

## Ex. No 6

# OpenStack Installation IaaS Implementation

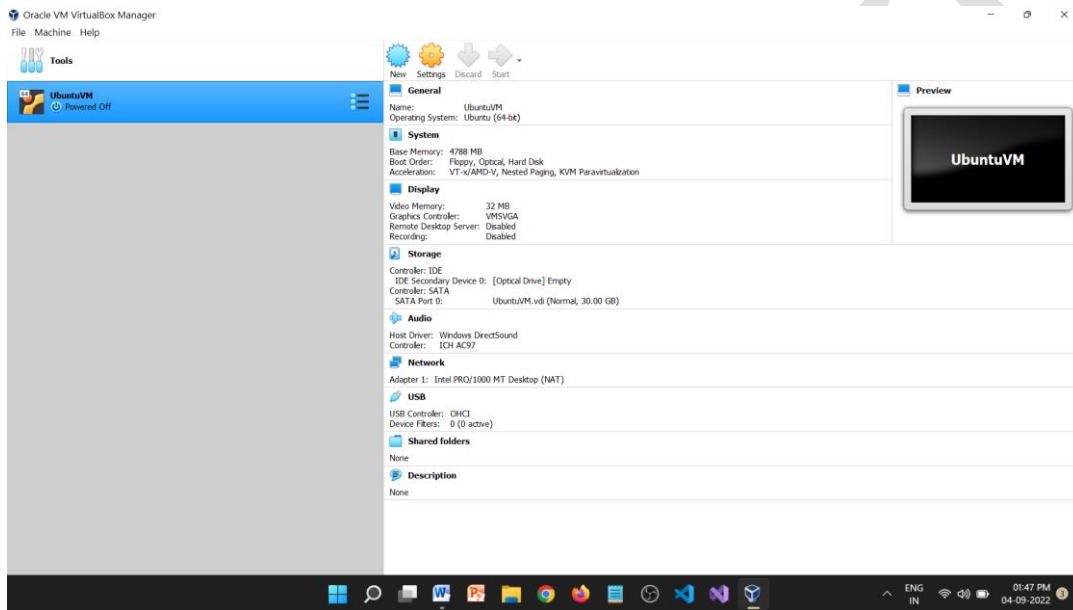
**Aim:** To implement IaaS by installing OpenStack.

## Softwares Required

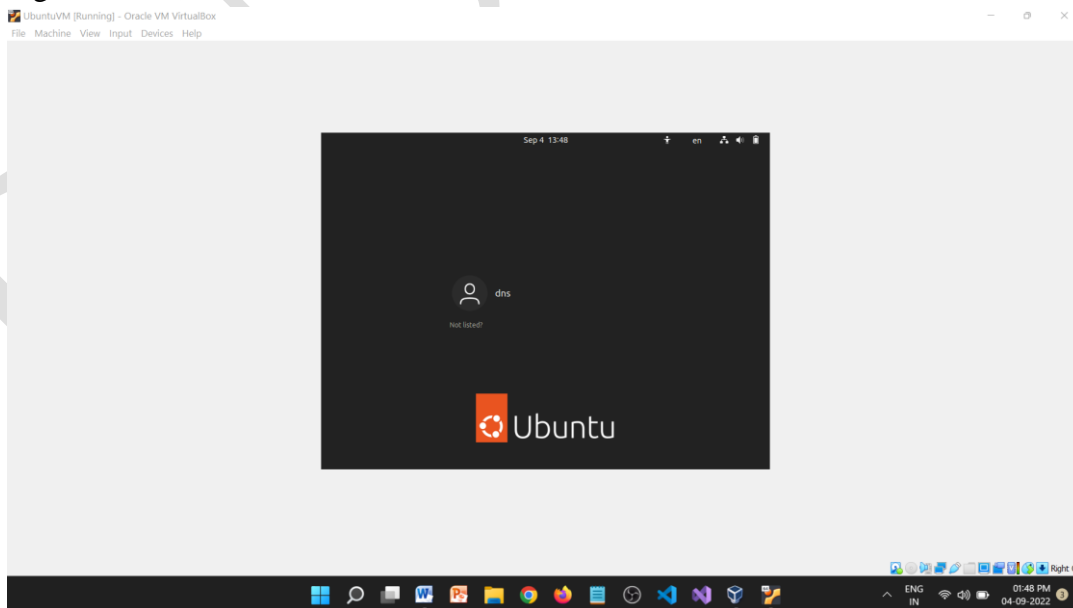
- VM VirtualBox (<https://www.virtualbox.org/wiki/Downloads>)
- Ubuntu OS (<https://ubuntu.com/download/desktop>)

