

# Replacement of Compute Server UCS C240 M4 - CPAR

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## Introduction

This document describes the steps required to replace a faulty compute server in an Ultra-M setup.

This procedure applies for an Openstack environment using NEWTON version where Elastic Services Controller (ESC) does not manage Cisco Prime Access Registrar (CPAR) and CPAR is installed directly on the VM deployed on Openstack.

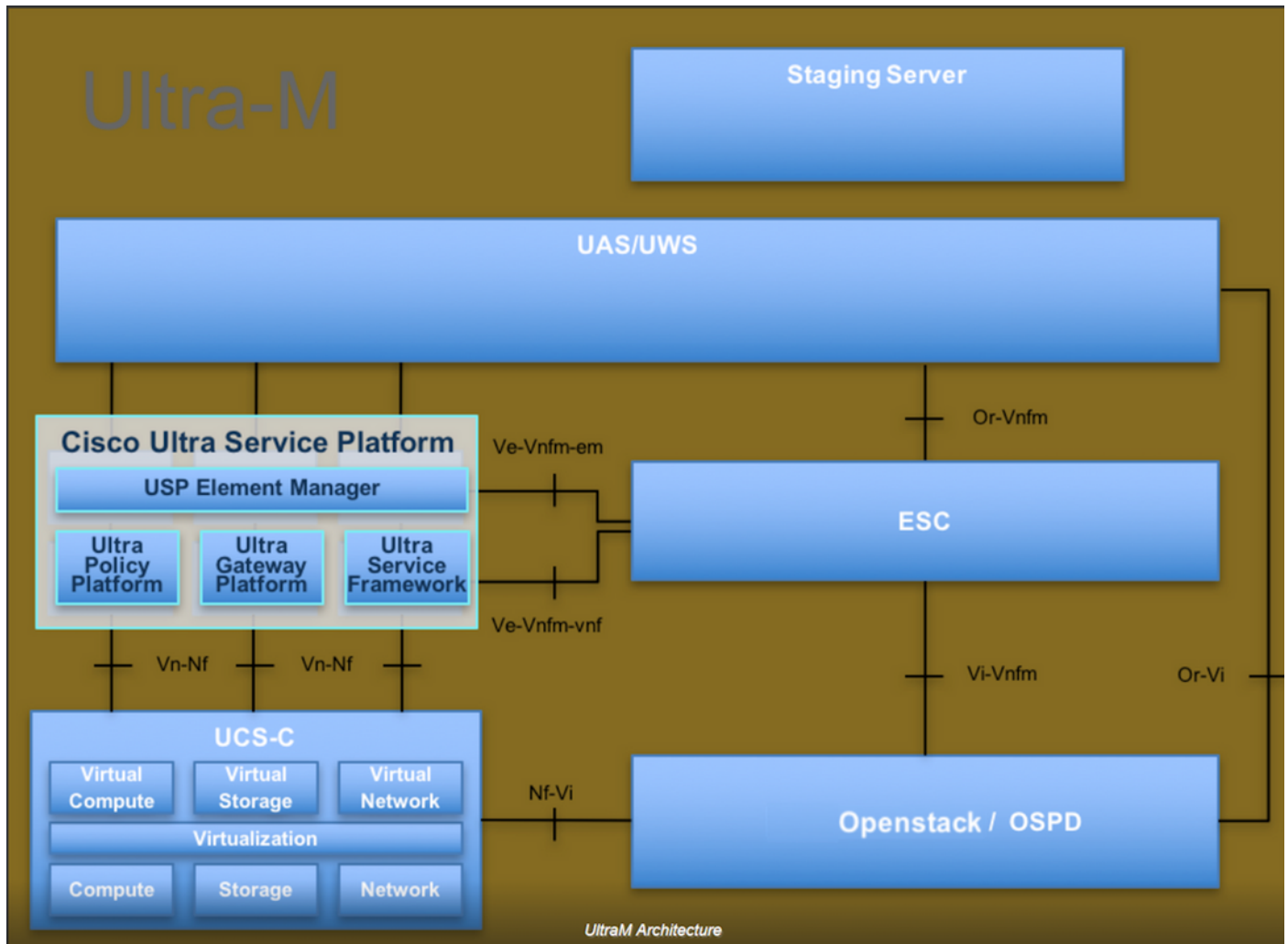
## Background Information

Ultra-M is a pre-packaged and validated virtualized mobile packet core solution that is designed in

order to simplify the deployment of VNFs. OpenStack is the Virtualized Infrastructure Manager (VIM) for Ultra-M and consists of these node types:

- Compute
- Object Storage Disk - Compute (OSD - Compute)
- Controller
- OpenStack Platform - Director (OSPD)

The high-level architecture of Ultra-M and the components involved are depicted in this image:



This document is intended for Cisco personnel who are familiar with Cisco Ultra-M platform and it details the steps required to be carried out at OpenStack and Redhat OS.

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**Note:** Ultra M 5.1.x release is considered in order to define the procedures in this document.

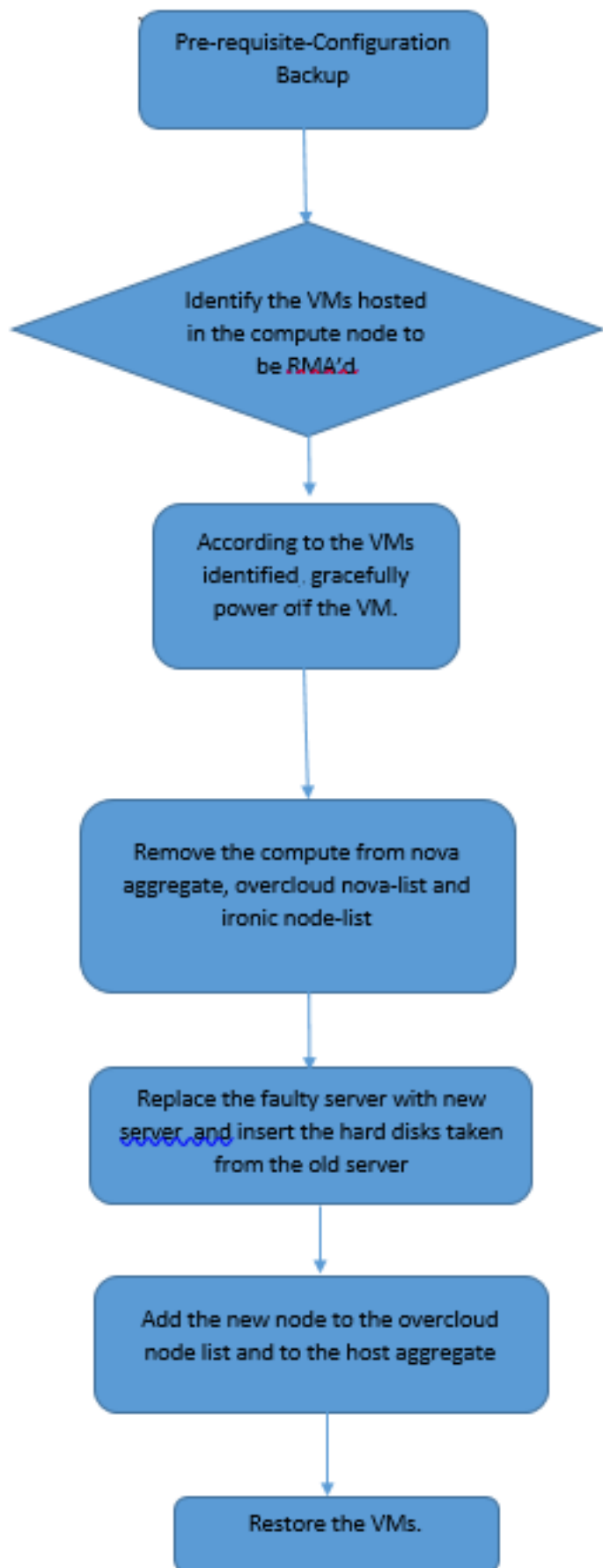
---

## Abbreviations

MOP Method of Procedure  
 OSD Object Storage Disks  
 OSPD OpenStack Platform Director  
 HDD Hard Disk Drive

SSD Solid State Drive  
VIM Virtual Infrastructure Manager  
VM Virtual Machine  
EM Element Manager  
UAS Ultra Automation Services  
UUID Universally Unique Identifier

## **Workflow of the MoP**



## Prerequisites

### Backup

Before you replace a **Compute** node, it is important to check the current state of your Red Hat OpenStack Platform environment. It is recommended you check the current state in order to avoid complications when the **Compute** replacement process is on. It can be achieved by this flow of replacement.

