

Ex. No: 6

Date:

Create Virtual Machine in OpenStack Cloud Platform

AIM

To create Virtual Machine in Online OpenStack Cloud Platform.

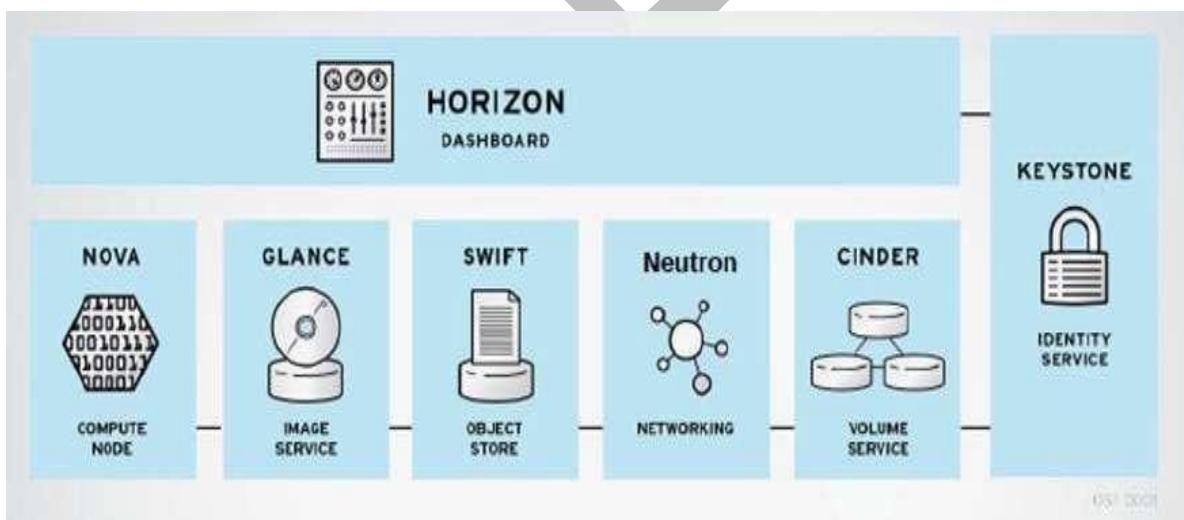
SCENARIO

You are a cloud intern tasked with creating a Virtual Machine (VM) on the OpenStack cloud platform for testing a new application. You will use the OpenStack Horizon Dashboard to set up the VM and configure its resources.

DESCRIPTION

- OpenStack was introduced by Rackspace and NASA in July 2010.
- OpenStack is an Infrastructure as a Service known as Cloud Operating System, that take resources such as Compute, Storage, Network and Virtualization Technologies and control those resources at a data center level
- The project is building an open-source community to share resources and technologies with the goal of creating a massively scalable and secure cloud infrastructure.
- The software is open source and limited to just open-source APIs such as Amazon.

OpenStack Architecture



- It is modular architecture
- Designed to easily scale out
- Based on (growing) set of core services

OPEN STACK COMPONENTS

KEYSTONE

- Identity service
- Common authorization framework
- Manage users, tenants and roles
- Pluggable back-ends (SQL,PAM,LDAP, IDM etc)

NOVA

- Core compute service comprised of
 - Compute Nodes: Hypervisors that run virtual machines
- Supports multiple hypervisors KVM, Xen, LXC, Hyper-V and ESX
 - Distributed controllers that handle scheduling, API calls, etc.
- Native OpenStack API and Amazon EC2 compatible API

GLANCE

- Image service
- Stores and retrieves disk images (Virtual machine templates)
- Supports RAW, QCOW, VHD, ISO, OVF & AMI/AKI
- Back-end Storage: File System, Swift, Gluster, Amazon S3

SWIFT

- Object Storage service
- Modeled after Amazon's Service
- Provides simple service for storing and retrieving arbitrary data
- Native API and S3 compatible API

NEUTRON

- Network service
- Provides framework for Software Defined Network
- Plugin architecture
 - Allows integration of hardware and software-based network solutions
 - Open vSwitch, Cisco UCS, Standard Linux Bridge, NiCira NVP

CINDER

- Block Storage (Volume) service
- Provides block storage for Virtual Machines (persistent disks)
- Like Amazon EBS service

- Plugin architecture for vendor extensions
- NetApp driver for cinder

HORIZON

- Dashboard
- Provides simple self-service UI for end-users
- Basic cloud administrator functions
 - Define users, tenants, and quotas
 - No infrastructure management

HEAT OpenStack Orchestration

- Provides template driven cloud application orchestration
- Modeled after AWS Cloud Formation
- Targeted to provide advanced functionality such as high availability and auto scaling
- Introduced by Redhat

CEILOMETER

- OpenStack Monitoring and Metering
- **Goal:** To Provide a single infrastructure to collect measurements from an entire OpenStack Infrastructure; Eliminate need for multiple agents attaching to multiple OpenStack Projects
- Primary targets metering and monitoring: Provided extensibility

PROCEDURAL STEPS

Step 1: Switch to “root” user

```
user@vmub-hadoop1:~$ sudo su -  
root@vmub-hadoop1:~# sudo apt-get update
```

Step 2: Install “git” and logout from “root user”

```
root@vmub-hadoop1:~# sudo apt-get install git  
root@vmub-hadoop1:~# exit  
logout  
user@vmub-hadoop1:~$
```

