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# Cloud Computing Lab

## Project-1

Building SRM Cloud with OpenStack/ CloudStack/any open source cloud OS in Multi-node environment

If each team member is creating more than one virtual machine ( $\geq 2$ ) in their system and establishes a connection between all

your team members and install OpenStack in 6 or 8 nodes (Each Member  $\geq 2$  VMS in a team total 3 or 4 team members. So ( $>2 \times 3 \Rightarrow 6$  or  $>2 \times 4 \Rightarrow 8$ ) VMs.

Where only one controller node, network node and storage node remain 3 or 5 nodes as compute nodes. After installation creates a VM using Dashboard (Successfully installed).

## Control Node :

```
osboxes@osboxes:~$ sudo snap install microstack --beta
[sudo] password for osboxes:
snap "microstack" is already installed, see 'snap help refresh'
osboxes@osboxes:~$ sudo microstack init
Would you like to configure clustering? (yes/no) [default=yes] >
2022-04-25 05:56:11,105 - microstack_init - INFO - Configuring clustering ...
Which role would you like to use for this node: "control" or "compute"? > control
Please enter the IP address of the control node [default=10.143.34] >
2022-04-25 05:56:15,181 - microstack_init - INFO - Setting up as a control node.
2022-04-25 05:56:21,468 - microstack_init - INFO - Generating TLS Certificate and Key
2022-04-25 05:56:25,306 - microstack_init - INFO - Configuring networking ...
2022-04-25 05:56:45,229 - microstack_init - INFO - Opening horizon dashboard up to *
2022-04-25 05:56:47,668 - microstack_init - INFO - Waiting for RabbitMQ to start ...
Waiting for 10.143.34:5672
2022-04-25 05:56:48,865 - microstack_init - INFO - RabbitMQ started!
2022-04-25 05:56:48,867 - microstack_init - INFO - Configuring RabbitMQ ...
2022-04-25 05:56:53,294 - microstack_init - INFO - RabbitMQ Configured!
2022-04-25 05:56:53,426 - microstack_init - INFO - Waiting for MySQL server to start ...
Waiting for 10.143.34:3306
2022-04-25 05:56:55,018 - microstack_init - INFO - MySQL server started! Creating databases ...
2022-04-25 05:56:58,950 - microstack_init - INFO - Configuring Keystone Fernet Keys ...
2022-04-25 05:57:15,333 - microstack_init - INFO - Bootstrapping Keystone ...
2022-04-25 05:57:21,040 - microstack_init - INFO - Creating service project ...
2022-04-25 05:57:25,573 - microstack_init - INFO - Keystone configured!
2022-04-25 05:57:25,661 - microstack_init - INFO - Configuring the Placement service...
2022-04-25 05:57:35,164 - microstack_init - INFO - Running Placement DB migrations...
2022-04-25 05:57:41,303 - microstack_init - INFO - Configuring nova control plane services ...
2022-04-25 05:57:46,081 - microstack_init - INFO - Running Nova API DB migrations (this may take a lot of time)...
2022-04-25 05:58:10,547 - microstack_init - INFO - Running Nova DB migrations (this may take a lot of time)...
Waiting for 10.143.34:8774
2022-04-25 05:59:08,243 - microstack_init - INFO - Creating default flavors...
2022-04-25 05:59:30,868 - microstack_init - INFO - Configuring nova compute hypervisor ...
2022-04-25 05:59:30,868 - microstack_init - INFO - Checking virtualization extensions presence on the host
2022-04-25 05:59:30,916 - microstack_init - WARNING - Unable to determine hardware virtualization support by CPU vendor id "GenuineIntel": assuming it is not supported
2022-04-25 05:59:30,917 - microstack_init - WARNING - Hardware virtualization is not supported - software emulation will be used for Nova instances
2022-04-25 05:59:36,267 - microstack_init - INFO - Configuring the Spice HTML5 console service...
2022-04-25 05:59:37,462 - microstack_init - INFO - Configuring Neutron
Waiting for 10.143.34:9696
2022-04-25 06:00:30,138 - microstack_init - INFO - Configuring Glance ...
2022-04-25 06:01:09,865 - microstack_init - INFO - Creating security group rules ...
2022-04-25 06:01:09,775 - microstack_init - INFO - Configuring the Cinder services...
2022-04-25 06:02:09,147 - microstack_init - INFO - Running Cinder DB migrations...
```

```
osboxes@osboxes:~$ sudo microstack add-compute
Use the following connection string to add a new compute node to the cluster (valid for 20 minutes from this moment):
hKhob3NobmFtZaoxMC4xLjQ2LjM0Q2ZpbmdlcnByaW50xCC8TrU2U8nsszcplILJFGnI/77WcPWjPbFHErMA/M3AHKjpZNgNzIONMQ20ThnYnY1NDg1MTg5MzVjMzk0YTYwNjIxZjanc2VjcV02S
osboxes@osboxes:~$ ssh -i /home/ubuntu/snap/microstack/common/.ssh/id_microstack cirros@10.20.20.204
Warning: Identity file /home/ubuntu/snap/microstack/common/.ssh/id_microstack not accessible: No such file or directory.
^[[ssh: connect to host 10.20.20.204 port 22: No route to host
osboxes@osboxes:~$ ssh -i /home/ubuntu/snap/microstack/common/.ssh/id_microstack cirros@10.20.20.204
Warning: Identity file /home/ubuntu/snap/microstack/common/.ssh/id_microstack not accessible: No such file or directory.
ssh: connect to host 10.20.20.204 port 22: No route to host
osboxes@osboxes:~$ microstack launch cirros --name test --availability-zone nova:pnatulis-ss-mstack-2.project.serverstack
Launching server ...
Uh-oh. Something went wrong launching test. Status is ERROR.
osboxes@osboxes:~$ sudo snap get microstack config.credentials.keystone-password
n3teSgRHSpInyRa2a9rlcFLKlJMN35p
osboxes@osboxes:~$ ssh -i /home/ubuntu/snap/microstack/common/.ssh/id_microstack cirros@10.20.20.204
Warning: Identity file /home/ubuntu/snap/microstack/common/.ssh/id_microstack not accessible: No such file or directory.
ssh: connect to host 10.20.20.204 port 22: No route to host
osboxes@osboxes:~$ microstack launch cirros --name test --availability-zone nova:pnatulis-ss-mstack-2.project.serverstack
Launching server ...
Uh-oh. Something went wrong launching test. Status is ERROR.
osboxes@osboxes:~$ sudo snap get microstack config.credentials.keystone-password
n3teSgRHSpInyRa2a9rlcFLKlJMN35p
osboxes@osboxes:~$ sudo snap get microstack config.credentials.keystone-password
n3teSgRHSpInyRa2a9rlcFLKlJMN35p
```

