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Instructor: Engr. Robin Valenzuela	Semester and SY: 3rd Year 1st Sem

Activity 15: OpenStack Installation (Neutron, Horizon, Cinder)

1. Objectives

Create a workflow to install OpenStack using Ansible as your Infrastructure as Code (IaC).

2. Intended Learning Outcomes

1. Analyze the advantages and disadvantages of cloud services
2. Evaluate different Cloud deployment and service models
3. Create a workflow to install and configure OpenStack base services using Ansible as documentation and execution.

3. Resources

Oracle VirtualBox (Hypervisor)

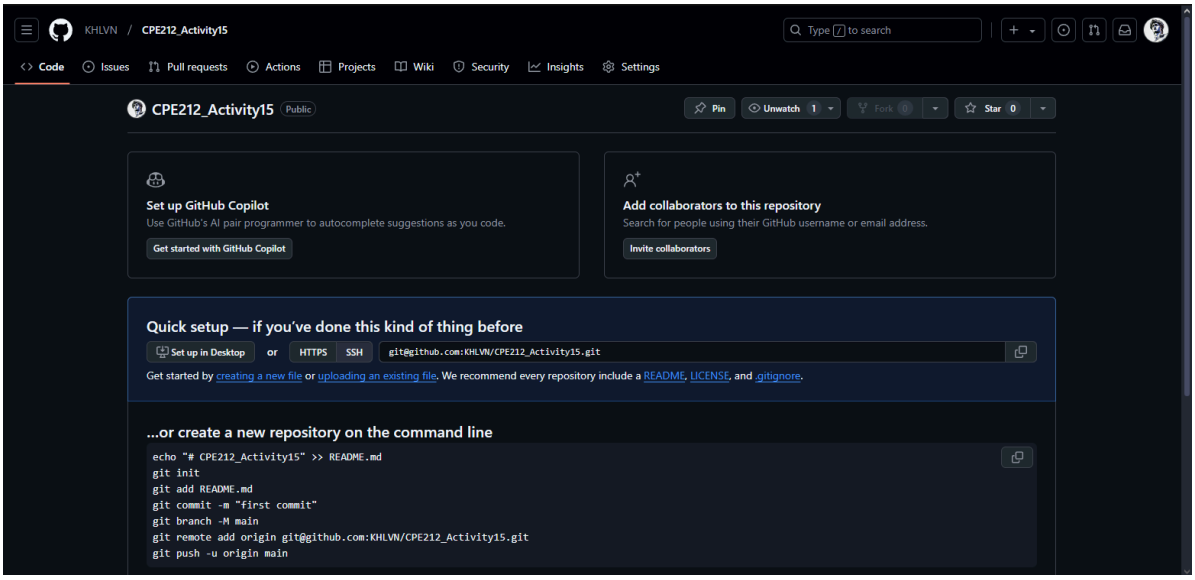
1x Ubuntu VM or Centos VM

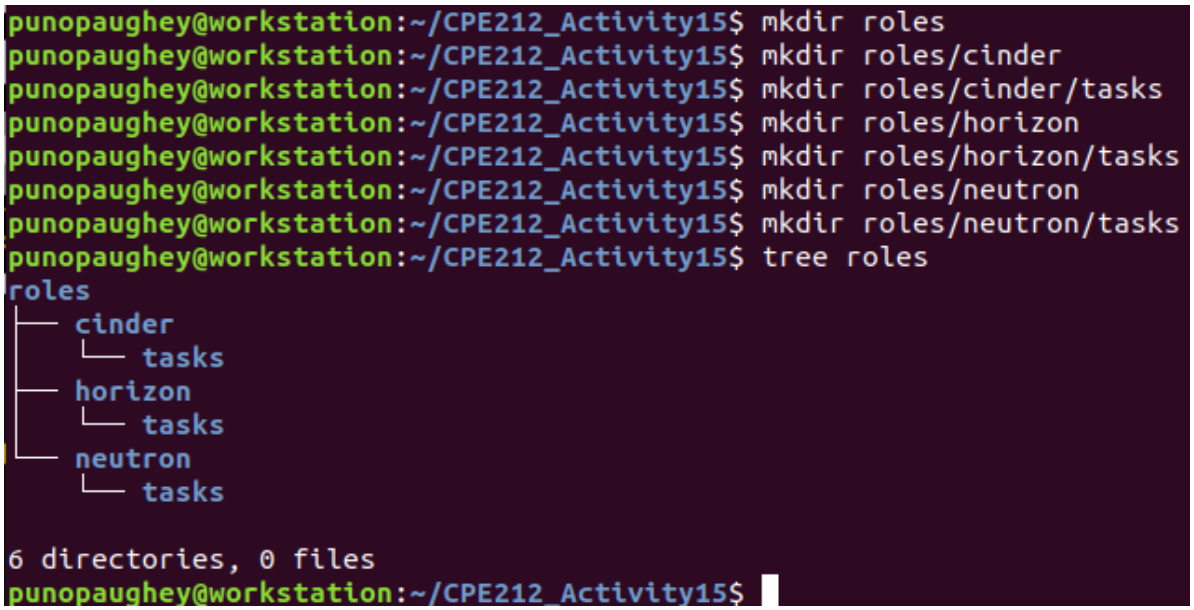
4. Tasks

1. Create a new repository for this activity.
2. Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/
    a. Neutron
    b. Horizon
    c. Cinder
    d. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in the Inventory file.
    e. Add, commit and push it to your GitHub repo.

5. **Output** (screenshots and explanations)

- Create a new repository for this activity.





- Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/
  - Neutron
  - Horizon
  - Cinder
  - Create different plays in installing per server type (controller, compute etc.) and identify it as a group in the Inventory file.

- Creating the setup.yml file

```
punopaughey@workstation:~/CPE212_Activity15$ cat setup.yml
- hosts: all
  become: true
  pre_tasks:

  - name: install updates (Ubuntu)
    tags: ubuntu
    apt:
      update_cache: yes
    when: ansible_distribution == "Ubuntu"

  - name: install updates (CentOS)
    tags: centos
    dnf:
      update_cache: yes
    when: ansible_distribution == "CentOS"

- hosts: all
  become: true
  roles:
    - cinder
    - horizon
    - neutron

punopaughey@workstation:~/CPE212_Activity15$
```

roles/cinder/tasks/main.yml

```
punopaughey@workstation:~/CPE212_Activity15$ cat roles/cinder/tasks/main.yml
---
 - name: Install Cinder (Ubuntu)
   tags: ubuntu
   apt:
     name:
       - cinder-volume
       - python3-mysqldb
     state: latest
   when: ansible_distribution == "Ubuntu"
```

roles/neutron/tasks/main.yml

```
punopaughey@workstation:~/CPE212_Activity15$ cat roles/neutron/tasks/main.yml
---
 - name: Install Neutron (Ubuntu)
   tags: ubuntu, neutron
   apt:
     name:
       - neutron-server
       - neutron-plugin-ml2
       - neutron-dhcp-agent
       - neutron-l3-agent
       - neutron-linuxbridge-agent