In case of recovery, Cisco recommends to take a backup of the OSPD database with the use of these steps:

```
[root@ al03-pod2-ospd ~]# mysqldump --opt --all-databases > /root/undercloud-all-databases.sql
[root@ al03-pod2-ospd ~]# tar --xattrs -czf undercloud-backup-`date +%F`.tar.gz
/root/undercloud-all-databases.sql
/etc/my.cnf.d/server.cnf /var/lib/glance/images /srv/node /home/stack
tar: Removing leading `/' from member names
```

This process ensures that a node can be replaced without affecting the availability of any instances.

**Note:** Ensure that you have the snapshot of the instance so that you can restore the VM when needed. Follow the below procedure on how to take snapshot of the VM.

## Identify the VMs Hosted in the Compute Node

Identify the VMs that are hosted on the compute server.

```
[stack@al03-pod2-ospd ~]$ nova list --field name,host
```

ID	Name	Host
46b4b9eb-ala6-425d-b886-a0ba760e6114	AAA-CPAR-testing-instance	pod2-stack-compute-4.localdomain
3bc14173-876b-4d56-88e7-b890d67a4122	aaa2-21	pod2-stack-compute-3.localdomain
f404f6ad-34c8-4a5f-a757-14c8ed7fa30e	aaa21june	pod2-stack-compute-3.localdomain

**Note:** In the output shown here, the first column corresponds to the Universally Unique Identifier (UUID), the second column is the VM name and the third column is the hostname where the VM is present. The parameters from this output will be used in subsequent sections.

## Snapshot Process

## CPAR Application Shutdown

Step 1. Open any SSH client connected to the network and connect to the CPAR instance.

It is important not to shutdown all 4 AAA instances within one site at the same time, do it in a one by one fashion.

Step 2. Shut Down CPAR application with this command:

```
/opt/CSCOar/bin/arserver stop
```

A Message states "Cisco Prime Access Registrar Server Agent shutdown complete." should show up.

---

**Note:** If a user left a CLI session open, the arserver stop command won't work and the following message will be displayed:

```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

In this example, the highlighted process id 2903 needs to be terminated before CPAR can be stopped. If this is the case, terminate the process with this command:

```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Then repeat the step 1.

Step 3. Verify that CPAR application was indeed shutdown by this command:

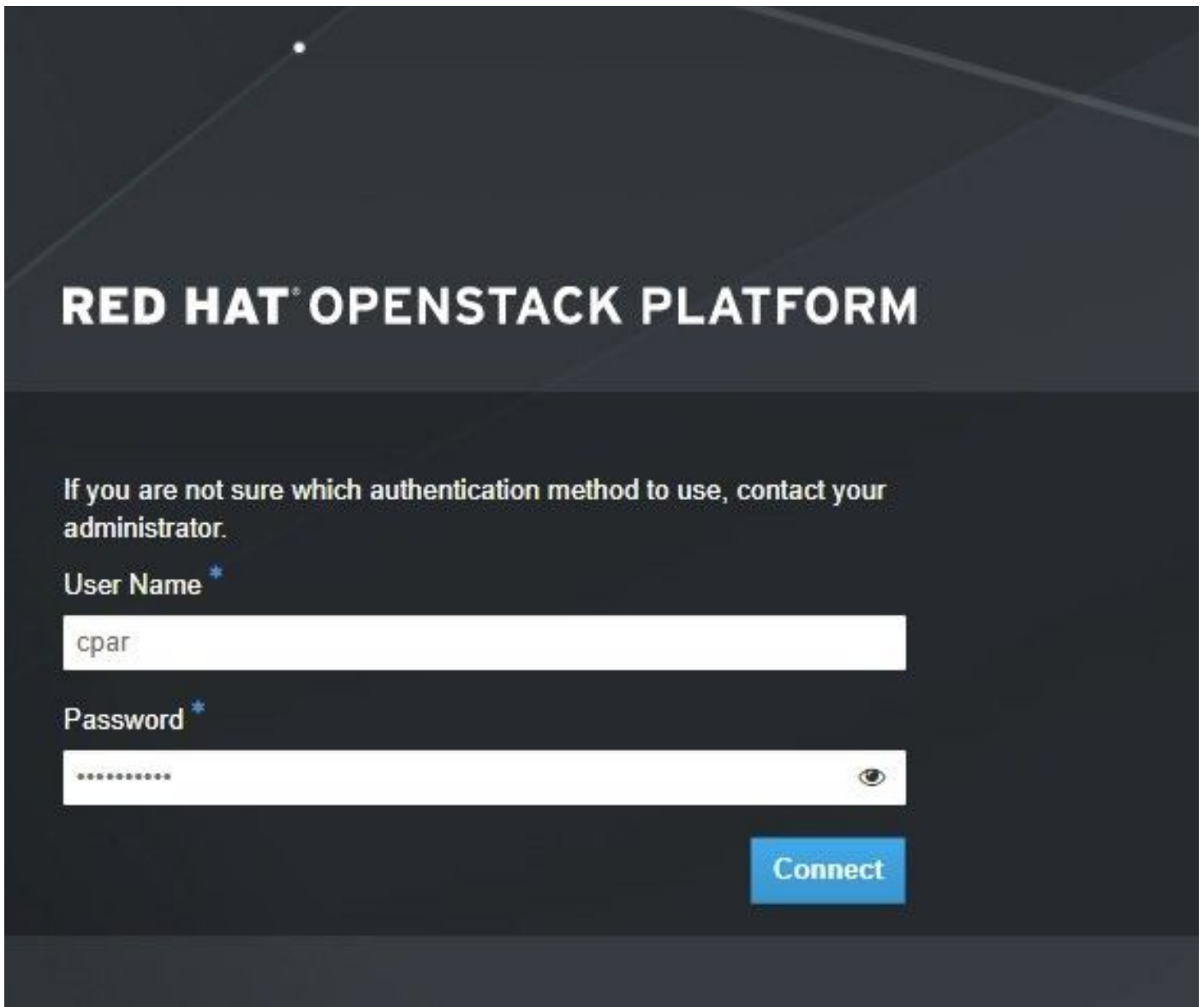
```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

These messages should appear:

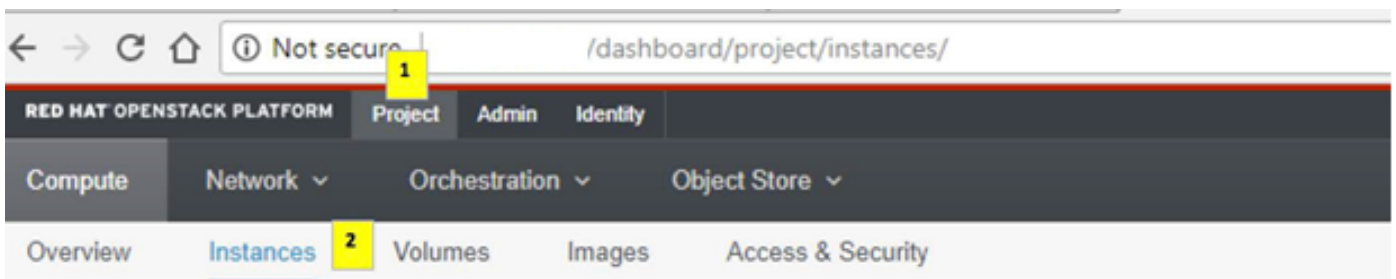
```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

## VM Snapshot Task

Step 1. Enter the Horizon GUI website that corresponds to the Site (City) currently being worked on. When the Horizon is accessed, the screen shown in the image is observed:



Step 2. As shown in the image, navigate to **Project > Instances**.



