CPAR AAA VM Deployment

Contents

Introduction

This document describes Cisco Prime Access Registrars (CPAR's) Authentication, Authorization, and Accounting (AAA) VM Deployment. This procedure applies for an OpenStack environment with the use of NEWTON version where ESC does not manage CPAR and CPAR is installed directly on the Virtual Machine (VM) deployed on OpenStack.

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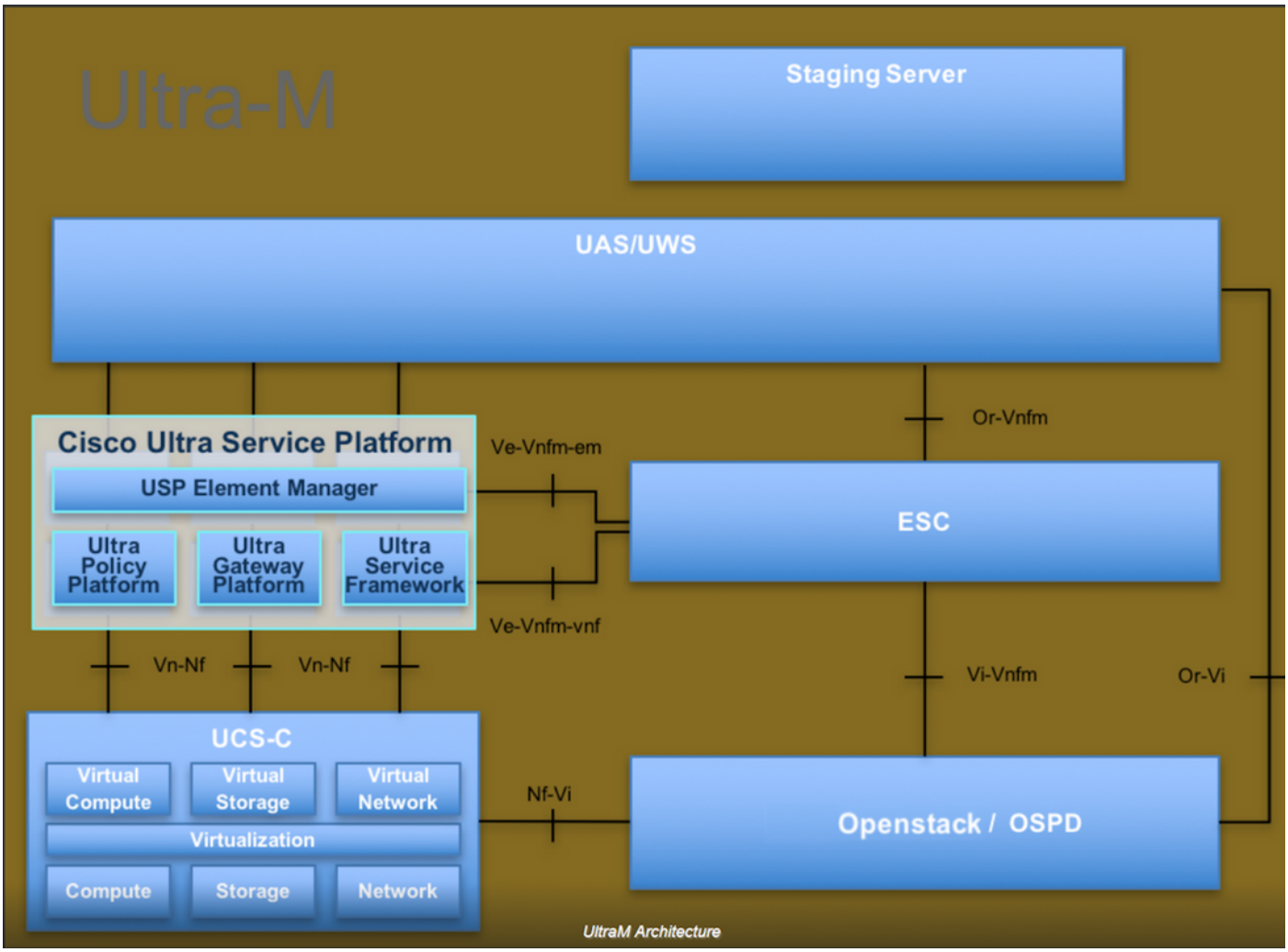
Background Information

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.

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

CPAR VM Instance Deployment Procedure

Login to the Horizon Interface.

Ensure that these are attained before you start with the VM Instance Deployment Procedure.

- Secure Shell (SSH) connectivity to the VM or Server
- Update the hostname and the same hostname should be there in **/etc/hosts**

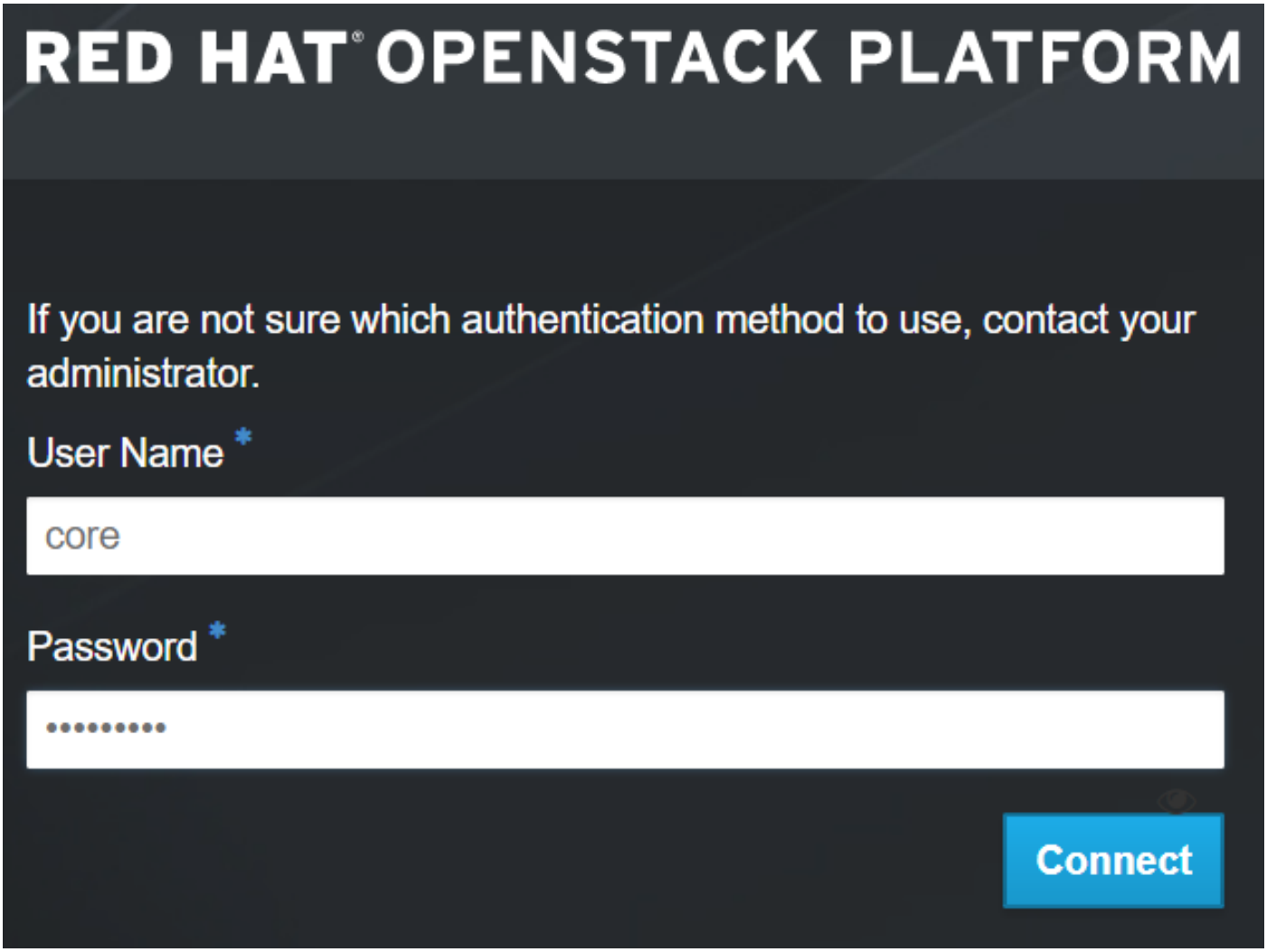
- The list includes the RPM required in order to install CPAR GUI

Required 64-bit rpms for Relevant RHEL OS Versions

rpm	RHEL OS Version 6.6	RHEL OS Version 7.0	RHEL OS Version 7.2
glibc	Yes	Yes	Yes
gdome2	Yes	Yes	Yes
glib	Yes	Yes	Yes
glib2	Yes	Yes	Yes
libgcc	Yes	Yes	Yes
libstdc++	Yes	Yes	Yes
libxml2	Yes	Yes	Yes
ncurses	No	No	No
nspr	Yes	Yes	Yes
nss	No	No	No
zlib	Yes	Yes	Yes
nss-softokn-freebl	Yes	Yes	Yes
ncurses-libs	Yes	Yes	Yes
nss-util	Yes	Yes	Yes
gamin	Yes	Yes	Yes
libselinux	Yes	Yes	Yes

Step 1. Open any Internet Browser and a corresponding IP address from the Horizon Interface.

