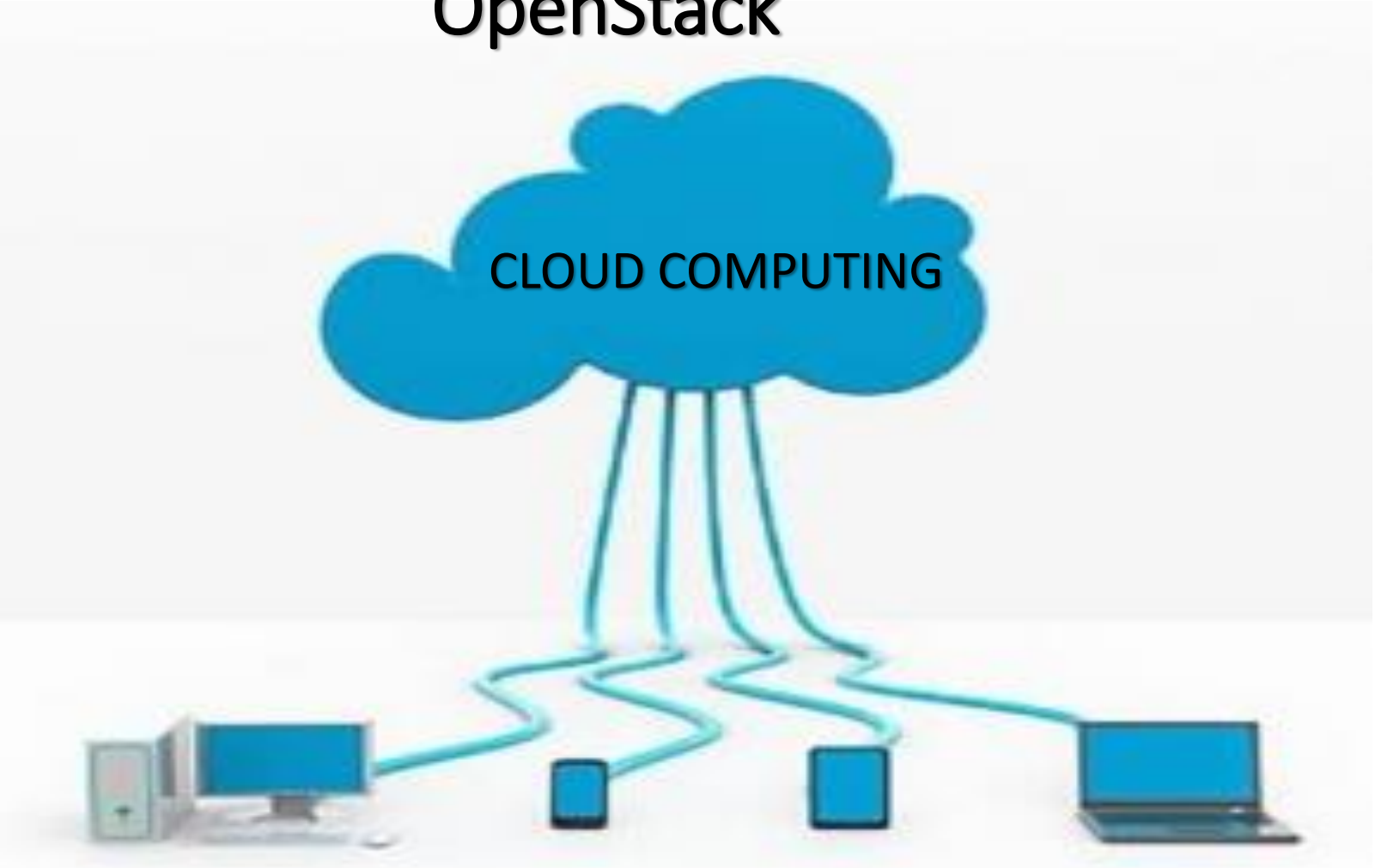
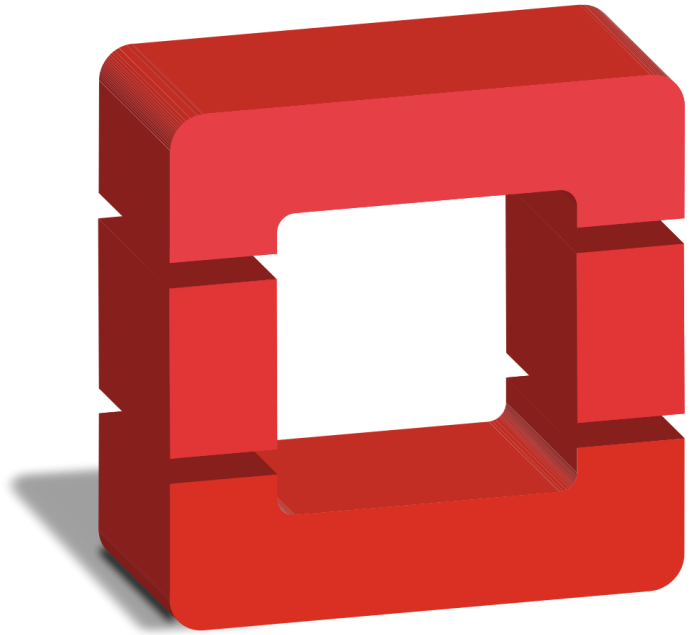
INFO 3606

Lab#5

How to Create, Deploy and Launch Virtual Machines in OpenStack





openstack®

CLOUD SOFTWARE

Nova- Instance Management

- instance management component in OpenStack
- provides a way to provision compute instances (aka virtual servers), which is used to host and manage cloud computing systems.

Objectives

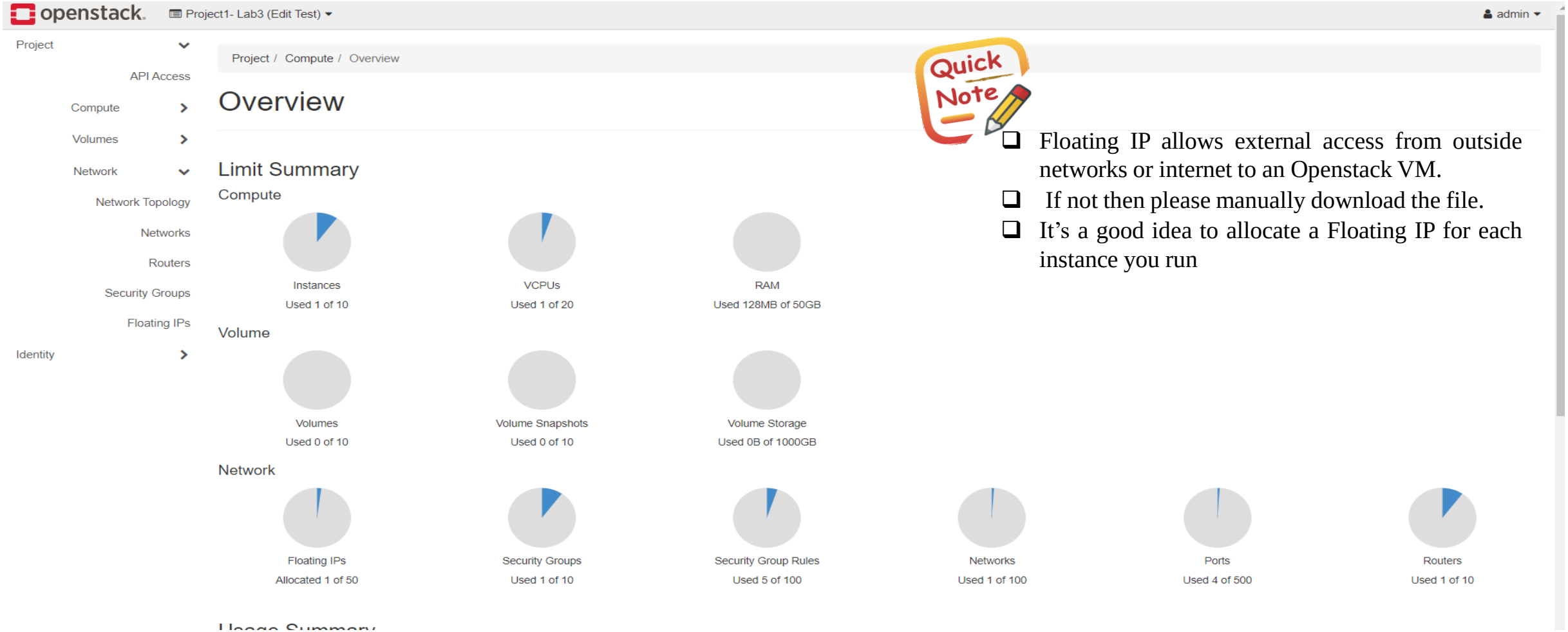
- Create images
- Launch an instance of an image (VM) in OpenStack

in a nutshell

Let’s Get Started!!!

Step 1: Allocate Floating IP

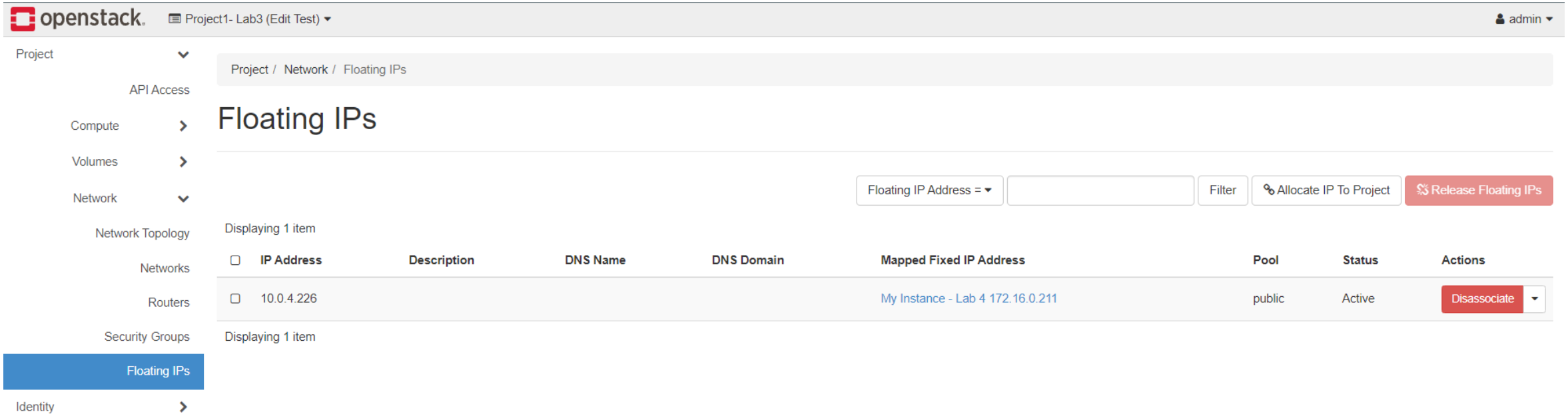
1. Project -> Network -> Floating IPs



- Floating IP allows external access from outside networks or internet to an Openstack VM.
- If not then please manually download the file.
- It's a good idea to allocate a Floating IP for each instance you run