If the user used was cpar, then only the 4 AAA instances will appear in this menu.

Step 3. Shut down only one instance at a time, repeat the whole process in this document. In order to shutdown the VM, navigate to **Actions > Shut Off Instance** and confirm your selection.



**Step 4** Validate that the instance was indeed shut down through Status = Shutoff and Power State = Shut Down.

Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
AAA-CPAR	-	Shutoff	AZ-dalaaa09	None	Shut Down	3 months, 2 weeks	Start Instance ▾

This step ends the CPAR shutdown process.

## VM Snapshot

Once the CPAR VMs are down, the snapshots can be taken in parallel, as they belong to independent computes.

The four QCOW2 files are created in parallel.

Take a snapshot of each AAA instance (25 minutes -1 hour) (25 minutes for instances that used a qcow image as a source and 1 hour for instances that user a raw image as a source).

Step 1. Login to POD's Openstack's Horizon **GUI**.

Step 2. Once logged in, proceed to the **Project > Compute > Instances**, section on the top menu and look for the AAA instances.

RED HAT OPENSTACK PLATFORM Project Admin Identity Project ▾ Help cpar ▾

Compute Network ▾ Orchestration ▾ Object Store ▾

Overview Instances Volumes Images Access & Security

Project / Compute / Instances

### Instances

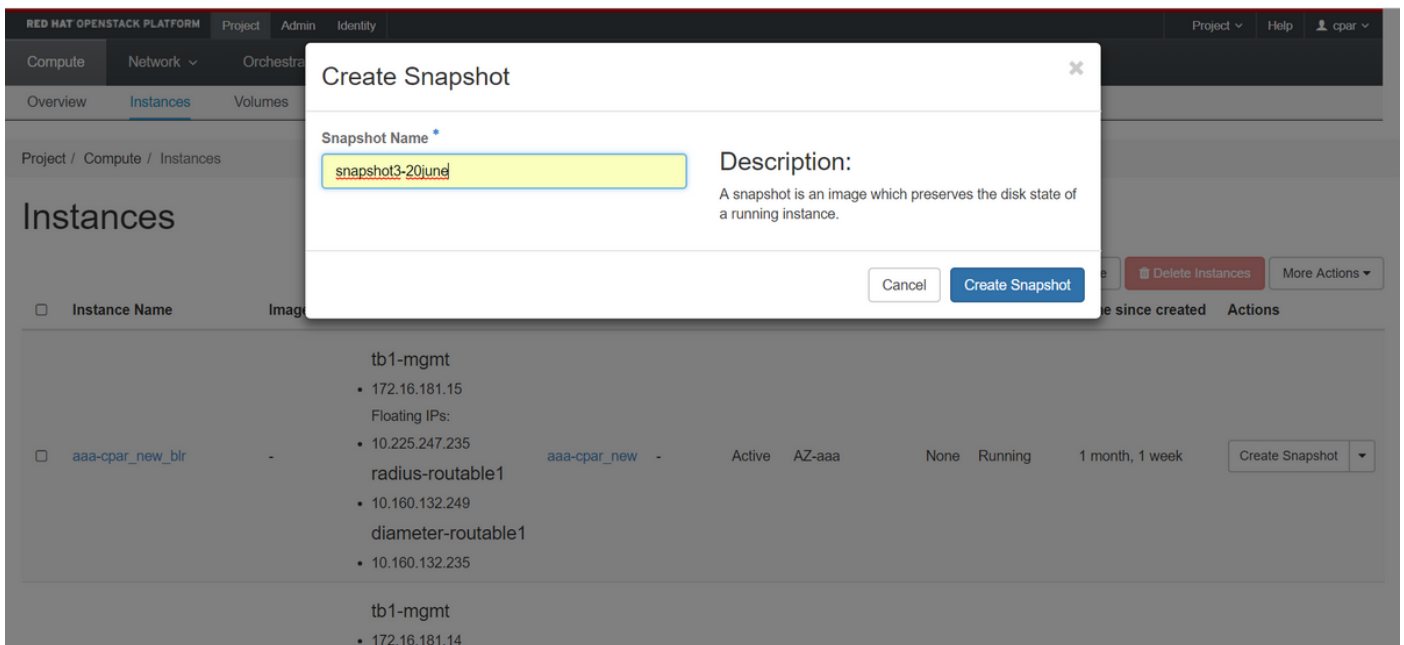
Instance Name =  Filter

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
<input type="checkbox"/> aaa-cpar_new_blr	-	tb1-mgmt • 172.16.181.15 Floating IPs: • 10.225.247.235 radius-routable1 • 10.160.132.249 diameter-routable1 • 10.160.132.235 tb1-mgmt	aaa-cpar_new	-	Active	AZ-aaa	None	Running	1 month, 1 week	Create Snapshot ▾

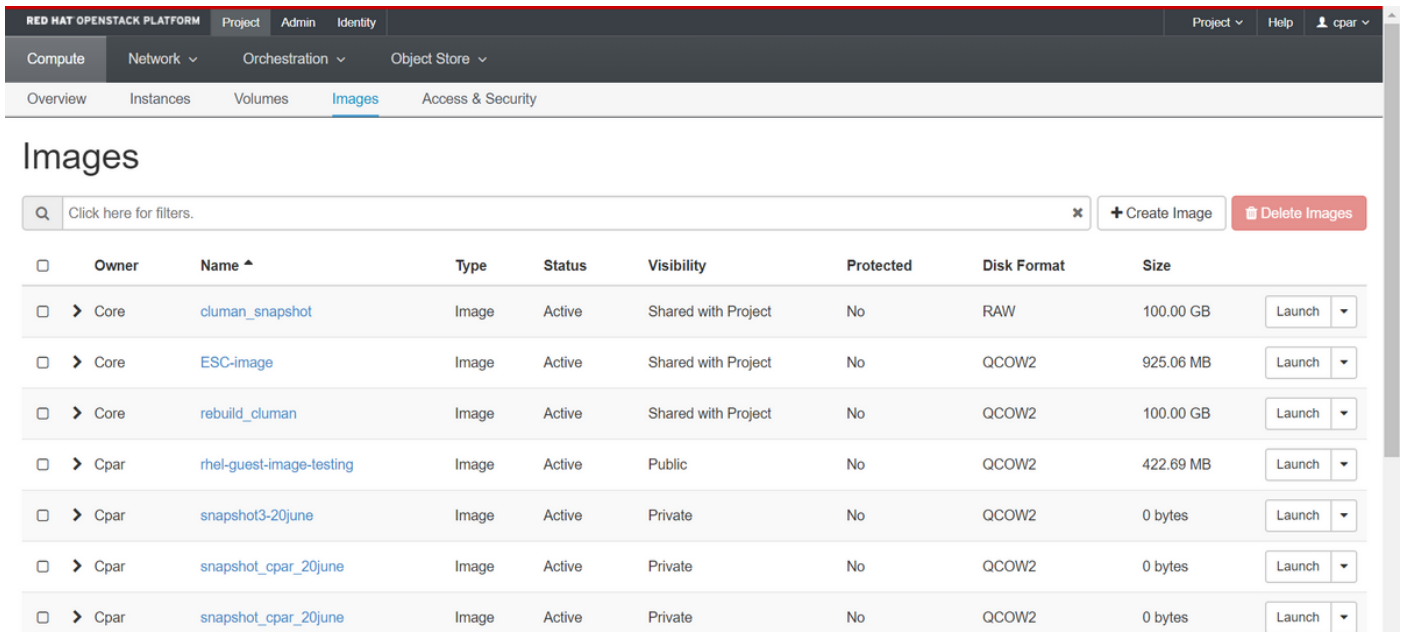
10.225.247.214/dashboard/project/images/.../create/

Step 3. Click on the **Create Snapshot** to proceed with snapshot creation (this needs to be executed on the corresponding AAA instance).