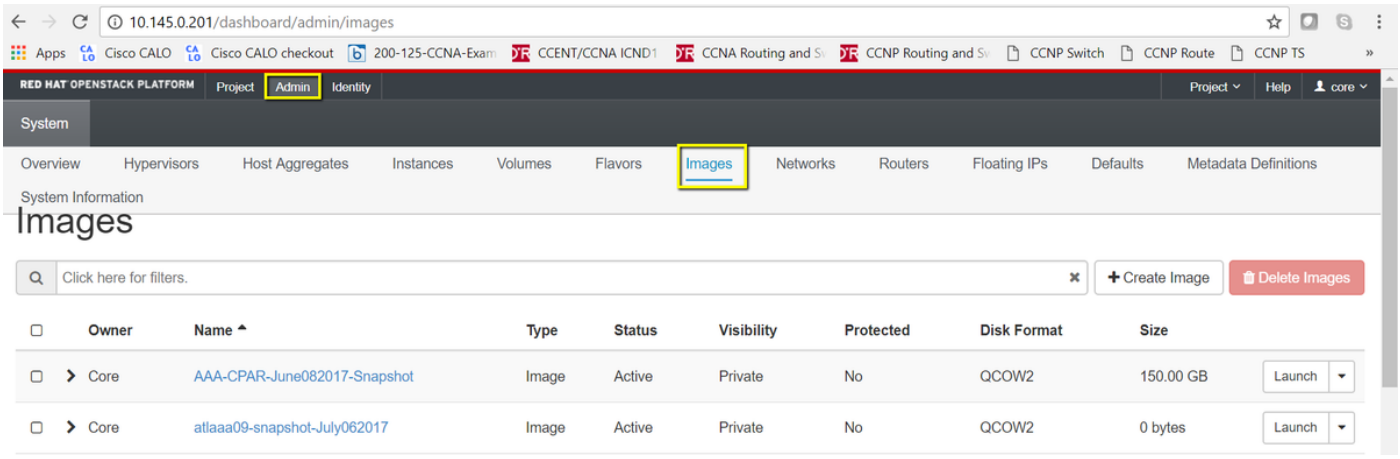
Step 2. Enter the proper user credentials and click the **Connect** button.



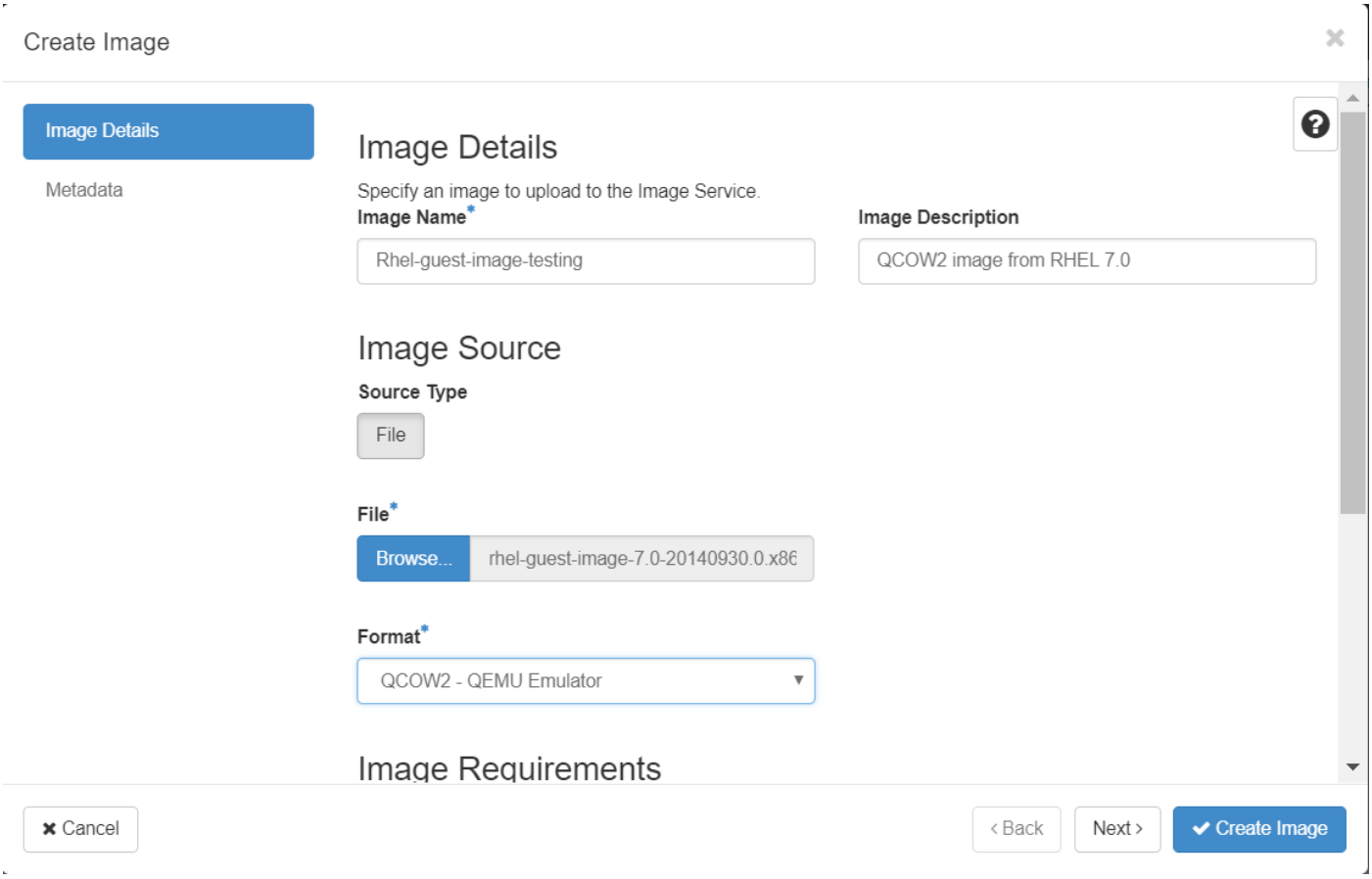
Upload RHEL Image to Horizon

Step 1. Navigate to **Content Repository** and download the file named **rhel-image**. This is a customized QCOW2 Red Hat image for CPAR AAA project.

Step 2. Go back to the Horizon tab and follow the route **Admin > Images** as shown in the image.



Step 3. Click on the **Create Image** button. Fill in the files labelled as **Image Name** and **Image Description**, select the QCOW2 file that was previously downloaded on Step 1. by clicking **Browse** at **File** section, and select **QCOW2-QUEMU Emulator** option at **Format** section. Then click on **Create Image** as shown in the image.



Create a New Flavor

Flavors represent the resource template used in the architecture of each instance.

Step 1. In the Horizon top menu, navigate to **Admin > Flavors** as shown in the image.

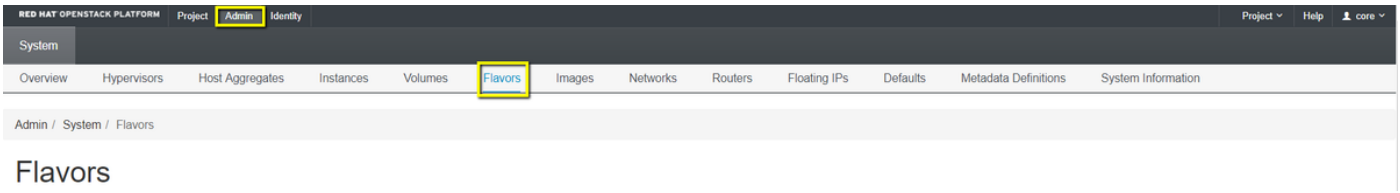


Figure 4 Horizon Flavors section.

Step 2. Click on the **Create Flavor** button.

Step 3. In the **Create Flavor** window, fill in the corresponding resource information. This is the configuration used for CPAR Flavor:

vCPUs 36

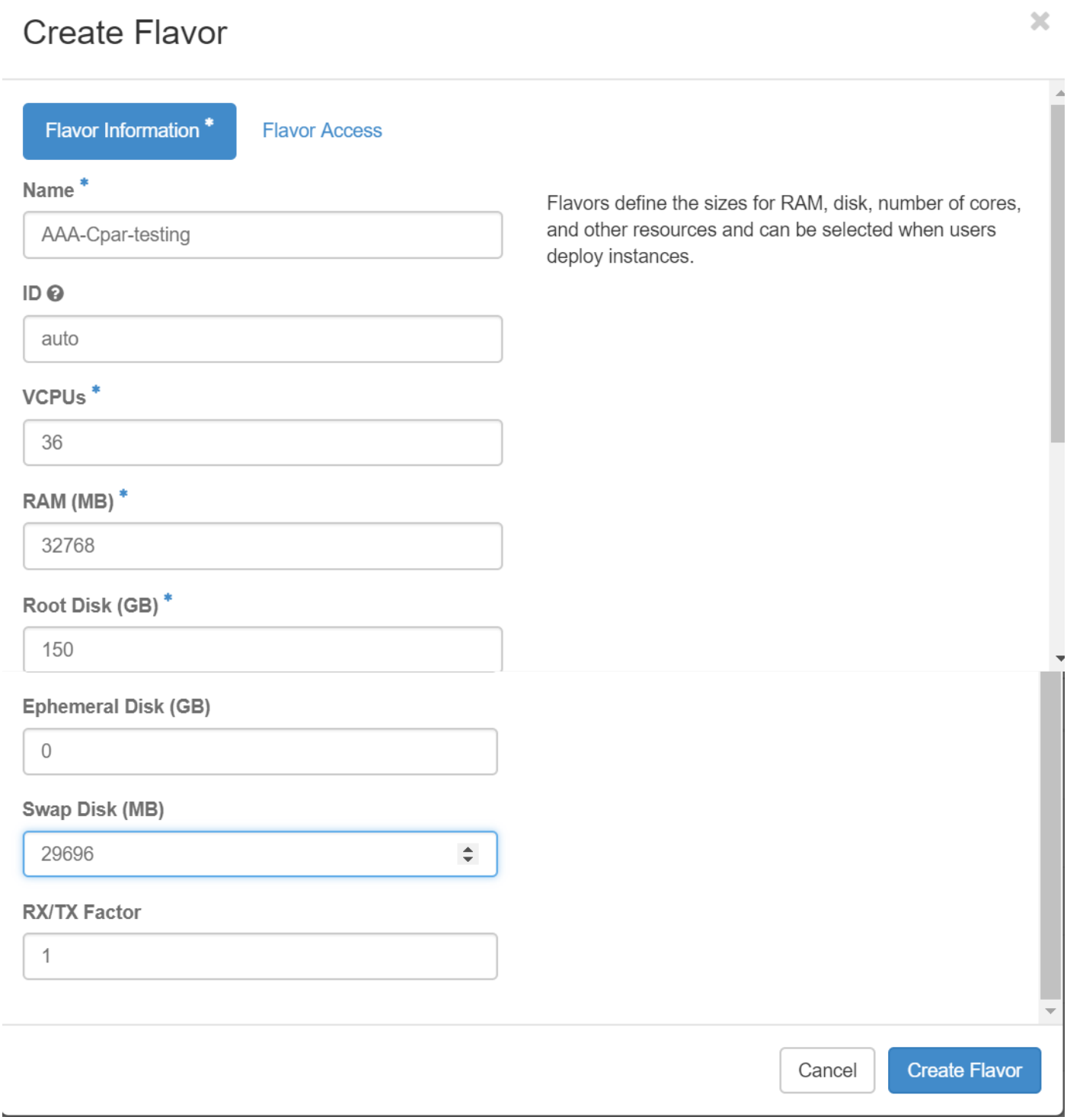
RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