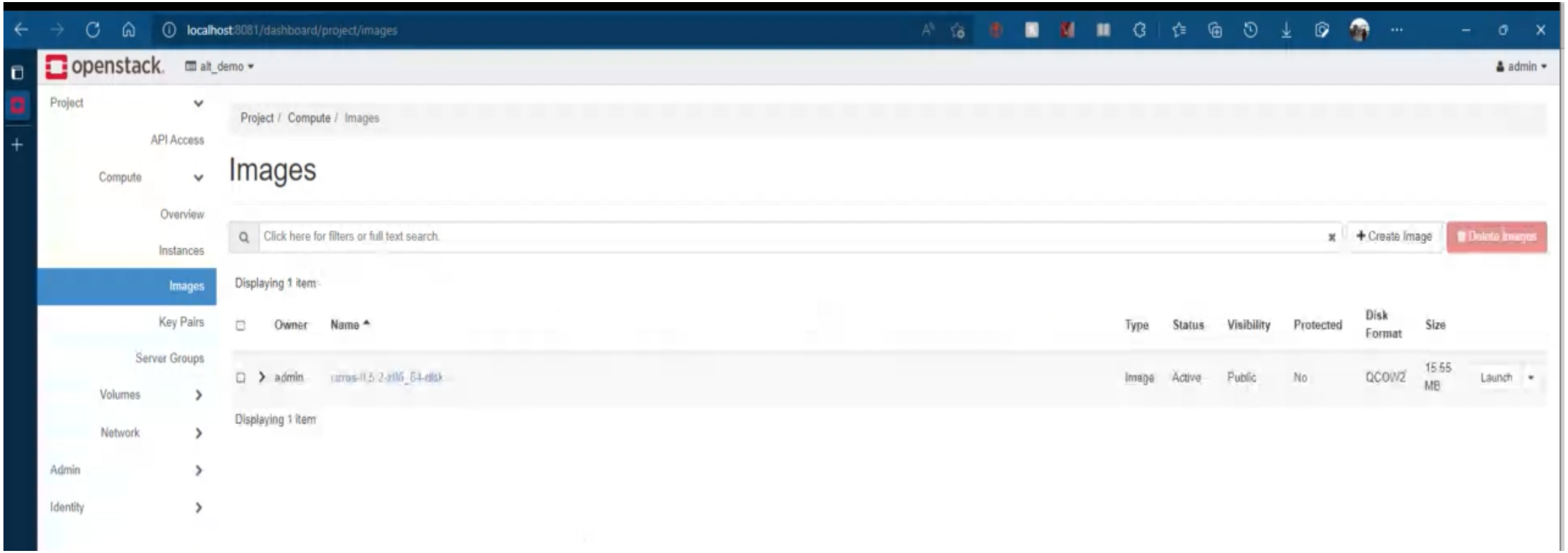
Step 1: Allocate Floating IP

1. Project -> Network-> Floating IPs
2. Click on Allocate IP to Project.
3. Choose **Public** Pool and hit on Allocate IP button
4. the IP address should appear in dashboard



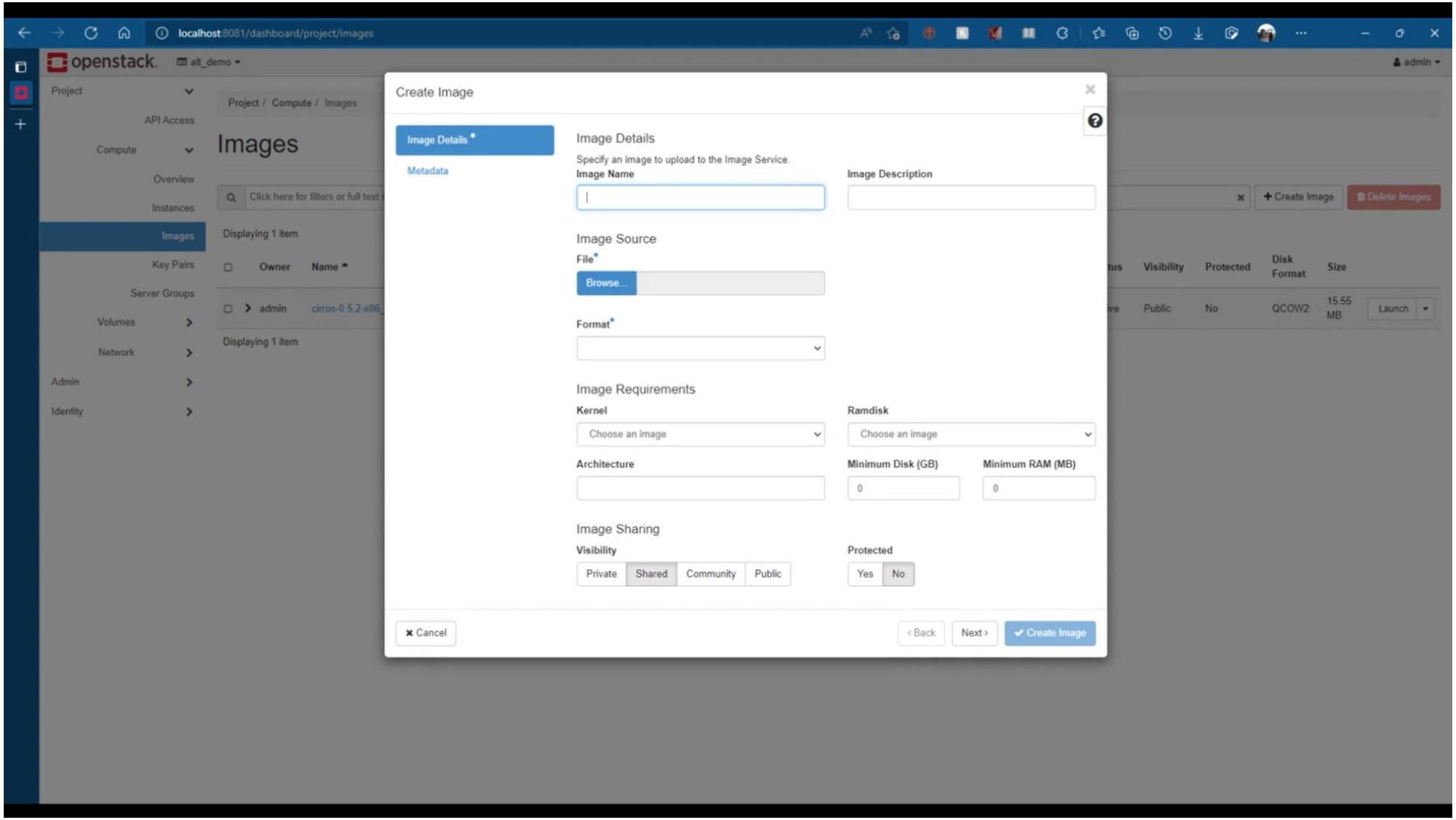
Step 2: Create an OpenStack Image

1. Project -> Compute -> Images
2. Click on Create Image button.



Step 2: Create an OpenStack Image

1. The Create Image prompt will appear



Step 2: Create an OpenStack Image

1. For demonstration purposes, we will deploy a test image, based on a lightweight **Cirros cloud image**
2. Click on the link http://download.cirros-cloud.net/0.3.4/ to download the image directly or downloaded locally on your machine and uploaded to OpenStack cloud.
3. You may select and download **cirros-0.3.4 – arm-initramfs** for this lab