Step 4. Once the snapshot is executed, navigate to the **Images** menu and verify that it finishes and reports no problems.



Step 5. The next step is to download the snapshot on a QCOW2 format and transfer it to a remote entity in case the OSPD is lost during this process. In order to achieve this, identify the snapshot with this command **glance image-list** at OSPD level

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSC0ar/bin/aregcmd -s
```

Step 6. Once identified the snapshot to be downloaded (in this case is going to be the one marked above in green), it is downloaded on a QCOW2 format through this command **glance image-download** as shown here.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
```

CLI with process id is:

```
2903 /opt/CSCOar/bin/aregcmd -s
```

- The “&” sends the process to background. It takes some time to complete this action, once it is done, the image can be located at /tmp directory.
- When the process is sent to the background, if connectivity is lost, then the process is also stopped.
- Run the command **disown -h** so that in case Secure Shell (SSH) connection is lost, the process still runs and finishes on the OSPD.

Step 7. Once the download process finishes, a compression process needs to be executed as that snapshot may be filled with ZEROES because of processes, tasks and temporary files handled by the Operating System. The command to be used for file compression is **virt-sparsify**.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
```

```
2903 /opt/CSCOar/bin/aregcmd -s
```

This process takes some time (around 10-15 minutes). Once finished, the resulting file is the one that needs to be transferred to an external entity as specified on next step.

Verification of the file integrity is required, in order to achieve this, run the next command and look for the **corrupt** attribute at the end of its output.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
```

```
2903 /opt/CSCOar/bin/aregcmd -s
```

In order to avoid a problem where the OSPD is lost, the recently created snapshot on QCOW2 format needs to be transferred to an external entity. Before to start the file transfer we have to check if the destination have enough available disk space, use the command **df -kh**, in order to verify the memory space. It is advised to transfer it to another site's OSPD temporarily through SFTP **sftp root@x.x.x.x** where x.x.x.x is the IP of a remote OSPD. In order to speed up the transfer, the destination can be sent to multiple OSPDs. In the same way, this command can be used **scp \*name\_of\_the\_file\*.qcow2 root@ x.x.x.x:/tmp** (where x.x.x.x is the IP of a remote OSPD) to transfer the file to another OSPD.

## Graceful Power Off

Power off Node

1. To power off the instance : `nova stop <INSTANCE_NAME>`
2. Now you see the instance name with the status shutoff.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
```

```
2903 /opt/CSCOar/bin/aregcmd -s
```

# Compute Node Deletion

The steps mentioned in this section are common irrespective of the VMs hosted in the **compute** node.

## Delete Compute Node from the Service List

Delete the **compute** service from the service list:

```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

### openstack compute service delete <ID>

```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

## Delete Neutron Agents

Delete the old associated neutron agent and open vswitch agent for the **compute** server:

```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

### openstack network agent delete <ID>

```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

## Delete from the Ironic Database

Delete a node from the ironic database and verify it:

### nova show <compute-node> | grep hypervisor

```
ERROR:      You can not shut down Cisco Prime Access Registrar while the
             CLI is being used.   Current list of running
             CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

### ironic node-delete <ID>

```
ERROR:    You can not shut down Cisco Prime Access Registrar while the
          CLI is being used.    Current list of running
          CLI with process id is:
```

```
2903 /opt/CSCOar/bin/aregcmd -s
```

Node deleted must not be listed now in ironic node-list.

## Delete from Overcloud

Step 1. Create a script file named **delete\_node.sh** with the contents as shown. Ensure that the templates mentioned are the same as the ones used in the **deploy.sh** script used for the stack deployment:

### delete\_node.sh

```
ERROR:    You can not shut down Cisco Prime Access Registrar while the
          CLI is being used.    Current list of running
          CLI with process id is:
```

```
2903 /opt/CSCOar/bin/aregcmd -s
```

```
ERROR:    You can not shut down Cisco Prime Access Registrar while the
          CLI is being used.    Current list of running
          CLI with process id is:
```

```
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 2. Wait for the OpenStack stack operation to move to the COMPLETE state:

```
ERROR:    You can not shut down Cisco Prime Access Registrar while the
          CLI is being used.    Current list of running
          CLI with process id is:
```

