

## Experiment-2.3

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**Semester:** 6<sup>th</sup>

**Date of Performance:** 18/03/2024

**Subject Name:** Cloud Computing and Distributed Systems

**Subject Code:** 21CSH-378

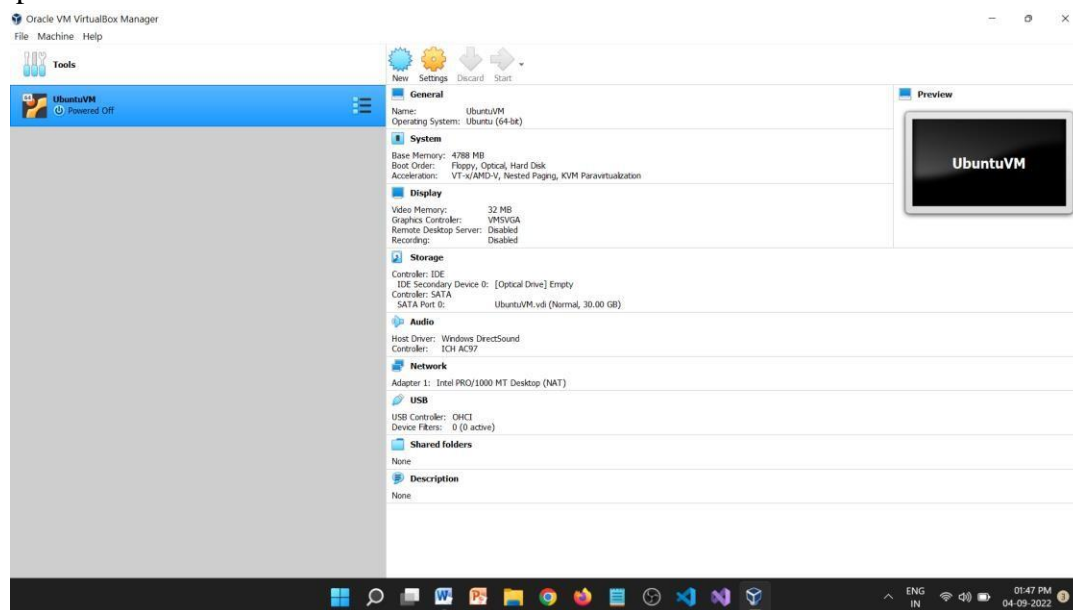
**Aim:** Discover a method for initiating a virtual machine using the TryStack (Online OpenStack Demo)

### Softwares Required

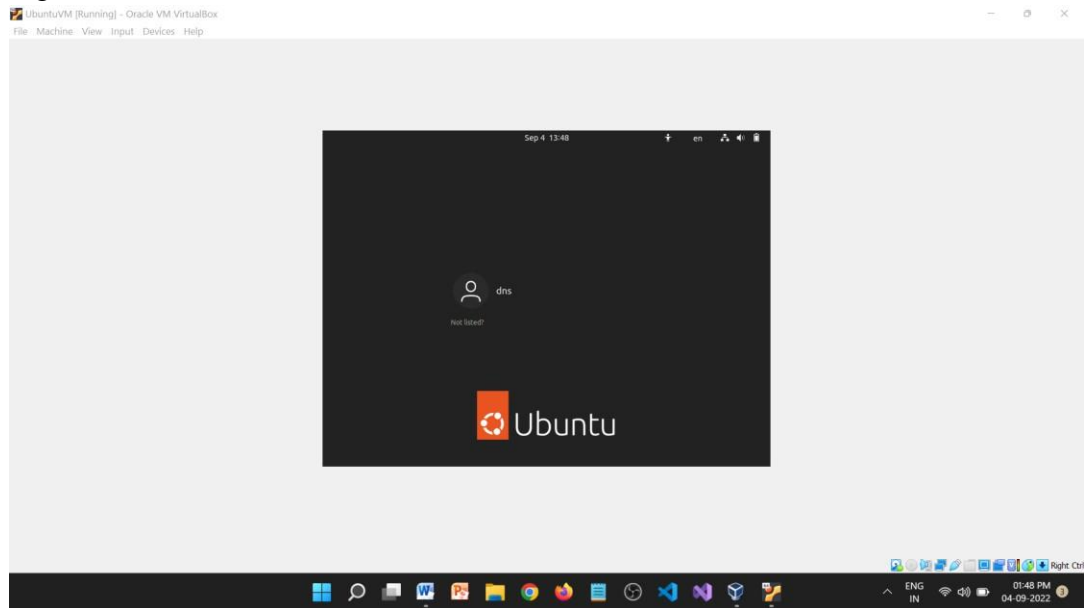
- VM VirtualBox (<https://www.virtualbox.org/wiki/Downloads>)
- Ubuntu OS (<https://ubuntu.com/download/desktop>)