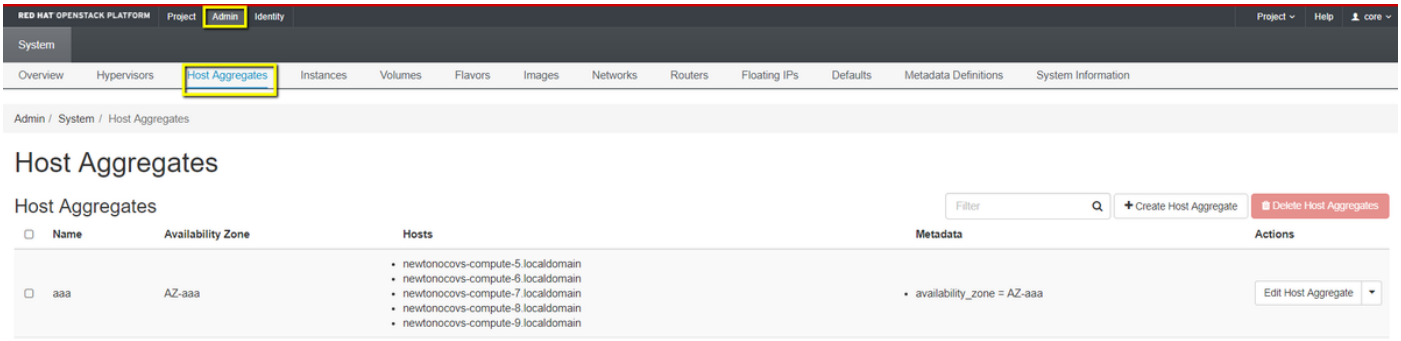


Step 4. On the same window, click on **Flavor Access** and select the project where this Flavor configuration is going to be used (i.e. Core).

Step 5. Click on **Create Flavor**.

Create a Host Aggregate/Availability Zone

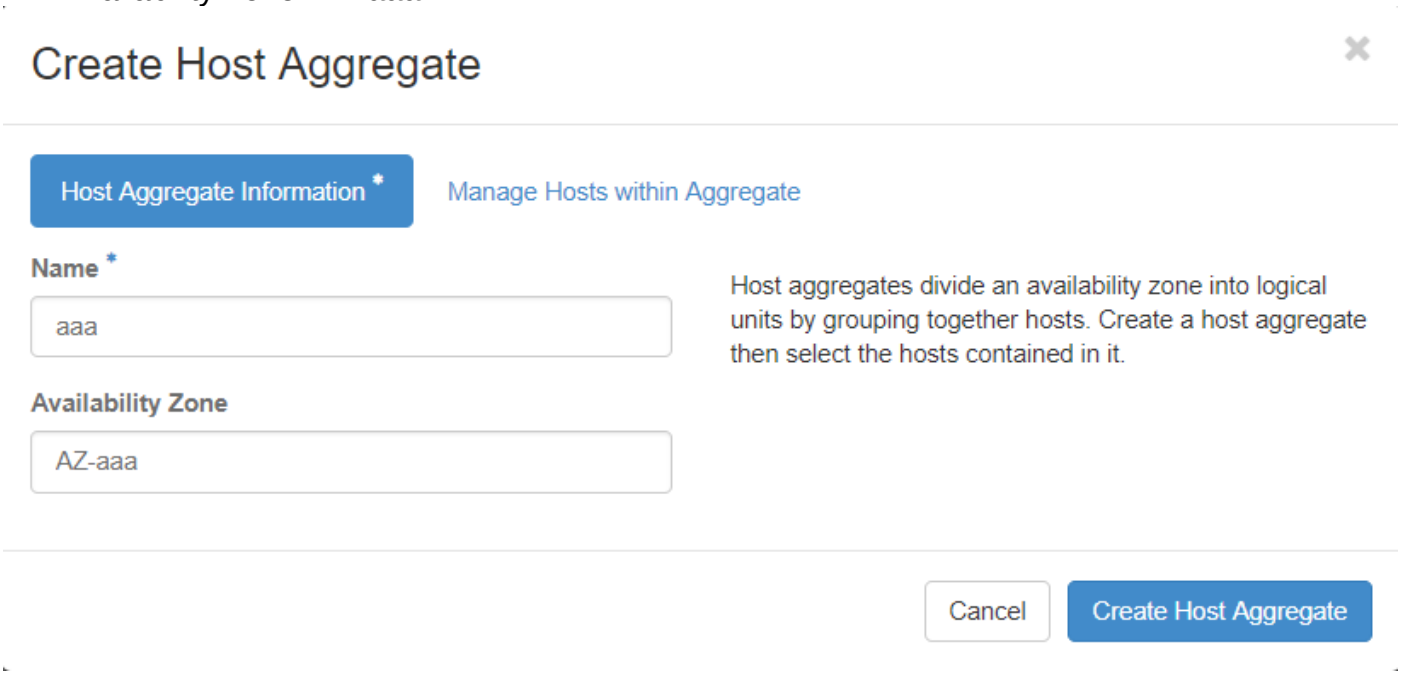
Step 1. In the Horizon top menu, navigate to **Admin > Host Aggregates** as shown in the image.



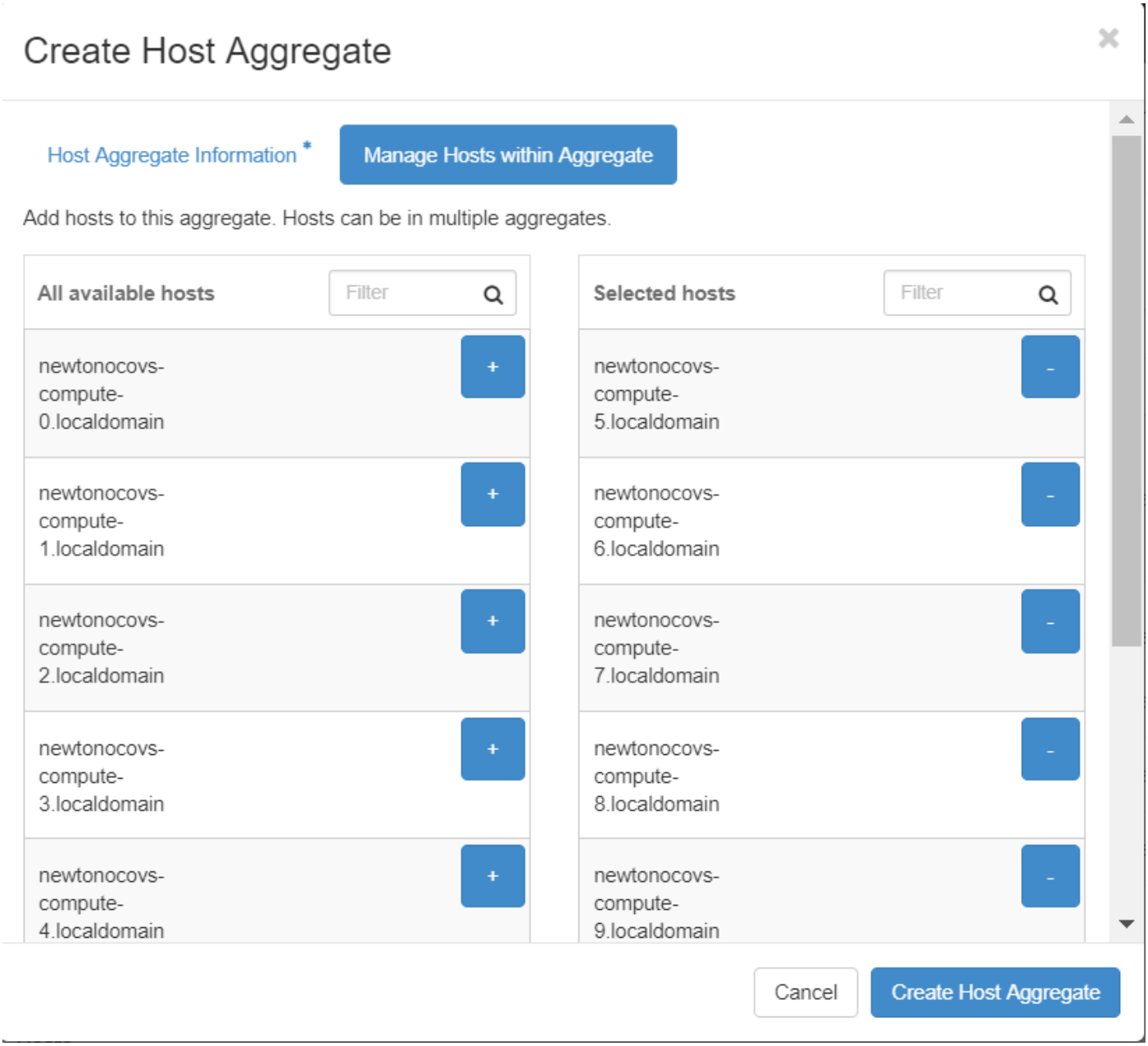
Step 2. Click on the **Create Host Aggregate** button.

Step 3. In the label **Host Aggregate Information*** fill in the **Name** and **Availability Zone** fields with the corresponding information. For the production environment, this information is currently used as shown in the image:

- Name: **aaa**
- Availability Zone: **AZ-aaa**



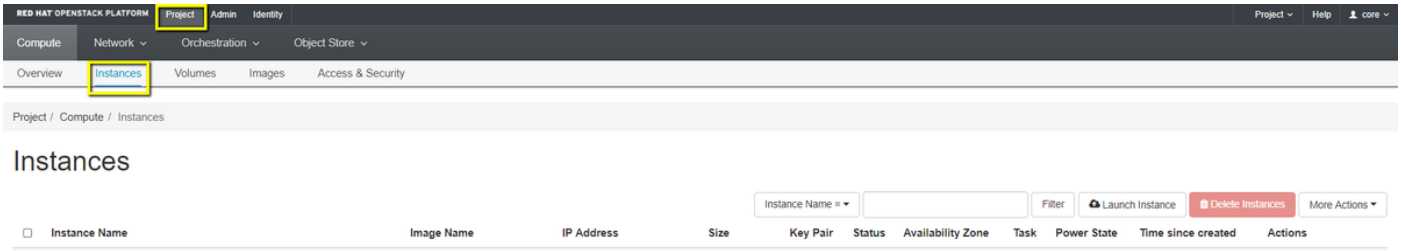
Step 4. Click on **Manage Hosts within Aggregate** tab and click on the button **+** for the hosts that are required to be added to the new availability zone.