```
2903 /opt/CSCOar/bin/aregcmd -s
```

## Install the New Compute Node

The steps in order to install a new UCS C240 M4 server and the initial setup steps can be referred from [Cisco UCS C240 M4 Server Installation and Service Guide](#)

Step 1. After the installation of the server, insert the hard disks in the respective slots as the old server.

Step 2. Login to server with the use of the CIMC IP.

Step 3. Perform BIOS upgrade if the firmware is not as per the recommended version used previously. Steps for BIOS upgrade are given here: [Cisco UCS C-Series Rack-Mount Server BIOS Upgrade Guide](#)

Step 4. In order to verify the status of Physical drives, which is **Unconfigured Good**, navigate to **Storage > Cisco 12G SAS Modular Raid Controller (SLOT-HBA) > Physical Drive Info**.

Cisco Integrated Management Controller

admin@10.65.33.67 - C240-FCH2114V1NW

Chassis / ... / Cisco 12G SAS Modular Raid Controller (SLOT-HBA) / Physical Drive Info

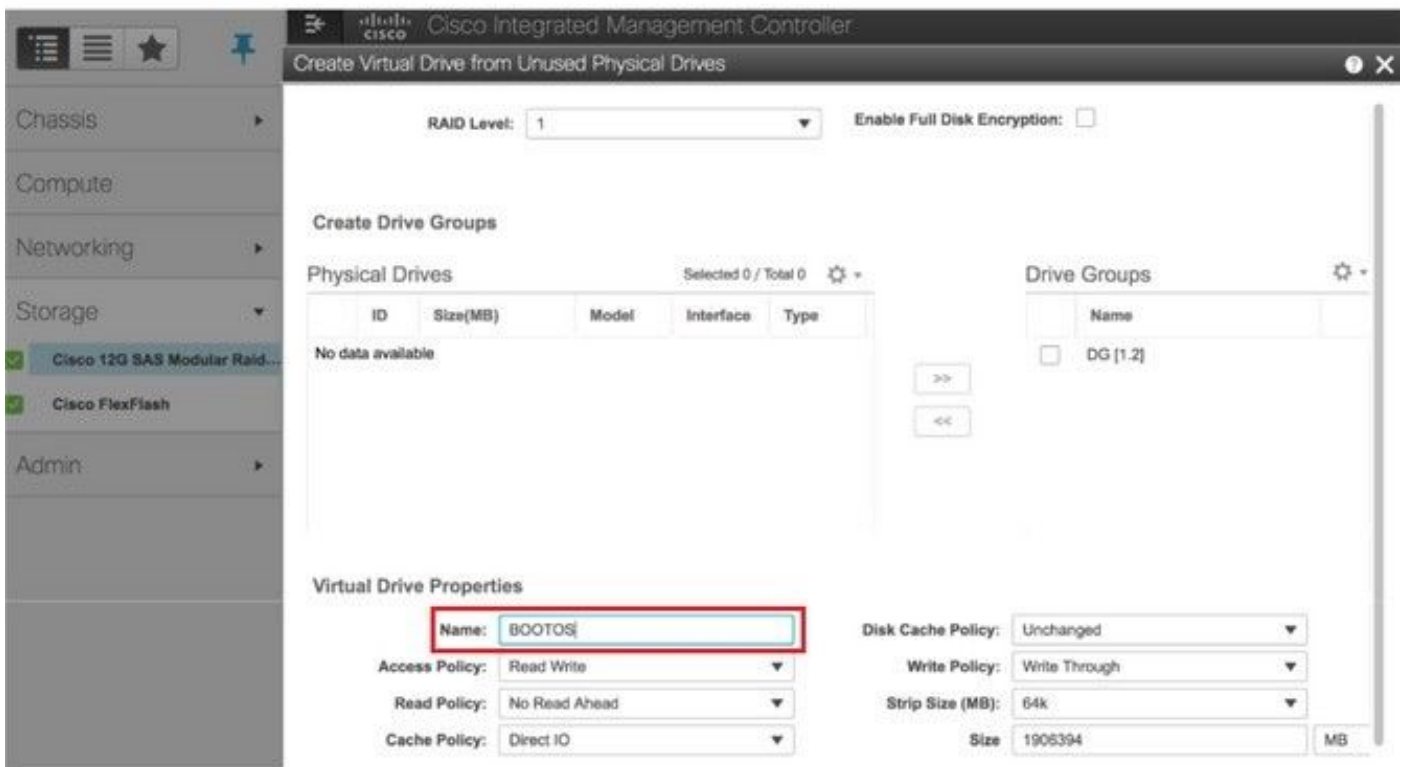
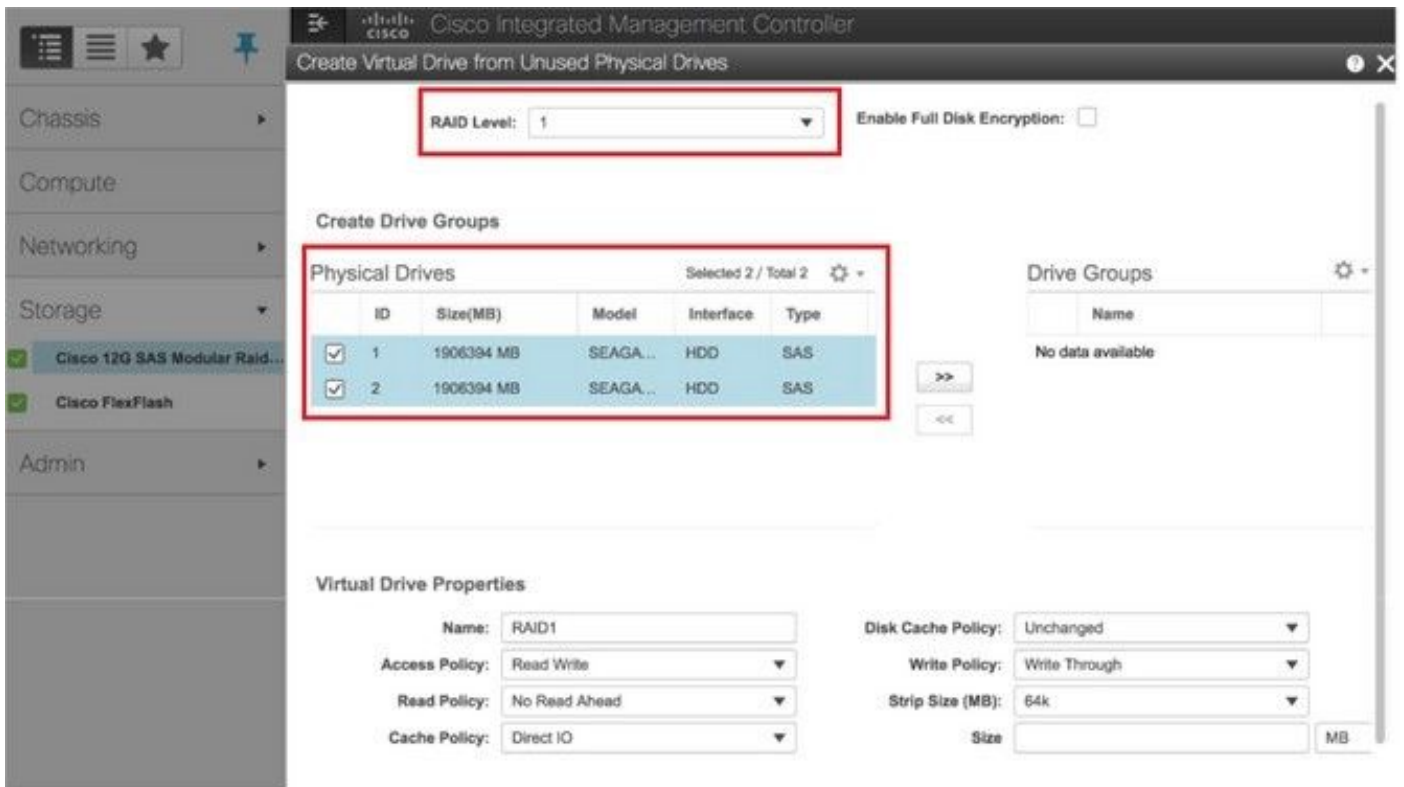
Controller Info | Physical Drive Info | Virtual Drive Info | Battery Backup Unit | Storage Log

Physical Drives

Selected 0 / Total 2

Controller	Physical Drive Number	Status	Health	Boot Drive	Drive Firmware
<input type="checkbox"/> SLOT-HBA	1	Unconfigured Good	Good	false	N003
<input type="checkbox"/> SLOT-HBA	2	Unconfigured Good	Good	false	N003

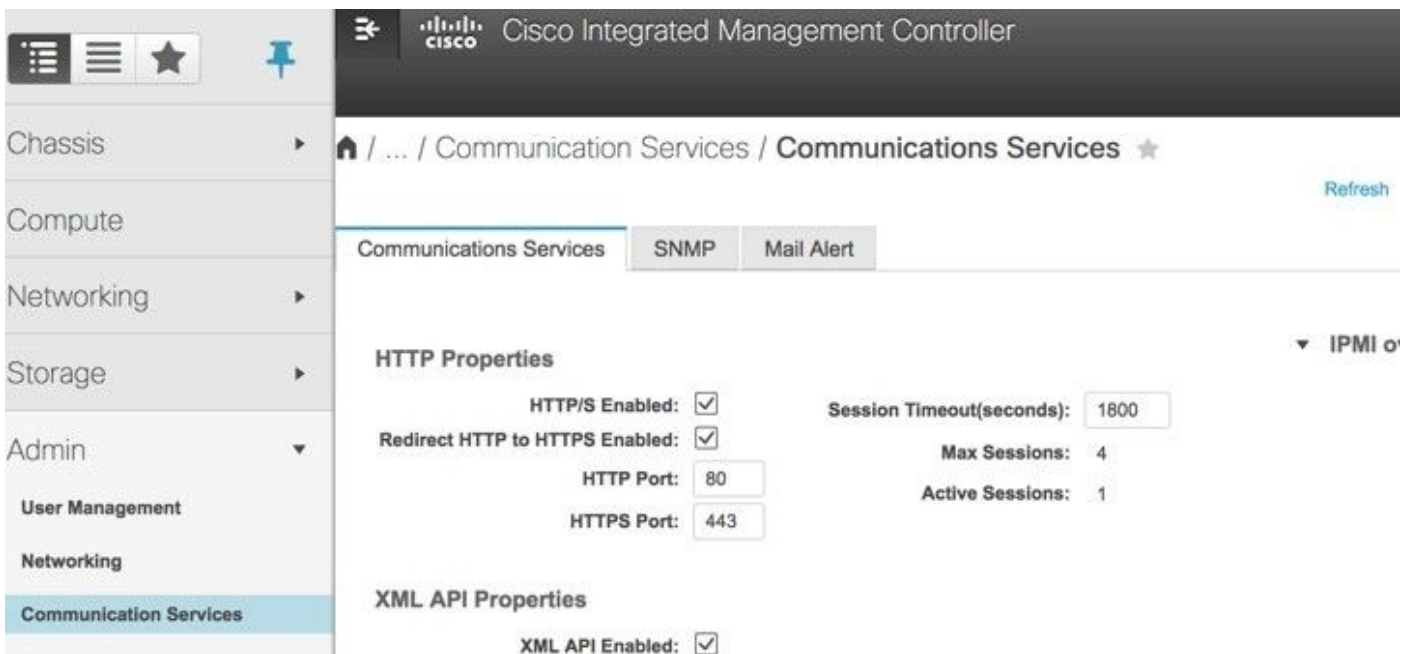
Step 5. In order to create a virtual drive from the physical drives with RAID Level 1, navigate to **Storage > Cisco 12G SAS Modular Raid Controller (SLOT-HBA) > Controller Info > Create Virtual Drive from Unused Physical Drives.**



Step 6. Select the VD and configure **Set as Boot Drive**, as shown in the image.

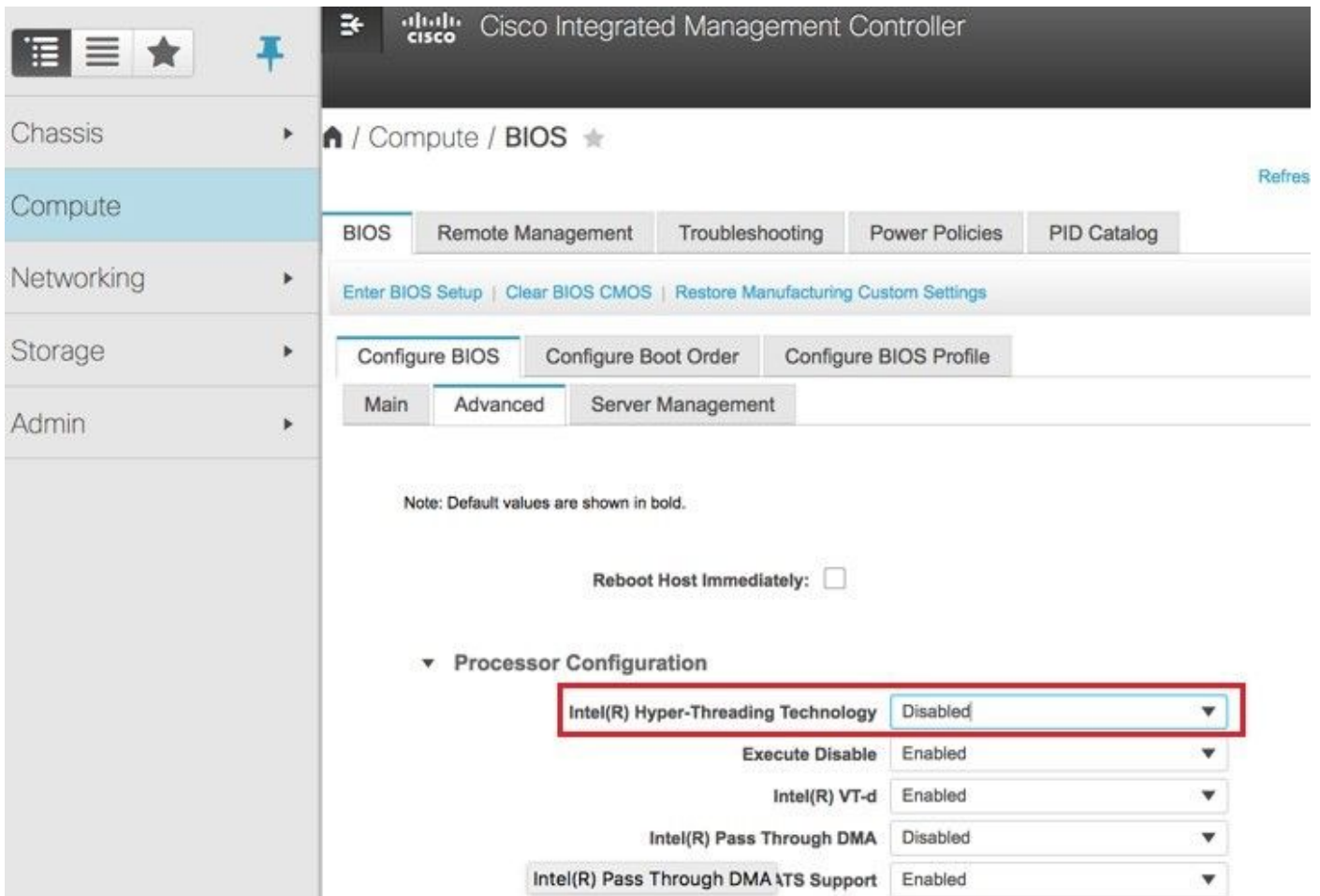


Step 7. In order to enable IPMI over LAN, navigate to **Admin > Communication Services > Communication Services**, as shown in the image.



Step 8. In order to disable hyperthreading, navigate to **Compute > BIOS > Configure BIOS > Advanced > Processor Configuration**.

**Note:** The image shown here and the configuration steps mentioned in this section are with reference to the firmware version 3.0(3e) and there might be slight variations if you work on other versions.



## Add the New Compute Node to the Overcloud

The steps mentioned in this section are common irrespective of the VM hosted by the **compute** node.

Step 1. Add **Compute** server with a different index

Create an **add\_node.json** file with only the details of the new **compute** server to be added. Ensure that the index number for the new **compute** server has not been used before. Typically, increment the next highest **compute** value.

Example: Highest prior was **compute-17**, therefore, created **compute-18** in case of 2-vnf system.

---

**Note:** Be mindful of the json format.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 2. Import the json file.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
```



```
CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 3. Run node introspection with the use of the UUID noted from the previous step.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 4. Run `deploy.sh` script that was previously used to deploy the stack, in order to add the new **compute** node to the overcloud stack:

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 5. Wait for the openstack stack status to be Complete.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 6. Check that new **compute** node is in the Active state.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

## Restore the VMs

### Recover an Instance through Snapshot

Recovery Process:

It is possible to redeploy the previous instance with the snapshot taken in previous steps.

Step 1 [OPTIONAL]. If there is no previous VMsnapshot available then connect to the OSPD node where the backup was sent and sftp the backup back to its original OSPD node. Through **sftp root@x.x.x.x** where x.x.x.x is the IP of the original OSPD. Save the snapshot file in /tmp directory.

Step 2. Connect to the OSPD node where the instance is re-deploy.

---