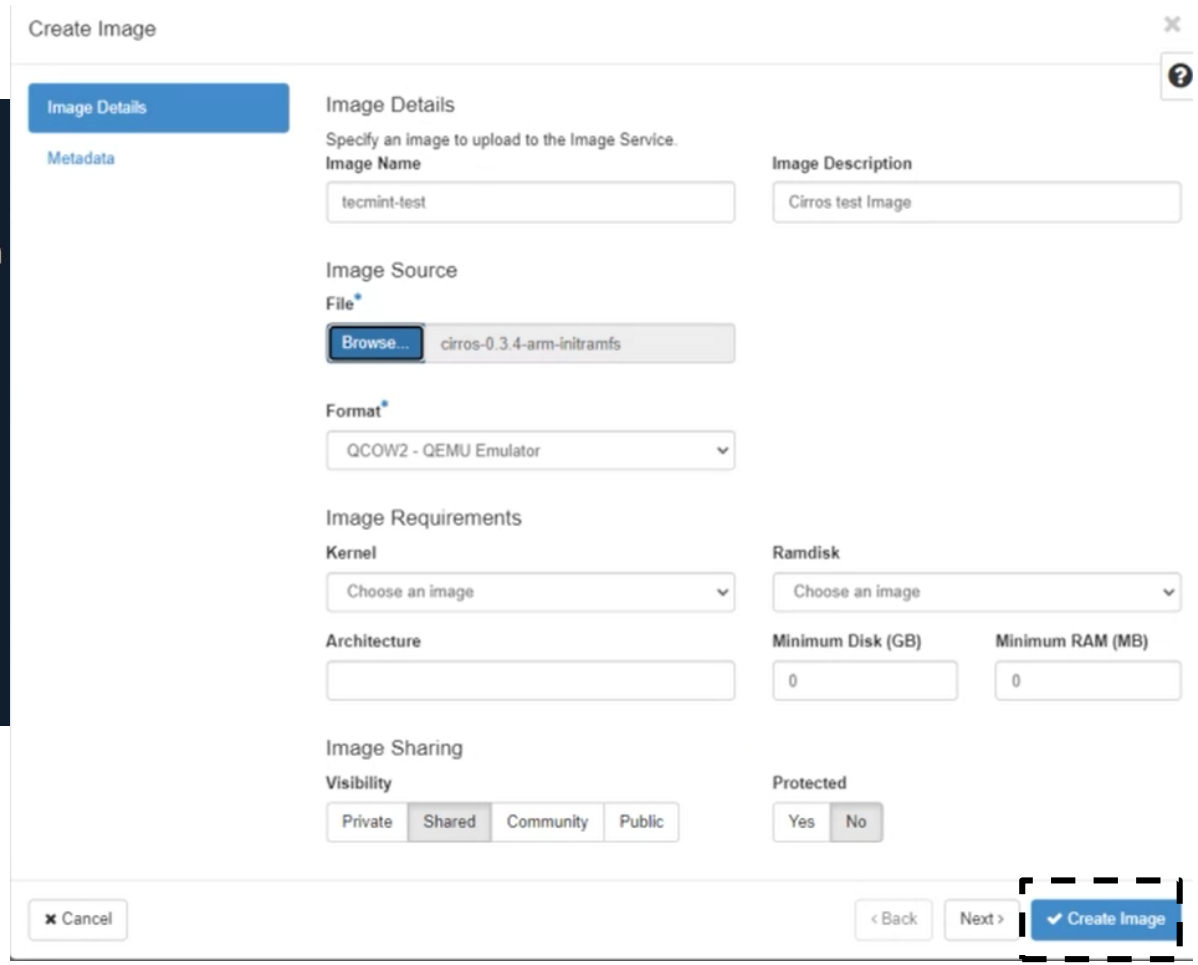
Index of /0.3.4

Name	Last modified	Size	Description
Parent Directory		-	
MD5SUMS	2015-05-07 09:49	1.5K	
buildroot_rootfs/	2015-05-07 09:49	-	
cirros-0.3.4-arm-initramfs	2015-05-07 09:48	3.3M	
cirros-0.3.4-arm-kernel	2015-05-07 09:48	3.7M	
cirros-0.3.4-arm-lxc.tar.gz	2015-05-07 09:48	3.3M	
cirros-0.3.4-arm-lxc.tar.xz	2017-11-20 07:19	2.4M	
cirros-0.3.4-arm-lxd.tar.xz	2017-11-20 07:19	568	
cirros-0.3.4-arm-rootfs.img.gz	2015-05-07 09:48	11M	
cirros-0.3.4-arm-uec.tar.gz	2015-05-07 09:48	7.0M	
cirros-0.3.4-arm-uec.tar.xz	2017-10-16 15:30	7.0M	
cirros-0.3.4-i386-disk.img	2015-05-07 09:48	12M	
cirros-0.3.4-i386-initramfs	2015-05-07 09:48	3.2M	
cirros-0.3.4-i386-kernel	2015-05-07 09:48	4.8M	
cirros-0.3.4-i386-lxc.tar.gz	2015-05-07 09:48	3.1M	
cirros-0.3.4-i386-lxc.tar.xz	2017-11-20 07:19	2.4M	
cirros-0.3.4-i386-lxd.tar.xz	2017-11-20 07:19	564	
cirros-0.3.4-i386-rootfs.img.gz	2015-05-07 09:48	11M	
cirros-0.3.4-i386-uec.tar.gz	2015-05-07 09:48	7.9M	
cirros-0.3.4-i386-uec.tar.xz	2017-10-16 15:30	7.8M	
cirros-0.3.4-powerpc-disk.img	2015-05-07 09:49	16M	
cirros-0.3.4-powerpc-initramfs	2015-05-07 09:48	3.6M	
cirros-0.3.4-powerpc-kernel	2015-05-07 09:48	25M	
cirros-0.3.4-powerpc-lxc.tar.gz	2015-05-07 09:48	3.4M	
cirros-0.3.4-powerpc-lxc.tar.xz	2017-11-20 07:19	2.4M	

Step 2: Create an OpenStack Image

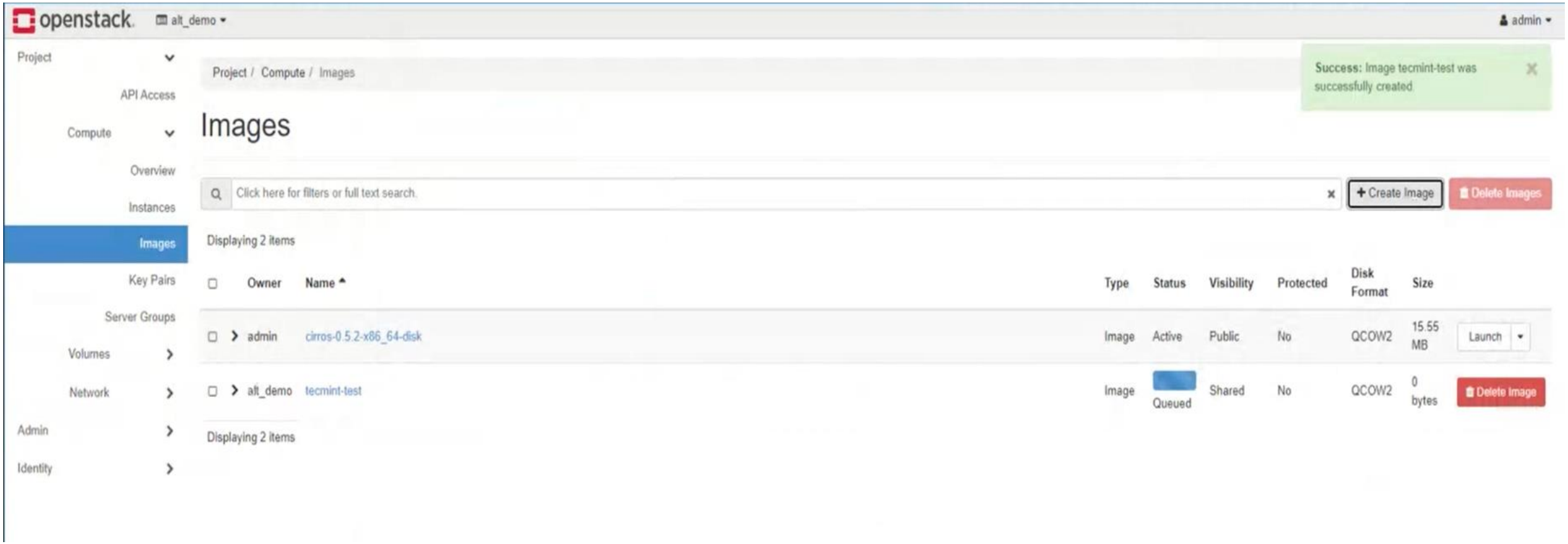
1. After clicking the Create Image button, use the following settings on the image prompt
2. Then click **Create Image** when done.

```
Name: tecmint-test
Description: Cirros test image
Image Source: Image Location  #Use Image File if you've downloaded the file locally on
Image Location: http://download.cirros-cloud.net/0.3.4/cirros-0.3.4-i386-disk.img
Format: QCOWW2 - QEMU Emulator
Architecture: leave blank
Minimum Disk: leave blank
Minimum RAM: leave blank
Image Location: checked
Public: unchecked
Protected: unchecked
```