## Procedure:

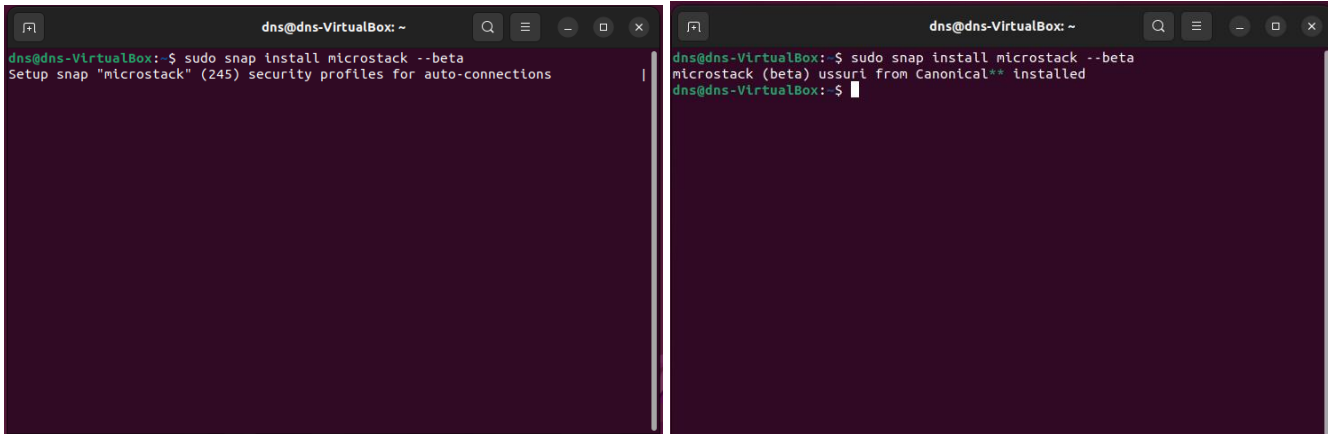
1. Open VirtualBox with Virtual Ubuntu OS installed in it.



2. Login to the Ubuntu OS.

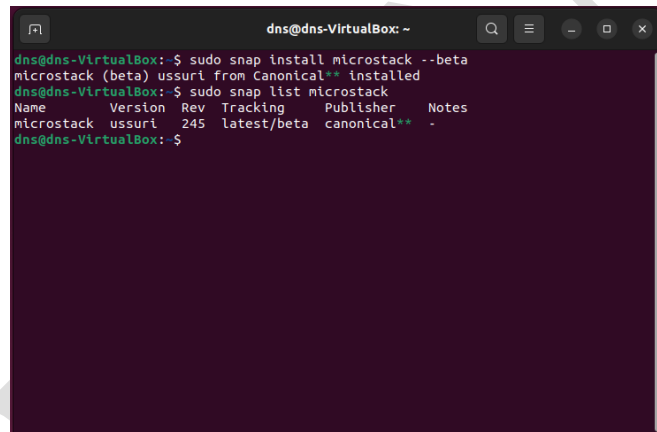


3. Open Terminal and type the command
  - a. **sudo snap install microstack --beta**



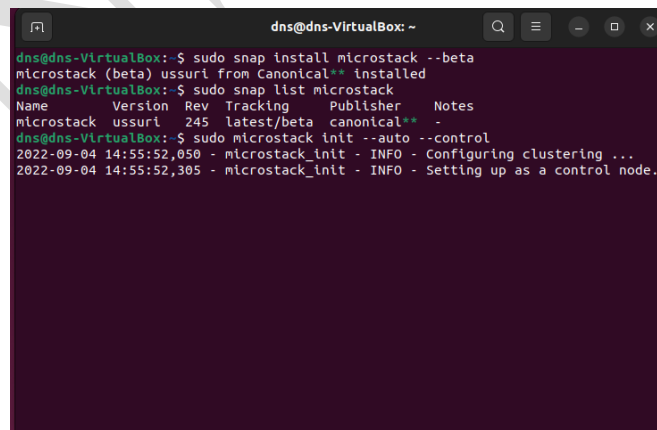
```
dns@dns-VirtualBox: ~  
dns@dns-VirtualBox:~$ sudo snap install microstack --beta  
Setup snap "microstack" (245) security profiles for auto-connections  
dns@dns-VirtualBox:~$  
dns@dns-VirtualBox:~$ sudo snap install microstack --beta  
microstack (beta) ussuri from Canonical** installed  
dns@dns-VirtualBox:~$
```