Step 5. Finally, click on **Create Host Aggregate Button**.

Launch a New Instance

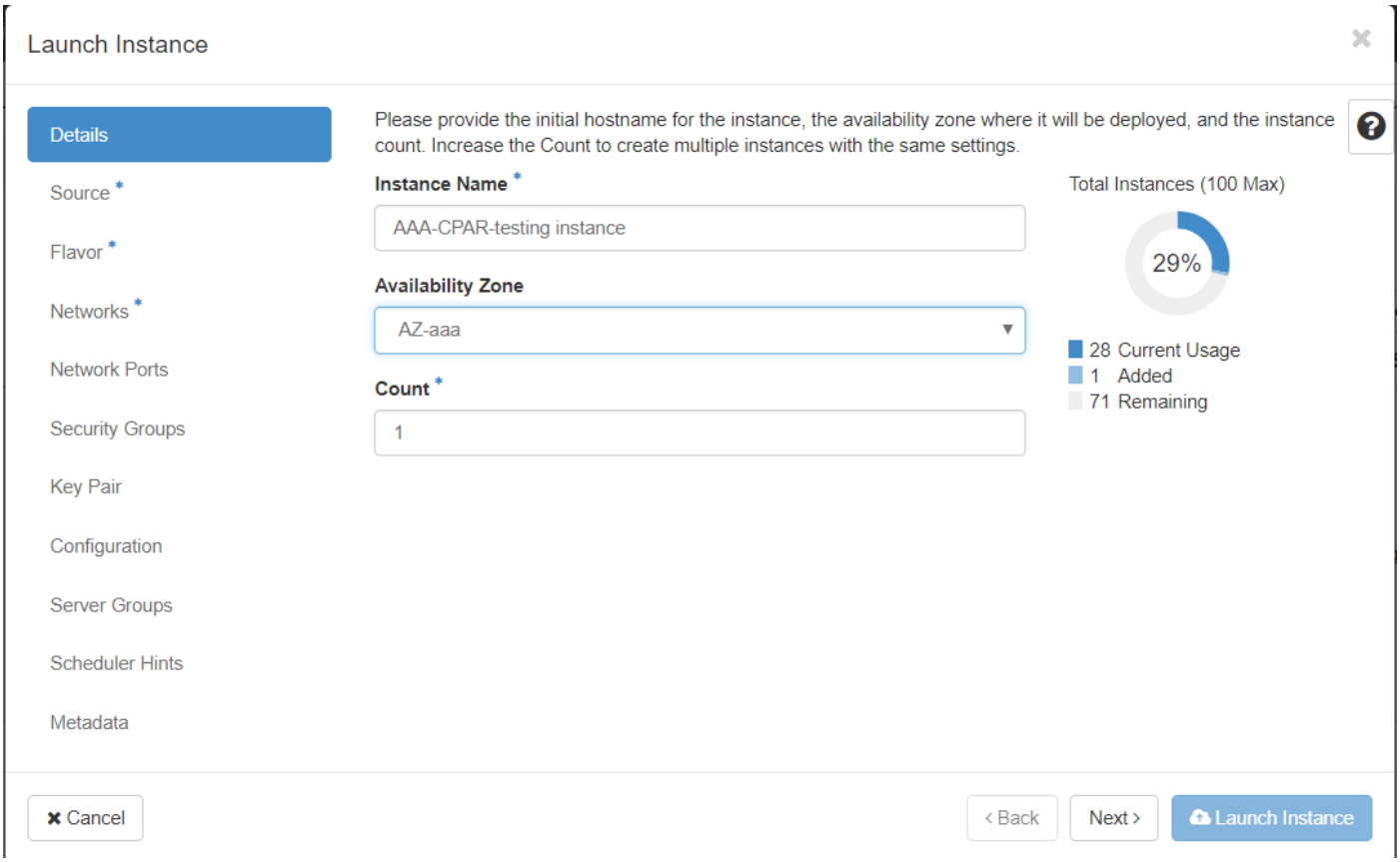
Step 1. In the Horizon top menu, navigate to **Project > Instances** as shown in the image.



Step 2. Click on **Launch Instance** button.

Step 3. In the **Details** tab enter a proper **Instance Name** for the new virtual machine, select the

corresponding **Availability Zone** (i.e. AZ-aaa), and set **Count** to 1 as shown in the image.

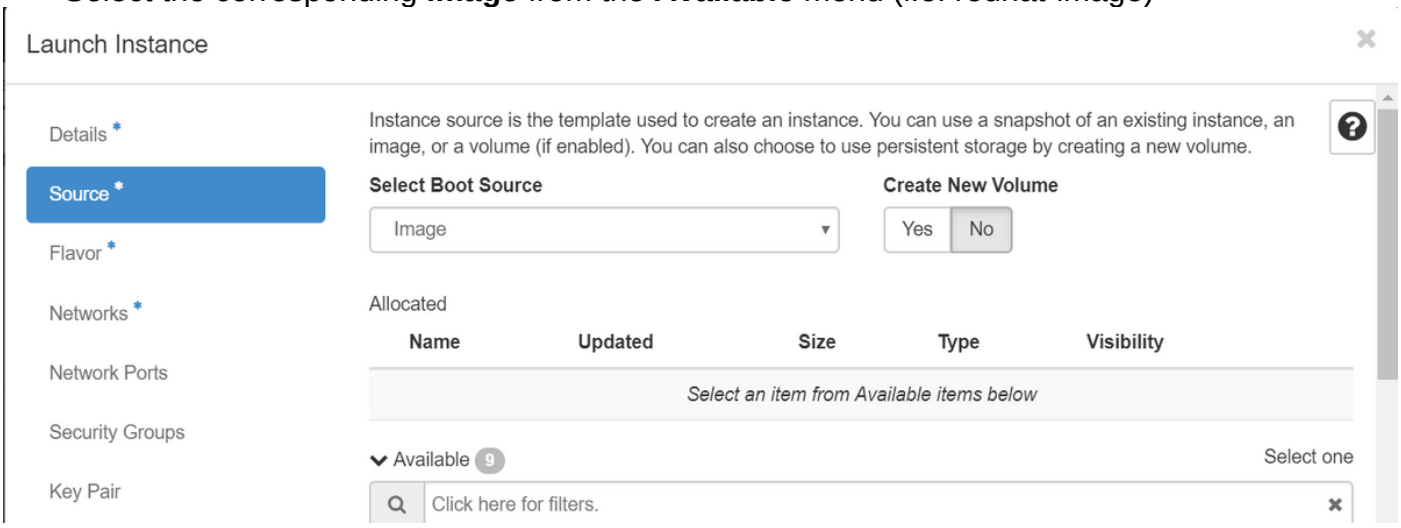


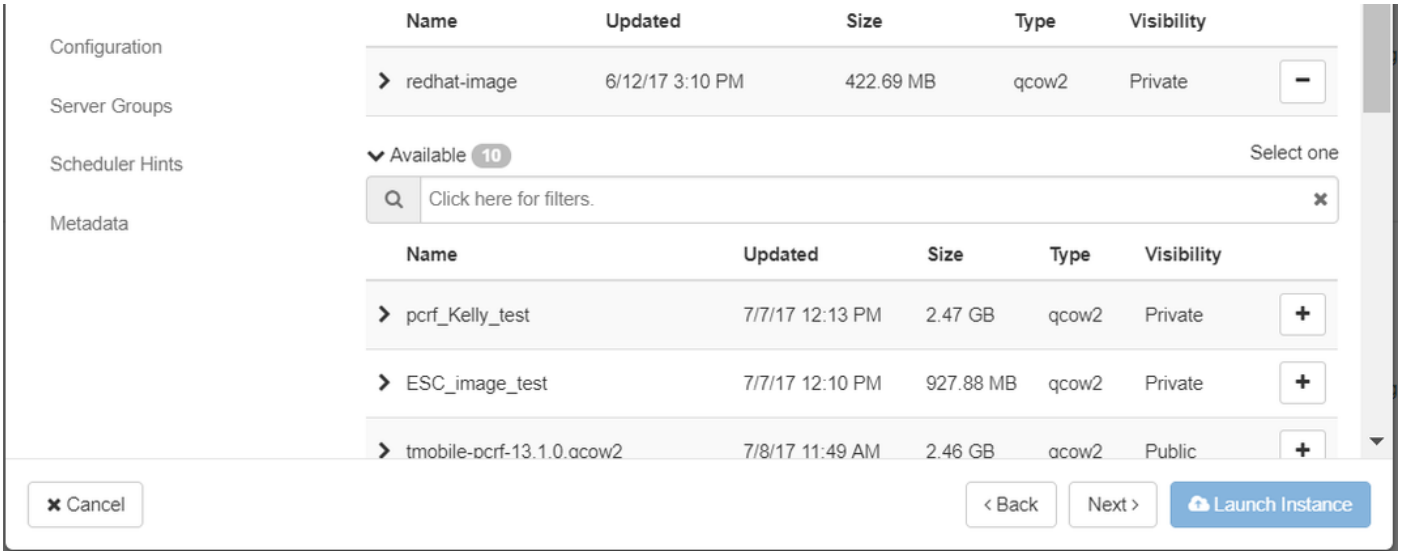
Step 4. Click on the **Source** tab, then select and execute one of these procedures:

1. Launch an instance based on a RHEL image.

Set the configuration parameters as follows:

- Select **Boot Source**: Image
- Create **New Volume**: No
- Select the corresponding **image** from the **Available** menu (i.e. redhat-image)