```
Last login: wed May 9 06:42:27 2018 from 10.169.119.213
[root@daucs01-ospd ~]# █
```

Source the environment variables with the following command:

ERROR: You can not shut down Cisco Prime Access Registrar while the CLI is being used. Current list of running CLI with process id is:

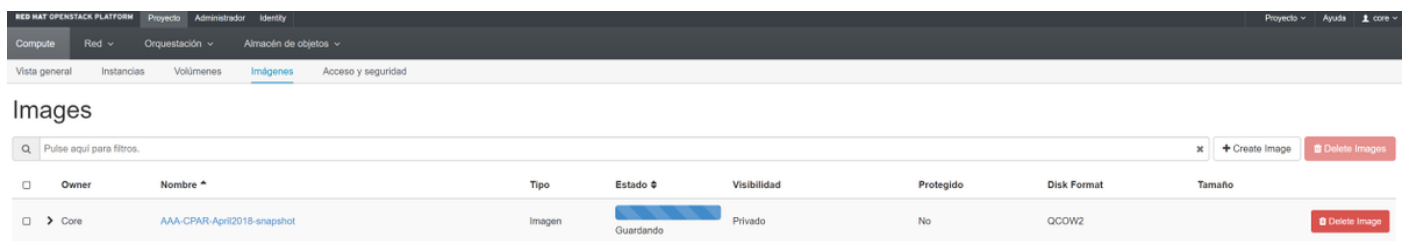
```
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 3. To use the snapshot as an image is necessary to upload it to horizon as such. Use the next command to do so.