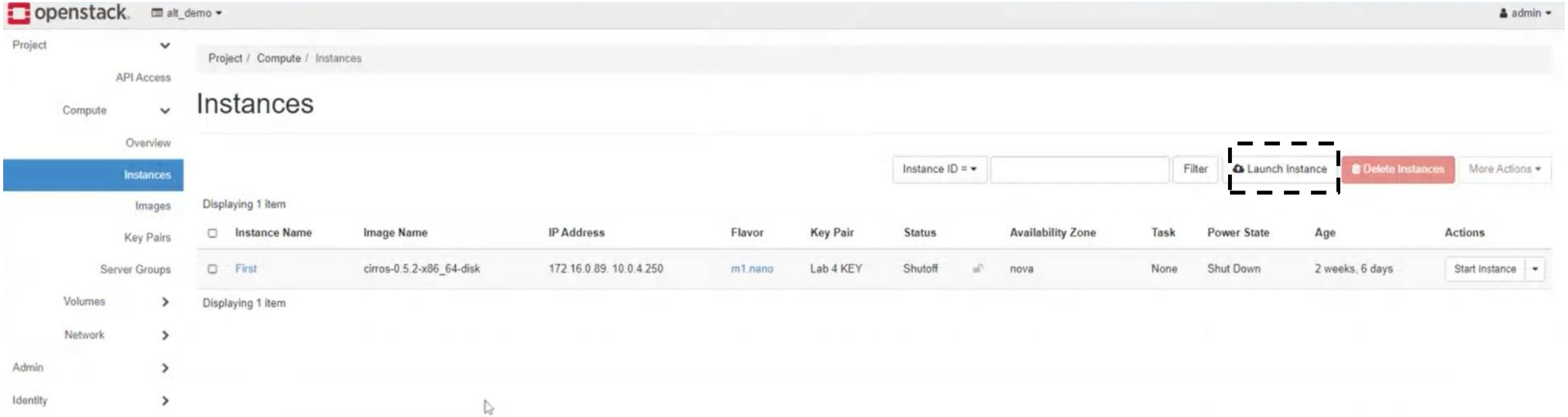
Step 2: Create an OpenStack Image

1. The image *techmint-test* will appear on the dashboard.



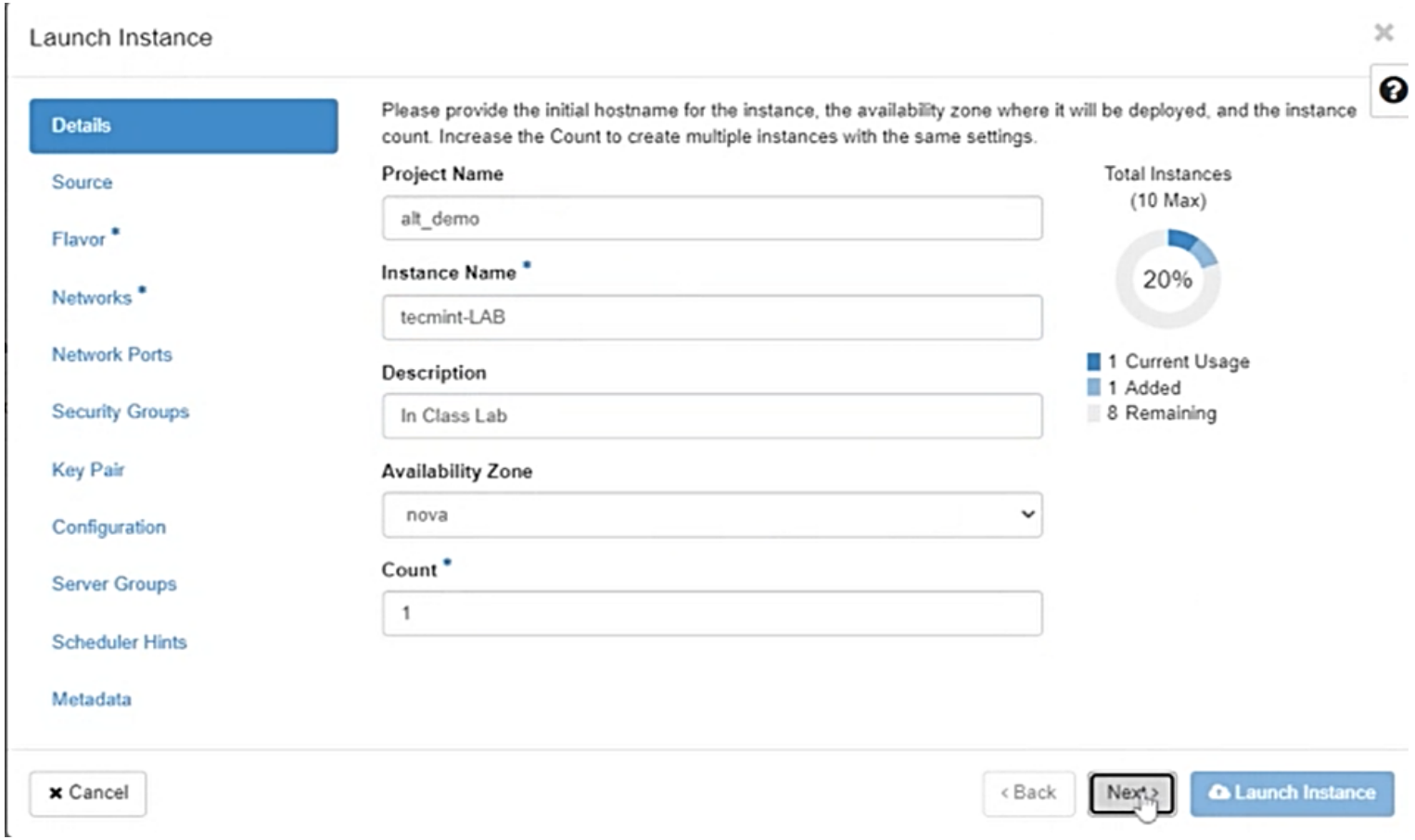
Step 3: Create an Instance of an Image

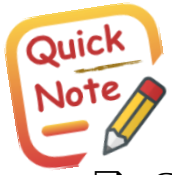
1. Project -> Compute -> Instances
2. Click on **Launch Instances**



Instance

- Add an appropriate name for your instance
- Leave the Availability Zone to nova
- Use one (1) instance count
- Click **Next** button to continue.

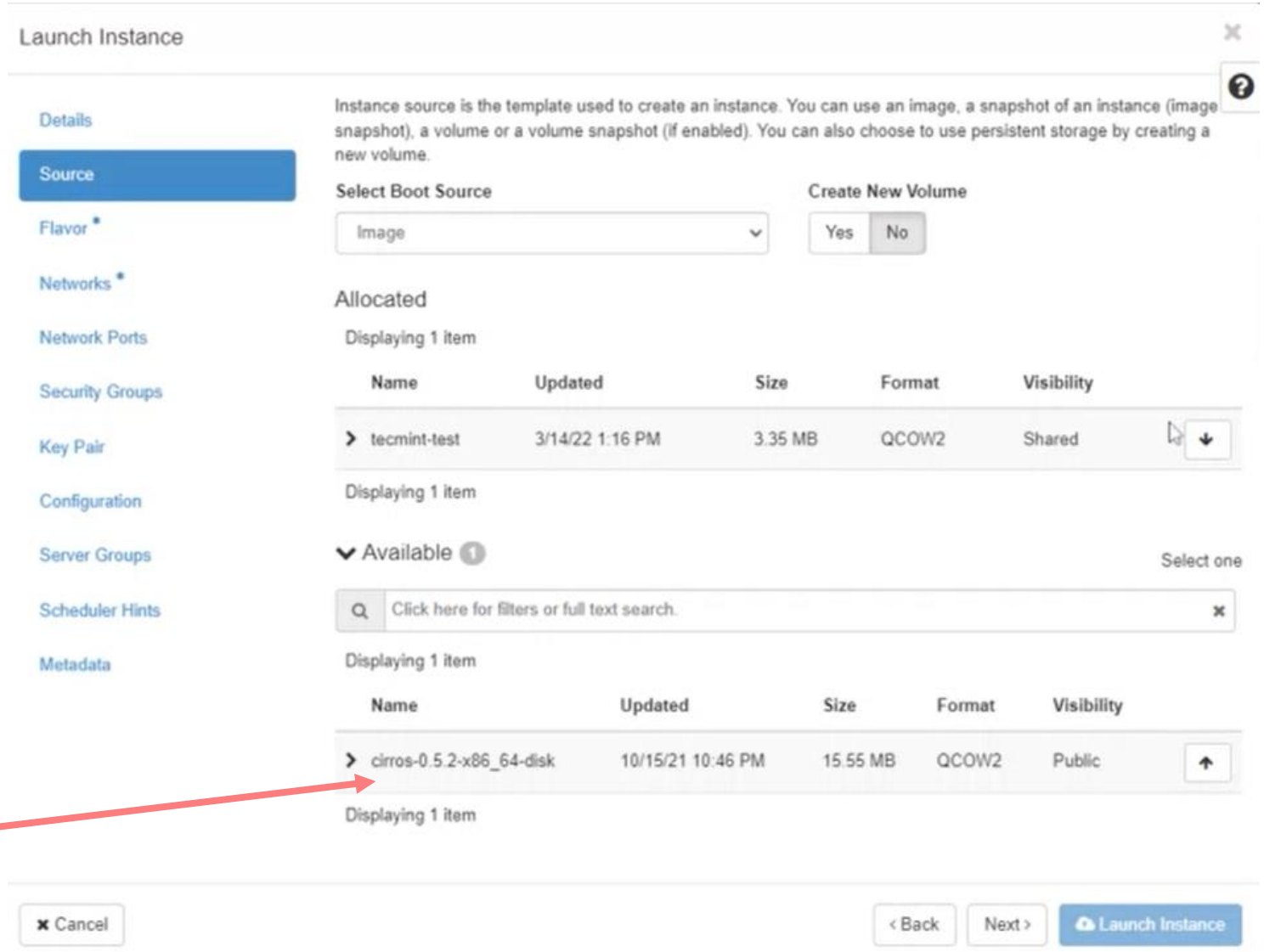




- ❑ Choose a **descriptive Instance Name** for your instance because this name will be used to form the virtual machine hostname.

Instance – Image Source

- Select Image as a Boot Source ; add the **cirros-0.5.2x86_64disk** by clicking the '⬆' up arrow under **Available**
- Create New Volume –**No**
- Click **Next** to proceed further.

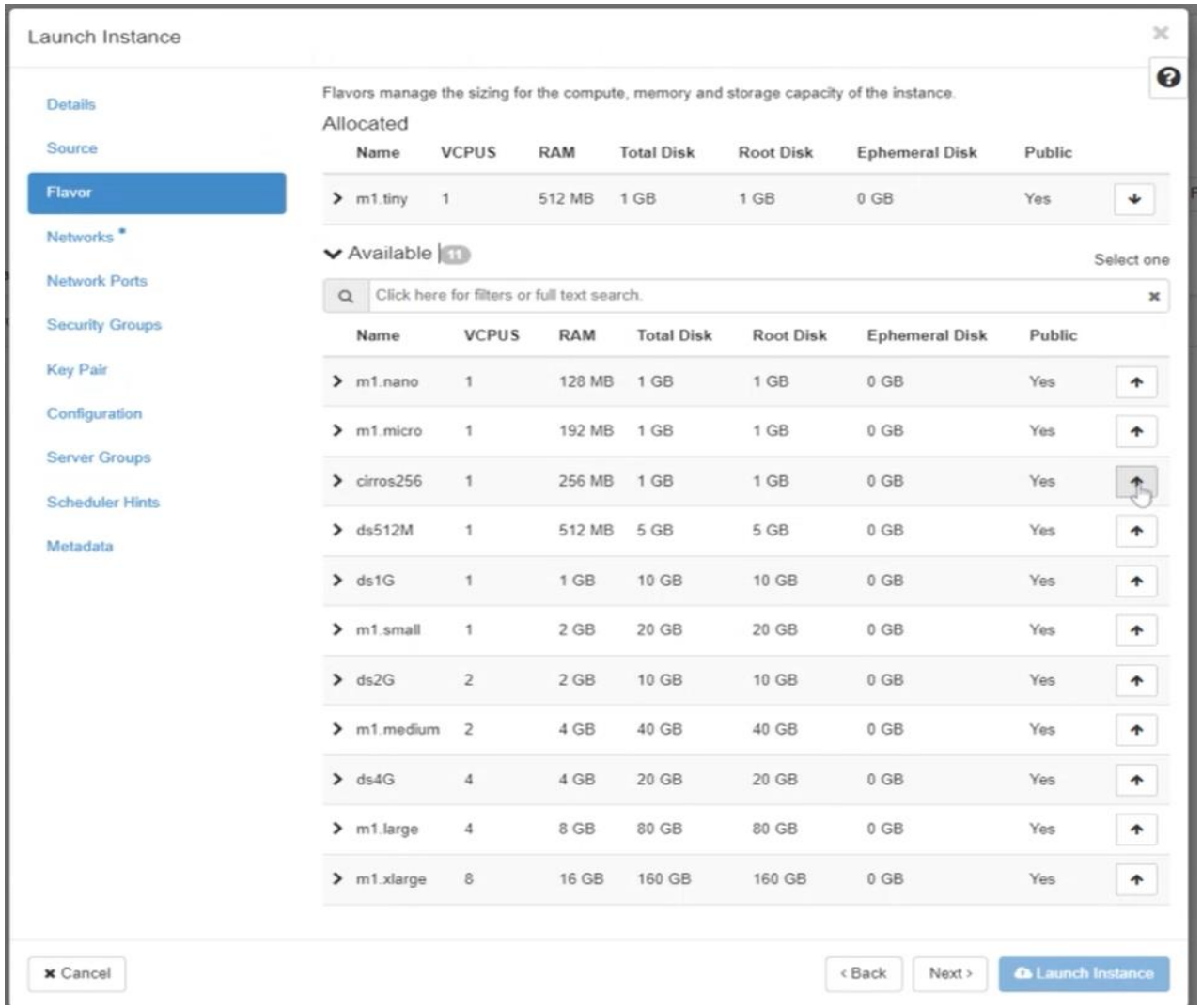


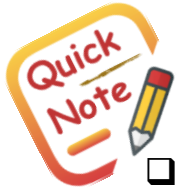
Quick Note

- Use this image provided instead to create the instance.

Instance – Adding Flavor

- Allocate the virtual machine resources by adding a flavor best suited for your needs by clicking the '⬆' up arrow
- Click on **Next** to move on.