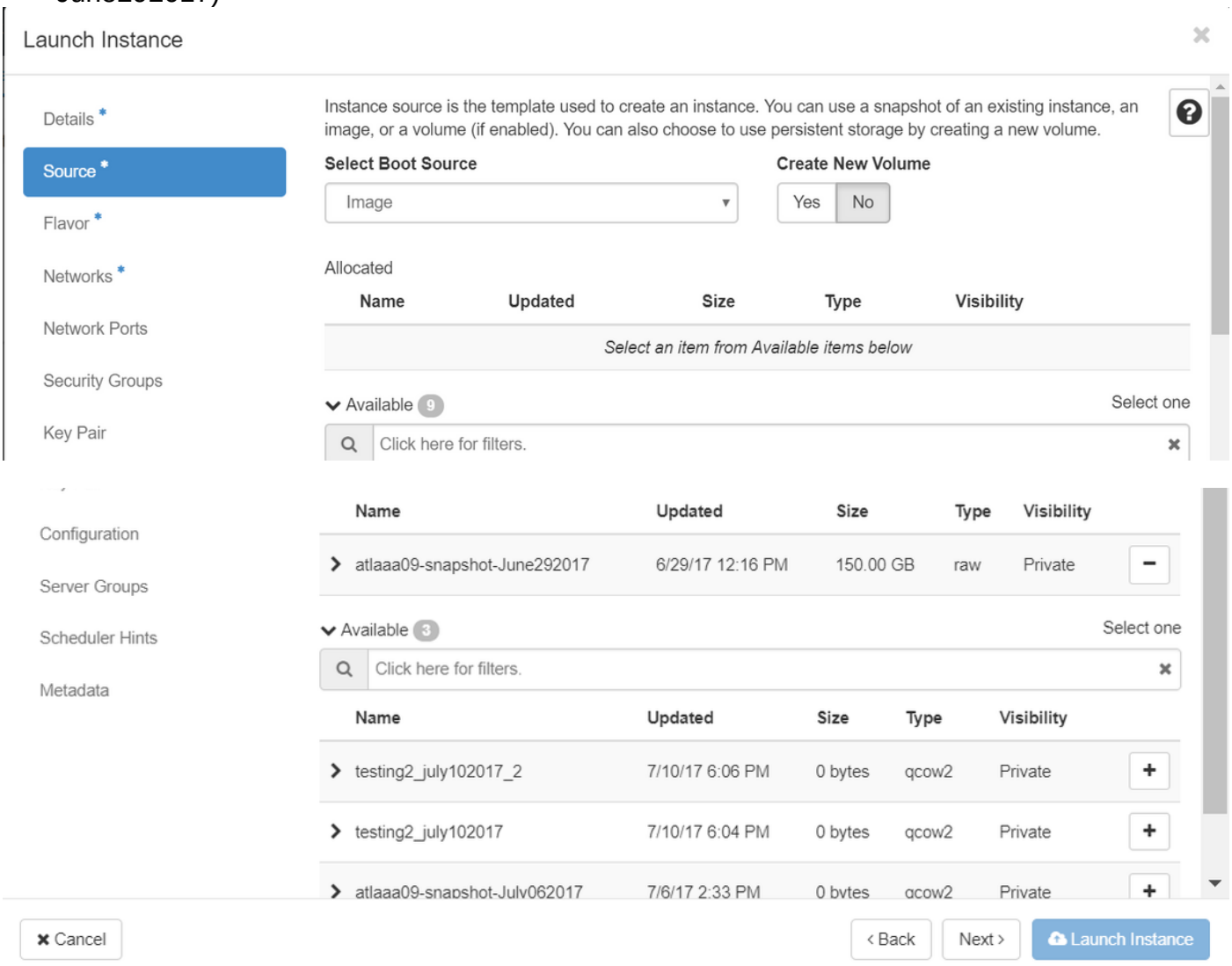




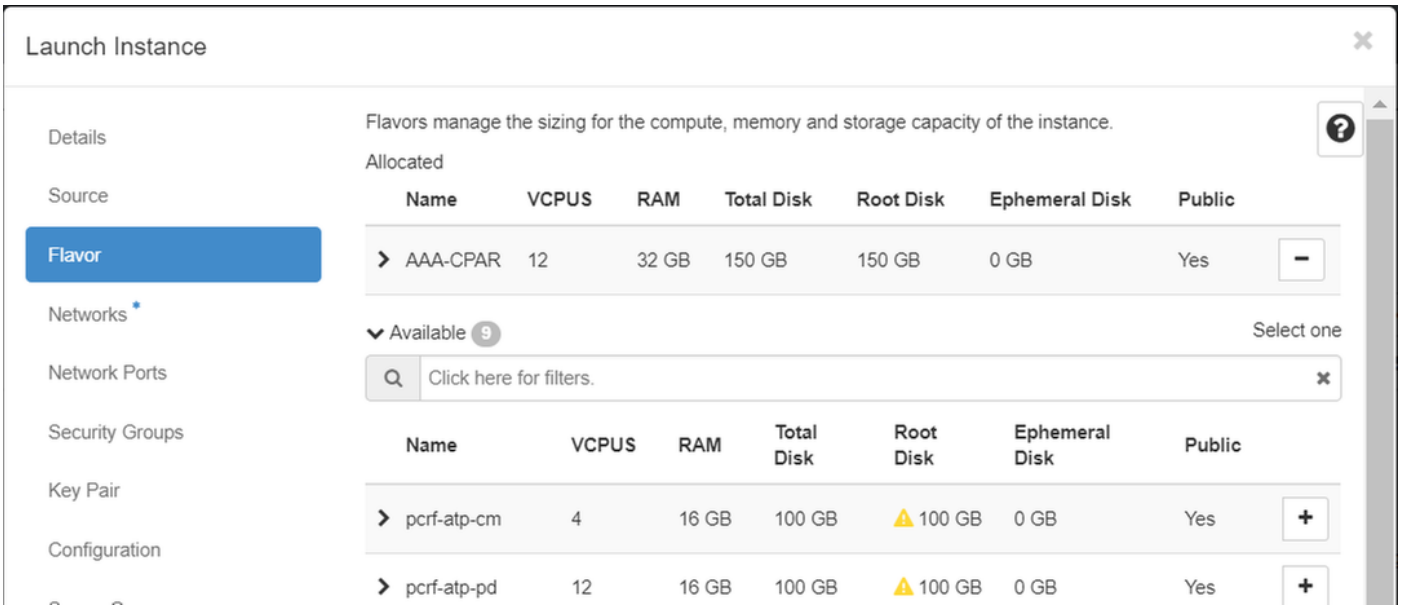
2. Launch an instance based on a Snapshot.

Set the configuration parameters as follows:

- Select **Boot Source**: Instance Snapshot
- Create **New Volume**: No
- Select the corresponding snapshot from the Available menu (i.e. aaa09-snapshot-June292017)

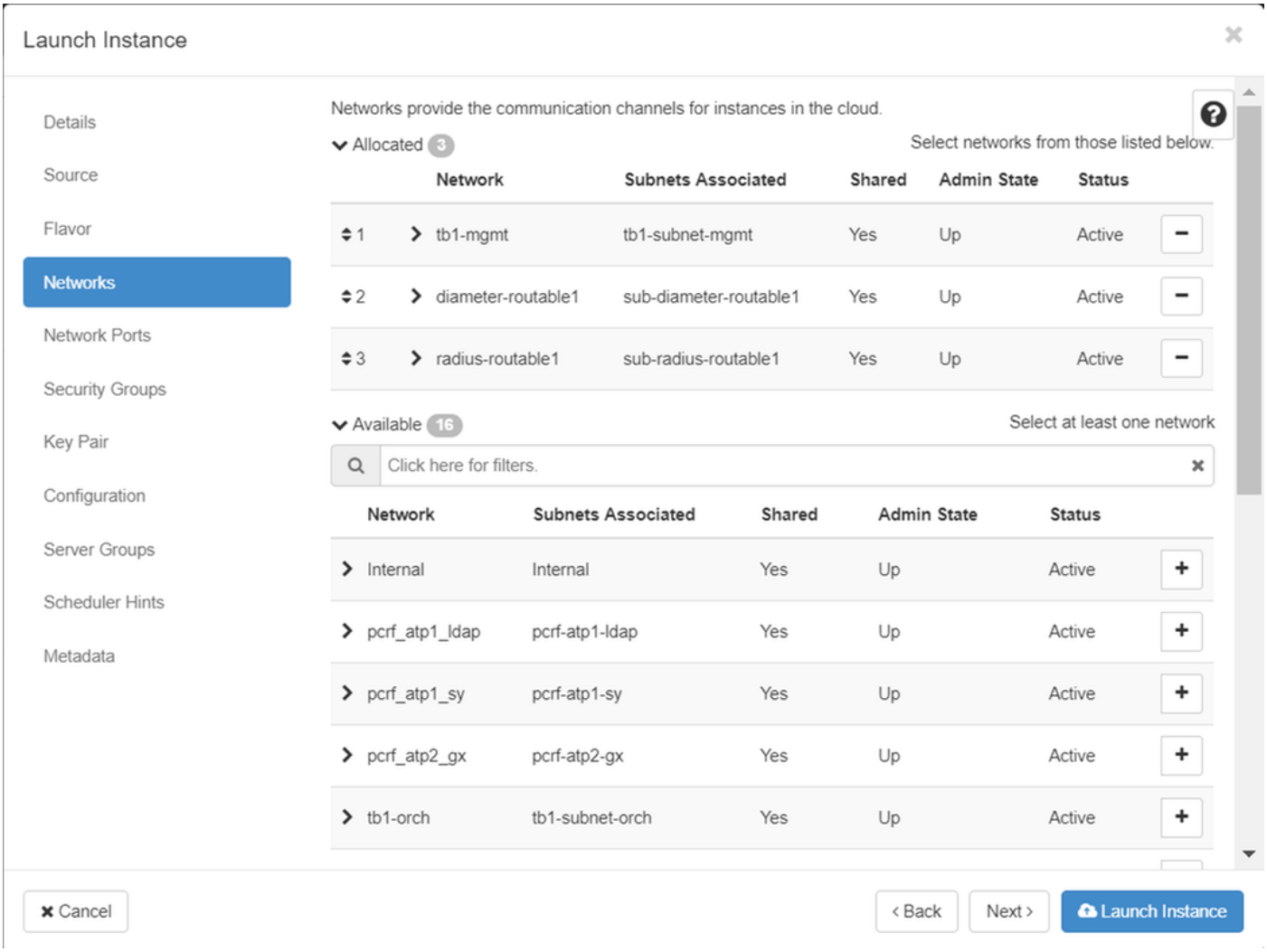


Step 5. Click on the **Flavor** tab and select the Flavor created in the section **Create a New Flavor**.



