

Motherboard Replacement in Ultra-M UCS 240M4 Server - CPAR

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Introduction

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

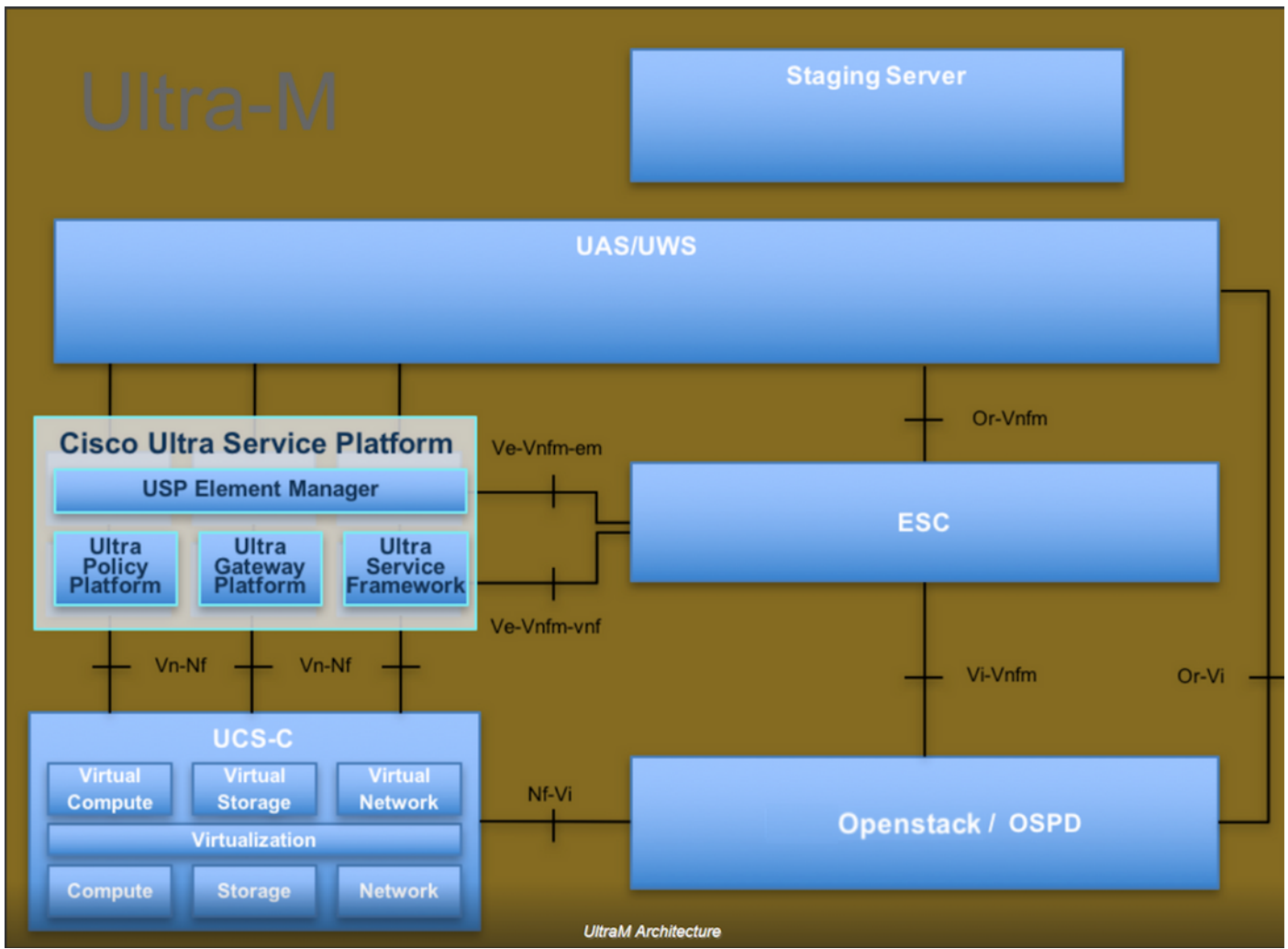
This procedure applies for an Openstack environment using NEWTON version where ESC is not managing CPAR and CPAR is installed directly on the VM deployed on Openstack.

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:



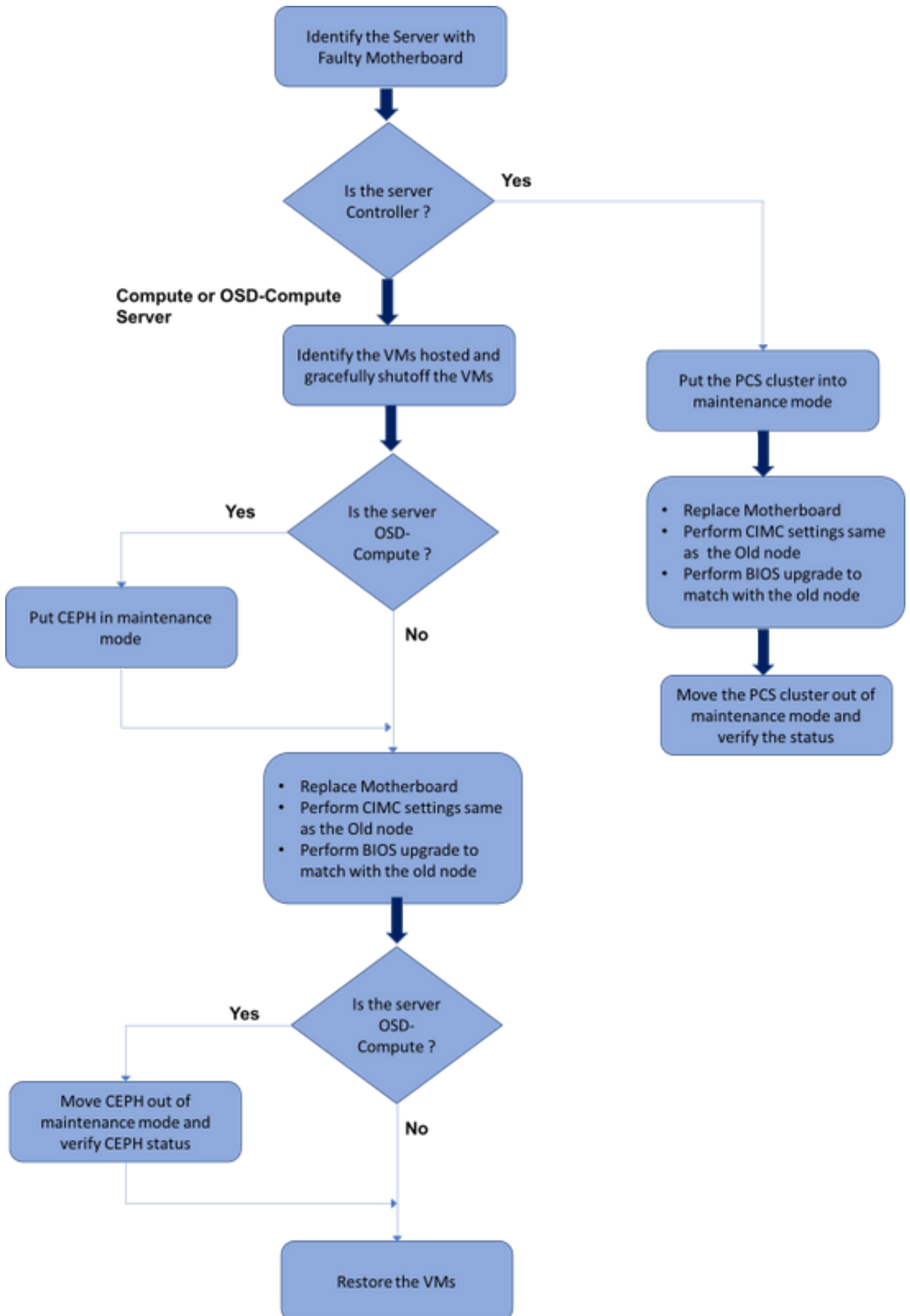
This document is intended for Cisco personnel who are familiar with Cisco Ultra-M platform and it details the steps that are required to be carried out at OpenStack and Redhat OS.