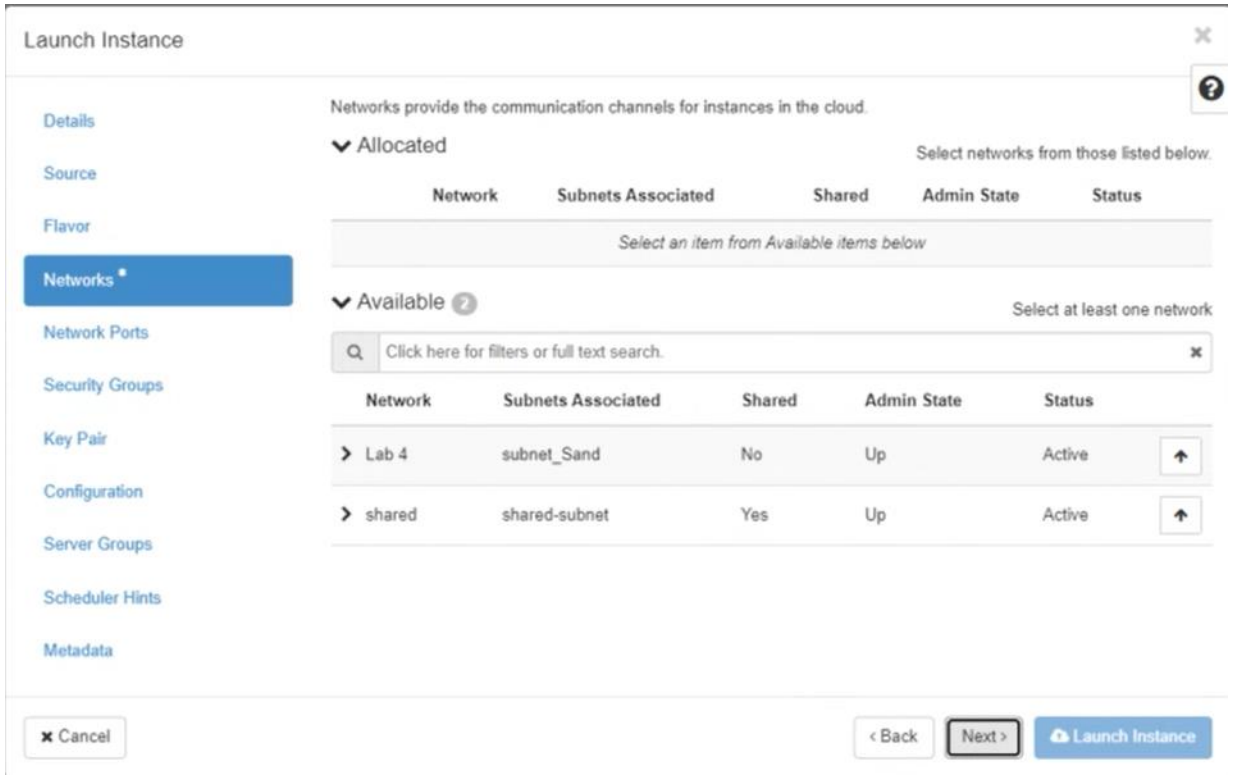


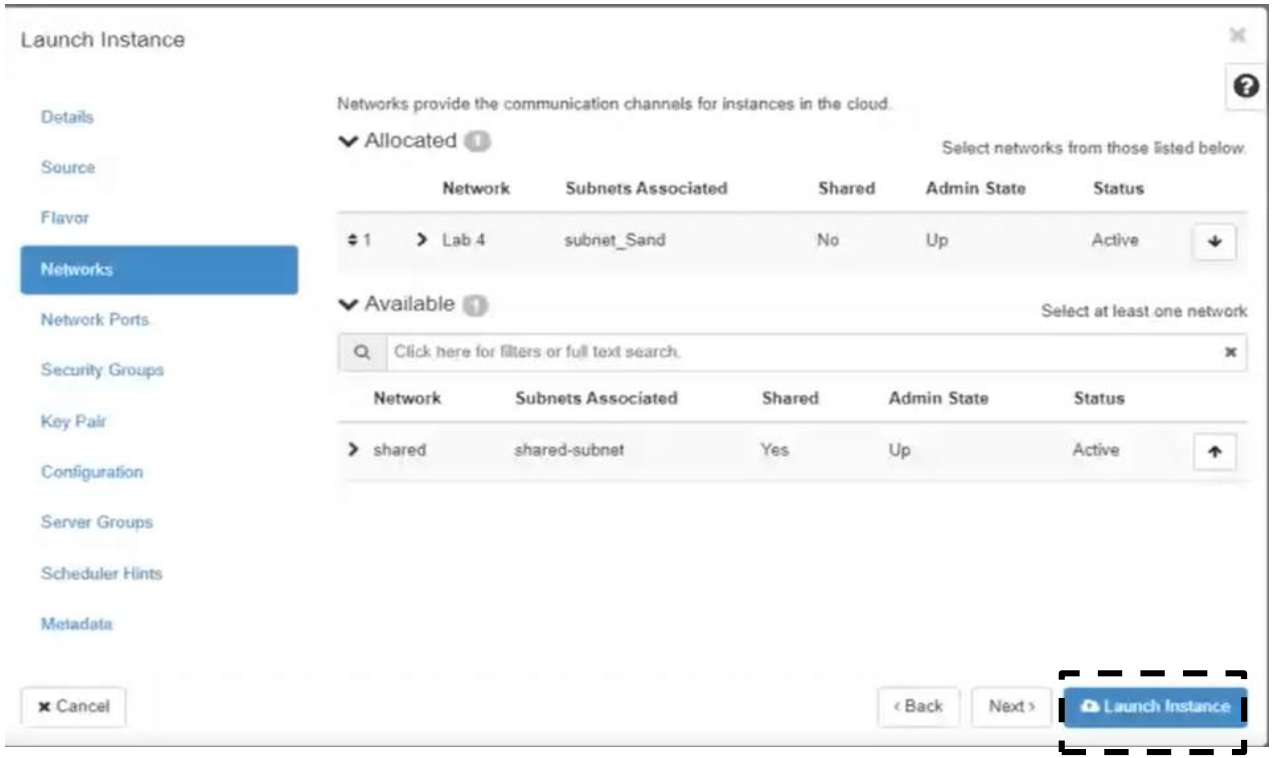


- ❑ When an instance is launched, an amount of resources that will be allocated to the instance.
- ❑ In OpenStack, this is defined by **flavors**.
- ❑ A **flavor** defines the quantum of virtual CPUs, RAM, and disk space that an instance will use when it launches

Instance – Add Network

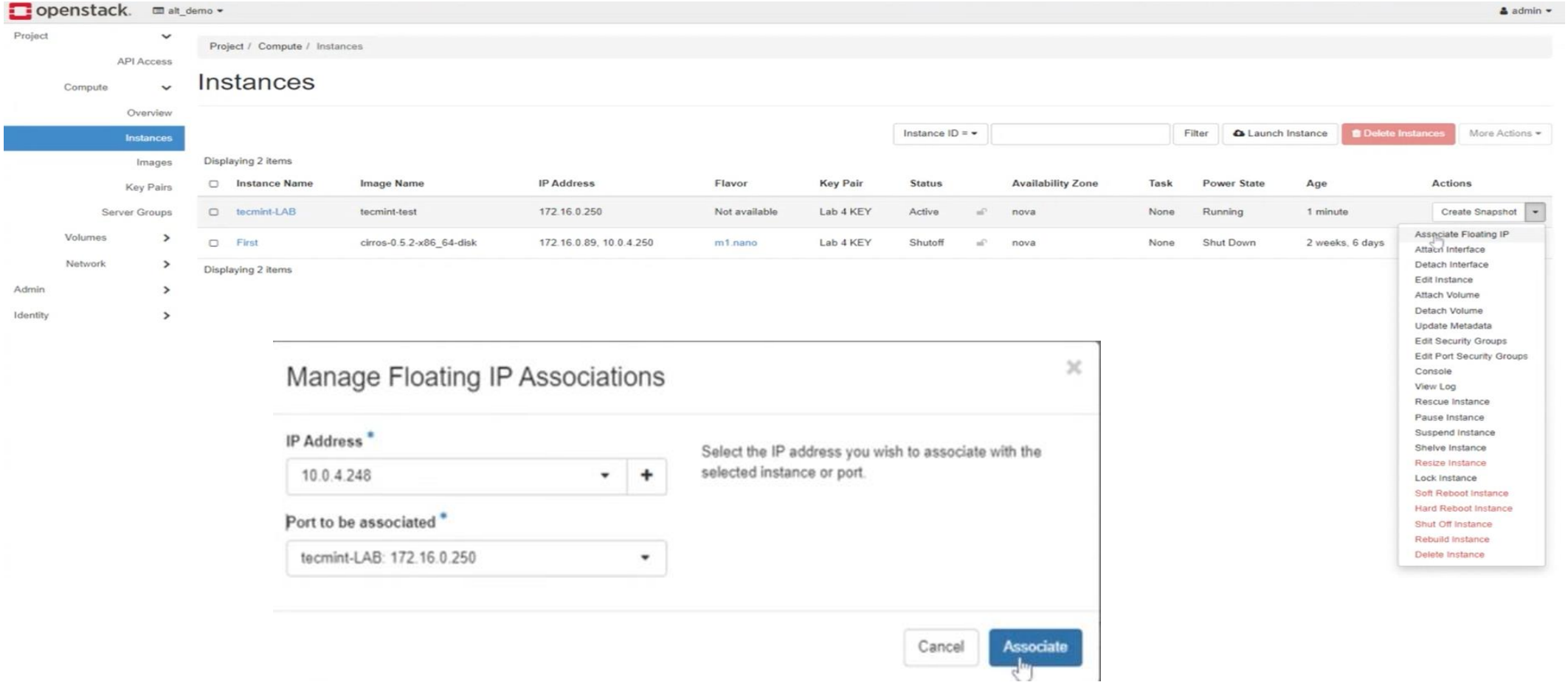
- Add one of the OpenStack available networks to your instance using the ‘⬆’ button.
- Click on **Launch Instance** to start the virtual machine.