### Procedure:

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

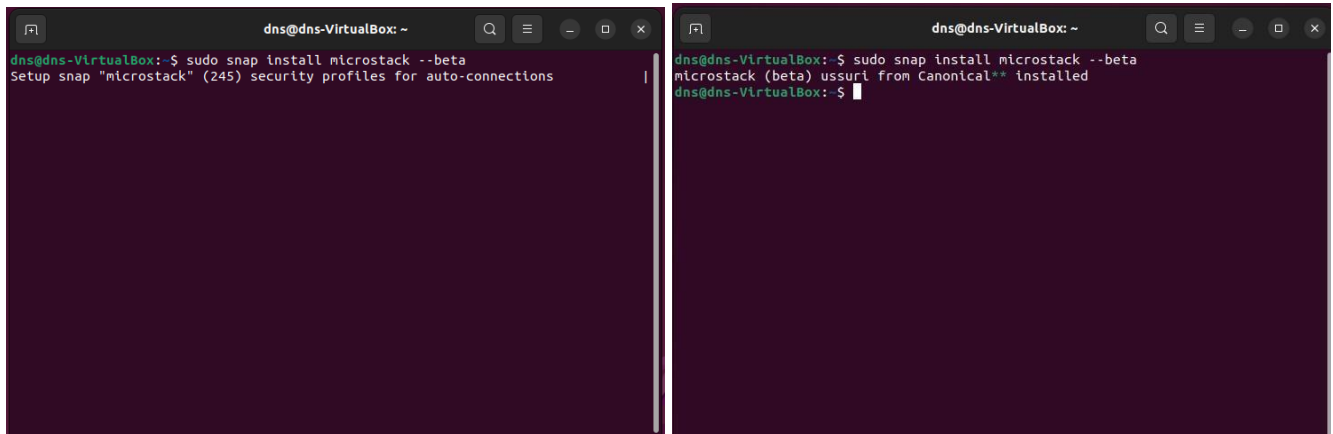


2. Login to the Ubuntu OS.



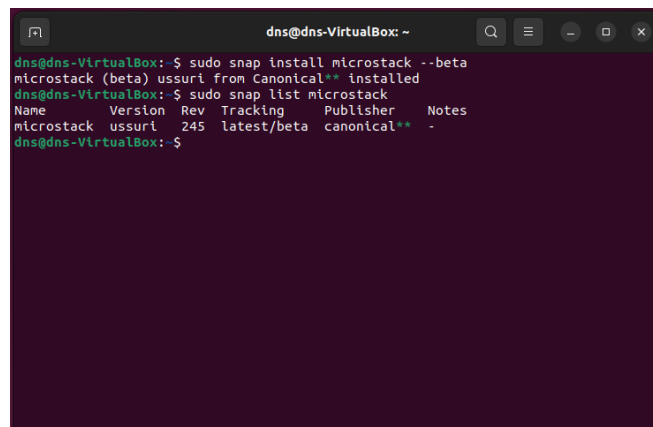
3. Open Terminal and type the command

a. sudo snap install microstack --beta



4. Check installation completion with the command

a. snap list microstack

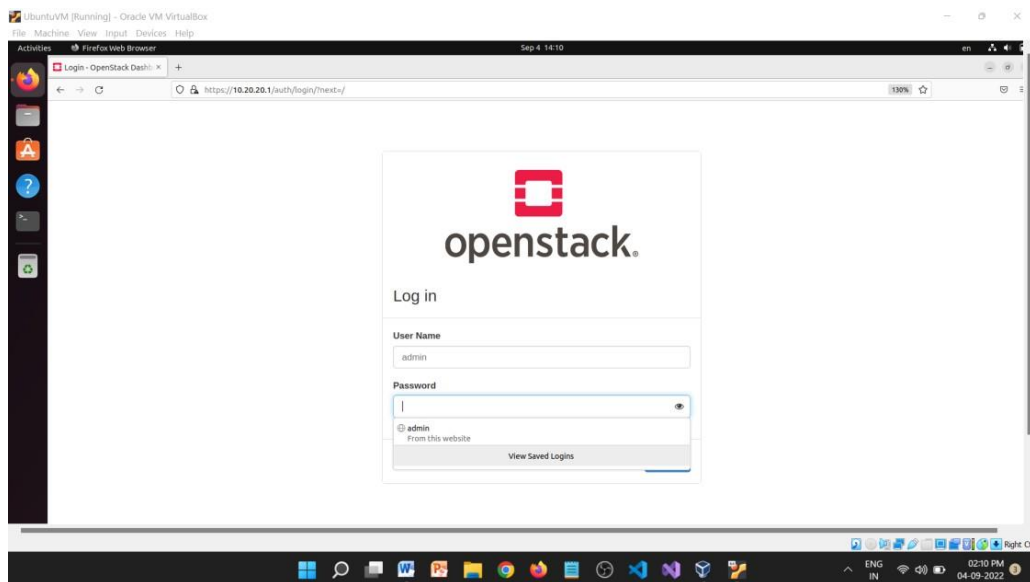


5. Initialize microstack with the command

a. sudo microstack init --auto --control

```
dns@dns-VirtualBox: ~
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.
```

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

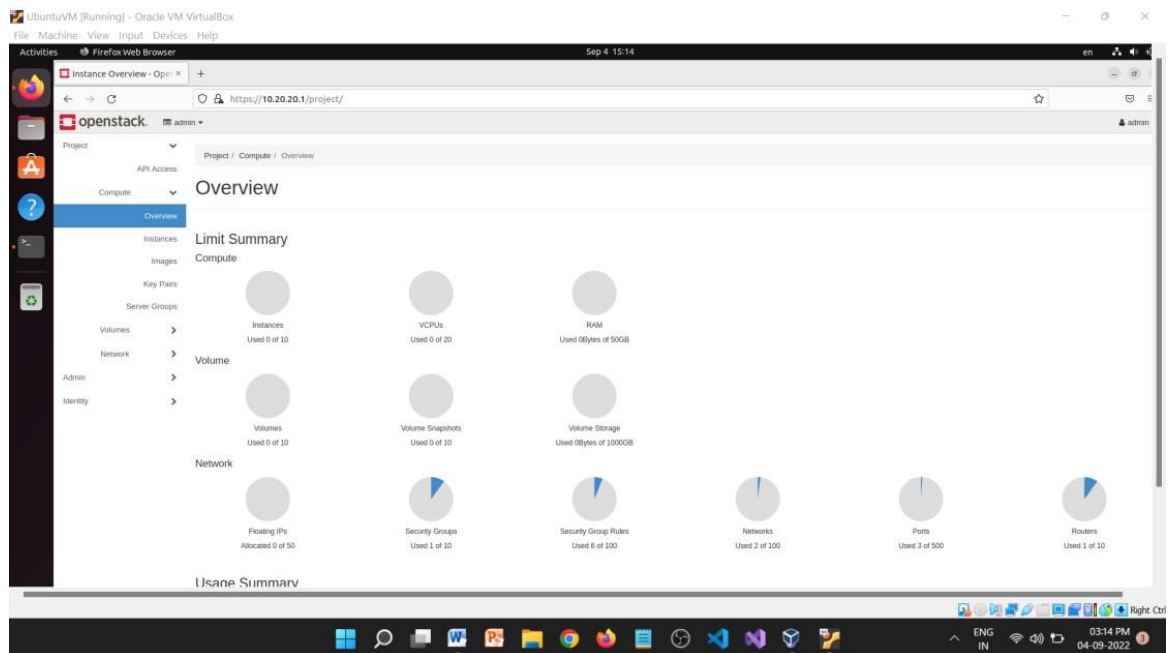
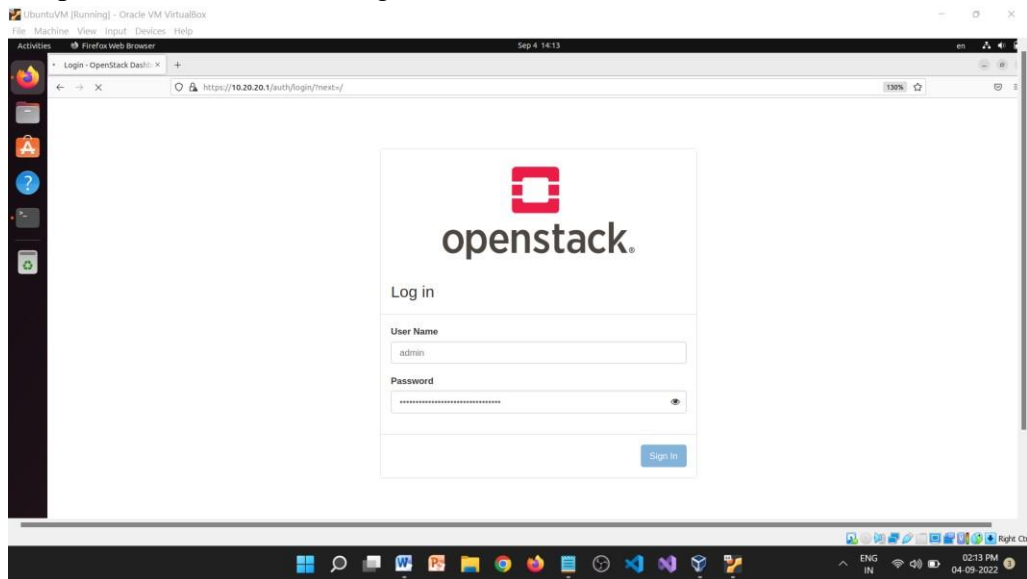