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



Motherboard Replacement in Ultra-M Setup

In an Ultra-M setup, there can be scenarios where a motherboard replacement is required in the following server types: Compute, OSD-Compute and Controller.

Note: The boot disks with the openstack installation are replaced after the replacement of the motherboard. Hence there is no requirement to add the node back to overcloud. Once the server is powered ON after the replacement activity, it would enrol itself back to the overcloud stack.

Prerequisites

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@director ~]# mysqldump --opt --all-databases > /root/undercloud-all-databases.sql
[root@director ~]# 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: Make sure you have the snapshot of the instance so that you can restore the VM when needed. Follow this procedure on how to take snapshot of the VM.

Motherboard Replacement in Compute Node

Before the activity, the VMs hosted in the Compute node are gracefully shutdown. Once the Motherboard has been replaced, the VMs are restored back.

Identify the VMs Hosted in the Compute Node

```
[stack@a103-pod2-ospd ~]$ nova list --field name,host
```

```
-----+-----+-----+
-----+
| ID                                     | Name                                     |
Host                                     |                                         |
```

```

+-----+-----+-----+
-----+
| 46b4b9eb-a1a6-425d-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 are used in subsequent sections.

Backup: Snapshot Process

Step 1. 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 stating "Cisco Prime Access Registrar Server Agent shutdown complete." Should show up

If a user left a CLI session open, the arserver stop command won't work and this message is 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 please terminate this 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 issuing the 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
```

This messages should appear:

```
ERROR: You can not shut down Cisco Prime Access Registrar while the
```

```
CLI is being used. Current list of running
```

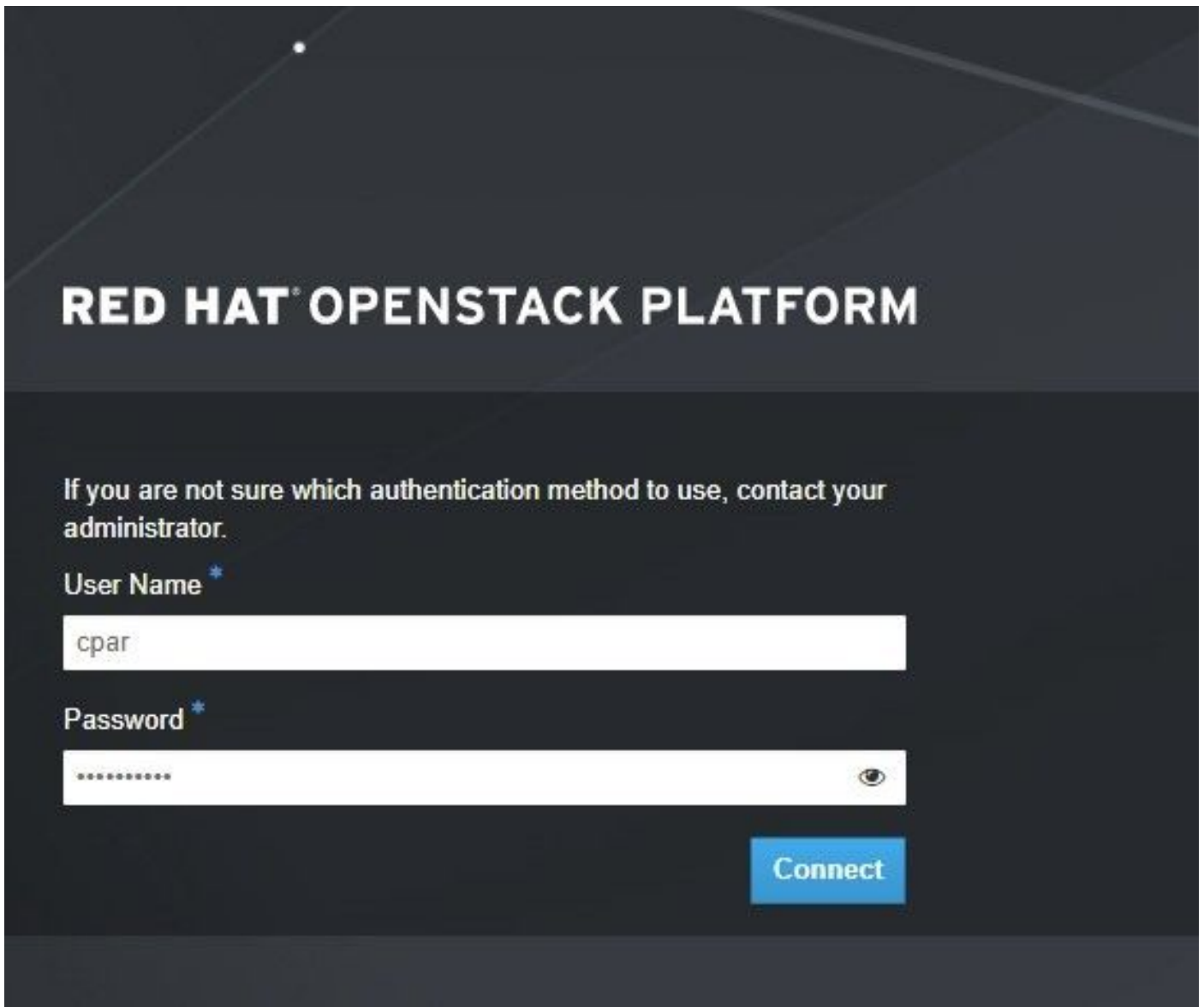
```
CLI with process id is:
```

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

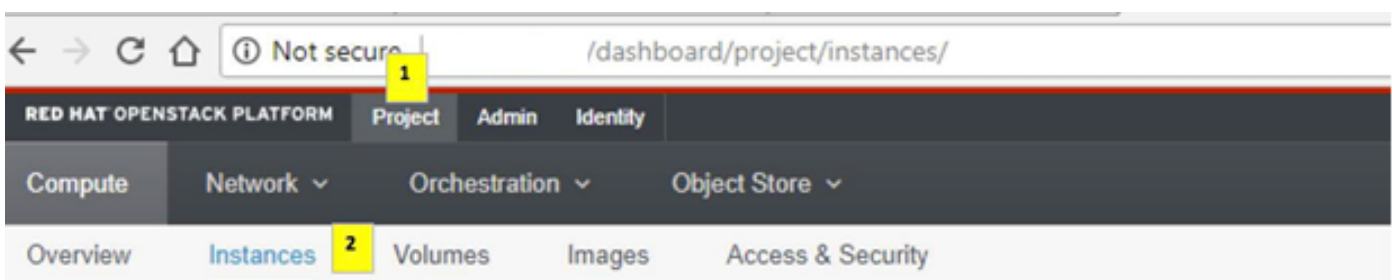
VM Snapshot Task

Step 1. Enter the Horizon GUI website that corresponds to the Site (City) currently being worked on.