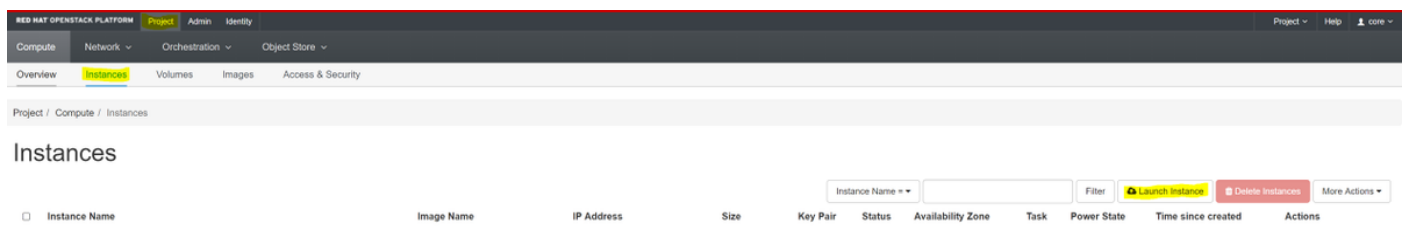
ERROR: You can not shut down Cisco Prime Access Registrar while the CLI is being used. Current list of running CLI with process id is:

```
2903 /opt/CSCOar/bin/aregcmd -s
```

The process can be seen in horizon.



Step 4. In the Horizon, navigate to **Project > Instances** and click on **Launch Instance**, as shown in the image.



Step 5. Enter the **Instance Name** and choose the **Availability Zone**, as shown in the image.

**Details**

Source \*  
Flavor \*  
Networks \*  
Network Ports  
Security Groups  
Key Pair  
Configuration  
Server Groups  
Scheduler Hints  
Metadata

Please provide the initial hostname for the instance, the availability zone where it will be deployed, and the instance count. Increase the Count to create multiple instances with the same settings.

**Instance Name \***  
dalaaa10

**Availability Zone**  
AZ-dalaaa10

**Count \***  
1

Total Instances (100 Max)  
27%

- 26 Current Usage
- 1 Added
- 73 Remaining

✕ Cancel   < Back   Next >   Launch Instance

Step 6. In the **Source** tab, choose the image to create the instance. In the **Select Boot Source** menu select **image**, a list of images is shown here, choose the one that was previously uploaded as you click on + sign.

Details

**Source**

Flavor \*

Networks \*

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

Instance source is the template used to create an instance. You can use a snapshot of an existing instance, an image, or a volume (if enabled). You can also choose to use persistent storage by creating a new volume.

**Select Boot Source**

Image

**Create New Volume**

Yes No

Allocated					
Name	Updated	Size	Type	Visibility	
> AAA-CPAR-April2018-snapshot	5/10/18 9:56 AM	5.43 GB	qcow2	Private	-

▼ Available 8 Select one

🔍 Click here for filters. ✕

Name	Updated	Size	Type	Visibility	
> redhat72-image	4/10/18 1:00 PM	469.87 MB	qcow2	Private	+
> tmobile-pcrf-13.1.1.qcow2	9/9/17 1:01 PM	2.46 GB	qcow2	Public	+
> tmobile-pcrf-13.1.1.iso	9/9/17 8:13 AM	2.76 GB	iso	Private	+
> AAA-Temporary	9/5/17 2:11 AM	180.00 GB	qcow2	Private	+
> CPAR_AAATEMPLATE_AUGUST222017	8/22/17 3:33 PM	16.37 GB	qcow2	Private	+
> tmobile-pcrf-13.1.0.iso	7/11/17 7:51 AM	2.82 GB	iso	Public	+
> tmobile-pcrf-13.1.0.qcow2	7/11/17 7:48 AM	2.46 GB	qcow2	Public	+
> ESC-image	6/27/17 12:45 PM	925.06 MB	qcow2	Private	+

✕ Cancel

< Back

Next >

Launch Instance

Step 7. In the **Flavor** tab, choose the AAA flavor as you click on + sign, as shown in the image.

Flavors manage the sizing for the compute, memory and storage capacity of the instance.

Allocated

Name	VCPUS	RAM	Total Disk	Root Disk	Ephemeral Disk	Public	
> AAA-CPAR	36	32 GB	180 GB	180 GB	0 GB	No	-

Networks \*  
Select one

Network Ports  
Click here for filters.

Name	VCPUS	RAM	Total Disk	Root Disk	Ephemeral Disk	Public	
> pcrf-oam	10	24 GB	100 GB	100 GB	0 GB	Yes	+
> pcrf-pd	12	16 GB	100 GB	100 GB	0 GB	Yes	+
> pcrf-qns	10	16 GB	100 GB	100 GB	0 GB	Yes	+
> pcrf-arb	4	16 GB	100 GB	100 GB	0 GB	Yes	+
> esc-flavor	4	4 GB	0 GB	0 GB	0 GB	Yes	+
> pcrf-sm	10	104 GB	100 GB	100 GB	0 GB	Yes	+
> pcrf-cm	6	16 GB	100 GB	100 GB	0 GB	Yes	+

✕ Cancel < Back Next > Launch Instance

Step 8. Now navigate to the **Networks** tab and choose the networks that the instance needs as you click on + sign. In this case, select **diameter-soutable1**, **radius-routable1** and **tb1-mgmt**, as shown in the image.

Details

Source

Flavor

**Networks**

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

Networks provide the communication channels for instances in the cloud. ?

▼ Allocated 3 Select networks from those listed below.

	Network	Subnets Associated	Shared	Admin State	Status	
↕ 1	> radius-routable1	radius-routable-subnet	Yes	Up	Active	−
↕ 2	> diameter-routable1	sub-diameter-routable1	Yes	Up	Active	−
↕ 3	> tb1-mgmt	tb1-subnet-mgmt	Yes	Up	Active	−

▼ Available 16 Select at least one network

	Network	Subnets Associated	Shared	Admin State	Status	
>	Internal	Internal	Yes	Up	Active	+
>	pcrf_dap2_ldap	pcrf_dap2_ldap	Yes	Up	Active	+
>	pcrf_dap2_usd	pcrf_dap2_usd	Yes	Up	Active	+
>	tb1-orch	tb1-subnet-orch	Yes	Up	Active	+
>	pcrf_dap1_usd	pcrf_dap1_usd	Yes	Up	Active	+
>	pcrf_dap1_sy	pcrf_dap1_sy	Yes	Up	Active	+
>	pcrf_dap1_gx	pcrf_dap1_gx	Yes	Up	Active	+
>	pcrf_dap1_nap	pcrf_dap1_nap	Yes	Up	Active	+
>	pcrf_dap2_sy	pcrf_dap2_sy	Yes	Up	Active	+
>	pcrf_dap2_rx	pcrf_dap2_rx	Yes	Up	Active	+

✕ Cancel
< Back
Next >
Launch Instance

Step 9. Click on Launch instance to create it. The progress can be monitored in Horizon:

RED HAT OPENSTACK PLATFORM Proyecto Administrador Identity Proyecto Ayuda core

Sistema Vista general Hipervisores Agregados de host Instancias Volúmenes Sabores Imágenes Redes Routers IPs flotantes Predeterminados Definiciones de los metadatos Información del Sistema

Administrador / Sistema / Instancias

### Instancias

Proyecto ▼

Filtrar
Eliminar Instancias

<input type="checkbox"/>	Proyecto	Host	Nombre	Nombre de la imagen	Dirección IP	Tamaño	Estado	Tarea	Estado de energía	Tiempo desde su creación	Acciones
<input type="checkbox"/>	Core	pod1-stack-compute-5.localdomain	dataaa10	AAA-CPAR-April2018-snapshot	tb1-mgmt • 172.16.181.11 radius-routable1 • 10.178.6.56 diameter-routable1 • 10.178.6.40	AAA-CPAR	Construir	Generando	Sin estado	1 minuto	Editar instancia ▼

After a few minutes the instance will be completely deployed and ready for use.