7. Use “admin” as username. Get password for the login from Terminal using the command

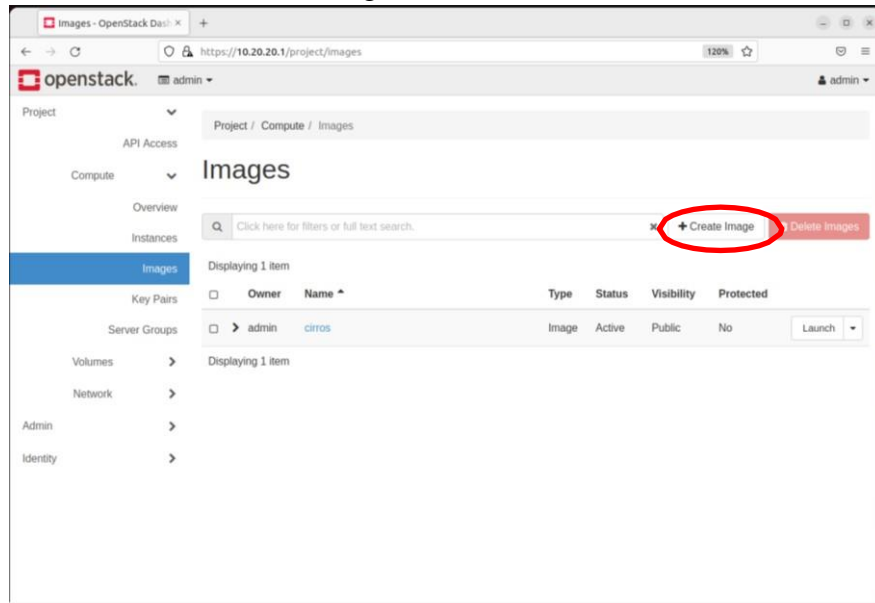
a. sudo snap get microstack config.credentials.keystone-password

```
dns@dns-VirtualBox: ~
dns@dns-VirtualBox:~$ sudo snap get microstack config.credentials.keystone-password
[sudo] password for dns:
6dWlddzyhXbkjdcBR5qMhacouMD41Jb1
dns@dns-VirtualBox:~$
```

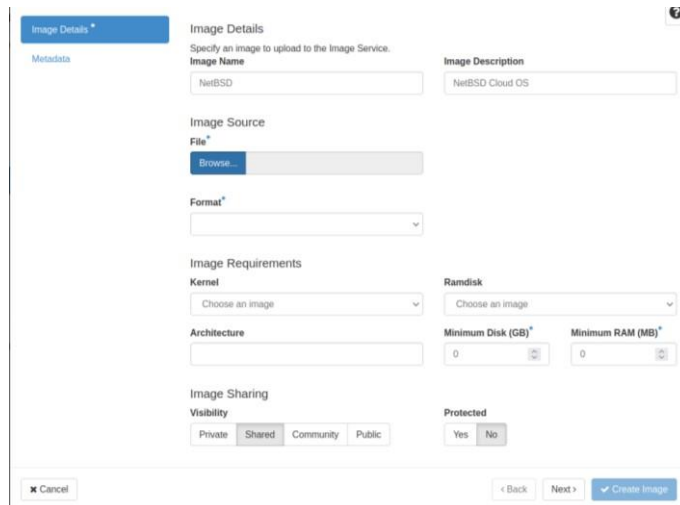
- Copy the password and use it to login to the dashboard.



- Open Images Tab and click Create Image



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

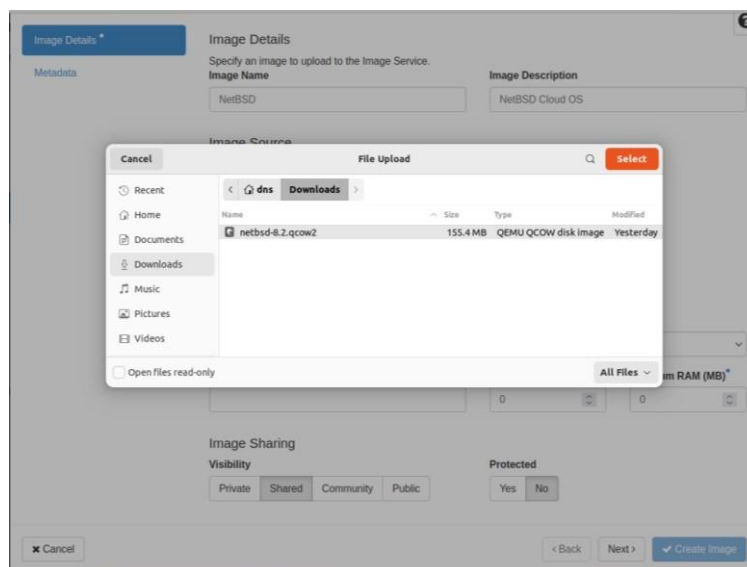


The screenshot shows the 'Image Details' form in the OpenStack dashboard. The form is divided into several sections:
 