When accessing Horizon, this screen is observed:



Step 2. Navigate to **Project > Instances**, as shown in the image.



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

Step 3. Shut down only one instance at a time, please 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 by checking the 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 will be created in parallel.

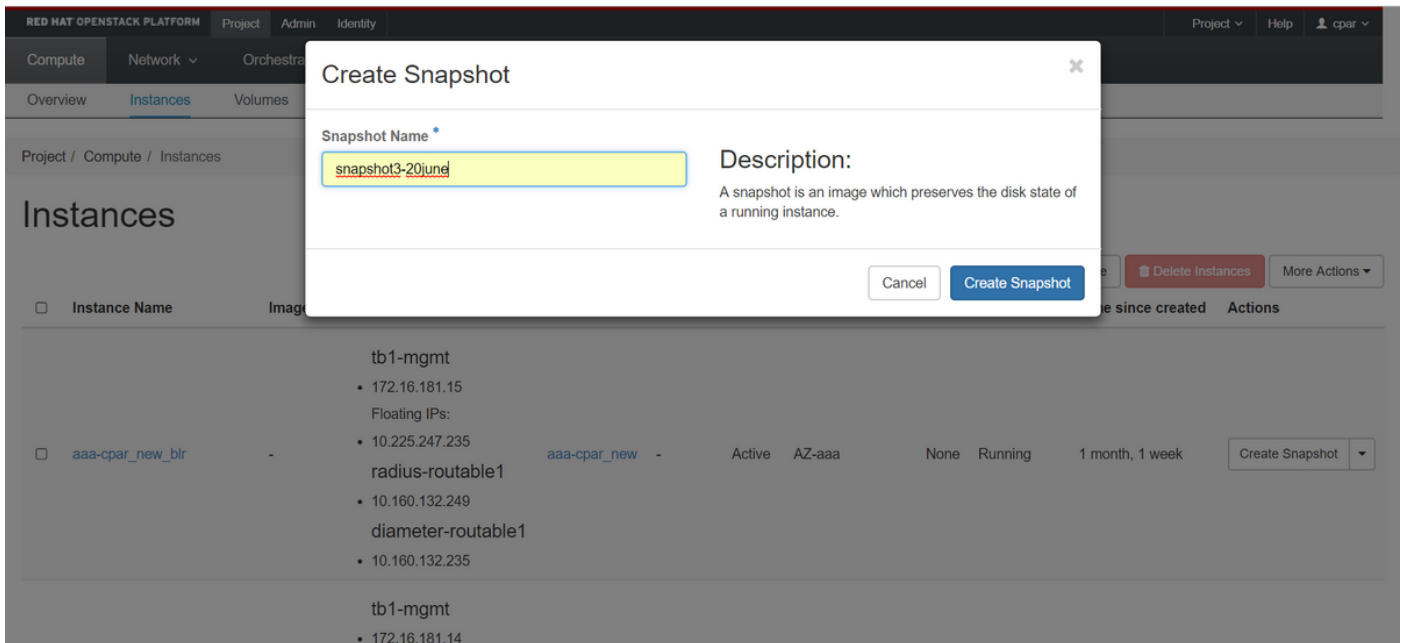
Taking a snapshot of each AAA instance (25 minutes -1 hour) (25 minutes for instances that used a qcow image as a source and 1 hour for instances that user a raw image as a source)

Step 1. Login to POD's Openstack's HorizonGUI.

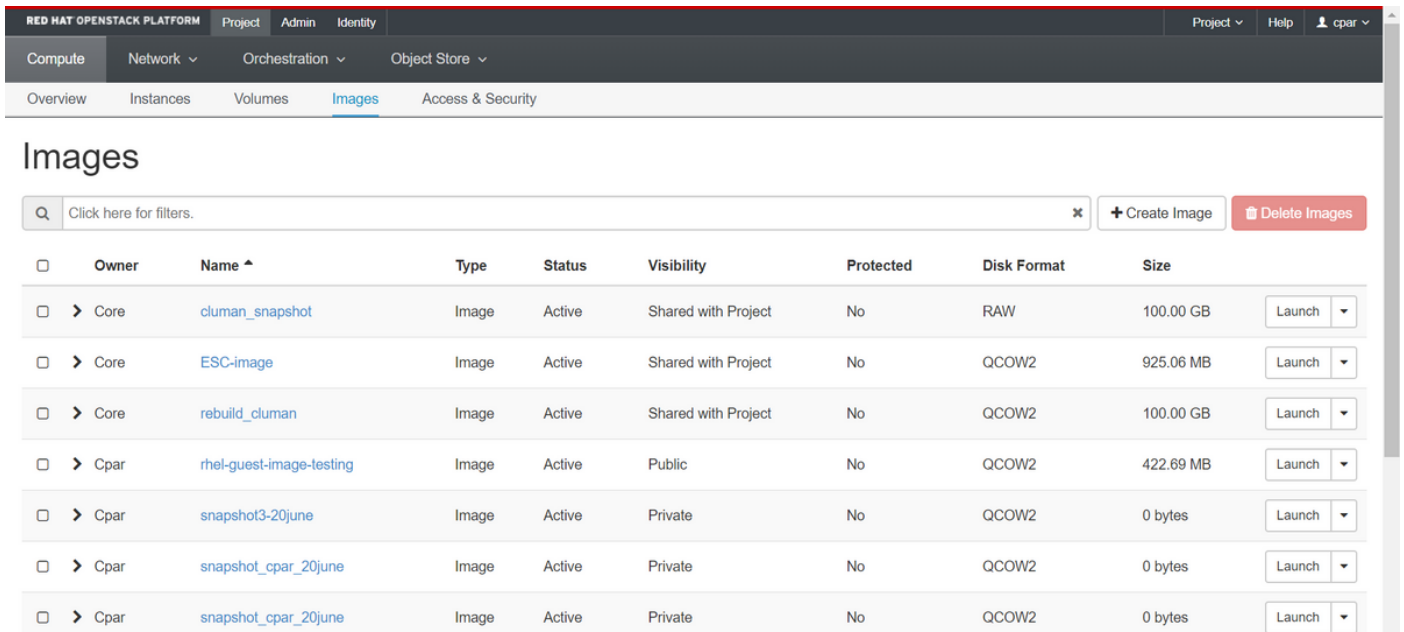
Step 2. Once logged in, proceed to the **Project > Compute > Instances** section on the top menu and look for the AAA instances.