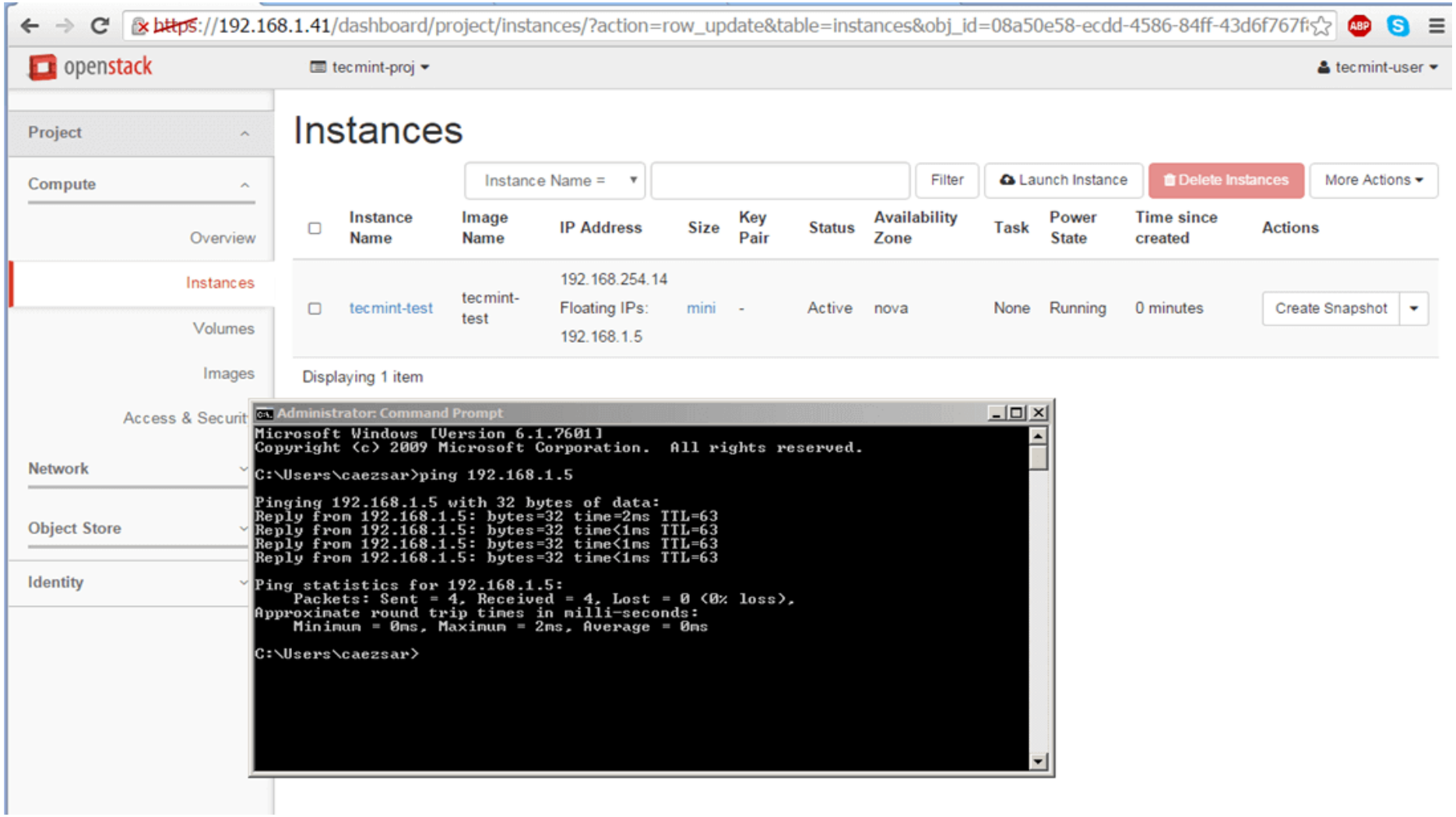
Instance

- Once the instance has been started, hit on the down arrow from Create Snapshot menu button
- Choose **Associate Floating IP**.
- Select one of the floating IP created earlier
- Click on **Associate** button in order to make the instance reachable from your internal LAN.



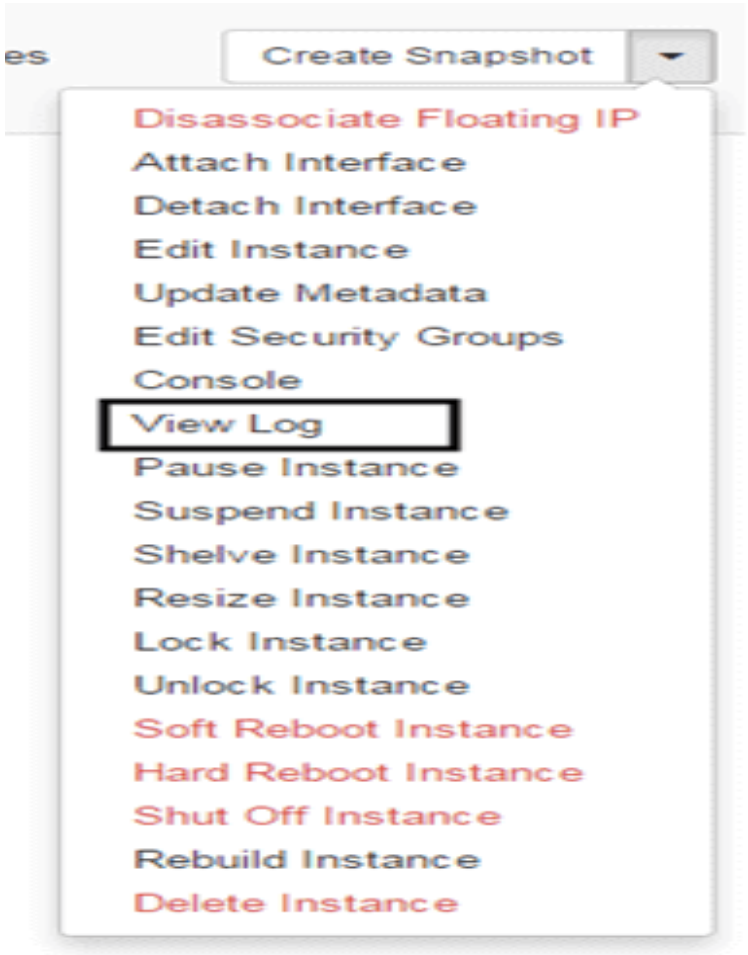
Testing

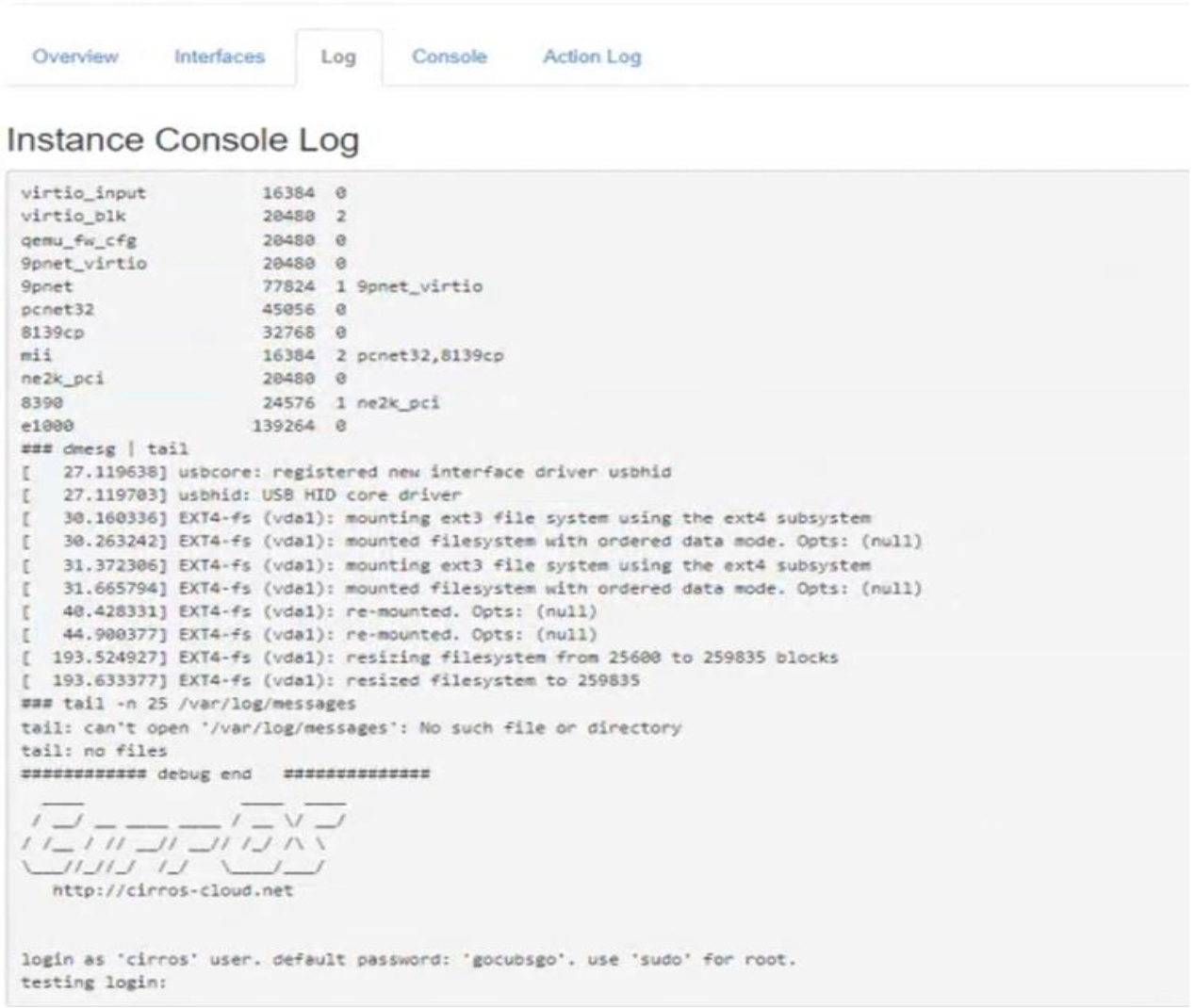
- To test the network connectivity for your active virtual machine, open the command prompt
- Issue a ping command against the instance floating IP address from a remote computer in your LAN.



Testing

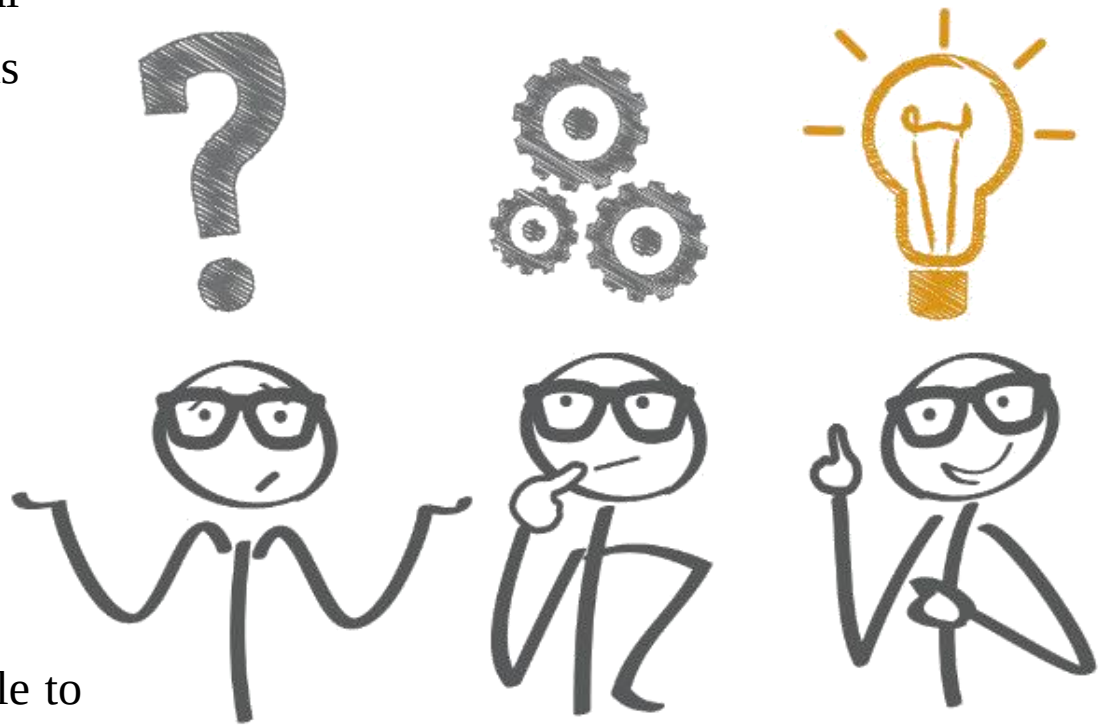
- If there's no issue with your instance and the ping command succeeds you can remotely login via SSH on your instance.
- Use the instance **View Log** utility to obtain Cirros default credentials as illustrated on the below screenshots.