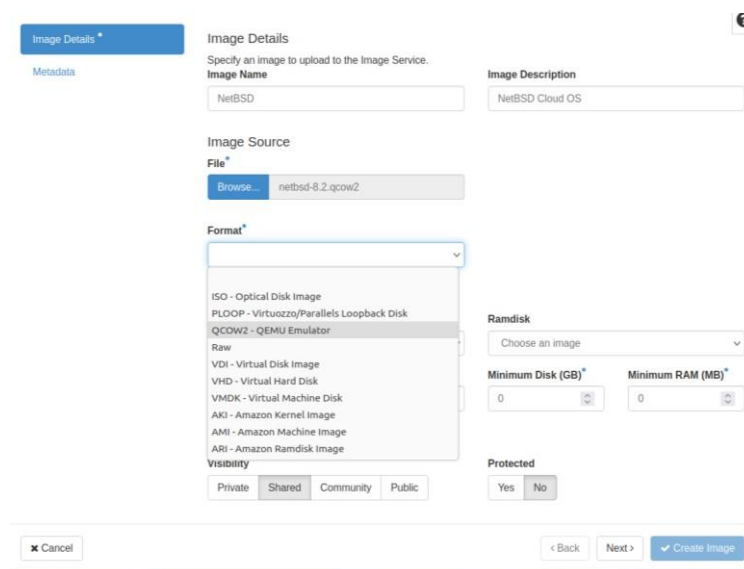
- Image Details:** Includes 'Image Name' (text input with 'NetBSD') and 'Image Description' (text input with 'NetBSD Cloud OS').
- Image Source:** Includes 'File\*' (with a 'Browse...' button) and 'Format\*' (a dropdown menu).
- Image Requirements:** Includes 'Kernel' (a dropdown menu), 'Architecture' (a text input), 'Ramdisk' (a dropdown menu), 'Minimum Disk (GB)\*' (a numeric input with '0'), and 'Minimum RAM (MB)\*' (a numeric input with '0').
- Image Sharing:** Includes 'Visibility' (radio buttons for 'Private', 'Shared', 'Community', 'Public') and 'Protected' (radio buttons for 'Yes', 'No').

 At the bottom, there are buttons for 'Cancel', '< Back', 'Next >', and 'Create Image'.

b. Choose Image Source – Downloaded Cloud OS Image



c. Choose File Format QCOW2



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

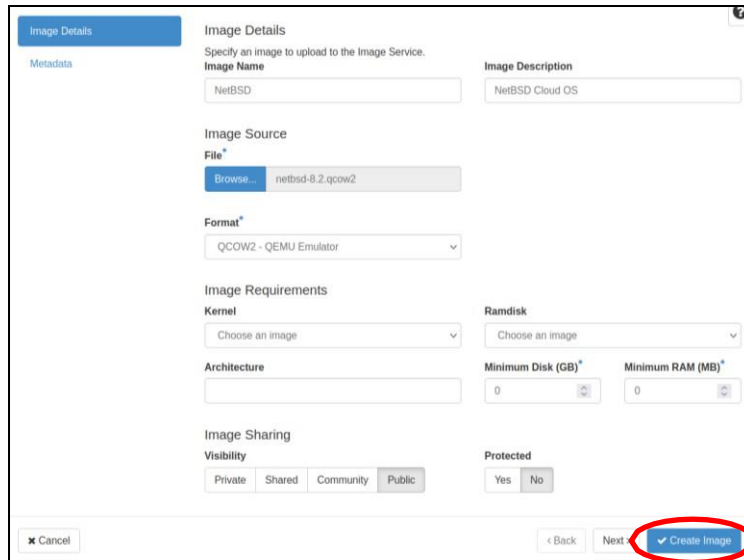


Image Details

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

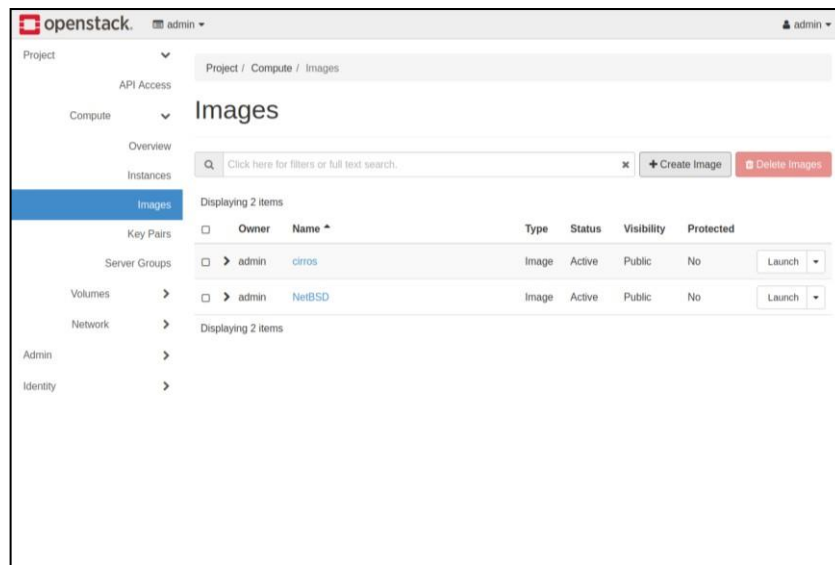
**Image Requirements**  
**Kernel**  
Choose an image