## Compute Node:

```
sudo snap install microstack --beta
sudo microstack init
```

The above commands are performed on a machine that is designated as compute node(n1) and then the string which has been generated by the controller node is given to join the cluster.

```
Activities Terminal Apr 25 06:10
osboxes@osboxes: ~
osboxes@osboxes:~$ sudo snap install microstack --beta
[sudo] password for osboxes:
snap "microstack" is already installed, see 'snap help refresh'
osboxes@osboxes:~$ sudo microstack init
Would you like to configure clustering? (yes/no) [default=yes] >
2022-04-25 06:08:46,201 - microstack_init - INFO - Configuring clustering ...
Which role would you like to use for this node: "control" or "compute"? > compute
The role must be either "control" or "compute".
Which role would you like to use for this node: "control" or "compute"? > compute
Please enter the ip address of this node [default=10.1.83.126] >
Please enter a connection string returned by the add-compute command > [default=] > hKhob3N0bmFtZaoxMC4xLjQzLjM0q2ZpbmdlcnByaW50xCC8TrU2U8ns
szcpILjFGnjI/77WcPWjPbFHErMA/MJAHKJpZnKgNzI0NWQ20ThnYmY1NDg1MTg5MzVjMzk0YTUwNjIxZjanc2VjcmV0ZS8pTjZzZGZySHJlZhd2b0Q1TLB6RzBxbzZrRk9SRk9sOQ==
2022-04-25 06:10:49,642 - microstack_init - INFO - Setting up as a compute node.
2022-04-25 06:10:58,476 - microstack_init - INFO - TLS certificates must be provided: config.tls.cacert-path, config.tls.cert-path, and confi
g.tls.key-path.
```

```
Activities Terminal Apr 25 06:13
osboxes@osboxes: ~
osboxes@osboxes:~$ sudo snap install microstack --beta
[sudo] password for osboxes:
snap "microstack" is already installed, see 'snap help refresh'
osboxes@osboxes:~$ sudo microstack init
Would you like to configure clustering? (yes/no) [default=yes] >
2022-04-25 06:08:46,201 - microstack_init - INFO - Configuring clustering ...
Which role would you like to use for this node: "control" or "compute"? > compute
The role must be either "control" or "compute".
Which role would you like to use for this node: "control" or "compute"? > compute
Please enter the ip address of this node [default=10.1.83.126] >
Please enter a connection string returned by the add-compute command > [default=] > hKhob3N0bmFtZaoxMC4xLjQzLjM0q2ZpbmdlcnByaW50xCC8TrU2U8ns
szcpILjFGnjI/77WcPWjPbFHErMA/MJAHKJpZnKgNzI0NWQ20ThnYmY1NDg1MTg5MzVjMzk0YTUwNjIxZjanc2VjcmV0ZS8pTjZzZGZySHJlZhd2b0Q1TLB6RzBxbzZrRk9SRk9sOQ==
2022-04-25 06:10:49,642 - microstack_init - INFO - Setting up as a compute node.
2022-04-25 06:10:58,476 - microstack_init - INFO - TLS certificates must be provided: config.tls.cacert-path, config.tls.cert-path, and confi
g.tls.key-path.
2022-04-25 06:11:03,388 - microstack_init - INFO - Configuring networking ...
2022-04-25 06:11:10,528 - microstack_init - INFO - Opening horizon dashboard up to *
2022-04-25 06:11:12,692 - microstack_init - INFO - Disabling local rabbit ...
2022-04-25 06:11:22,616 - microstack_init - INFO - Disabling local MySQL ...
2022-04-25 06:11:25,916 - microstack_init - INFO - Disabling the Placement service...
2022-04-25 06:11:46,379 - microstack_init - INFO - Disabling nova control plane services ...
2022-04-25 06:12:21,519 - microstack_init - INFO - Configuring nova compute hypervisor ...
2022-04-25 06:12:21,520 - microstack_init - INFO - Checking virtualization extensions presence on the host
2022-04-25 06:12:21,550 - microstack_init - WARNING - Unable to determine hardware virtualization support by CPU vendor id "GenuineIntel": as
suming it is not supported.
2022-04-25 06:12:21,555 - microstack_init - WARNING - Hardware virtualization is not supported - software emulation will be used for Nova ins
tances
2022-04-25 06:12:24,127 - microstack_init - INFO - Configuring the Spice HTML5 console service...
2022-04-25 06:12:47,919 - microstack_init - INFO - Creating security group rules ...
2022-04-25 06:12:57,260 - microstack_init - INFO - Disabling Cinder services...
(experimental) Would you like to setup a loop device-backed LVM volume backend for Cinder? (yes/no) [default=no] >
2022-04-25 06:13:46,833 - microstack_init - INFO - restarting libvirt and virtlogd ...
2022-04-25 06:13:48,838 - microstack_init - INFO - Complete. Marked microstack as initialized!
Would you like to setup extra services? (yes/no) [default=no] >
osboxes@osboxes:~$
```