4. Check installation completion with the command
  - a. **sudo snap list microstack**



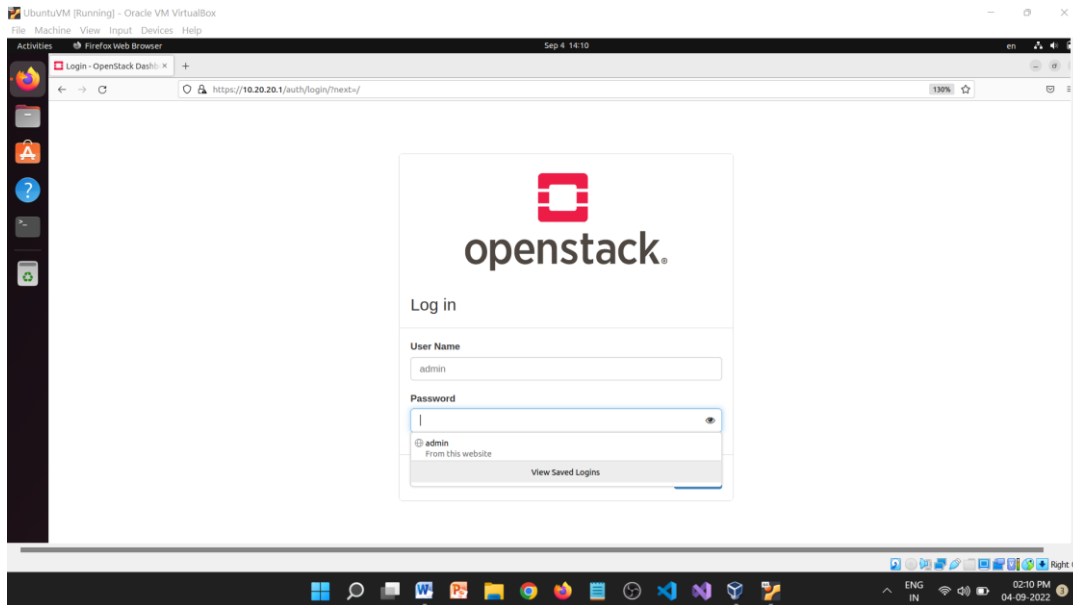
```
dns@dns-VirtualBox:~$ sudo snap install microstack --beta  
microstack (beta) ussuri from Canonical** installed  
dns@dns-VirtualBox:~$ sudo snap list microstack  
Name      Version  Rev  Tracking  Publisher  Notes  
microstack ussuri   245  latest/beta canonical** -  
dns@dns-VirtualBox:~$
```

5. Initialize microstack with the command
  - a. **sudo microstack init --auto --control**



```
dns@dns-VirtualBox:~$ sudo snap install microstack --beta  
microstack (beta) ussuri from Canonical** installed  
dns@dns-VirtualBox:~$ sudo snap list microstack  
Name      Version  Rev  Tracking  Publisher  Notes  
microstack ussuri   245  latest/beta canonical** -  
dns@dns-VirtualBox:~$ sudo microstack init --auto --control  
2022-09-04 14:55:52,050 - microstack_init - INFO - Configuring clustering ...  
2022-09-04 14:55:52,305 - microstack_init - INFO - Setting up as a control node.  
dns@dns-VirtualBox:~$
```

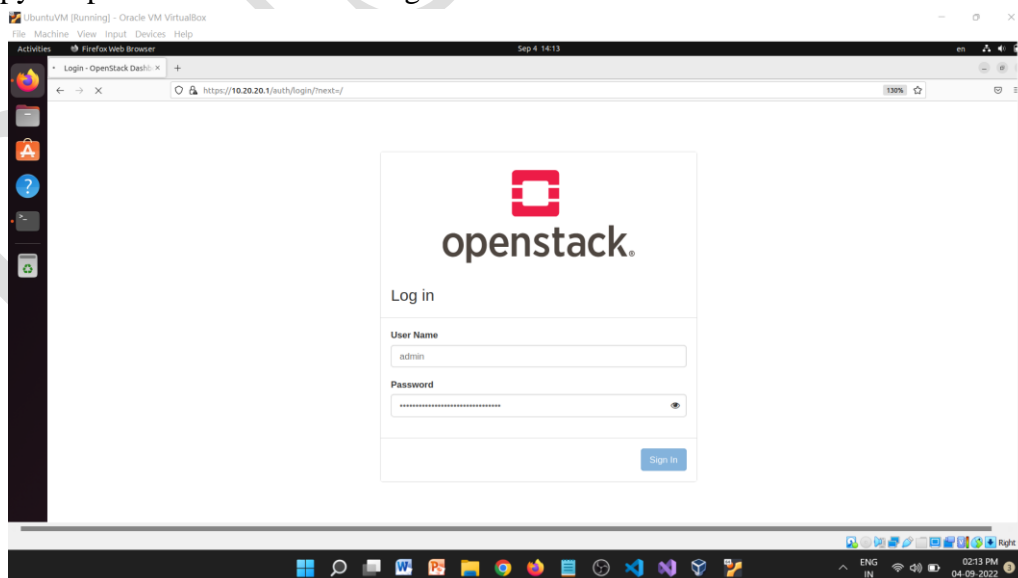
6. After initialization of OpenStack. Use browser to launch OpenStack Dashboard. Use the IP address **10.20.20.1** to login to the dashboard.