**Architecture**  
Choose an image

**Image Sharing**  
**Visibility**  
Private Shared Community **Public**

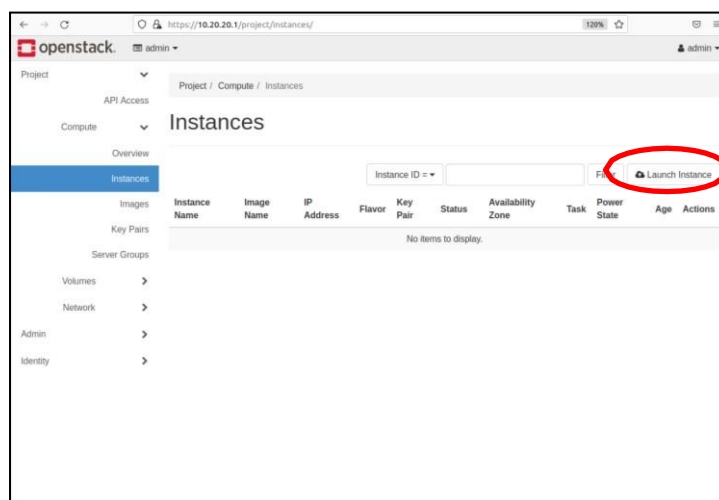
**Protected**  
Yes No

Cancel Back Next **Create Image**

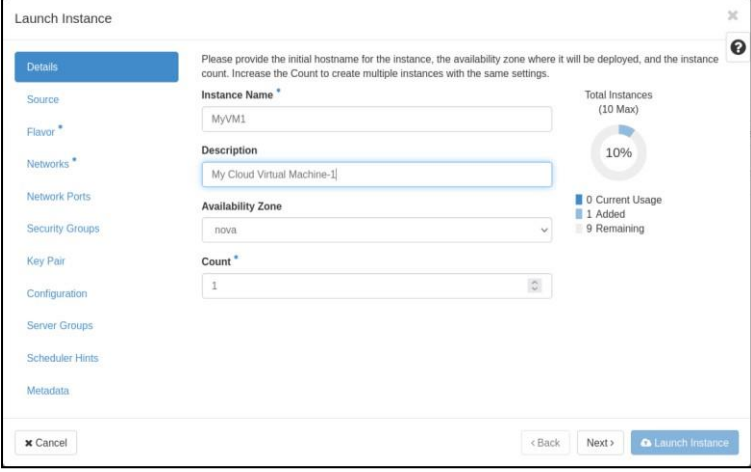


- Create Instance from the available Images using web interface or Terminal Interface.
- Instance Creation Using Web Interface

a. Open Interfaces section and select Launch Instance



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

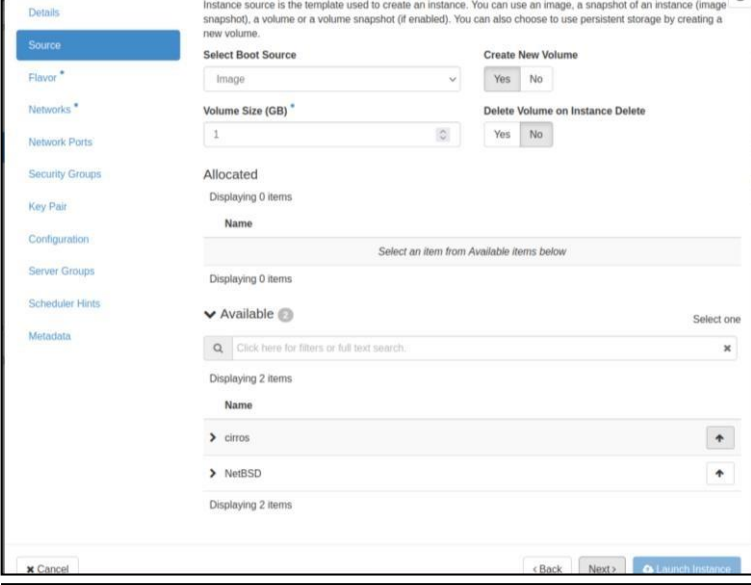
**Count \***  
1

**Total Instances (10 Max)**  
10%  
0 Current Usage  
1 Added  
9 Remaining

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

**Cancel** **< Back** **Next >** **Launch Instance**

c. Select “cirros” as source form the available images



**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 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

**Create New Volume**  
Yes No

**Delete Volume on Instance Delete**  
Yes No

**Allocated**  
Displaying 0 items

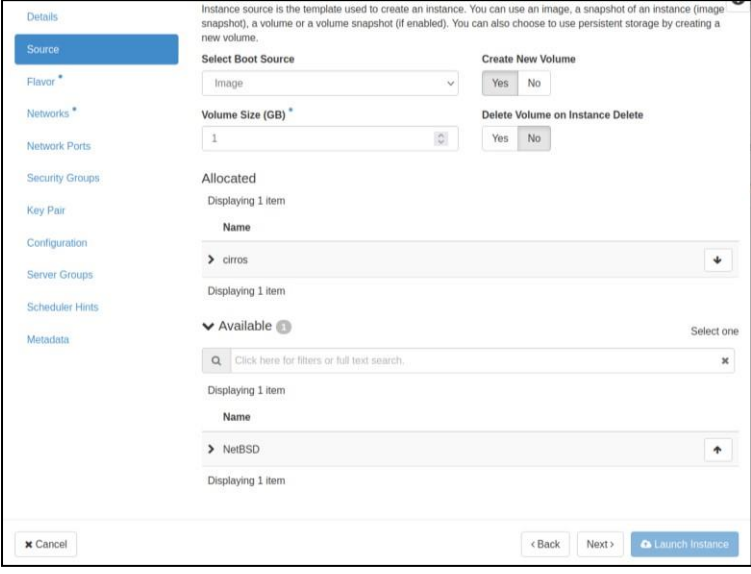
**Available**  
Select one  
Click here for filters or full text search.

**Displaying 2 items**

Name
> cirros
> NetBSD

**Displaying 2 items**

**Cancel** **< Back** **Next >** **Launch Instance**



**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 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

**Create New Volume**  
Yes No

**Delete Volume on Instance Delete**  
Yes No

**Allocated**  
Displaying 1 item

**Available**  
Select one  
Click here for filters or full text search.

**Displaying 1 item**

Name
> NetBSD

**Displaying 1 item**

**Cancel** **< Back** **Next >** **Launch Instance**



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

Launch Instance

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	Public
Select an item from Available items below				

Available

Select one

Click here for filters or full text search.

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

Cancel

Back Next Launch Instance

Launch Instance

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	Public
m1.tiny	1	512 MB	1 GB	Yes

Available

Select one

Click here for filters or full text search.

Name	VCPUS	RAM	Total Disk	Public
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

Cancel

Back Next Launch Instance

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

Launch Instance

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

Select networks from those listed below.