Step 6. Click on **Networks** tab and select the corresponding networks which are going to be used for each Ethernet interface of the new instance/VM. This setup is currently being used for the Production environment:

- eth0 = **tb1-mgmt**
- eth1 = **diameter-routable1**
- eth2 = **radius-routable1**



Step 7. Finally, click on the **Launch Instance** button in order to start the deployment of the new instance.

Create and Assign a Floating IP Address

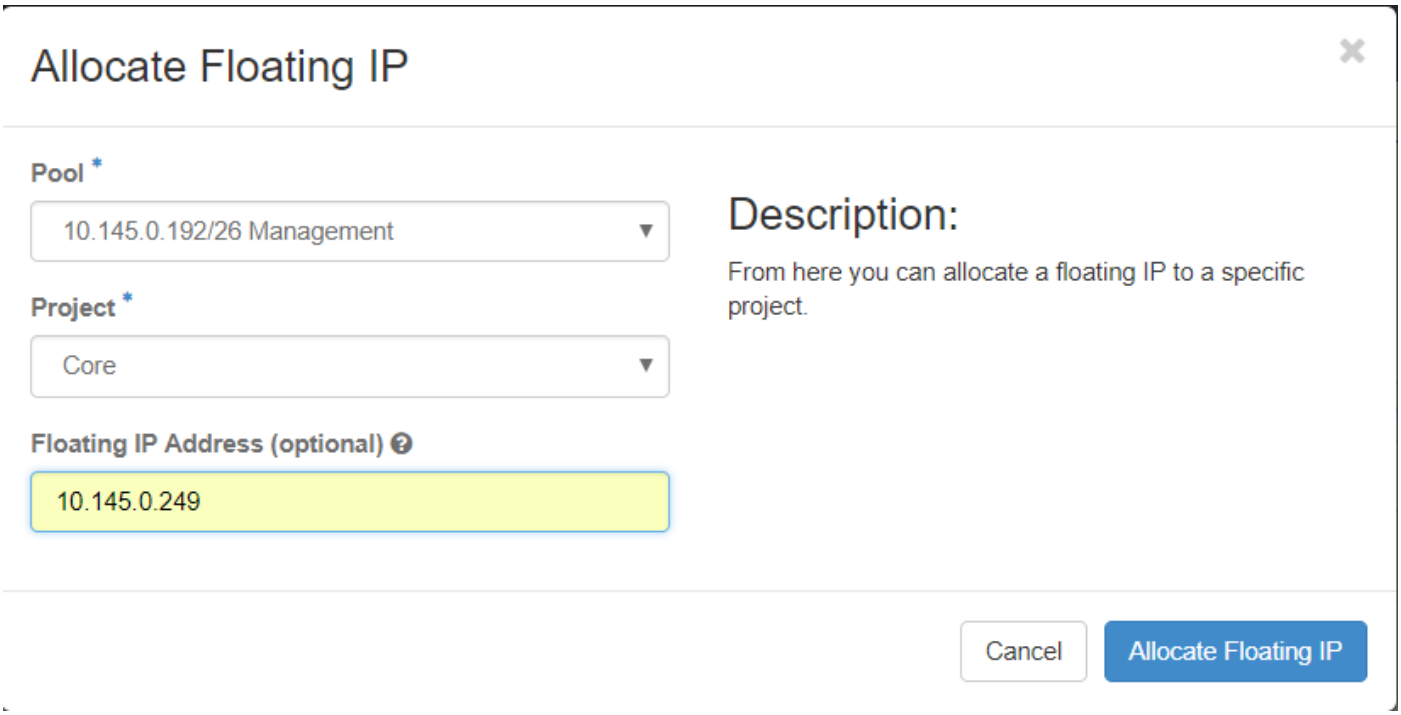
A floating IP address is a routable address, which means that it is reachable from the outside of Ultra M/OpenStack architecture, and is able to communicate with other nodes from the network.

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:

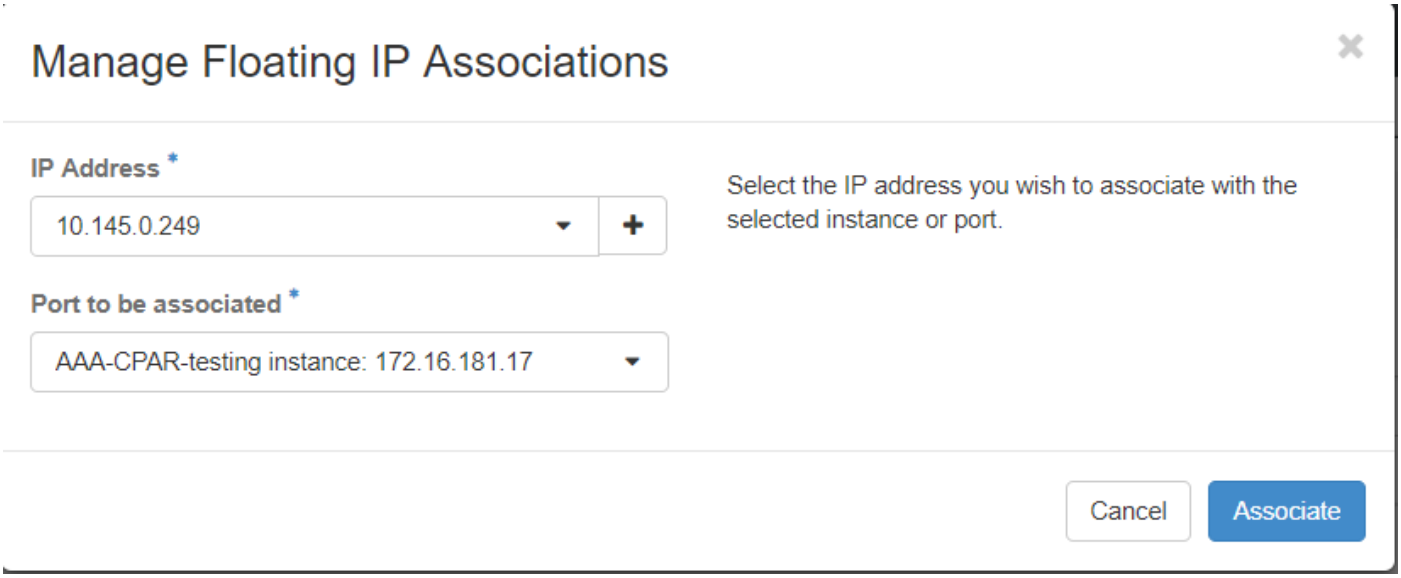


Step 4. Click on **Allocate Floating IP** button.

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** as shown in the image.



Step 8. Finally, click on the **Associate** button.

Enable SSH

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

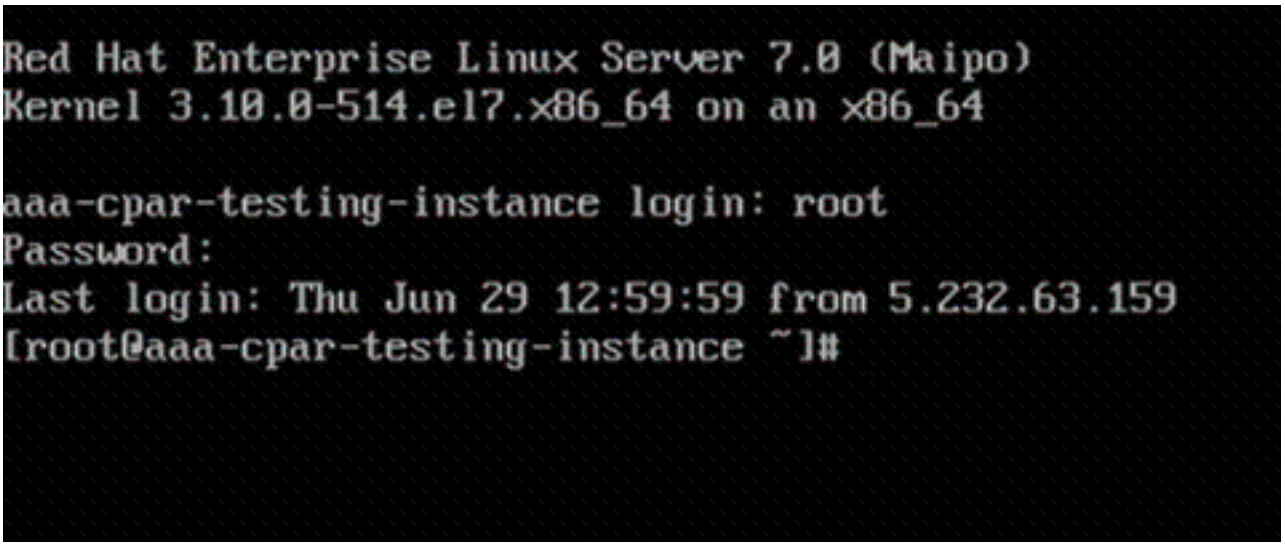
Step 2. Click on the name of the instance/VM that was created in section **Launch a new instance**.

Step 3. Click on the **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: **xxxxx**

Password: **xxxxx**



Step 5. In the CLI, enter the command **vi /etc/ssh/sshd_config** in orderto edit SSH configuration.

Step 6. Once the SSH configuration file is open, press **I** in orderto edit the file. Then look for the

section showed here 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!** in orderto 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 with 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 a SSH Session

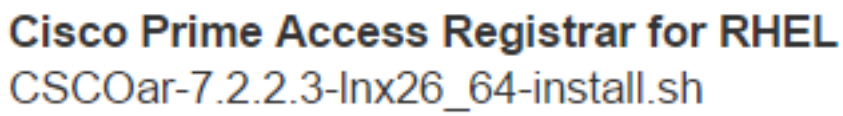
Open a SSH session with the use of the IP address of the corresponding VM/server where the application will be installed.

```
[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 ~]#
```

Upload CPAR Software and License(s)

Step 1. Download the corresponding CPAR version installation script (**CSCOar-x.x.x.x-lnx26_64-**

install.sh) from the Cisco Software platform: https://software.cisco.com/download/release.html?mdfid=286309432&flowid=&softwareid=284671441&release=7.2.2.3&relind=AVAILABLE&rellifecycle=&reltype=latest



Step 2. Upload **CSCOar-x.x.x.x-lnx26_64-install.sh** file to the new **VM/Server** at **/tmp** directory.