The screenshot shows the OpenStack Horizon GUI. The top navigation bar includes 'RED HAT OPENSTACK PLATFORM', 'Project', 'Admin', 'Identity', 'Project', 'Help', and a user profile. The main navigation menu has 'Compute', 'Network', 'Orchestration', and 'Object Store'. The 'Instances' page is active, showing a breadcrumb 'Project / Compute / Instances'. The 'Instances' section has a search bar and buttons for 'Launch Instance', 'Delete Instances', and 'More Actions'. A table lists instances with columns: Instance Name, Image Name, IP Address, Size, Key Pair, Status, Availability Zone, Task, Power State, Time since created, and Actions. One instance, 'aaa-cpar_new_blr', is selected, showing its details: Image Name is '-', IP Address is '10.225.247.235', Size is 'aaa-cpar_new', Key Pair is '-', Status is 'Active', Availability Zone is 'AZ-aaa', Task is 'None', Power State is 'Running', and Time since created is '1 month, 1 week'. A 'Create Snapshot' button is visible in the Actions column. The URL at the bottom is '10.225.247.214/dashboard/project/images/.../create/'.

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



Step 4. Once the snapshot runs, navigate to the IMAGES menu and verify that all finish and report 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/CSCOar/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), download it on a QCOW2 format using the 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 will take some time to complete this action, once it is done, the image can be located at /tmp directory.
- On sending the process to background, if connectivity is lost, then the process is also stopped.
- Execute the command “disown -h” so that in case of 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, execute 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 has enough available disk space, use the command “*df -kh*” in order to verify the memory space. Our advice is to transfer it to another site’s OSPD temporarily by using 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, we can use the following command *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 will 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
```

Replace Motherboard

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

1. Login to the server with the use of the CIMC IP.
2. 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](#)

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. Using "sftproot@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 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
```

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

next command to do so.

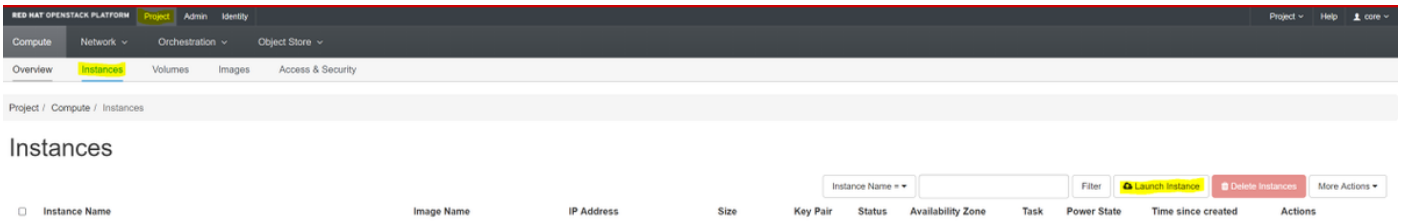
ERROR: You can not shut down Cisco Prime Access Registrar while the CLI is being used. Current list of running CLI with process id is:

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

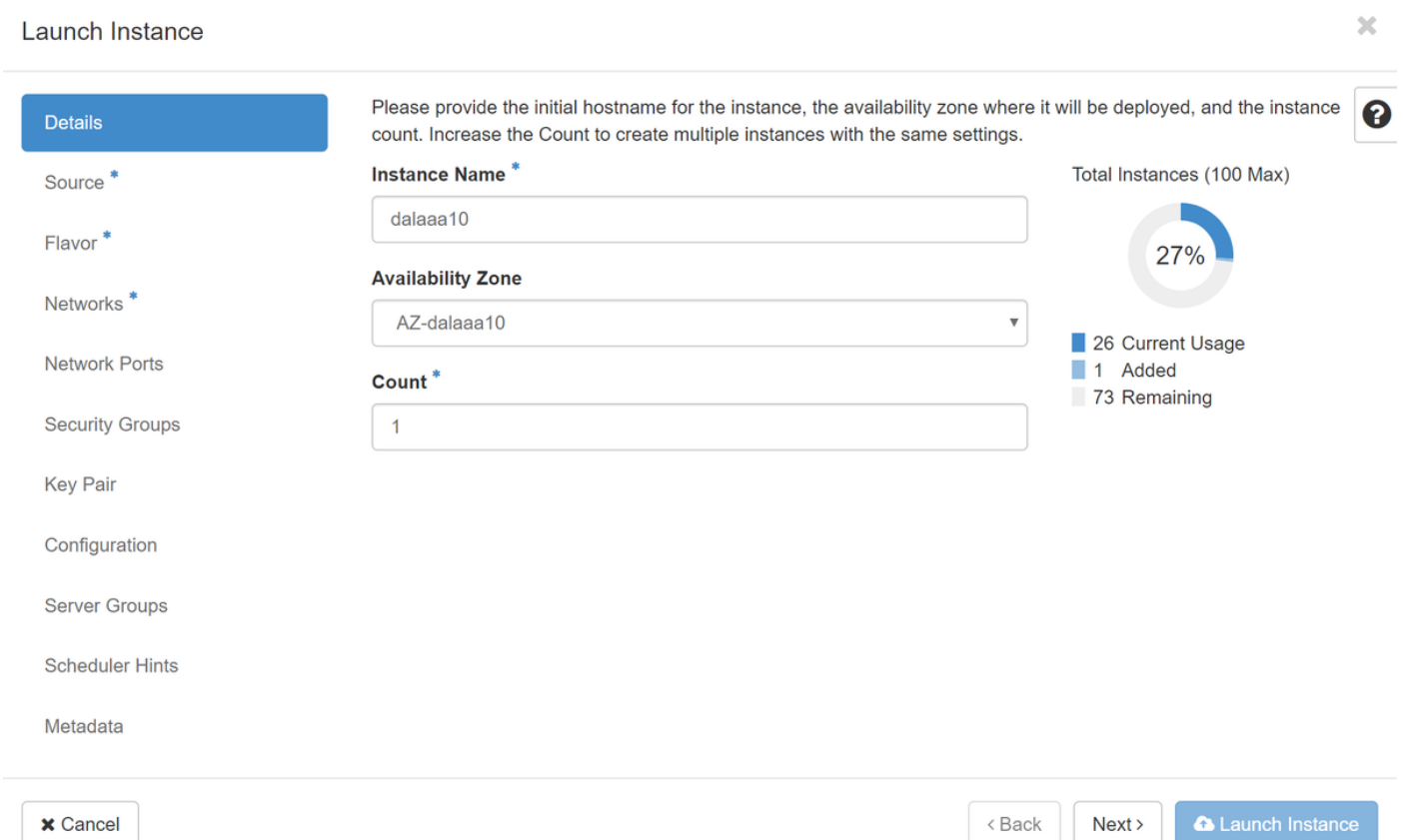
The process can be seen on the horizon.



Step 4. In Horizon, navigate to **Project > Instances** and click on **Launch Instance**.



Step 5. Fill in the instance name and choose the availability zone.



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.

Launch Instance ✕

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 **Create New Volume**

Image 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< BackNext >Launch Instance

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

Details

Source

Flavor

Networks *

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

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	-

▼ Available 7 Select one

✕

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. Finally, navigate to the network tab and choose the networks that the instance needs as you click on + sign. For this case select **diameter-soutable1**, **radius-routable1** and **tb1-mgmt**.

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. Finally, 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 is completely deployed and ready for use.



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 [X]

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. Finally, click on **Associate** button.

Enabling 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 will display the command line interface 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 `!o` to edit the file. Then look for the section showed below and change the first line from **PasswordAuthentication** 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. Execute 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 using 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
<input type="checkbox"/> dilaaa04	dilaaa01-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-dilaaa04	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. Run 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/CSC0ar/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 using by issuing the following 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.