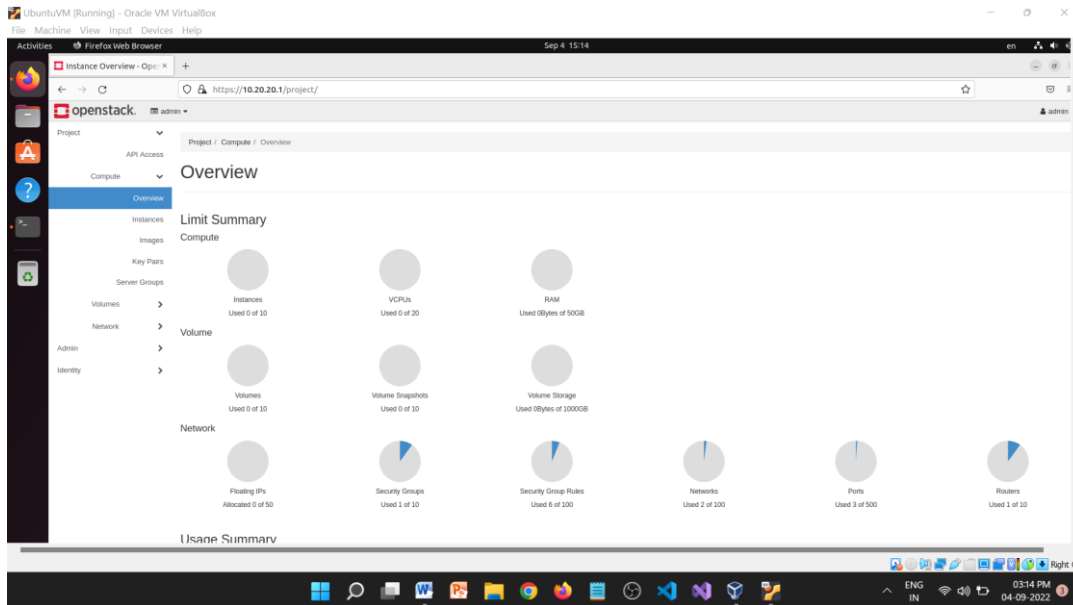


7. Use “admin” as username. Get password for the login from Terminal using the command
  - a. **sudo snap get microstack config.credentials.keystone-password**

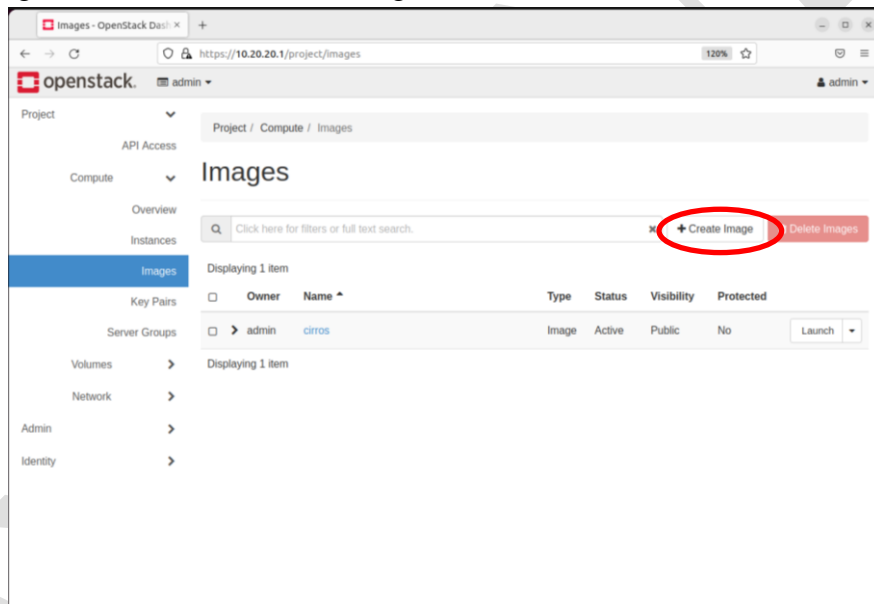
```
dns@dns-VirtualBox: ~  
dns@dns-VirtualBox:~$ sudo snap get microstack config.credentials.keystone-passw  
ord  
[sudo] password for dns:  
6dvlldzyhXbkjdcBR5qMhacouMD41Jb1  
dns@dns-VirtualBox:~$
```