Step 3. Upload the corresponding license(s) file(s) to the new VM/Server at **/tmp** directory.

```
[cloud-user@rhel-instance tmp]$ ls
CSCOar-7.2.2.2-lnx26_64-install.sh  PAR201703171741194350.lic
```

Upload RHEL/CentOS Image

Upload the corresponding RHEL or CentOS **.iso** file to the **VM/server/tmp** directory.

```
[cloud-user@rhel-instance tmp]$ ls | grep rhel
rhel-server-7.2-source-dvd1.iso
```

Create Yum Repository

Yum is a Linux's tool, which assists the user to install new RPMs with all their dependencies. This tool is used at the time of the installation of CPAR mandatory RPMs and at the time of the kernel upgrade procedure.

Step 1. Navigate to directory **/mnt** with the use of the command **cd/mnt** and create a new directory named **disk1** and execute the command mkdir **disk1**.

Step 2. Navigate to **/tmp** directory with the use of the command **cd /tmp** where the RHEL or CentOS **.iso** file have been previously uploaded and follow the steps as mentioned in section 3.3.

Step 3. Mount the RHEL/CentOS image in the directory which was created on Step 1. with the use of the command **mount –o loop <name of the iso file> /mnt/disk1**.

Step 4. In **/tmp**,create a new directory named **repo** with the use of the command **mkdir repo**. Then, change this directory's permissions and execute the command **chmod –R o-w+r repo**.

Step 5. Navigate to the Packages directory of the RHEL/CentOS image (mounted on Step 3.) with the use of the command **cd /mnt/disk1**. Copy all Packages directory files to **/tmp/repo** with the use of the command **cp –v * /tmp/repo.**

Step 6. Go back to the repo directory and execute **cd /tmp/repo** and use these commands:

RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

These commands install the three required RPMs in order to install and use Yum. The version of the RPMs mentioned previously might be different and it depends on the RHEL/CentOS version. If any of these RPMs is not included in the /Packages directory, refer to the https://rpmfind.net website where it can be downloaded from.

Step 7. Create a new RPM repository with the command **createrepo /tmp/repo**.

Step 8. Navigate to directory **/etc/yum.repos.d/** with the use of the command **cd /etc/yum.repos.d/**. Create a new file named **myrepo.repo** which contains this with the command **vi myrepo.repo**:

vCPUs 36

RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

Press **I** in order to enable insert mode. In order to save and close press ESC key and then enter ":wq!" and press Enter.

Install CPAR Required RPMs

Step 1. Navigate to **/tmp/repo directory** with the command **cd /tmp/repo**.

Step 2. Install CPAR required RPMs and execute these commands:

vCPUs 36

RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

Note: The version of the RPMs might be different and it depends on the RHEL/CentOS

version. If any of these RPMs is not included in the /Packages directory, refer to the https://rpmfind.net website where it can be downloaded. In order to download **Java SE 1.7** RPM, refer to http://www.oracle.com/technetwork/java/javase/downloads/java-archive-downloads-javase7-521261.html and download jre-**7u80-**linux-**x64.rpm**.

Kernel Upgrade to 3.10.0-693.1.1.el7 Version

Step 1. Navigate to **/tmp/repo** directory with the use of the command **cd /tmp/repo**.

Step 2. Install **kernel-3.10.0-514.el7.x86_64** RPM and execute the command **yum install kernel-3.10.0-693.1.1.el7.x86_64.rpm**.

Step 3. Reboot the VM/Server with the use of the command **reboot**.

Step 4. Once the machine starts again, verify that the kernel version was updated and execute the command **uname –r**. The output should be **3.10.0-693.1.1.el7.x86_64**.

Set-Up the Network Parameters

Modify the Hostname

Step 1. Open in writing mode the file **/etc/hosts** and execute the command **vi /etc/hosts**.

Step 2. Press **I** in order to enable insert mode and write the corresponding host network information and follow this format:

vCPUs 36

RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

For example: **10.178.7.37 aaa07.aaa.epc.mnc30.mcc10.3gppnetwork.org aaa07**

Step 3. Save changes and close the file pressing the ESC key and then writing "**:wq!**" and pressing Enter.

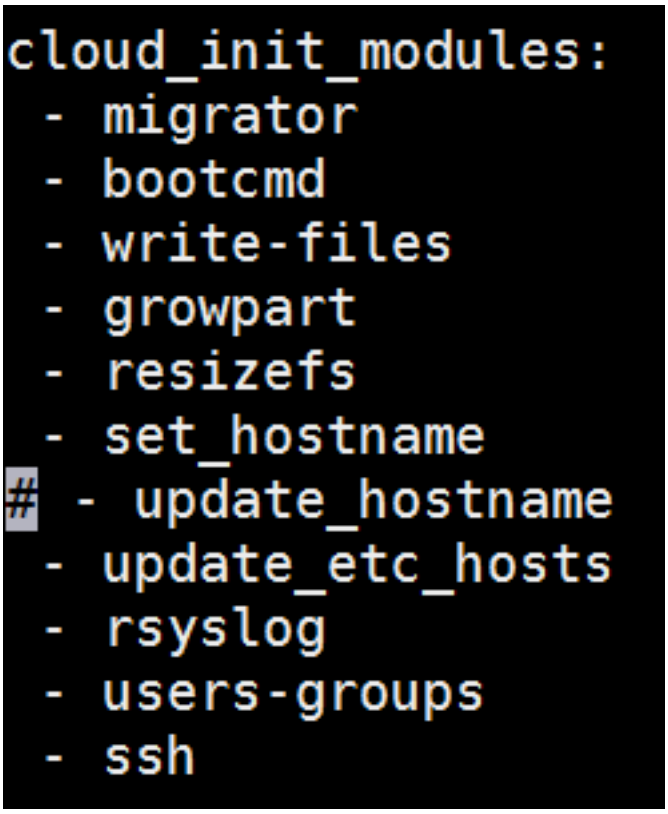
Step 4. Execute the command **hostnamectl set-hostname <Host's FQDN>**. For example: **hostnamectl set-hostname aaa.epc.mnc.mcc.3gppnetwork.org**.

Step 5. Restart network service with the use of the command service network restart.

Step 6. Verify that the hostname changes were applied and execute the commands: **hostname –a**, **hostname –f**, which should display VM/Server's hostname and its FQDN.

Step 7. Open **/etc/cloud/cloud_config** with the command **vi /etc/cloud/cloud_config** and insert

a “#” in front of line “**- update hostname**”. This is to prevent the hostname changes after a reboot. The file should look like this:



Set-Up the Network Interfaces

Step 1. Navigate to directory **/etc/sysconfig/network-scripts** with the use of **cd /etc/sysconfig/network-scripts**.

Step 2. Open ifcfg**-eth0** with the command **vi ifcfg-eth0**. This is the management interface; its configuration should look like this.

vCPUs 36

RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

Perform any required modification, then save and close the file pressing ESC key and entering: wq**!**.

Step 3. Create eth1 network configuration file with the command **vi ifcfg-eth1**. This is the **diameter interface**. Access to insert mode by pressing **I** and enter this configuration.

vCPUs 36

RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

Modify **<eth1 IP>** for the corresponding **diameter's IP** for this instance. Once everything is in place, save and close the file.

Step 4. Create eth2 network configuration file with the command**vi ifcfg-eth2**. This is the **radius interface**. Enter to insert mode pressing **I** and enter this configuration:

vCPUs 36

RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

Modify **<eth2 IP>** for the corresponding **radius' IP** for this instance. Once everything is in place, save and close the file.

Step 5. Restart network service with the use of the command **service network restart**. Verify that the network configuration changes were applied with the use of the command **ifconfig**. Each network interfaces should have an IP according to its network configuration file (ifcfg-ethx). If eth1 or eth2 do not boot automatically, execute the command **ifup ethx**.

Install CPAR

Step 1. Navigate to **/tmp** directory by executing the command **cd /tmp**.

Step 2. Change permissions for **./CSCOar-x.x.x.x.-lnx26_64-install.sh** file with the command **chmod 775 ./CSCOar-x.x.x.x.-lnx26_64-install.sh**.

Step 3. Start the installation script with the use of the command **./CSCOar-x.x.x.x.-lnx26_64-install.sh**.

```
[cloud-user@rhel-instance tmp]$ sudo ./CSCOar-7.2.2.2-lnx26_64-install.sh
./CSCOar-7.2.2.2-lnx26_64-install.sh: line 343: [: 148: unary operator expected
Name        : CSCOar                       Relocations: /opt/CSCOar
Version     : 7.2.2.2                           Vendor: Cisco Systems, Inc.
Release     : 1491821640                    Build Date: Mon Apr 10 04:02:17 2017
Install Date: (not installed)               Build Host: nm-rtp-view4
Signature   : (none)
build_tag: [Linux-2.6.18, official]

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This program contains proprietary and confidential information.
All rights reserved except as may be permitted by prior written consent.

Where do you want to install <CSCOar>? [/opt/CSCOar] [?,q]
```

Step 4. For the question **Where do you want to install <CSCOar>? [/opt/CSCOar] [?,q]**, press **Enter** to select the default location (**/opt/CSCOar/**).

Step 5. After the question **Where are the FLEXlm license files located? [] [?,q]** provide the location of the license(s) which should be **/tmp**.

Step 6. For question **Where is the J2RE installed? [] [?,q]** enter the directory where Java is installed. For example: **/usr/java/jre1.8.0_144/.**

Verify this is the corresponding Java version for the current CPAR version.

Step 7. Skip Oracle input by pressing **Enter** since Oracle is not used in this deployment.

Step 8. Skip **SIGTRAN-M3UA** functionality step by pressing **Enter**. This feature is not required for this deployment.

Step 9. For question **Do you want CPAR to be run as non-root user? [n]: [y,n,?,q]** press **Enter** in order to use the default answer which is n.

Step 10. For question **Do you want to install the example configuration now? [n]: [y,n,?,q]** press **Enter** in order to use the default answer which is n.