Step 3: Create/Add a user “stack” with “no password”

```
user@vmub-hadoop1:~$ sudo useradd -s /bin/bash -d /opt/stack -m stack  
user@vmub-hadoop1:~$ echo "stack ALL=(ALL) NOPASSWD: ALL" | sudo tee  
/etc/sudoers.d/stack  
stack ALL=(ALL) NOPASSWD: ALL
```

Step 4: Move to “stack” user

```
user@vmub-hadoop1:~$ sudo su - stack
```

Step 5: Clone the “devstack” from the specified link

```
stack@vmub-hadoop1:~$ git clone https://github.com/openstack-dev/devstack
```

```
Cloning into 'devstack'...  
remote: Enumerating objects: 49330, done.  
remote: Counting objects: 100% (2556/2556), done.  
remote: Compressing objects: 100% (836/836), done.  
remote: Total 49330 (delta 1831), reused 2226 (delta 1709), pack-reused 46774  
Receiving objects: 100% (49330/49330), 15.56 MiB | 2.33 MiB/s, done.  
Resolving deltas: 100% (34462/34462), done.  
Checking connectivity... done.
```

Step 6: Move to “/devstack/samples”

```
stack@vmub-hadoop1:~$ cd devstack  
stack@vmub-hadoop1:~/devstack$ ls  
clean.sh      doc      functions      gate      lib      openrc      roles      stackrc  tools  
CONTRIBUTING.rst extras.d  functions-common HACKING.rst LICENSE  playbooks  
run_tests.sh  stack.sh  tox.ini  
data          files    FUTURE.rst     inc       Makefile README.rst samples    tests  
unstack.sh  
stack@vmub-hadoop1:~/devstack$ cd samples  
stack@vmub-hadoop1:~/devstack/samples$ ls  
local.conf local.sh
```

Step 7: Copy “local.conf” file to “devstack”

```
stack@vmub-hadoop1:~/devstack/samples$ cp local.conf ../  
stack@vmub-hadoop1:~/devstack/samples$ cd ..  
stack@vmub-hadoop1:~/devstack$ ls  
clean.sh      doc      functions      gate      lib      Makefile  README.rst  samples  
tests        unstack.sh  
  
CONTRIBUTING.rst  extras.d  functions-common  HACKING.rst  LICENSE  openrc  
roles        stackrc  tools  
data         files    FUTURE.rst     inc      local.conf playbooks  run_tests.sh  
stack.sh  tox.ini
```

Step 8: Open “local.conf” and edit the lines

```
stack@vmub-hadoop1:~/devstack$ nano local.conf
```

```
ADMIN_PASSWORD=p1  
DATABASE_PASSWORD=p1  
RABBIT_PASSWORD=p1  
SERVICE_PASSWORD=p1
```

```
HOST_IP=10.0.2.4  
FLOATING_RANGE=10.0.2.224/27
```

Step 9: Remove the following files to Lock the error

```
stack@vmub-hadoop1:~/devstack$ sudo rm /var/lib/dpkg/lock  
stack@vmub-hadoop1:~/devstack$ sudo rm /var/lib/apt/lists/lock  
stack@vmub-hadoop1:~/devstack$ sudo rm /var/cache/apt/archives/lock  
stack@vmub-hadoop1:~/devstack$ sudo rm -rf /var/lib/apt/lists/*
```

Step 10: To install stack

```
stack@vmub-hadoop1:~/devstack$ FORCE=yes ./stack.sh
```

```
        print a[2]
    }
' /opt/stack/devstack/local.conf
+./stack.sh:main:1489                      set +o xtrace

=====
DevStack Component Timing
(times are in seconds)
=====
run_process          53
test_with_retry      2
apt-get-update       1
osc                  177
wait_for_service     21
dbsync               56
pip_install          149
apt-get              7
-----
Unaccounted time    418
=====
Total runtime        884

This is your host IP address: 10.128.0.8
This is your host IPv6 address: ::1
Horizon is now available at http://10.128.0.8/dashboard
Keystone is serving at http://10.128.0.8/identity/
The default users are: admin and demo
The password: StrongAdminSecret

WARNING:
Using lib/neutron-legacy is deprecated, and it will be removed in the future

Services are running under systemd unit files.
For more information see:
https://docs.openstack.org/devstack/latest/systemd.html

DevStack Version: train
Change: 16d11d27f375b8c027bbc3a1db1885e90ce6c604 Merge "Option "lock_path" from group "DEFAULT"
OS Version: Ubuntu 18.04 bionic

2019-06-04 12:19:19.207 | stack.sh completed in 884 seconds.
```

Accessing OpenStack on a web browser

To access OpenStack via a web browser browse your Ubuntu's IP address as shown.

<https://server-ip/dashboard>

This directs you to a login page as shown.

The image shows two screenshots of the OpenStack interface. The top screenshot is the 'Log in' page, featuring the OpenStack logo and fields for 'User Name' and 'Password'. The bottom screenshot is the 'Overview' page for the 'admin' user, displaying resource usage statistics for Compute, Volume, and Network services.

Log in

User Name:

Password:

Sign In

openstack admin

Project / Compute / Overview

Overview

Limit Summary

Compute	Instances	VCPUs	RAM
Key Pairs	Used 0 of 10	Used 0 of 20	Used 0Bytes of 50GB
Server Groups			
Volumes	Used 0 of 10		
Network		Used 0 of 10	
Admin			
Identity	Used 0 of 10	Volume Snapshots	Volume Storage
		Used 0 of 10	Used 0Bytes of 1000GB

Network

VIVA QUESTIONS

1. What is OpenStack?