Network	Shared	Admin State	Status
Select an item from Available items below			

Available

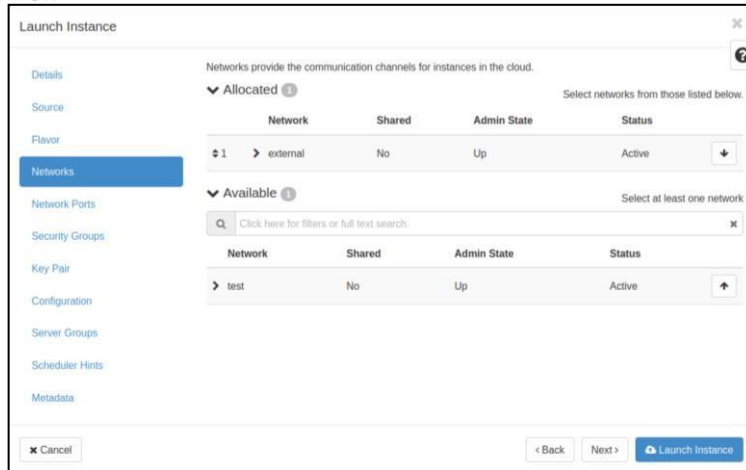
Select at least one network

Click here for filters or full text search.

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

Cancel

Back Next Launch Instance



Launch Instance

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 1

Select networks from those listed below.

Network	Shared	Admin State	Status
external	No	Up	Active

▼ Available 1

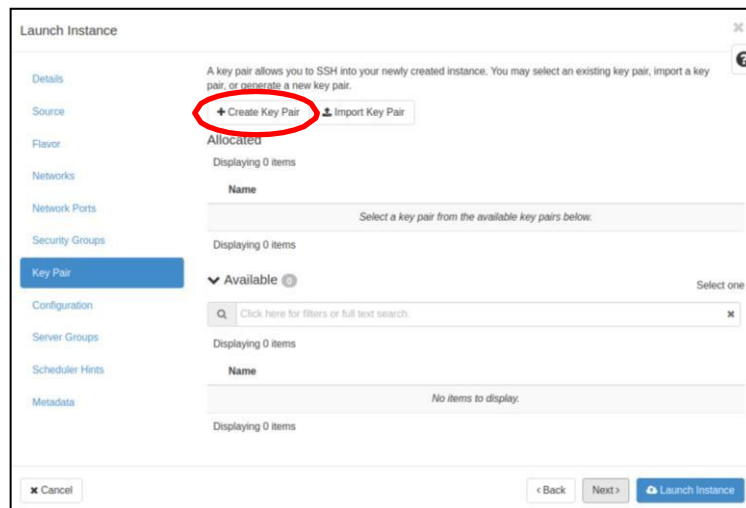
Select at least one network

Click here for filters or full text search.

Network	Shared	Admin State	Status
test	No	Up	Active

Cancel 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.



Launch Instance

Details

Source

Flavor

Networks

Network Ports

Security Groups

**Key Pair**

Configuration

Server Groups

Scheduler Hints

Metadata

A key pair allows you to SSH into your newly created instance. You may select an existing key pair, import a key pair, or generate a new key pair.

+ Create Key Pair Import Key Pair

Allocated

Displaying 0 items

Name

Select a key pair from the available key pairs below.

Displaying 0 items

▼ Available 0

Select one

Click here for filters or full text search.

Displaying 0 items

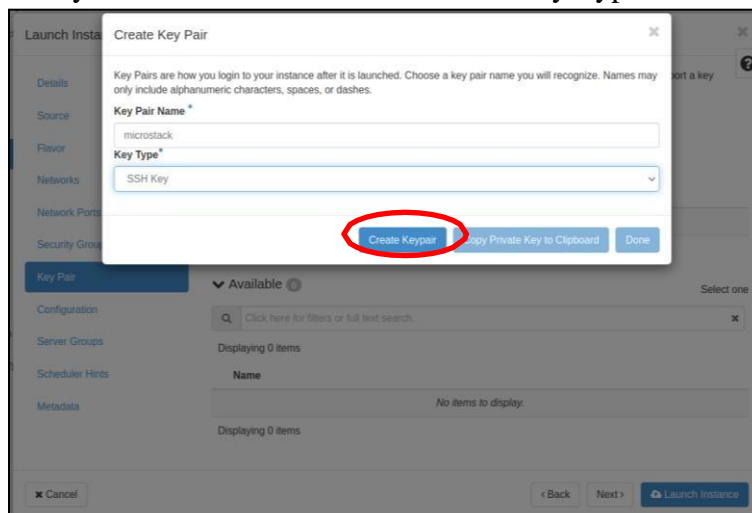
Name

No items to display.

Displaying 0 items

Cancel Back Next Launch Instance

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



Launch Instance

Details

Source

Flavor

Networks

Network Ports

Security Groups

**Key Pair**

Configuration

Server Groups

Scheduler Hints

Metadata

Create Key Pair

Key Pairs are how you login to your instance after it is launched. Choose a key pair name you will recognize. Names may only include alphanumeric characters, spaces, or dashes.

Key Pair Name \*

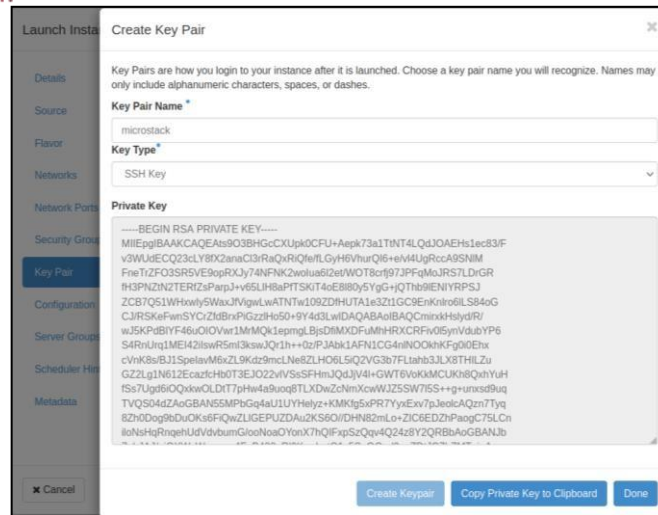
microstack

Key Type \*

SSH Key

Create Keypair Copy Private Key to Clipboard Done

Cancel Back Next Launch Instance



**Create Key Pair**

Key Pairs are how you login to your instance after it is launched. Choose a key pair name you will recognize. Names may only include alphanumeric characters, spaces, or dashes.