Step 11. Wait for CPAR installation process in order to finish, and then verify that all the CPAR processes are running. Navigate to directory **/opt/CSCOar/bin** and execute the command **./arstatus**. The output should look like this:

```
[root@dalaaa06 bin]# ./arstatus
Cisco Prime AR RADIUS server running      (pid: 1192)
Cisco Prime AR Server Agent running       (pid: 1174)
Cisco Prime AR MCD lock manager running   (pid: 1177)
Cisco Prime AR MCD server running         (pid: 1191)
Cisco Prime AR GUI running                (pid: 1194)
SNMP Master Agent running               (pid: 1193)
```

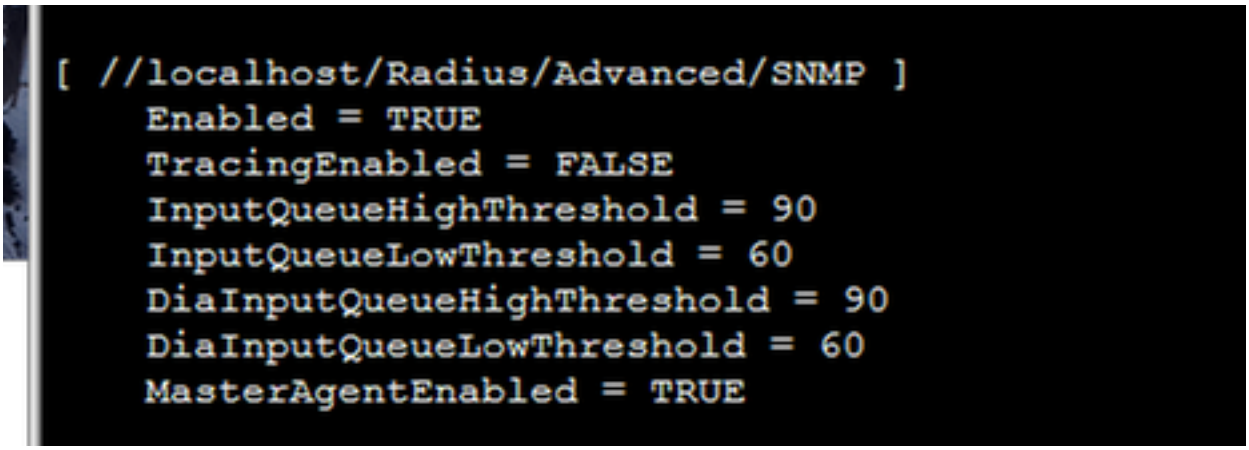
Configure SNMP

Set CPAR SNMP

Step 1. Open the file **snmpd.conf** with the command **/cisco-ar/ucd-snmp/share/snmp/snmpd.conf** in orderto include the required SNMP community, trap community and trap receiver IP address: Insert the line **trap2sink xxx.xxx.xxx.xxx cparaaasnmp 162**.

Step 2. Execute the command **cd /opt/CSCOar/bin** and login to CPAR CLI with the use of the command **./aregcmd** and enter admin credentials.

Step 3. Move to **/Radius/Advanced/SNMP** and issue the command set **MasterAgentEnabled TRUE**. Save the changes with the use of the command **save** and **quit** CPAR CLI issuing exit.

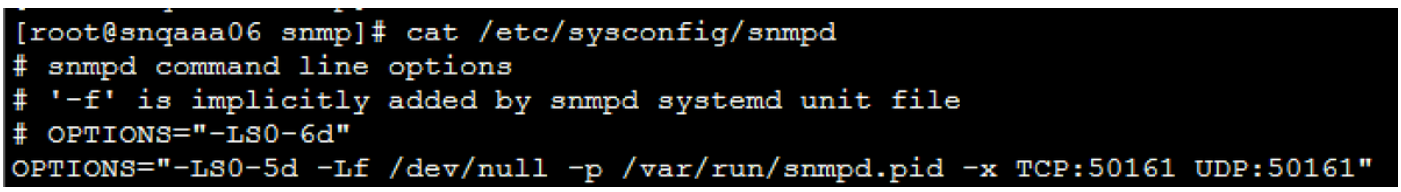


Step 4. Verify that the CPAR OID's are available by with the command **snmpwalk -v2c -c public 127.0.0.1 .1.**

If the OS does not recognize the **snmpwalk** command, navigate to **/tmp/repo** and execute **yum install net-snmp-libs-5.5-49.el6.x86_64.rpm**.

Set OS SNMP

Step 1. Edit the file **/etc/sysconfig/snmpd** in orderto specify port 50161 for the OS SNMP listener, otherwise, default port 161 is used which is currently used by the CPAR SNMP agent.



Step 2. Restart the SNMP service with the command **service snmpd restart.**

```
[root@snqaaa06 bin]# service snmpd restart
Redirecting to /bin/systemctl restart  snmpd.service
```

Step 3. Validate that the OS OIDs are able to be queried by issuing the command **snmpwalk -v2c -c public 127.0.0.1:50161.1.**

```
[root@snqaaa06 snmp]# snmpwalk -v2c -c public 127.0.0.1:50161 .1
SNMPv2-MIB::sysDescr.0 = STRING: Linux snqaaa06.aaa.epc.mnc300.mcc310.3gppnetwork.org 3.10.0-514.el7.x86_64 #1 SMP Tue Nov 22 16:42:41 UTC 2016 x86_64
SNMPv2-MIB::sysObjectID.0 = OID: NET-SNMP-MIB::netSnmpAgentOIDs.10
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (3466) 0:00:34.66
SNMPv2-MIB::sysContact.0 = STRING: Root <root@localhost> (configure /etc/snmp/snmp.local.conf)
SNMPv2-MIB::sysName.0 = STRING: snqaaa06.aaa.epc.mnc300.mcc310.3gppnetwork.org
SNMPv2-MIB::sysLocation.0 = STRING: Unknown (edit /etc/snmp/snmpd.conf)
SNMPv2-MIB::sysORLastChange.0 = Timeticks: (1) 0:00:00.01
SNMPv2-MIB::sysORID.1 = OID: SNMP-MPD-MIB::snmpMPDCompliance
SNMPv2-MIB::sysORID.2 = OID: SNMP-USER-BASED-SM-MIB::usmMIBCompliance
SNMPv2-MIB::sysORID.3 = OID: SNMP-FRAMEWORK-MIB::snmpFrameworkMIBCompliance
SNMPv2-MIB::sysORID.4 = OID: SNMPv2-MIB::snmpMIB
SNMPv2-MIB::sysORID.5 = OID: TCP-MIB::tcpMIB
SNMPv2-MIB::sysORID.6 = OID: IP-MIB::ip
SNMPv2-MIB::sysORID.7 = OID: UDP-MIB::udpMIB
```

Configure NTP

Step 1. Verify that the NTP RPMs are already installed, execute the command **rpm –qa | grep ntp**. The output should look like this image.

```
[root@dalaaa06 repo]# rpm -qa | grep ntp
ntp-4.2.6p5-25.el7.centos.x86_64
ntpdate-4.2.6p5-25.el7.centos.x86_64
```

If the RPMs are not installed, navigate to **/tmp/repo** directory with the use of **cd /tmp/repo** and execute the commands:

vCPUs 36

RAM (MB) 32768

Root Disk (GB) 150

Ephemeral Disk (GB) 0

Swap Disk (MB) 29696

RX/TX Factor 1

Step 2. Open **/etc/ntp.conf** file with the command **vi /etc/ntp.conf** and add the corresponding IPs of the NTP servers for this VM/Server.

Step 3. Close the **ntp.conf** file and restart the ntpd service with the command **service ntpd restart**.

Step 4. Verify that the VM/Server is now attached to the NTP servers by issuingwith the command **ntpq –p**.

CPAR Configuration Backup/Restore Procedure (Optional)

Note: This section should only be executed if an existing CPAR configuration is going to be replicated in this new VM/Server. This procedure only works for scenarios where the same CPAR version is used in both source and destination instances.

Obtain the CPAR Configuration Backup File from an Existing CPAR Instance

Step 1. Open a new SSH session with the corresponding VM where the backup file will be obtained with the use of root credentials.

Step 2. Navigate to directory **/opt/CSCOar/bin** with the use of the command **cd /opt/CSCOar/bin**.

Step 3. Stop CPAR services and execute the command **./arserver stop** in order to do so.

Step 4. Verify that the CPAR service was stopped with the use of the command **./arstatus**, and look for the message **Cisco Prime Access Registrar Server Agent not running**.

Step 5. In order to create a new backup, execute the command **./mcdadmin -e /tmp/config.txt**. When asked, enter CPAR administrator credentials.

Step 6. Navigate to directory **/tmp** with the use of the command **cd /tmp**. The file named **config.txt** is the backup of this CPAR instance configuration.

Step 7. Upload **config.txt** file to the new VM/Server where the backup is going to be restored. Use the command **scp config.txt root@<new VM/Server IP>:/tmp**.

Step 8. Go back to the directory **/opt/CSCOar/bin** with the use of the command **cd /opt/CSCOar/bin** and bring CPAR up again with the command **./arserver start.**

Restore CPAR Configuration Backup File in the New VM/Server

Step 1. In the new VM/Server, navigate to directory **/tmp** with the use of the command **cd/tmp** and verify there is **config.txt** file which was uploaded in Step 7. of section Obtaining the CPAR configuration backup file from an existing CPAR instance. If the file is not there, refer to that section and verify that the **scp command** was well-executed.

Step 2. Navigate to the directory **/opt/CSCOar/bin** with the use of the command **cd /opt/CSCOar/bin** and turn off CPAR service by executing .**/arserver stop** command.

Step 3. In order to restore the backup, execute the command **./mcdadmin –coi /tmp/config.txt**.

Step 4. Turn on the CPAR service again by issuing the command **./arserver start**.

Step 5. Finally, check the CPAR status with the use of the command **./arstatus**. The output should look like this.

```
[root@dalaaa06 bin]# ./arstatus
Cisco Prime AR RADIUS server running        (pid: 1192)
Cisco Prime AR Server Agent running         (pid: 1174)
Cisco Prime AR MCD lock manager running     (pid: 1177)
Cisco Prime AR MCD server running           (pid: 1191)
Cisco Prime AR GUI running                  (pid: 1194)
SNMP Master Agent running                  (pid: 1193)
```