8. Copy the password and use it to login to the dashboard.





9. Open Images Tab and click Create Image



10. Provide the Image downloaded from <https://docs.openstack.org/image-guide/obtain-images.html> to create a new image.

- a. Provide Image Name

**Image Details**  
Specify an image to upload to the Image Service.

**Image Name**  
NetBSD

**Image Description**  
NetBSD Cloud OS

**Image Source**  
File\*  
Browse...

**Format\***  
[Dropdown menu]

**Image Requirements**  
Kernel: Choose an image  
Architecture: [Dropdown menu]  
Ramdisk: Choose an image  
Minimum Disk (GB)\*: 0  
Minimum RAM (MB)\*: 0

**Image Sharing**  
Visibility: Private Shared Community Public  
Protected: Yes No

Buttons: Cancel, Back, Next, Create Image

b. Choose Image Source – Downloaded Cloud OS Image

**Image Details**  
Specify an image to upload to the Image Service.

**Image Name**  
NetBSD

**Image Description**  
NetBSD Cloud OS

**Image Source**  
File\*  
Browse... netbsd-8.2.qcow2

**Format\***  
[Dropdown menu]

**Image Requirements**  
Kernel: Choose an image  
Architecture: [Dropdown menu]  
Ramdisk: Choose an image  
Minimum Disk (GB)\*: 0  
Minimum RAM (MB)\*: 0

**Image Sharing**  
Visibility: Private Shared Community Public  
Protected: Yes No

Buttons: Cancel, Back, Next, Create Image

**File Upload Dialog:**  
Recent, Home, Documents, Downloads, Music, Pictures, Videos  
netbsd-8.2.qcow2 (155.4 MB, QEMU QCOW disk image, Yesterday)

c. Choose File Format **QCOW2**

**Image Details**  
Specify an image to upload to the Image Service.

**Image Name**  
NetBSD

**Image Description**  
NetBSD Cloud OS

**Image Source**  
File\*  
Browse... netbsd-8.2.qcow2

**Format\***  
ISO - Optical Disk Image  
PLOOP - Virtuozzo/Parallels Loopback Disk  
QCOW2 - QEMU Emulator  
Raw  
VDI - Virtual Disk Image  
VHD - Virtual Hard Disk  
VMDK - Virtual Machine Disk  
AKI - Amazon Kernel Image  
AMI - Amazon Machine Image  
ARI - Amazon Ramdisk Image

**Image Requirements**  
Kernel: Choose an image  
Architecture: [Dropdown menu]  
Ramdisk: Choose an image  
Minimum Disk (GB)\*: 0  
Minimum RAM (MB)\*: 0

**Image Sharing**  
Visibility: Private Shared Community Public  
Protected: Yes No

Buttons: Cancel, Back, Next, Create Image

d. Choose Visibility **Public** and Create Image

Image Details

Specify an image to upload to the Image Service.

**Image Name**  
NetBSD

**Image Description**  
NetBSD Cloud OS

**Image Source**

**File\***  
Browse... netbsd-8.2.qcow2

**Format\***  
QCOW2 - QEMU Emulator

**Image Requirements**

**Kernel**  
Choose an image

**Ramdisk**  
Choose an image

**Architecture**  
Choose an image

**Minimum Disk (GB)\***  
0

**Minimum RAM (MB)\***  
0

**Image Sharing**

**Visibility**  
Private Shared Community **Public**

**Protected**  
Yes No

Cancel < Back Next **Create Image**

openstack admin

Project / Compute / Images

Images

Click here for filters or full text search. + Create Image Delete Images

Displaying 2 items

Owner	Name	Type	Status	Visibility	Protected	
admin	cirros	Image	Active	Public	No	Launch
admin	NetBSD	Image	Active	Public	No	Launch

11. Create Instance from the available Images using web interface or Terminal Interface.

12. Instance Creation Using Web Interface

a. Open Interfaces section and select Launch Instance

openstack admin

Project / Compute / Instances

Instances

Instance ID = [ ] Launch Instance

Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions
No items to display.										

b. Provide Instance Name and select Next

Launch Instance

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 \***  
MyVM1

**Description**  
My Cloud Virtual Machine-1

**Availability Zone**  
nova

**Count \***  
1

Total Instances (10 Max)  
10%

0 Current Usage  
1 Added  
9 Remaining

Cancel Back Next Launch Instance

c. Select "cirros" as source form the available images

Source

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

**Select Boot Source**  
Image

**Volume Size (GB) \***  
1

**Allocated**  
Displaying 0 items

**Available**  
Select one

Displaying 2 items

Name

- > cirros
- > NetBSD

Displaying 2 items

Cancel Back Next Launch Instance

Source

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

**Select Boot Source**  
Image

**Volume Size (GB) \***  
1

**Allocated**  
Displaying 1 item

**Available**  
Select one

Displaying 1 item

Name

- > NetBSD

Displaying 1 item

Cancel Back Next Launch Instance

d. Select Flavor “m1.tiny” from the available Flavors

Launch Instance

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

Source

Flavor \* *Select an item from Available items below*

Networks \* *Select one*

Network Ports *Click here for filters or full text search.*

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

Name	VCPUS	RAM	Total Disk	Public
> m1.tiny	1	512 MB	1 GB	Yes
> m1.small	1	2 GB	20 GB	Yes
> m1.medium	2	4 GB	20 GB	Yes
> m1.large	4	8 GB	20 GB	Yes
> m1.xlarge	8	16 GB	20 GB	Yes