The same has been done on another two nodes.

```
microstack.openstack image list
microstack.openstack hypervisor list
```

```
Activities Terminal Apr 25 14:45
srmap@SRM: ~

srmap@SRM:~$ sudo snap install microstack --beta
[sudo] password for srmap:
microstack (beta) ursuri from Canonical: installed
srmap@SRM:~$ sudo microstack init
Would you like to configure clustering? (yes/no) [default=no] > yes
2022-04-25 14:24:38,654 - microstack_init - INFO - Configuring clustering ...
Which role would you like to use for this node: "control" or "compute"? > compute
Please enter the ip address of this node [default=172.16.50.31] >
Please enter a connection string returned by the add-compute command > [default=] > hkHob3N0bNftZa0xMC4xLjQzLjM0q2ZpbmdlcnByaW50cC8TRu2U8nssz
A/HJAHK3pZnKgNDIXvM3M2Y0YjASNGVWZg4MtcWzdhN2Y2NjMxZjJcnc2VjcWV0ZS8qCvVrHnIjeJ2WYld5THpkbWYMG9DVkQ5RENVUMe1VA==
2022-04-25 14:31:22,765 - microstack_init - INFO - Setting up as a compute node.
2022-04-25 14:31:29,899 - microstack_init - INFO - TLS certificates must be provided: config.tls.cacert-path, config.tls.cert-path, and config.
2022-04-25 14:31:38,736 - microstack_init - INFO - Configuring networking ...
2022-04-25 14:31:34,257 - microstack_init - INFO - Opening horizon dashboard up to *
2022-04-25 14:31:34,910 - microstack_init - INFO - Disabling local rabbit ...
2022-04-25 14:31:35,498 - microstack_init - INFO - Disabling local MySQL ...
2022-04-25 14:31:36,035 - microstack_init - INFO - Disabling the Placement service...
2022-04-25 14:31:36,566 - microstack_init - INFO - Disabling nova control plane services ...
2022-04-25 14:31:36,747 - microstack_init - INFO - Configuring nova compute hypervisor ...
2022-04-25 14:31:38,747 - microstack_init - INFO - Checking virtualization extensions presence on the host
2022-04-25 14:31:38,783 - microstack_init - INFO - Hardware virtualization is supported - KVM will be used for Nova instances
2022-04-25 14:31:40,417 - microstack_init - INFO - Configuring the Spice HTML5 console service...
2022-04-25 14:31:50,796 - microstack_init - INFO - Creating security group rules ...
2022-04-25 14:31:58,491 - microstack_init - INFO - Disabling Cinder services...
(experimental) Would you like to setup a loop device-backed LVM volume backend for Cinder? (yes/no) [default=no] > no
2022-04-25 14:32:10,342 - microstack_init - INFO - restarting libvirt and virtlogd ...
2022-04-25 14:32:36,282 - microstack_init - INFO - Complete. Marked microstack as initialized!
Would you like to setup extra services? (yes/no) [default=no] > no
srmap@SRM:~$ microstack.openstack hypervisor list
+-----+-----+-----+-----+-----+
| ID | Hypervisor | Hostname | Hypervisor Type | Host IP | State |
+-----+-----+-----+-----+-----+
| 1 | osboxes | | QEMU | 10.1.43.34 | up |
+-----+-----+-----+-----+-----+
srmap@SRM:~$ ifconfig
br-ex: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.20.20.1 netmask 255.255.255.0 broadcast 0.0.0.0
    inet6 fe80::c4f9:3aff:fe85:d45 prefixlen 64 scopeid 0x20<link>
```

```
Activities Terminal Apr 25 15:42
srmap@SRM: ~

File "/snap/microstack/245/bin/microstack", line 11, in <module>