Motherboard Replacement in OSD Compute Node

Before the activity, the VMs hosted in the Compute node are gracefully shutdown and the CEPH is put into maintenance mode. Once the Motherboard has been replaced, the VMs are restored back and CEPH is moved out of maintenance mode.

Identify the VMs Hosted in the Osd-Compute Node

Identify the VMs that are hosted on the OSD compute server.

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

Backup: 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:

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

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 please terminate this 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 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
```

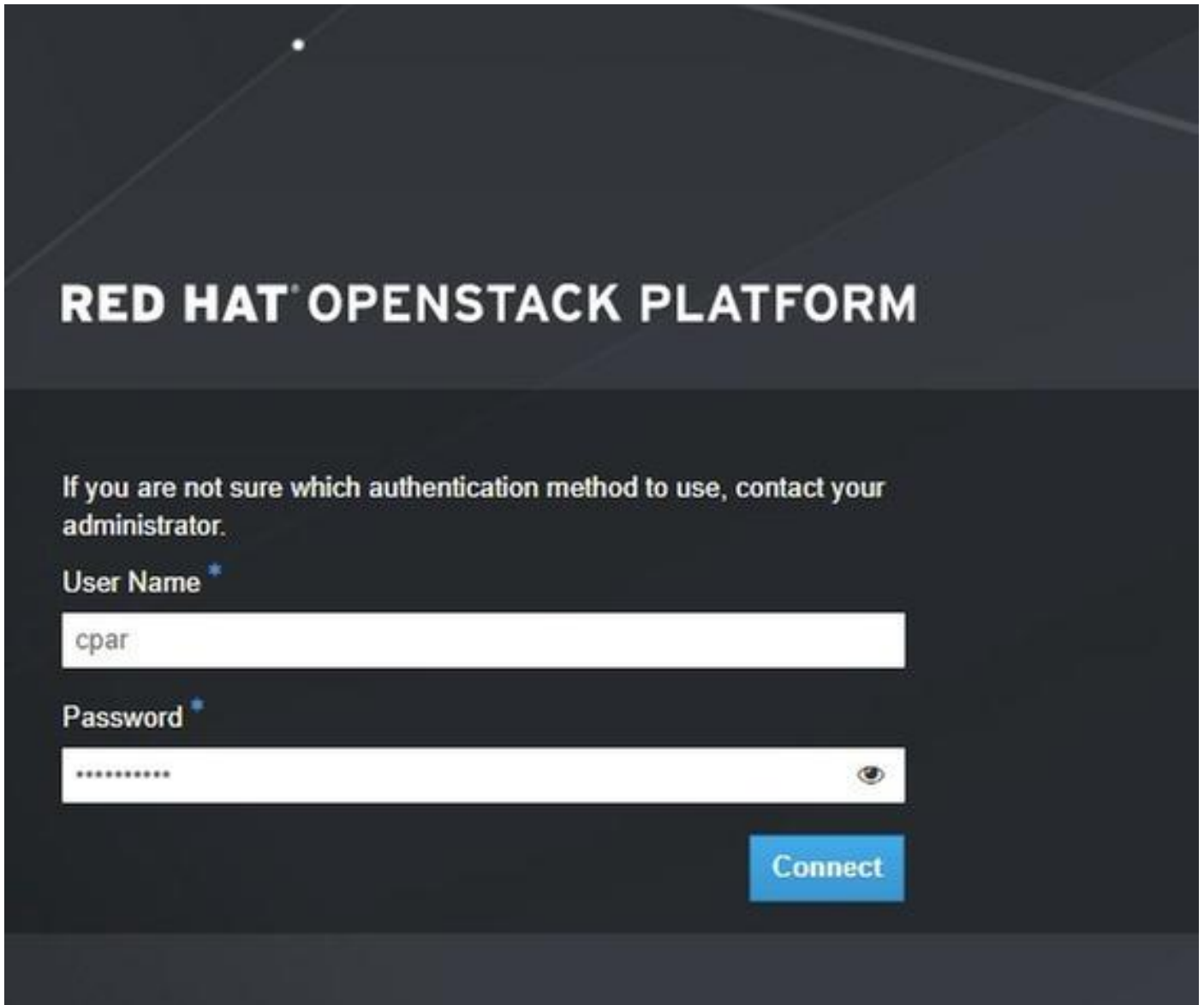
These messages appear:

```
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:
```

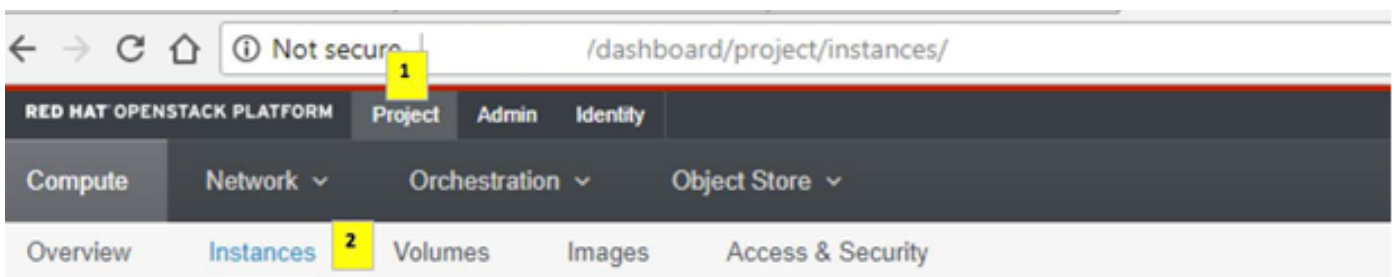
VM Snapshot task

Step 1. Enter the Horizon GUI website that corresponds to the Site (City) currently being worked on.

When accessing Horizon, the image shown is observed:



Step 2. Navigate to **Project > Instances**, as shown in the image.



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

Step 3. Shut down only one instance at a time, please repeat the whole process in this document.

In order to shutdown the VM, navigate to **Actions > Shut Off Instance** and confirm your selection.

Shut Off Instance

Step 4. Validate that the instance was indeed shut down by checking the 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

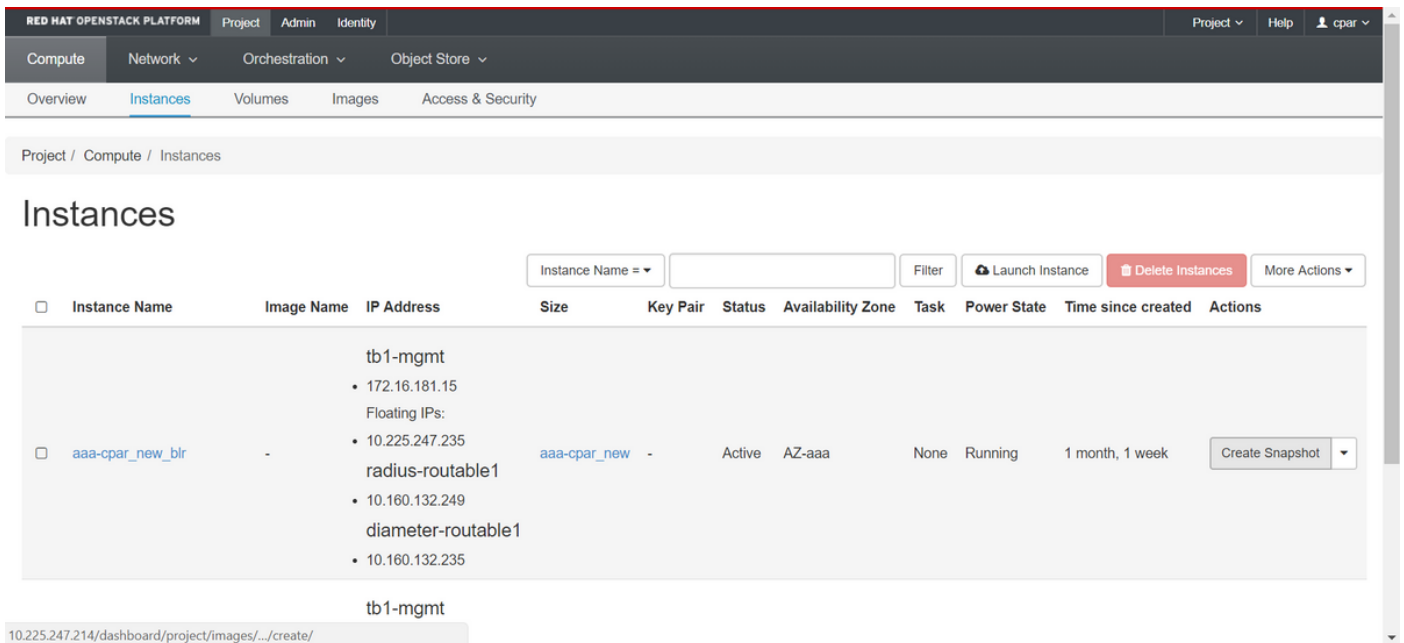
Once the CPAR VMs are down, the snapshots can be taken in parallel, as they belong to independent computes.

The four QCOW2 files are created in parallel.

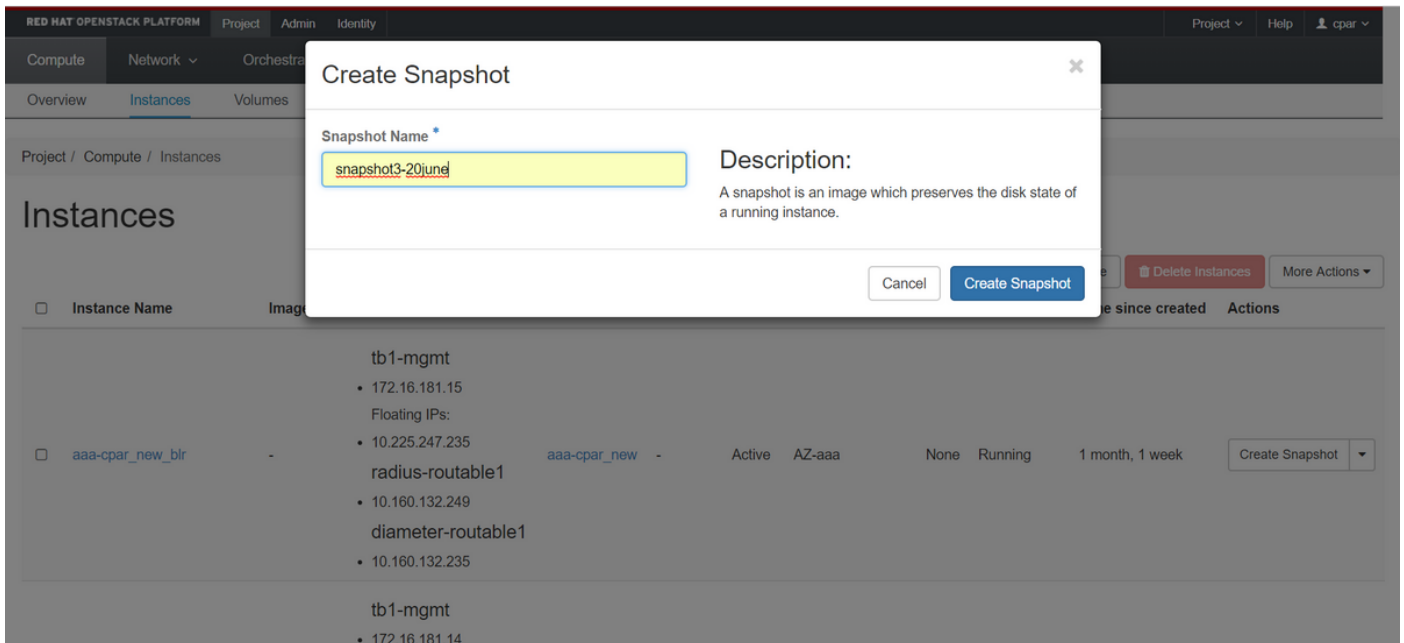
Take a snapshot of each AAA instance (25 minutes -1 hour) (25 minutes for instances that used a qcow image as a source and 1 hour for instances that user a raw image as a source)

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.



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



Step 4. Once the snapshot runs, navigate to the IMAGES menu and verify that all finish and report no problems.

RED HAT OPENSTACK PLATFORM									Project	Admin	Identity	Project	Help	↑ cpar
Compute		Network	Orchestration	Object Store										
Overview	Instances	Volumes	Images	Access & Security										
<input type="text" value="Click here for filters."/> <input type="button" value="+ Create Image"/> <input type="button" value="Delete Images"/>														
<input type="checkbox"/>	Owner	Name ^	Type	Status	Visibility	Protected	Disk Format	Size						
<input type="checkbox"/>	> Core	cluman_snapshot	Image	Active	Shared with Project	No	RAW	100.00 GB	<input type="button" value="Launch"/>					
<input type="checkbox"/>	> Core	ESC-image	Image	Active	Shared with Project	No	QCOW2	925.06 MB	<input type="button" value="Launch"/>					
<input type="checkbox"/>	> Core	rebuild_cluman	Image	Active	Shared with Project	No	QCOW2	100.00 GB	<input type="button" value="Launch"/>					
<input type="checkbox"/>	> Cpar	rhel-guest-image-testing	Image	Active	Public	No	QCOW2	422.69 MB	<input type="button" value="Launch"/>					
<input type="checkbox"/>	> Cpar	snapshot3-20june	Image	Active	Private	No	QCOW2	0 bytes	<input type="button" value="Launch"/>					
<input type="checkbox"/>	> Cpar	snapshot_cpar_20june	Image	Active	Private	No	QCOW2	0 bytes	<input type="button" value="Launch"/>					
<input type="checkbox"/>	> Cpar	snapshot_cpar_20june	Image	Active	Private	No	QCOW2	0 bytes	<input type="button" value="Launch"/>					

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/CSCOar/bin/aregcmd -s
```

Step 6. Once identified the snapshot is to be downloaded (in this case is going to be the one marked above in green), now download it on a QCOW2 format with this command **glance image-download** as shown in 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 will take some time to complete this action, once it is done, the image can be located at /tmp directory.
- On sending the process to background, if connectivity is lost, then the process is also stopped.
- Execute the command “disown -h” so that in case of SSH connection is lost, the process still runs and finishes on the OSPD.