< Back Next > Launch Instance

Launch Instance

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

Source

Flavor *Select an item from Available items below*

Networks \* *Select one*

Network Ports *Click here for filters or full text search.*

Security Groups

Key Pair

Configuration

Server Groups

Scheduler Hints

Metadata

Name	VCPUS	RAM	Total Disk	Public
> m1.tiny	1	512 MB	1 GB	Yes
> m1.small	1	2 GB	20 GB	Yes
> m1.medium	2	4 GB	20 GB	Yes
> m1.large	4	8 GB	20 GB	Yes
> m1.xlarge	8	16 GB	20 GB	Yes

< Back Next > Launch Instance

e. Select “external” network as the network for the Instance

Launch Instance

Networks provide the communication channels for instances in the cloud.

Source

Flavor

Networks \* *Select networks from those listed below.*

Network Ports

Security Groups

Key Pair

Configuration

Server Groups

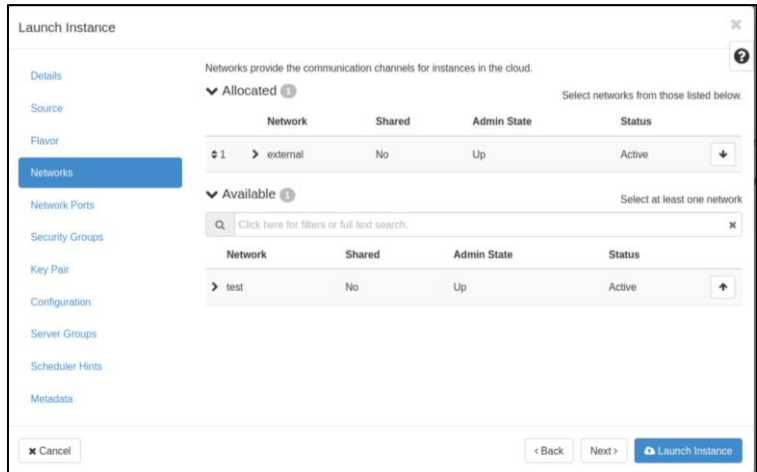
Scheduler Hints

Metadata

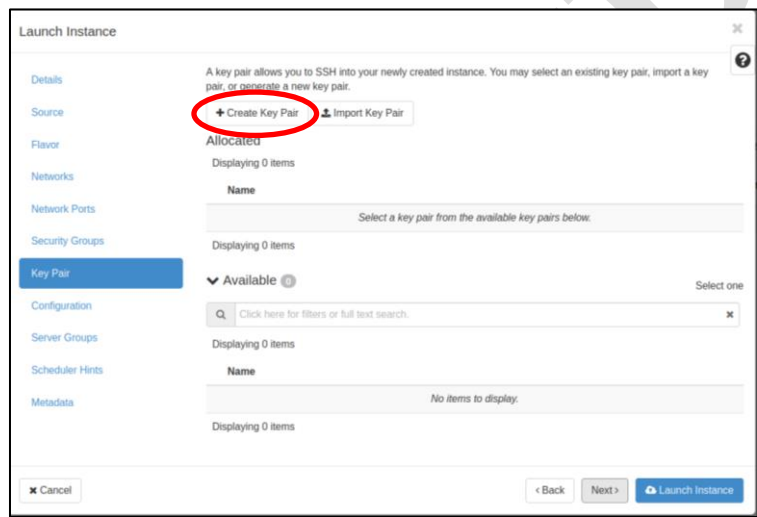
Network	Shared	Admin State	Status
> test	No	Up	Active
> external	No	Up	Active