    load_entry_point('microstack==0.0.1', 'console scripts', 'microstack')()
File "/snap/microstack/245/lib/python3.8/site-packages/microstack/main.py", line 44, in main
    cmd()
File "/snap/microstack/245/lib/python3.8/site-packages/init/main.py", line 60, in wrapper
    return func(*args, **kwargs)
File "/snap/microstack/245/lib/python3.8/site-packages/init/main.py", line 228, in init
    question.ask()
File "/snap/microstack/245/lib/python3.8/site-packages/init/questions/question.py", line 210, in ask
    self.yes(awr)
File "/snap/microstack/245/lib/python3.8/site-packages/init/questions/_init_.py", line 74, in yes
    role_question.ask()
File "/snap/microstack/245/lib/python3.8/site-packages/init/questions/question.py", line 207, in ask
    self.type = 'auto' or self._input_func(prompt) or default)
File "/snap/microstack/245/lib/python3.8/site-packages/init/questions/clustering.py", line 39, in _input_func
    role = input("{} > ".format(self._question))
KeyboardInterrupt

srmap@SRM:~$ sudo microstack init
Would you like to configure clustering? (yes/no) [default=yes] >
2022-04-25 15:37:29,110 - microstack_init - INFO - Configuring clustering ...
Which role would you like to use for this node: "control" or "compute"? > compute
Please enter the ip address of this node [default=172.16.50.31] >
Please enter a connection string returned by the add-compute command > [default=hkHob3N0bNftZa0xMC4xLjQzLjM0q2ZpbmdlcnByaW50cC8TRu2U8nsszcp1JfGnJ1/77wCPWjPbFHERMA/HJ
AHK3pZnKgNDIXvM3M2Y0YjASNGVWZg4MtcWzdhN2Y2NjMxZjJcnc2VjcWV0ZS8qCvVrHnIjeJ2WYld5THpkbWYMG9DVkQ5RENVUMe1VA==] > hkHob3N0bNftZa0xMC4xLjQzLjM0q2ZpbmdlcnByaW50cC8TRu2U8n
sszcp1JfGnJ1/77wCPWjPbFHERMA/HJAHK3pZnKgNDIXvM3M2Y0YjASNGVWZg4MtcWzdhN2Y2NjMxZjJcnc2VjcWV0ZS8qCvVrHnIjeJ2WYld5THpkbWYMG9DVkQ5RENVUMe1VA==
2022-04-25 15:37:47,001 - microstack_init - INFO - Setting up as a compute node.
2022-04-25 15:37:52,820 - microstack_init - INFO - TLS certificates must be provided: config.tls.cacert-path, config.tls.cert-path, and config.tls.key-path.
2022-04-25 15:37:53,810 - microstack_init - INFO - Configuring networking ...
2022-04-25 15:37:56,739 - microstack_init - INFO - Opening horizon dashboard up to *
2022-04-25 15:37:57,414 - microstack_init - INFO - Disabling local rabbit ...
2022-04-25 15:38:00,698 - microstack_init - INFO - Disabling local MySQL ...
2022-04-25 15:38:01,904 - microstack_init - INFO - Disabling the Placement service...
2022-04-25 15:38:02,482 - microstack_init - INFO - Disabling nova control plane services ...
2022-04-25 15:38:04,971 - microstack_init - INFO - Configuring nova compute hypervisor ...
2022-04-25 15:38:04,997 - microstack_init - INFO - Checking virtualization extensions presence on the host
2022-04-25 15:38:06,721 - microstack_init - INFO - Hardware virtualization is supported - KVM will be used for Nova instances
2022-04-25 15:38:08,191 - microstack_init - INFO - Configuring the Spice HTML5 console service...
2022-04-25 15:38:48,191 - microstack_init - INFO - Creating security group rules ...
2022-04-25 15:38:58,491 - microstack_init - INFO - Disabling Cinder services ...
```

