/contrail19/information-products/topic-collections/release-notes/readme-contrail-19.pdf

Access to Registry

Please reach out to contrail-registry@juniper.net to get access credentials for Contrail Container Registry.

> please modify 'command_server.yml' and 'instances.yml' files with username and password properly.

```
[root@contrailcommand-221 ~]# cat command_servers.yml
---
command_servers:
  server1:
    ip: 172.27.122.221 # IP address of server where
    connection: ssh
    ssh_user: root
    ssh_pass: contrail123
    sudo_pass: contrail123
    ntpserver: 66.129.233.81
  registry_insecure: false
  container_registry: hub.juniper.net/contrail
  container_tag: 2005.62
  container_registry_username: JNPR-XXXXXXXXXX
  container_registry_password: XXXXXXXXXXXXXXXX
  config_dir: /etc/contrail
  contrail_config:
    database:
      type: postgres
      dialect: postgres
      password: contrail123
    keystone:
      assignment:
        data:
          users:
            admin:
              password: contrail123
      insecure: true
    client:
      password: contrail123
```

```
[root@contrailcommand-221 ~]# cat /root/instances.yml
global_configuration:
  CONTAINER_REGISTRY: hub.juniper.net/contrail
  REGISTRY_PRIVATE_INSECURE: false
  CONTAINER_REGISTRY_USERNAME: JNPR-XXXXXXXXXX
  CONTAINER_REGISTRY_PASSWORD: XXXXXXXXXXXXXXXX
```

> later during contrail installation, you must put username and password like below.

```
//Download the contrail-command-deployer Docker container image to deploy contrail-command (contrail_command, contrail_psql containers) from hub.juniper.net. Allow Docker to connect to the private secure registry.  
//Access container tag for contrail-command-deployer located at README Access to Contrail Registry .
```

```
docker login hub.juniper.net --username JNPR-XXXXX --password XXXXXXXXXXXXX
```

4.2. Check it on all servers

1). Ping reachable among all servers and MX960 lo0 and QFX5110 lo0

- Ping must be reachable between internal 100.0.0.X/24 to lo0 of MX960 and QFX/EX2200.

Please refer to device configuration.



all_config.txt

> On Compute1/Compute2 Server, to ensure ping reachable to MX960/QFX5100 loopback, you should add routing.

```
[root@compute1-224 ~]#ip route add 3.3.3.0/24 via 100.0.0.240  
[root@compute1-224 ~]#ping 3.3.3.71
```

2). Do ping test on all servers (command, controller, CSN, compute1, compute2) to yahoo.com to see if DNS server set is working or not. Ping must be reachable.

```
[root@contrailcommand-221 ~]#ping yahoo.com
```

4.3. Move on to Contrail-Command server

- If your ping tests are successful, go to 'contrail-command' server.

Contrail installation process will go only at 'contrail-command' server, you don't need to do anything on other servers.

Please place 'command_servers.yml' and 'instance.yml' files to /root directory after modifying uername and password

> please find the file attached command_servers.yml and instance.yml sample.



command_servers
and instance.yml.txt

4.4 put & execute command below step by step on "contrail_command" server

```
curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py  
python get-pip.py
```

```
python2 -m pip install --upgrade --force-reinstall pip
clear
```

//docker-py Python module is superseded by docker Python module. You must remove docker-py and docker Python packages from all the nodes where you want to install the Contrail Command UI.

```
pip uninstall docker-py docker
```

//Install Docker to pull contrail-command-deployer container. This package is required to automate the deployment of Contrail Command software.

```
yum install -y yum-utils device-mapper-persistent-data lvm2
yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
yum install -y docker-ce-18.06.0.ce
systemctl start docker
```

```
pip install setuptools==30.1.0
pip uninstall docker
pip install docker==4.3.1 pyyaml==5.3.1
```

//Download the contrail-command-deployer Docker container image to deploy contrail-command (contrail_command, contrail_psql containers) from hub.juniper.net. Allow Docker to connect to the private secure registry.
//Access container_tag for contrail-command-deployer located at README Access to Contrail Registry .

```
docker login hub.juniper.net --username JNPR-XXXXX --password XXXXXXXXXXXXX
```

//Pull contrail-command-deployer container from the private secure registry.
//docker pull hub.juniper.net/contrail/contrail-command-deployer:<container_tag>
//Example, for container_tag: 2005.62, use the following command:

```
docker pull hub.juniper.net/contrail/contrail-command-deployer:2005.62
docker run -td --net host -e action=provision_cluster -v /root/command_servers.yml:/command_servers.yml -v /root/instances.yml:/instances.yml --privileged --name contrail_command_deployer hub.juniper.net/contrail/contrail-command-deployer:2005.62
```

4.5. Installation monitoring.

- 1). On 'contrail-command' server, when you docker run, you can see 'contrail_command_deployer container ID' displayed. Then copy & paste container-id, you can monitor it's installation.

```
[root@contrailcommand-221 ~]# docker run -td --net host -e action=provision_cluster -v /root/command_servers.yml:/command_servers.yml -v /root/instances.yml:/instances.yml --privileged --name contrail_command_deployer hub.juniper.net/contrail/contrail-command-deployer:2005.62
```

```
12816b57c202f5d25759cc9f873f57a46f95765e0de2d9199268d0eae8bb944a ← when you run docker run above, container id returned.
[root@contrailcommand-221 ~]#
```

> monitoring installation

```
[root@contrailcommand-221 /]# docker logs -f 12816b57c202f5d25759cc9f873f57a46f95765e0de2d9199268d0eae8bb944a
```

2). Once `contrail_command_deployer` installation done, `contrail_command_deployer` goes to 'Exited'. And then the next installation process, "contrail-kolla-ansible-deployer:2005.62" will start.

```
[root@contrailcommand-221 /]# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED
STATUS	PORTS	NAMES	
befabc168465	hub.juniper.net/contrail/contrail-kolla-ansible-deployer:2005.62	"/bin/bash"	4 minutes ago
minutes	ansible-player_20210118015923		Up 4
02714fd5901e	hub.juniper.net/contrail/contrail-command:2005.62	"/bin/commandappserv	9 minutes ago
8 minutes	contrail_command		Up
b18b4f209f9a	circleci/postgres:10.3-alpine	"docker-entrypoint.s	11 minutes ago
Up 10 minutes	contrail_psql		
12816b57c202	hub.juniper.net/contrail/contrail-command-deployer:2005.62	"/entrypoint.sh /bin	16 minutes ago
Exited (0) 5 minutes ago	contrail_command_deployer		

```
> monitoring installation
```

```
[root@contrailcommand-221 /]# docker exec ansible-player_20210118015923 tail -f /var/log/ansible.log
```


5. How to remove contrail only (on all servers)

2 method

1. Just re-image CentOS7.7

or

2. Just remove containers, volume and images, and docker on all node

```
docker stop $(docker ps -qa)
docker rm $(docker ps -qa)
docker rmi $(docker images -q)
docker volume rm $(docker volume ls -q)
```

=> if volume is not removed.

```
root@contrailcommand-221:/var/lib/docker[root@contrailcommand-221 docker]# cd /var/tmp
root@contrailcommand-221:/var/tmp[root@contrailcommand-221 tmp]# ls
contrail_cluster systemd-private-1bd5187c4c7f45c4a521a29f4c7661d5-ntpd.service-hTd972
root@contrailcommand-221:/var/tmp[root@contrailcommand-221 tmp]# rm -rf contrail_cluster/
```

```
docker system prune
pip uninstall docker
```