< Back Next > Launch Instance

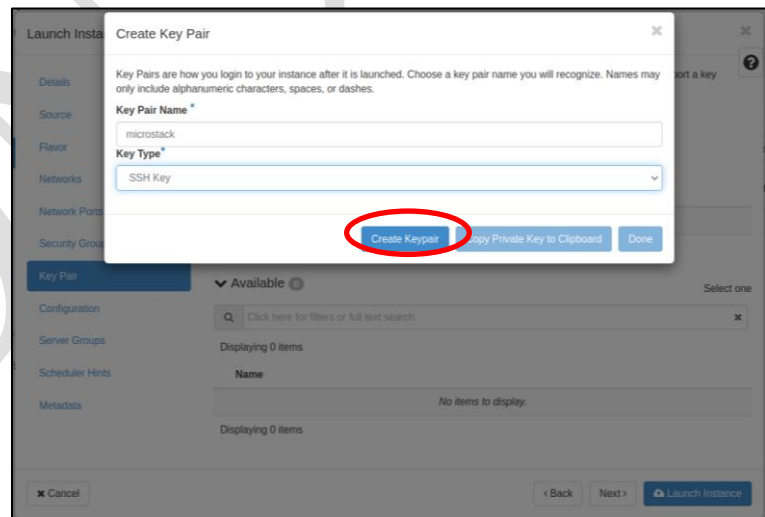


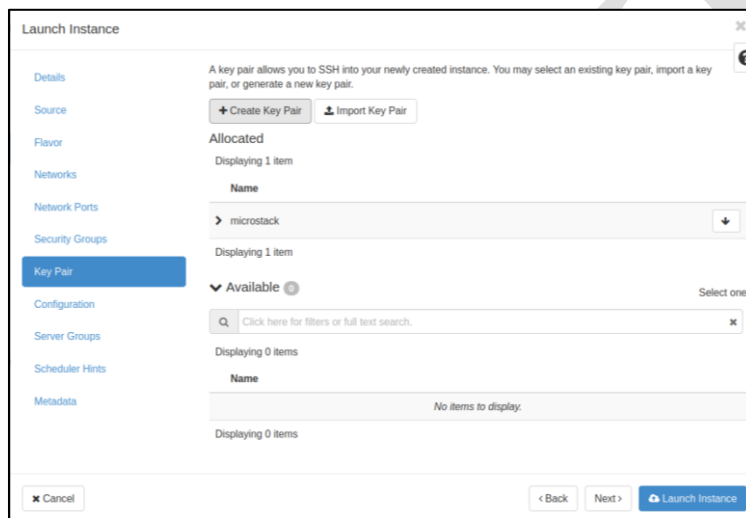
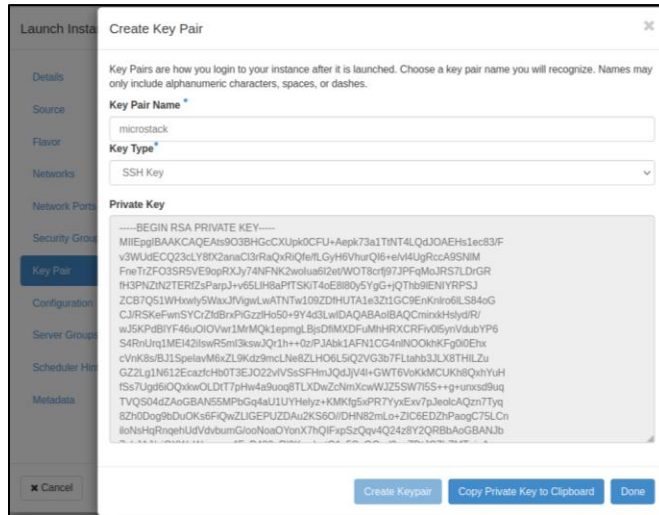


f. Network Ports and Security Group use the default Options. In Key Pair Section Create a new SSH Key Pair with name “microstack” and select it.