Testing

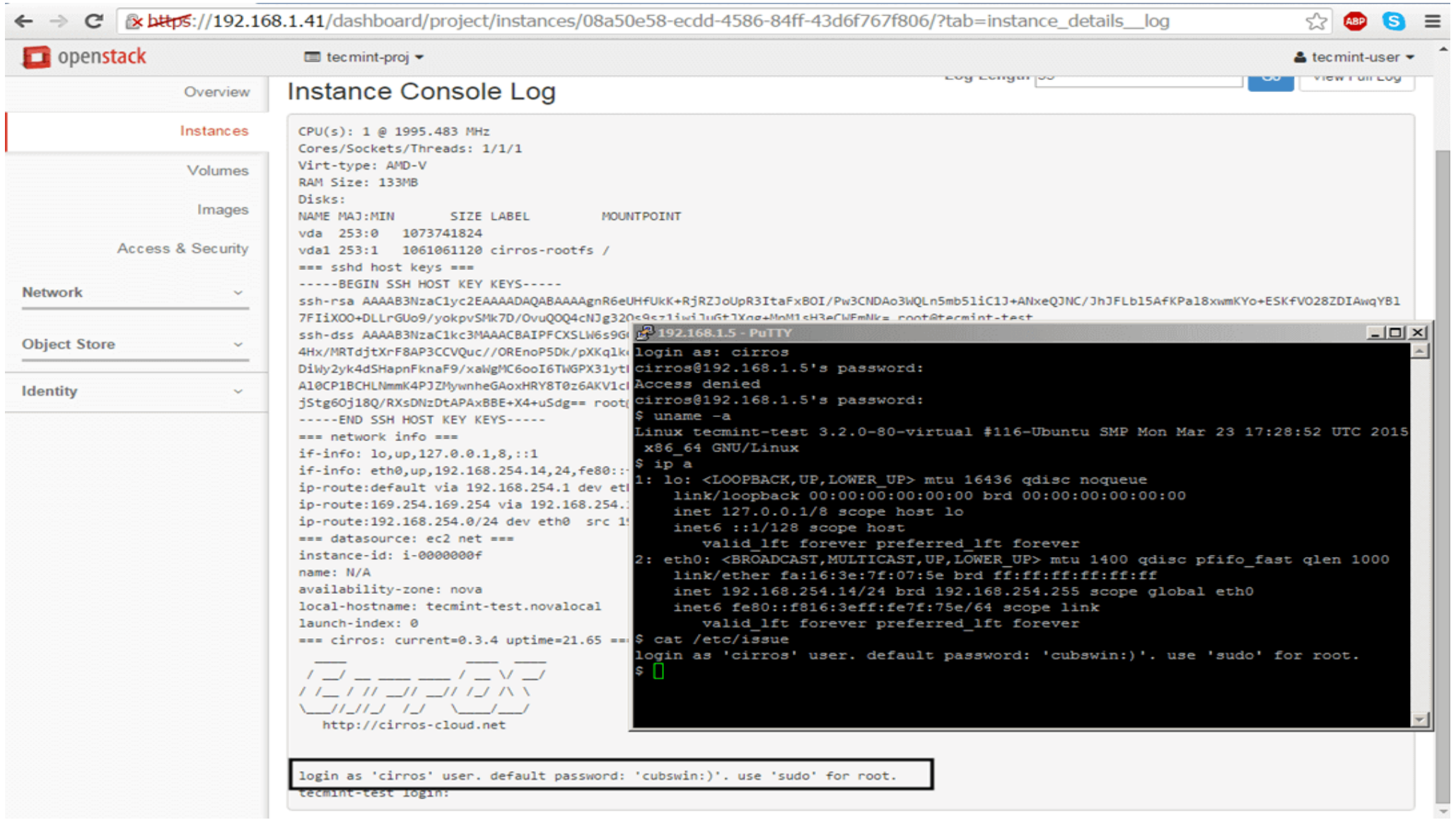
By default, no DNS name servers will be allocated from the internal network DHCP server for your virtual machine. This problem leads to domain connectivity issues from instance counterpart.

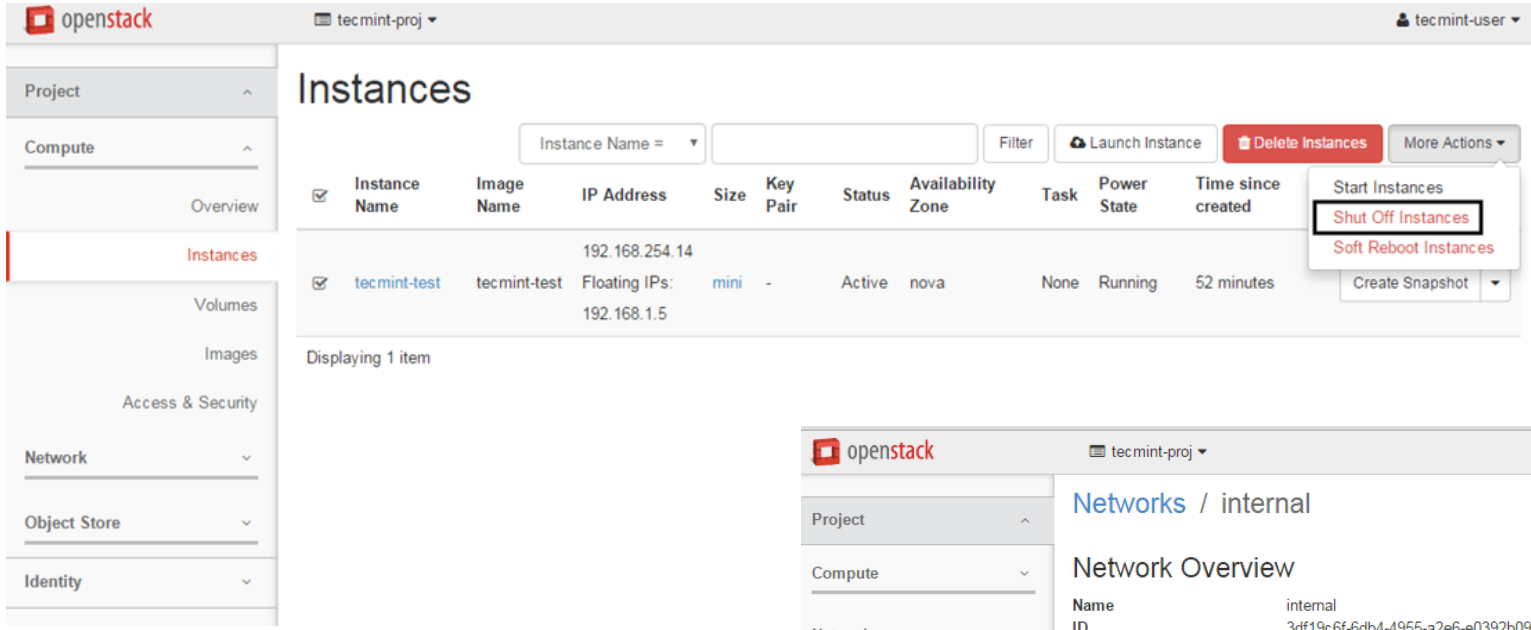


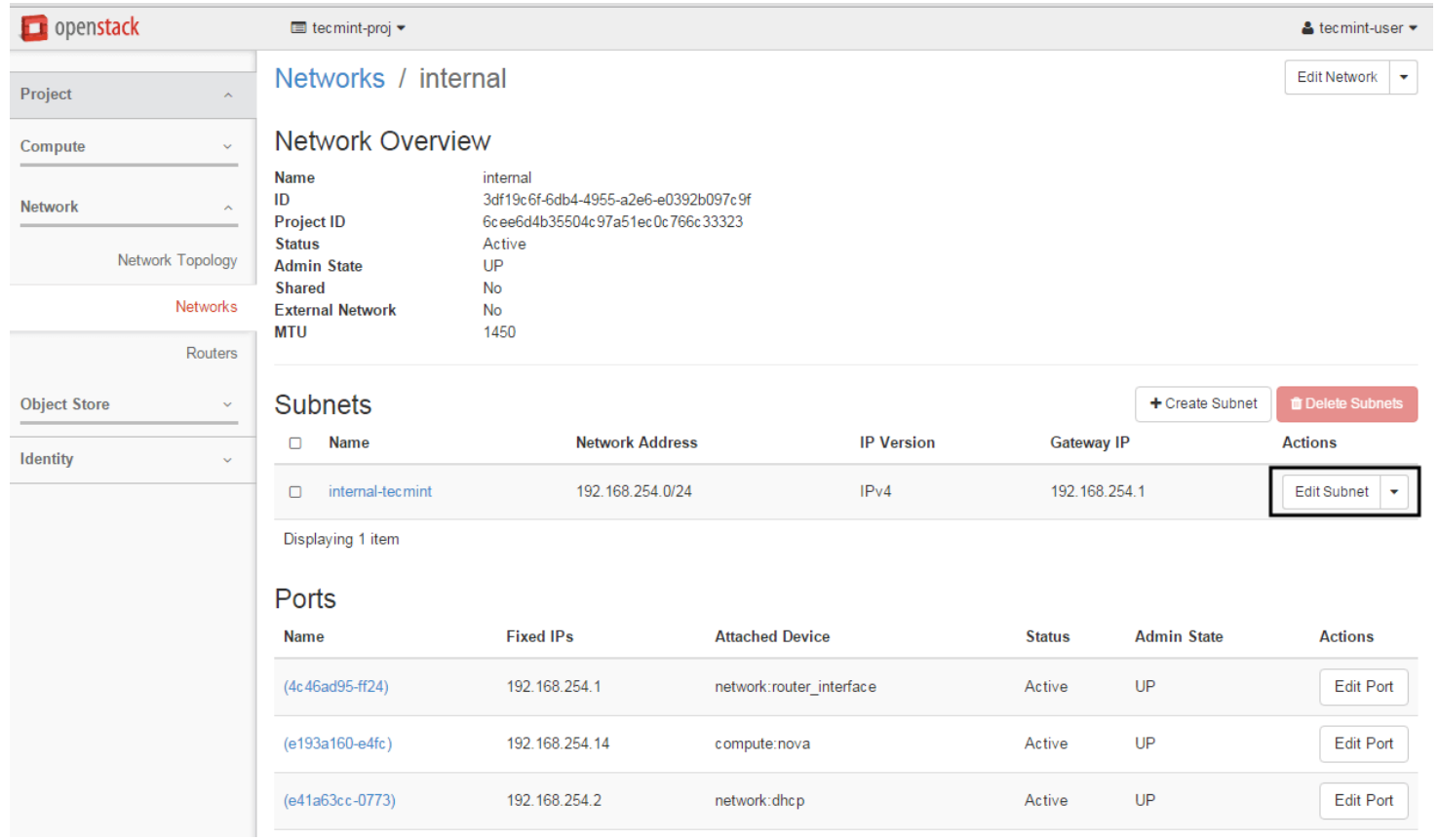
Solution:

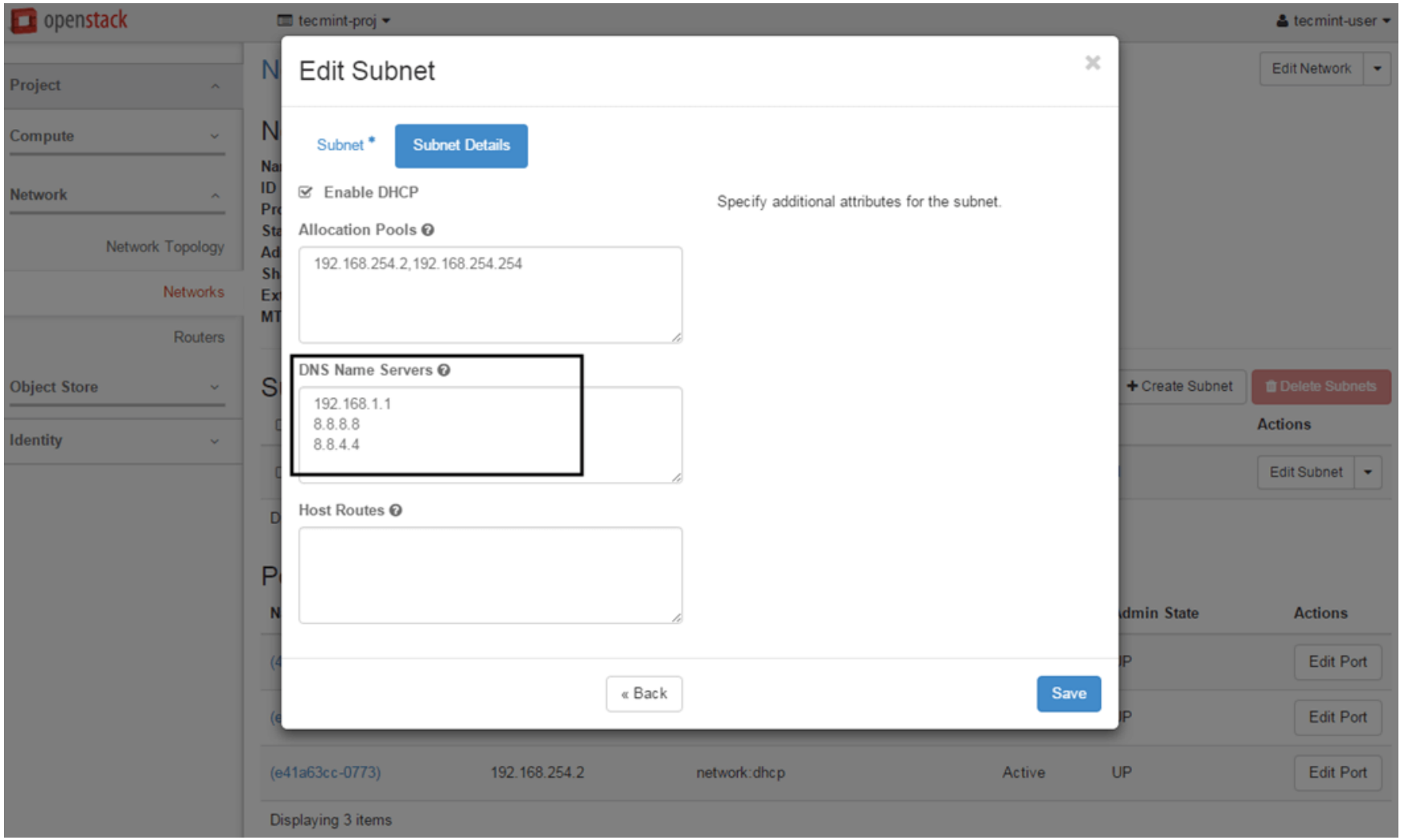
- Stop the instance
- Project -> Network -> Networks
- Edit the proper subnet by clicking on the Subnet Details button.
- **Add** the required DNS name servers
- **Save** the configuration, start and connect to the instance console to test if the new configuration has been applied by pinging a domain name.
- Use the following screenshots as a guide.

Testing


https://192.168.1.41/dashboard/project/instances/08a50e58-ecdd-4586-84ff-43d6f767f806/?tab=instance_details__log
openstack
tecmint-proj
tecmint-user
Overview
Instances
Volumes
Images
Access & Security
Network
Object Store
Identity
Instance Console Log
CPU(s): 1 @ 1995.483 MHz
Cores/Sockets/Threads: 1/1/1
Virt-type: AMD-V
RAM Size: 133MB
Disks:
NAME MAJ:MIN SIZE LABEL MOUNTPOINT
vda 253:0 1073741824
vda1 253:1 1061061120 cirros-rootfs /
=== sshd host keys ===
-----BEGIN SSH HOST KEY KEYS-----
-----END SSH HOST KEY KEYS-----
=== network info ===
=== datasource: ec2 net ===
instance-id: i-0000000f
name: N/A
availability-zone: nova
local-hostname: tecmint-test.novalocal
launch-index: 0
http://cirros-cloud.net
login as 'cirros' user. default password: 'cubswin:)'. use 'sudo' for root.
tecmint-test login:
192.168.1.5 - PuTTY
login as: cirros
cirros@192.168.1.5's password:
Access denied
cirros@192.168.1.5's password:
$ uname -a
Linux tecmint-test 3.2.0-80-virtual #116-Ubuntu SMP Mon Mar 23 17:28:52 UTC 2015 x86_64 GNU/Linux
$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1400 qdisc pfifo_fast qlen 1000
link/ether fa:16:3e:7f:07:5e brd ff:ff:ff:ff:ff:ff
inet 192.168.254.14/24 brd 192.168.254.255 scope global eth0
inet6 fe80::f816:3eff:fe7f:75e/64 scope link
valid_lft forever preferred_lft forever
$ cat /etc/issue
login as 'cirros' user. default password: 'cubswin:)'. use 'sudo' for root.
$


openstack
tecmint-proj
tecmint-user
Project
Compute
Overview
Instances
Volumes
Images
Access & Security
Network
Object Store
Identity
Instances
Instance Name =
Filter
Launch Instance
Delete Instances
More Actions
Start Instances
Shut Off Instances
Soft Reboot Instances
Instance Name
Image Name
IP Address
Size
Key Pair
Status
Availability Zone
Task
Power State
Time since created
tecmint-test
tecmint-test
192.168.254.14
Floating IPs:
192.168.1.5
mini
-
Active
nova
None
Running
52 minutes
Create Snapshot
Displaying 1 item


openstack
tecmint-proj
tecmint-user
Project
Compute
Network
Network Topology
Networks
Routers
Object Store
Identity
Networks / internal
Edit Network
Network Overview
Name internal
ID 3df19c6f-6db4-4955-a2e6-e0392b097c9f
Project ID 6cee6d4b35504c97a51ec0c766c33323
Status Active
Admin State UP
Shared No
External Network No
MTU 1450
Subnets
+ Create Subnet
Delete Subnets
Name
Network Address
IP Version
Gateway IP
Actions
internal-tecmint
192.168.254.0/24
IPv4
192.168.254.1
Edit Subnet
Displaying 1 item
Ports
Name
Fixed IPs
Attached Device
Status
Admin State
Actions
(4c46ad95-ff24)
192.168.254.1
network:router_interface
Active
UP
Edit Port
(e193a160-e4fc)
192.168.254.14
compute:nova
Active
UP
Edit Port
(e41a63cc-0773)
192.168.254.2
network:dhcp
Active
UP
Edit Port


openstack
tecmint-proj
tecmint-user
Project
Compute
Network
Network Topology
Networks
Routers
Object Store
Identity
Edit Network
Edit Subnet
Subnet *
Subnet Details
Enable DHCP
Specify additional attributes for the subnet.
Allocation Pools
192.168.254.2,192.168.254.254
DNS Name Servers
192.168.1.1
8.8.8.8
8.8.4.4
Host Routes
« Back
Save
+ Create Subnet
Delete Subnets
Actions
Edit Subnet
Admin State
Actions
Edit Port
Edit Port
(e41a63cc-0773)
192.168.254.2
network:dhcp
Active
UP
Edit Port
Displaying 3 items

Notes

We looked at managing flavors, key pairs, instances, and floating IP addresses. A running instance's storage is ephemeral by design. This means that any data stored in the instance's local disk is lost upon the instance's termination.

We will attach a virtual block storage device to the running instance. This storage will persist after an instance that it is attached to is terminated.

Notes to support what you have done in this lab:

Some groundwork is needed to get to launching an instance. We need a tenant for the instance to live in, an image on which it can run, a network for it to live in, and a key pair to authenticate with. These are all the necessary resources to create in order to launch an instance, and now that these resources have been created, they can be reused for future instances that will be launched.

Now that an instance is running, the next step is to communicate with it in a fashion other than with the console through a web browser. In the instance list you just
saw, an IP address on the tenant network will be listed once it's been assigned. The IP address that's initially assigned to the instance is not a routeable IP address; to communicate with the instance, you will need to assign a floating IP address from the external network. The floating IP address will be mapped to the tenant network IP address, and you will be able to communicate with the instance by way of the floating IP address.


The End

Instance – Image Source

- Select Image as a Boot Source ; add the **cirros-0.5.2x86_64disk** by clicking the ‘ ’ up arrow under **Available**
- Create New Volume –No
- Click **Next** to proceed further.