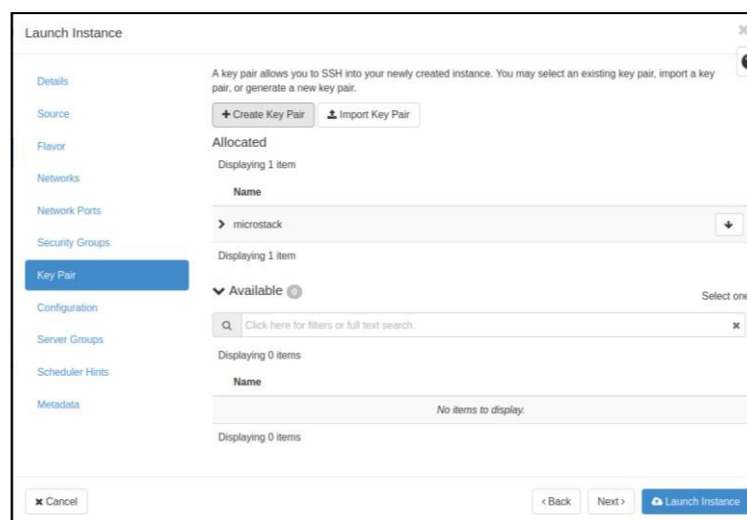
**Key Pair Name \***  
microstack

**Key Type \***  
SSH Key

**Private Key**

```
-----BEGIN RSA PRIVATE KEY-----
MIIEpQIBAAKCAQEA903BHGcCXUpk0CFU+Aepk73a1TtNT4QdJOAEHs1ec83f
v3WUdECQ23cLY8X2anaC3RaQvRQleflGyH6HvurQ6+ehM4UgRccA9SNM
FneTzF03SR5VE9opRXJy74NFk2wolu6i2etWOT8cr973PFqMaJRS7LDGR
fh3PNZIN2TERIZsParpJ+v65LIH8aPRTSGT4ceE880y5YgG+JQThb9ENIYRPSJ
ZCB7Q51Whxly5WaxJfVgwLwATNTw109ZDRHUTA1e321GC9Enkro6LS84oG
CJRSKefwSYCzZld8nPiGzH050+9Y4d3LwIDAQABAoIBAQCminxkHsldR/
wJ5KPdBYF46uOIOVmr1MrMQk1epmgLBjsDMMXDFuMhHRXCRFv05ynVdubYP6
S4RnUrq1MEI42lsW5m13kswJqr1h++OzPJAbk1AFN1CG4nInOOKhFg00Ehx
cVnK8sBJ1SpelavM6xZL9Kdz9mclNe6ZLHO6LSQ2VG3b7FLtuh3JLX8THILZu
GZ2lg1N612EcazfCH0T3EJO22vIV5s5FhmJQd3V4H+GWT6vKkMCUKn8QmYuh
ISa7Uydf0QJxwOLDT77pHw4aBuog8TLXDwZnNmCwWJZSSW7I6S++p+unssd9uq
TVQ5044ZaAGBAN5MPbGa4u1UUYHelyz+KMk95xPR7YpExw7pJedeAQzmTyq
8zh0DogR8DuOKs6fQwZLUGEPUZDAu2K560i/DH#82mLo+ZIC6EDZhpangC75LcN
80NshqRngehUdVdvbumGlosNoaYonX7hQIFxpScQv4Q24z8Y2QRBBaAGBANJb
-----END RSA PRIVATE KEY-----
```

**Cancel** **Create Key Pair** **Copy Private Key to Clipboard** **Done**



**Launch Instance**

A key pair allows you to SSH into your newly created instance. You may select an existing key pair, import a key pair, or generate a new key pair.

**Create Key Pair** **Import Key Pair**

**Allocated**

Displaying 1 item

Name
microstack

Displaying 1 item

**Available** 0

Select one

Click here for filters or full text search.

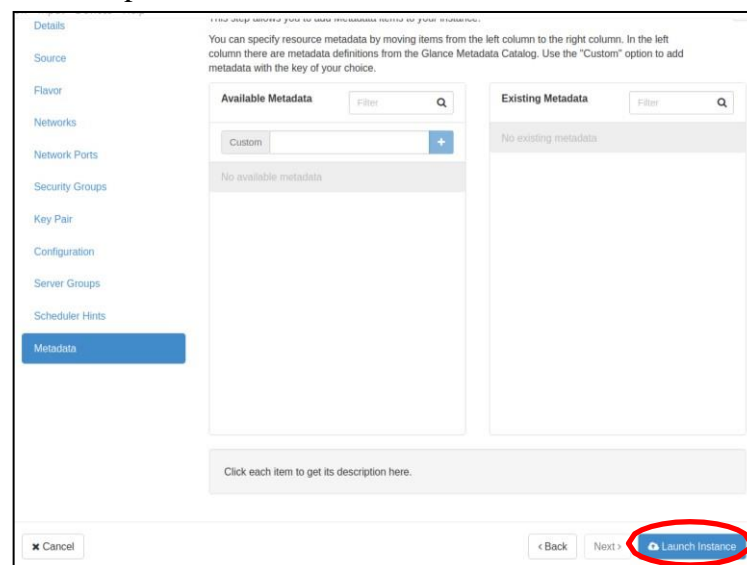
Displaying 0 items

Name	
No items to display.	

Displaying 0 items

**Cancel** **Back** **Next** **Launch Instance**

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



**Launch Instance**

You can specify resource metadata by moving items from the left column to the right column. In the left column there are metadata definitions from the Glance Metadata Catalog. Use the “Custom” option to add metadata with the key of your choice.