Core	pod1-stack-compute-5.localdomain	delaaa10	AAA-CPAR-April2018-snapshot	tb1-mgmt	AAA-CPAR	Activo	Ninguno	Ejecutando	8 minutos	Editar instancia
				<ul style="list-style-type: none"> <li>172.16.181.16</li> <li>IPs flotantes:</li> <li>10.145.0.62</li> <li>radius-routable1</li> <li>10.178.6.56</li> <li>diameter-routable1</li> <li>10.178.6.40</li> </ul>						

## Create and Assign a Floating IP Address

A floating IP address is a routable address, which means that it's reachable from the outside of Ultra M/Openstack architecture, and it's able to communicate with other nodes from the network.

Step 1. In the Horizon top menu, navigate to **Admin > Floating IPs**.

Step 2. Click on the button **Allocate IP to Project**.

Step 3. In the **Allocate Floating IP** window select the **Pool** from which the new floating IP belongs, the **Project** where it is going to be assigned, and the new **Floating IP Address** itself.

For example:

### Allocate Floating IP

✕

**Pool \***

10.145.0.192/26 Management ▼

**Project \***

Core ▼

**Floating IP Address (optional) ?**

10.145.0.249

**Description:**

From here you can allocate a floating IP to a specific project.

Cancel

Allocate Floating IP

Step 4. Click on **Allocate Floating IP** button.

Step 5. In the Horizon top menu, navigate to **Project > Instances**.

Step 6. In the **Action** column, click on the arrow that points down in the **Create Snapshot** button, a menu should be displayed. Select **Associate Floating IP** option.

Step 7. Select the corresponding floating IP address intended to be used in the **IP Address** field, and choose the corresponding management interface (eth0) from the new instance where this floating IP is going to be assigned in the **Port to be associated**. Please refer to the next image as an example of this procedure.

## Manage Floating IP Associations



IP Address \*

Select the IP address you wish to associate with the selected instance or port.

Port to be associated \*

Cancel

Associate

Step 8. Click on **Associate**.

## Enable SSH

Step 1. In the Horizon top menu, navigate to **Project > Instances**.

Step 2. Click on the name of the instance/VM that was created in section **Lunch a new instance**.

Step 3. Click on **Console** tab. This displays the CLI of the VM.

Step 4. Once the CLI is displayed, enter the proper login credentials:

Username: **root**

Password: **cisco123**

```
Red Hat Enterprise Linux Server 7.0 (Maipo)
Kernel 3.10.0-514.el7.x86_64 on an x86_64

aaa-cpar-testing-instance login: root
Password:
Last login: Thu Jun 29 12:59:59 from 5.232.63.159
[root@aaa-cpar-testing-instance ~]#
```

Step 5. In the CLI enter the command **vi /etc/ssh/sshd\_config** to edit ssh configuration.

Step 6. Once the ssh configuration file is open, press **I** to edit the file. Then look for the section showed below and change the first line from **PasswordAuthentication no** to **PasswordAuthentication yes**.



```
# To disable tunneled clear text passwords, change to no here!  
PasswordAuthentication yes_  
#PermitEmptyPasswords no  
PasswordAuthentication no
```

Step 7. Press **ESC** and enter **:wq!** to save sshd\_config file changes.

Step 8. Run the command service sshd restart.

```
[root@aaa-cpar-testing-instance ssh]# service sshd restart  
Redirecting to /bin/systemctl restart sshd.service  
[root@aaa-cpar-testing-instance ssh]#
```

Step 9. In order to test SSH configuration changes have been correctly applied, open any SSH client and try to establish a remote secure connection **using the floating IP** assigned to the instance (i.e. 10.145.0.249) and the user **root**.

```
[2017-07-13 12:12.09] ~  
[dieaguil.DIEAGUIL-CWRQ7] > ssh root@10.145.0.249  
Warning: Permanently added '10.145.0.249' (RSA) to the list of known hosts  
.  
root@10.145.0.249's password:  
X11 forwarding request failed on channel 0  
Last login: Thu Jul 13 12:58:18 2017  
[root@aaa-cpar-testing-instance ~]#  
[root@aaa-cpar-testing-instance ~]#
```

## Establish an SSH Session

Open an SSH session with the IP address of the corresponding VM/server where the application is installed.

```
[dieaguil.DIEAGUIL-CWRQ7] > ssh root@10.145.0.59  
X11 forwarding request failed on channel 0  
Last login: Wed Jun 14 17:12:22 2017 from 5.232.63.147  
[root@dalaaa07 ~]#
```

## CPAR Instance Start

Please follow the below steps, once the activity has been completed and CPAR services can be re-established in the Site that was shut down.

1. In order to login back to Horizon, navigate to **Project > Instance > Start Instance**.
2. Verify that the status of the instance is active and the power state is running:

## Instances

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
dlaaa04	dlaaa01-sept092017	diameter-routable1 • 10.160.132.231 radius-routable1 • 10.160.132.247 tb1-mgmt • 172.16.181.16 Floating IPs: • 10.250.122.114	AAA-CPAR	-	Active	AZ-dlaaa04	None	Running	3 months	Create Snapshot

## Post-activity Health Check

Step 1. Execute the command `/opt/CSCOar/bin/arstatus` at OS level.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 2. Execute the command `/opt/CSCOar/bin/aregcmd` at OS level and enter the admin credentials. Verify that CPAR Health is 10 out of 10 and the exit CPAR CLI.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 3. Execute the command `netstat | grep diameter` and verify that all DRA connections are established.

The output mentioned below is for an environment where Diameter links are expected. If fewer links are displayed, this represents a disconnection from the DRA that needs to be analyzed.

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
        CLI is being used. Current list of running
        CLI with process id is:
2903 /opt/CSCOar/bin/aregcmd -s
```

Step 4. Check that the TPS log shows requests being processed by CPAR. The values highlighted represent the TPS and those are the ones we need to pay attention to.

The value of TPS should not exceed 1500.

```
[root@wscaaa04 ~]# tail -f /opt/CSCOar/logs/tps-11-21-2017.csv
11-21-2017,23:57:35,263,0
11-21-2017,23:57:50,237,0
11-21-2017,23:58:05,237,0
11-21-2017,23:58:20,257,0
11-21-2017,23:58:35,254,0
```

```
11-21-2017,23:58:50,248,0
11-21-2017,23:59:05,272,0
11-21-2017,23:59:20,243,0
11-21-2017,23:59:35,244,0
11-21-2017,23:59:50,233,0
```

Step 5. Look for any “error” or “alarm” messages in name\_radius\_1\_log

```
[root@wscaaa04 ~]# tail -f /opt/CSCOar/logs/tps-11-21-2017.csv
11-21-2017,23:57:35,263,0
11-21-2017,23:57:50,237,0
11-21-2017,23:58:05,237,0
11-21-2017,23:58:20,257,0
11-21-2017,23:58:35,254,0
11-21-2017,23:58:50,248,0
11-21-2017,23:59:05,272,0
11-21-2017,23:59:20,243,0
11-21-2017,23:59:35,244,0
11-21-2017,23:59:50,233,0
```

Step 6. Verify the amount of memory that the CPAR process is, with this command:

**top | grep radius**

```
[root@sfraaa02 ~]# top | grep radius
27008 root      20   0 20.228g 2.413g 11408 S 128.3  7.7  1165:41 radius
```

This highlighted value should be lower than: 7Gb, which is the maximum allowed at an application level.