computeNodes

# Open Stack :

<https://10.20.20.1>

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

Project / Compute / Instances

## Instances

Displaying 5 items

Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions
test	cirros	m1.tiny	microstack		Error	nova	None	No State	0 minutes	Edit Instance
test	cirros	m1.tiny	microstack		Error	nova	None	No State	4 minutes	Edit Instance
test	cirros	m1.tiny	microstack		Error	nova	None	No State	1 hour, 3 minutes	Edit Instance
test	cirros	m1.tiny	microstack		Error	nova	None	No State	1 hour, 5 minutes	Edit Instance
test	cirros	m1.tiny	microstack		Error	nova	None	No State	21 hours, 27 minutes	Edit Instance

Displaying 5 items

## Overview

### Limit Summary

Compute

- Instances: Used 5 of 10
- VCPUs: Used 5 of 20
- RAM: Used 2.5GB of 50GB

Volume

- Volumes: Used 0 of 10
- Volume Snapshots: Used 0 of 10
- Volume Storage: Used 0 bytes of 100GB

Network

- Floating IPs: Allocated 0 of 50
- Security Groups: Used 1 of 10
- Security Group Rules: Used 6 of 100
- Networks: Used 2 of 100
- Ports: Used 3 of 500
- Routers: Used 1 of 10

### Usage Summary

Select a period of time to query its usage:

The date should be in YYYY-MM-DD format.