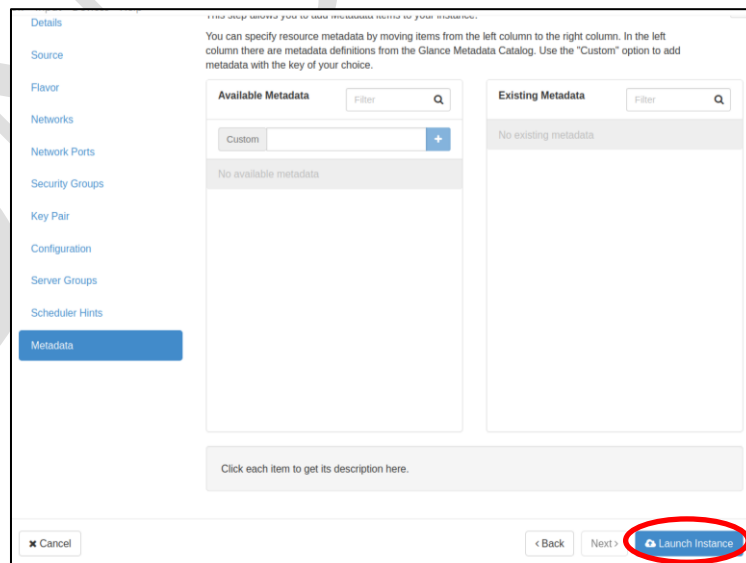


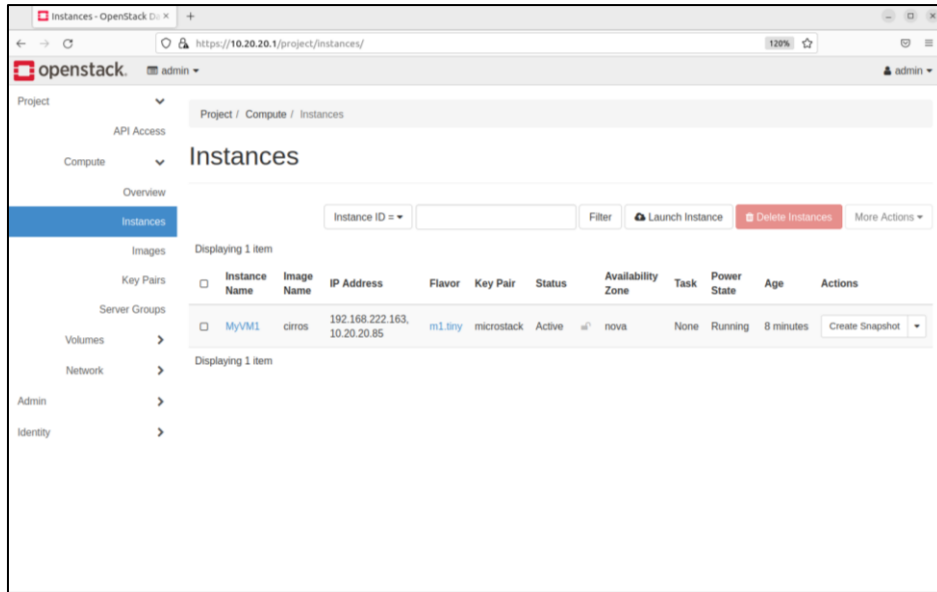
g. Provide Key Name “microstack” and Choose Key Type as “SSH”.





h. Remaining Options “Configuration”, “Server Groups”, “Scheduler Hints” and “Metadata” keep the default values. Launch the Instance.





### 13. Instance Creation using Terminal Interface using the given command

#### a. `microstack launch cirros -n MyVM1`

```
dns@dns-VirtualBox: ~
dns@dns-VirtualBox:~$ microstack launch cirros -n MyVM1
Creating local "microstack" ssh key at /home/dns/snap/microstack/common/.ssh/id_microstack
```

```
dns@dns-VirtualBox:~$ microstack launch cirros -n MyVM1
Creating local "microstack" ssh key at /home/dns/snap/microstack/common/.ssh/id_microstack
Launching server ...
Allocating floating ip ...
Server MyVM1 launched! (status is BUILD)

Access it with 'ssh -i /home/dns/snap/microstack/common/.ssh/id_microstack cirros@10.20.20.85'
You can also visit the OpenStack dashboard at https://10.20.20.1:443
dns@dns-VirtualBox:~$
```

### 14. Type the "ssh" command created to login to the system

```
dns@dns-VirtualBox:~$ ssh -i /home/dns/snap/microstack/common/.ssh/id_microstack cirros@10.20.20.85
sign_and_send_pubkey: no mutual signature supported
cirros@10.20.20.85's password:
```

15. Enter “gocubsgo” as the password to login to the instance. Create a folder “test” and display it.

```
dns@dns-VirtualBox: ~$ ssh -i /home/dns/snap/microstack/common/.ssh/id_microstack cirros@10.20.20.85
sign and send pubkey: no mutual signature supported
cirros@10.20.20.85's password:
$ mkdir test
$ ls
test
$
```

16. Try Creating another Instance with NetBSD Image using the Command

a. Get the host name using **microstack.openstack hypervisor list**

```
dns@dns-VirtualBox: ~$ microstack.openstack hypervisor list
+-----+-----+-----+-----+-----+
| ID | Hypervisor Hostname | Hypervisor Type | Host IP | State |
+-----+-----+-----+-----+-----+
| 1 | dns-VirtualBox | QEMU | 10.0.2.15 | up |
+-----+-----+-----+-----+-----+
dns@dns-VirtualBox: ~$
```

b. Use the Terminal Command **microstack launch NetBSD -n MyVM2 -f m1.small -t external --availability-zone nova:dns-VirtualBox**

```
Terminal
Sep 4 10:14
dns@dns-VirtualBox: ~$ microstack launch NetBSD -n MyVM2 -f m1.small -t external --availability-zone nova:dns-VirtualBox -w
Launching server ...
```

DNS TMP1

**Result:**

Thus implementation of OpenStack installation to realize IaaS is completed and verified.