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/CSC0ar/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/CSC0ar/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 has enough available disk space, use the command "`df -kh`" in order to verify the memory space. Our advice is to transfer it to another site's OSPD temporarily by using SFTP "`sftproot@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, we can use the following command `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.

Put CEPH in Maintenance Mode

Step 1. Verify ceph osd tree status are up in the 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/CSC0ar/bin/aregcmd -s
```

Step 2. Login to the OSD Compute node and put CEPH in the maintenance mode.

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd set norebalance
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd set noout
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
```

```
health HEALTH_WARN
```

```
noout,norebalance,sortbitwise,require_jewel_osds flag(s) set
```

```
monmap e1: 3 mons at {pod2-stack-controller-0=11.118.0.10:6789/0,pod2-stack-controller-1=11.118.0.11:6789/0,pod2-stack-controller-2=11.118.0.12:6789/0}
```

```
election epoch 10, quorum 0,1,2 pod2-stack-controller-0,pod2-stack-controller-1,pod2-stack-controller-2
```

```
osdmap e79: 12 osds: 12 up, 12 in
```

```
flags noout,norebalance,sortbitwise,require_jewel_osds
```

```
pgmap v22844323: 704 pgs, 6 pools, 804 GB data, 423 kobjects
```

```
2404 GB used, 10989 GB / 13393 GB avail
```

```
704 active+clean
client io 3858 kB/s wr, 0 op/s rd, 546 op/s wr
```

Note: When CEPH is removed, VNF HD RAID goes into the Degraded state but hd-disk must still be accessible

Graceful Power Off

Power off Node

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

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd set norebalance
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd set noout
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_WARN
noout,norebalance,sortbitwise,require_jewel_osds flag(s) set
monmap e1: 3 mons at {pod2-stack-controller-0=11.118.0.10:6789/0,pod2-stack-controller-1=11.118.0.11:6789/0,pod2-stack-controller-2=11.118.0.12:6789/0}
election epoch 10, quorum 0,1,2 pod2-stack-controller-0,pod2-stack-controller-1,pod2-stack-controller-2
osdmap e79: 12 osds: 12 up, 12 in
flags noout,norebalance,sortbitwise,require_jewel_osds
pgmap v22844323: 704 pgs, 6 pools, 804 GB data, 423 kobjects
2404 GB used, 10989 GB / 13393 GB avail
704 active+clean
client io 3858 kB/s wr, 0 op/s rd, 546 op/s wr
```

Replace Motherboard

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

1. Login to the server with the use of the CIMC IP.
2. 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](#)

Move CEPH out of Maintenance Mode

Login to the OSD Compute node and move CEPH out of the maintenance mode.

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset norebalance
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset noout
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_OK
monmap e1: 3 mons at {pod2-stack-controller-0=11.118.0.10:6789/0,pod2-stack-controller-1=11.118.0.11:6789/0,pod2-stack-controller-2=11.118.0.12:6789/0}
election epoch 10, quorum 0,1,2 pod2-stack-controller-0,pod2-stack-controller-1,pod2-stack-controller-2
osdmap e81: 12 osds: 12 up, 12 in
flags sortbitwise,require_jewel_osds
pgmap v22844355: 704 pgs, 6 pools, 804 GB data, 423 kobjects
2404 GB used, 10989 GB / 13393 GB avail
704 active+clean
client io 3658 kB/s wr, 0 op/s rd, 502 op/s wr
```

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. Using "sftproot@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-deployed.

```
Last login: wed May 9 06:42:27 2018 from 10.169.119.213
[root@dauucs01-ospd ~]# █
```

Source the environment variables with this command:

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset norebalance
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset noout
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_OK
monmap e1: 3 mons at {pod2-stack-controller-0=11.118.0.10:6789/0,pod2-stack-controller-1=11.118.0.11:6789/0,pod2-stack-controller-2=11.118.0.12:6789/0}
election epoch 10, quorum 0,1,2 pod2-stack-controller-0,pod2-stack-controller-1,pod2-stack-controller-2
osdmap e81: 12 osds: 12 up, 12 in
flags sortbitwise,require_jewel_osds
pgmap v22844355: 704 pgs, 6 pools, 804 GB data, 423 kobjects
2404 GB used, 10989 GB / 13393 GB avail
704 active+clean
client io 3658 kB/s wr, 0 op/s rd, 502 op/s wr
```

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

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset norebalance
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset noout
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_OK
monmap e1: 3 mons at {pod2-stack-controller-0=11.118.0.10:6789/0,pod2-stack-controller-1=11.118.0.11:6789/0,pod2-stack-controller-2=11.118.0.12:6789/0}
election epoch 10, quorum 0,1,2 pod2-stack-controller-0,pod2-stack-controller-1,pod2-stack-controller-2
osdmap e81: 12 osds: 12 up, 12 in
flags sortbitwise,require_jewel_osds
pgmap v22844355: 704 pgs, 6 pools, 804 GB data, 423 kobjects
2404 GB used, 10989 GB / 13393 GB avail
704 active+clean
client io 3658 kB/s wr, 0 op/s rd, 502 op/s wr
```

The process can be seen on the horizon.

Owner	Nombre	Tipo	Estado	Visibilidad	Protegido	Disk Format	Tamaño
Core	AAA-CPAR-April2018-snapshot	Imagen	Guardando	Privado	No	QCOW2	

Step 4. In Horizon, navigate to **Project > Instances** and click on **Launch Instance**.

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
---------------	------------	------------	------	----------	--------	-------------------	------	-------------	--------------------	---------

Step 5. Fill in the instance name and choose the availability zone.

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 *

Availability Zone

Count *

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 are 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 the + sign.

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	-

Available 7 Select one

Q 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. Finally, navigate to the network tab and choose the networks that the instance needs as you click on the + sign. For this case select **diameter-soutable1**, **radius-routable1** and **tb1-mgmt**.

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. Finally, 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	dalaaa10	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 is completely deployed and ready for use.



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 [X]

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. Finally, click on the **Associate** button.

Enabling 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 **!** to edit the file. Then look for the section shown here and change the first line from **PasswordAuthentication** to **no**.

```
# 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 using 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 these steps, once the activity has been completed and CPAR services can be re-established in the Site that was shut down.

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

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset norebalance
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset noout
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_OK
monmap e1: 3 mons at {pod2-stack-controller-0=11.118.0.10:6789/0,pod2-stack-controller-1=11.118.0.11:6789/0,pod2-stack-controller-2=11.118.0.12:6789/0}
election epoch 10, quorum 0,1,2 pod2-stack-controller-0,pod2-stack-controller-1,pod2-stack-controller-2
osdmap e81: 12 osds: 12 up, 12 in
flags sortbitwise,require_jewel_osds
pgmap v22844355: 704 pgs, 6 pools, 804 GB data, 423 kobjects
2404 GB used, 10989 GB / 13393 GB avail
704 active+clean
client io 3658 kB/s wr, 0 op/s rd, 502 op/s wr
```

Step 2. Run 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.