**Available Metadata** Filter Q

Custom +

No available metadata

**Existing Metadata** Filter Q

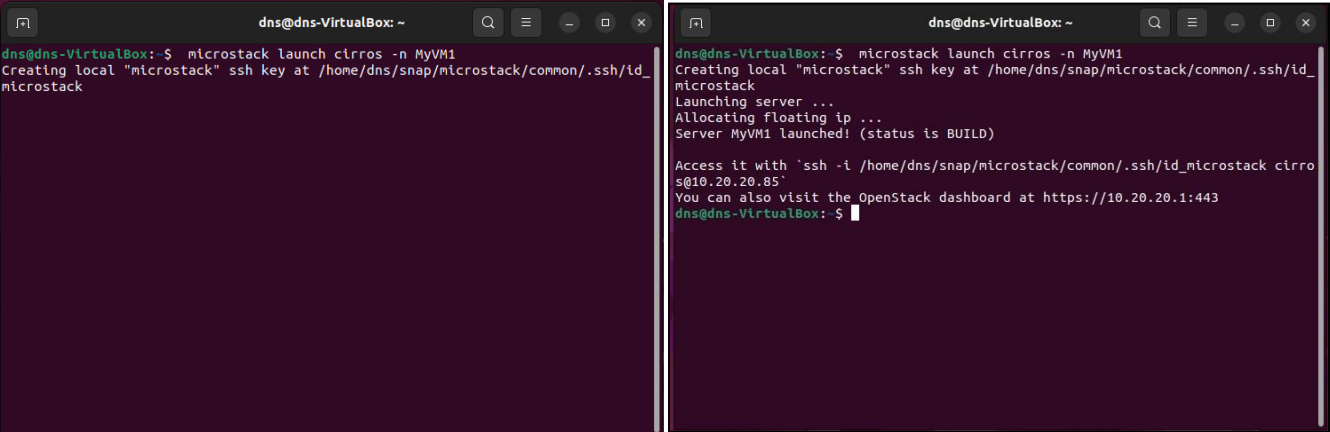
No existing metadata

Click each item to get its description here.

**Cancel** **Back** **Next** **Launch Instance**

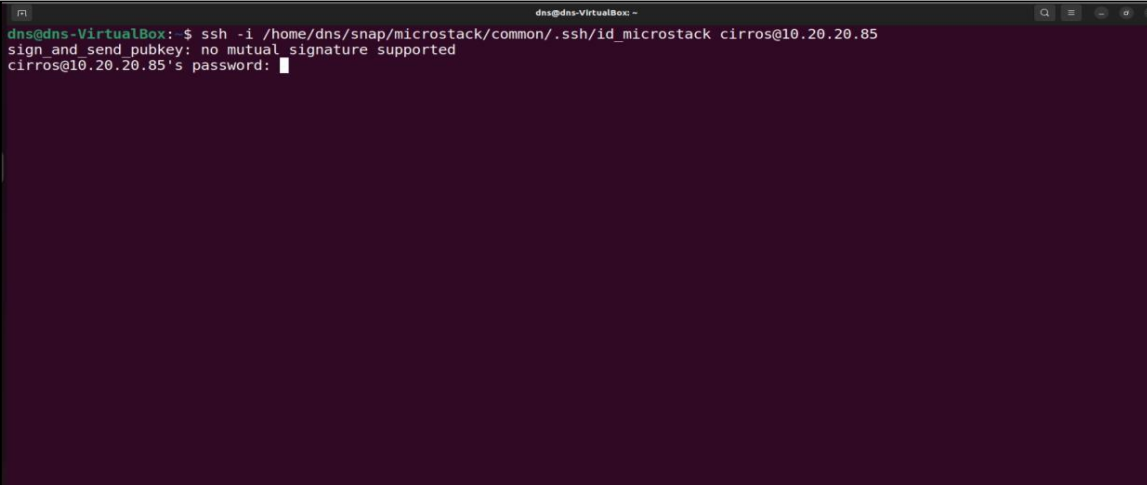
- Instance Creation using Terminal Interface using the given command

a. microstack launch cirros -n MyVM1



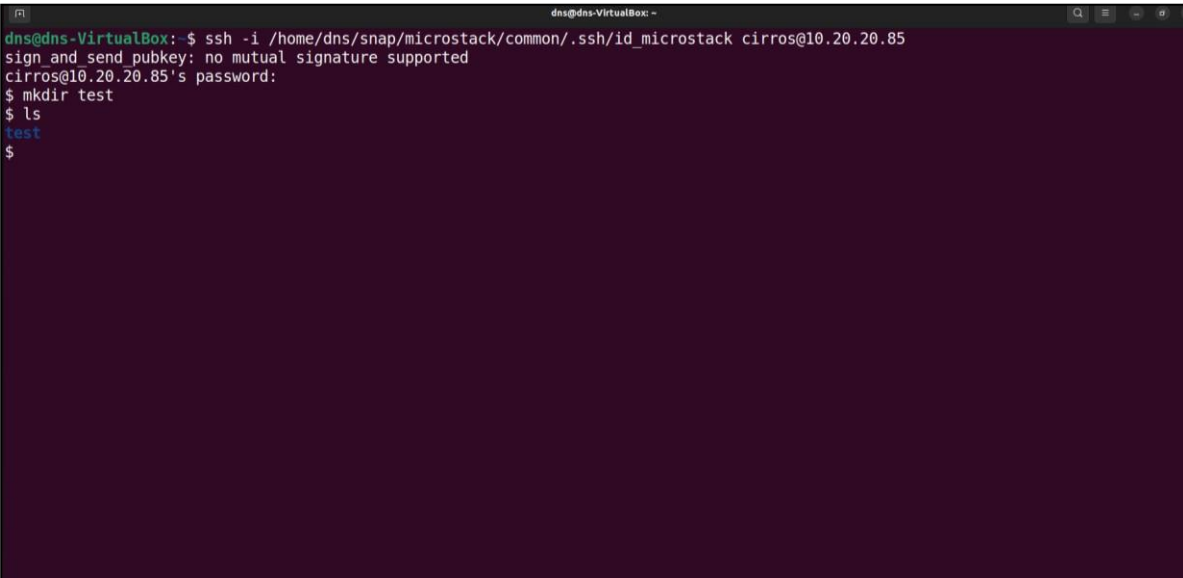
```
dns@dns-VirtualBox: ~  
dns@dns-VirtualBox:~$ microstack launch cirros -n MyVM1  
Creating local "microstack" ssh key at /home/dns/snap/microstack/common/.ssh/id_microstack  
dns@dns-VirtualBox:~$ microstack launch cirros -n MyVM1  
Creating local "microstack" ssh key at /home/dns/snap/microstack/common/.ssh/id_microstack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

- 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:
```

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



```
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  
$
```

- 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 |
+-----+-----+-----+-----+-----+
```

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

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

### Learning Outcomes:

- Learnt the use of try stack.
- Learnt the concept of try stack using virtual box.