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset norebalance
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset noout
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_OK
monmap e1: 3 mons at {pod2-stack-controller-0=11.118.0.10:6789/0,pod2-stack-controller-1=11.118.0.11:6789/0,pod2-stack-controller-2=11.118.0.12:6789/0}
election epoch 10, quorum 0,1,2 pod2-stack-controller-0,pod2-stack-controller-1,pod2-stack-controller-2
osdmap e81: 12 osds: 12 up, 12 in
flags sortbitwise,require_jewel_osds
pgmap v22844355: 704 pgs, 6 pools, 804 GB data, 423 kobjects
2404 GB used, 10989 GB / 13393 GB avail
704 active+clean
client io 3658 kB/s wr, 0 op/s rd, 502 op/s wr
```

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

The output mentioned here 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.

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset norebalance
[root@pod2-stack-osd-compute-0 ~]# sudo ceph osd unset noout
```

```
[root@pod2-stack-osd-compute-0 ~]# sudo ceph status
```

```
cluster eb2bb192-b1c9-11e6-9205-525400330666
health HEALTH_OK
monmap e1: 3 mons at {pod2-stack-controller-0=11.118.0.10:6789/0,pod2-stack-controller-1=11.118.0.11:6789/0,pod2-stack-controller-2=11.118.0.12:6789/0}
election epoch 10, quorum 0,1,2 pod2-stack-controller-0,pod2-stack-controller-1,pod2-stack-controller-2
osdmap e81: 12 osds: 12 up, 12 in
flags sortbitwise,require_jewel_osds
pgmap v22844355: 704 pgs, 6 pools, 804 GB data, 423 kobjects
2404 GB used, 10989 GB / 13393 GB avail
704 active+clean
client io 3658 kB/s wr, 0 op/s rd, 502 op/s wr
```

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/CSC0ar/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/CSC0ar/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 uses 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.

Motherboard Replacement in Controller Node

Verify Controller Status and put Cluster in Maintenance Mode

From OSPD, login to the controller and verify pcs is in good state – all three controllers Online and galera showing all three controllers as Master.

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

Put the cluster in maintenance mode

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

```
[heat-admin@pod2-stack-controller-0 ~]$ sudo pcs status
Cluster name: tripleo_cluster
Stack: corosync
Current DC: pod2-stack-controller-2 (version 1.1.15-11.el7_3.4-e174ec8) - partition with quorum
Last updated: Fri Jul 6 09:03:10 2018Last change: Fri Jul 6 09:03:06 2018 by root via
crm_attribute on pod2-stack-controller-0
```

3 nodes and 19 resources configured

Node pod2-stack-controller-0: standby

Online: [pod2-stack-controller-1 pod2-stack-controller-2]

Full list of resources:

```
ip-11.120.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
Clone Set: haproxy-clone [haproxy]
Started: [ pod2-stack-controller-1 pod2-stack-controller-2 ]
Stopped: [ pod2-stack-controller-0 ]
Master/Slave Set: galera-master [galera]
Masters: [ pod2-stack-controller-0 pod2-stack-controller-1 pod2-stack-controller-2 ]
ip-192.200.0.110(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
ip-11.120.0.44(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
ip-11.118.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
Clone Set: rabbitmq-clone [rabbitmq]
Started: [ pod2-stack-controller-0 pod2-stack-controller-1 pod2-stack-controller-2 ]
ip-10.225.247.214(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
Master/Slave Set: redis-master [redis]
Masters: [ pod2-stack-controller-2 ]
Slaves: [ pod2-stack-controller-1 ]
Stopped: [ pod2-stack-controller-0 ]
ip-11.119.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
openstack-cinder-volume(systemd:openstack-cinder-volume):Started pod2-stack-controller-1
```

Daemon Status:


```
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
```

Replace Motherboard

Procedure to replace the motherboard in a UCS C240 M4 server can be referred from [Cisco UCS C240 M4 Server Installation and Service Guide](#)

1. Login to the server with the use of the CIMC IP.
2. 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](#)

Restore Cluster Status

Login to the impacted controller, remove standby mode by setting **unstandby**. Verify controller comes Online with cluster and galera shows all three controllers as Master. This may take a few minutes.

```
[heat-admin@pod2-stack-controller-0 ~]$ sudo pcs status
Cluster name: tripleo_cluster
Stack: corosync
Current DC: pod2-stack-controller-2 (version 1.1.15-11.e17_3.4-e174ec8) - partition with quorum
Last updated: Fri Jul 6 09:03:10 2018Last change: Fri Jul 6 09:03:06 2018 by root via
crm_attribute on pod2-stack-controller-0
```

3 nodes and 19 resources configured

Node pod2-stack-controller-0: standby

Online: [pod2-stack-controller-1 pod2-stack-controller-2]

Full list of resources:

```
ip-11.120.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
Clone Set: haproxy-clone [haproxy]
Started: [ pod2-stack-controller-1 pod2-stack-controller-2 ]
Stopped: [ pod2-stack-controller-0 ]
Master/Slave Set: galera-master [galera]
Masters: [ pod2-stack-controller-0 pod2-stack-controller-1 pod2-stack-controller-2 ]
ip-192.200.0.110(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
ip-11.120.0.44(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
ip-11.118.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
Clone Set: rabbitmq-clone [rabbitmq]
Started: [ pod2-stack-controller-0 pod2-stack-controller-1 pod2-stack-controller-2 ]
ip-10.225.247.214(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
Master/Slave Set: redis-master [redis]
Masters: [ pod2-stack-controller-2 ]
Slaves: [ pod2-stack-controller-1 ]
Stopped: [ pod2-stack-controller-0 ]
ip-11.119.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
openstack-cinder-volume(systemd:openstack-cinder-volume):Started pod2-stack-controller-1
```

Daemon Status:

```
corosync: active/enabled
pacemaker: active/enabled
```

pcsd: active/enabled

```
[heat-admin@pod2-stack-controller-0 ~]$ sudo pcs status
Cluster name: tripleo_cluster
Stack: corosync
Current DC: pod2-stack-controller-2 (version 1.1.15-11.e17_3.4-e174ec8) - partition with quorum
Last updated: Fri Jul 6 09:03:37 2018Last change: Fri Jul 6 09:03:35 2018 by root via
crm_attribute on pod2-stack-controller-0
```

3 nodes and 19 resources configured

Online: [pod2-stack-controller-0 pod2-stack-controller-1 pod2-stack-controller-2]

Full list of resources:

```
ip-11.120.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
Clone Set: haproxy-clone [haproxy]
Started: [ pod2-stack-controller-0 pod2-stack-controller-1 pod2-stack-controller-2 ]
Master/Slave Set: galera-master [galera]
Masters: [ pod2-stack-controller-1 pod2-stack-controller-2 ]
Slaves: [ pod2-stack-controller-0 ]
ip-192.200.0.110(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
ip-11.120.0.44(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
ip-11.118.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
Clone Set: rabbitmq-clone [rabbitmq]
Started: [ pod2-stack-controller-1 pod2-stack-controller-2 ]
Stopped: [ pod2-stack-controller-0 ]
ip-10.225.247.214(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-1
Master/Slave Set: redis-master [redis]
Masters: [ pod2-stack-controller-2 ]
Slaves: [ pod2-stack-controller-0 pod2-stack-controller-1 ]
ip-11.119.0.49(ocf::heartbeat:IPaddr2):Started pod2-stack-controller-2
openstack-cinder-volume(systemd:openstack-cinder-volume):Started pod2-stack-controller-1
```

Daemon Status:

```
corosync: active/enabled
pacemaker: active/enabled
pcsd: active/enabled
```