       - python3-neutronclient
     state: latest
   when: ansible_distribution == "Ubuntu"
punopaughey@workstation:~/CPE212_Activity15$
```

roles/horizon/tasks/main.yml

```
punopaughey@workstation:~/CPE212_Activity15$ cat roles/horizon/tasks/main.yml
---
 - name: Install Horizon (Ubuntu)
   tags: ubuntu, horizon
   apt:
     name:
       - openstack-dashboard
     state: latest
   when: ansible_distribution == "Ubuntu"

 - name: Restart apache service (Ubuntu)
   tags: ubuntu, horizon
   systemd:
     name: apache2
     state: restarted
     enabled: yes
   when: ansible_distribution == "Ubuntu"

punopaughey@workstation:~/CPE212_Activity15$
```

RUNNING THE PLAYBOOK:

```
BECOME password:

PLAY [all] *********************************************************************

TASK [Gathering Facts] *********************************************************
ok: [server1]

TASK [install updates (Ubuntu)] ************************************************
changed: [server1]

TASK [install updates (CentOS)] ************************************************
skipping: [server1]

PLAY [all] *********************************************************************

TASK [Gathering Facts] *********************************************************
ok: [server1]

TASK [cinder : Install Cinder (Ubuntu)] ****************************************
ok: [server1]

TASK [horizon : Install Horizon (Ubuntu)] **************************************
ok: [server1]

TASK [neutron : Install Neutron (Ubuntu)] **************************************
changed: [server1]

PLAY RECAP *********************************************************************
server1                    : ok=6    changed=2    unreachable=0    failed=0    s
kipped=1    rescued=0    ignored=0
```

```
TASK [Gathering Facts] *********************************************************
ok: [server1]

TASK [horizon : Install Horizon (Ubuntu)] **************************************
ok: [server1]

TASK [horizon : Restart apache service (Ubuntu)] *******************************
changed: [server1]

PLAY RECAP *********************************************************************
server1                    : ok=4    changed=1    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
```

VERIFYING SERVICES

Cinder:

```
punopaughey@server1:~$ systemctl status cinder-volume
● cinder-volume.service - OpenStack Cinder Volume
   Loaded: loaded (/lib/systemd/system/cinder-volume.service; enabled; vendor pr
   Active: active (running) since Fri 2024-12-13 00:32:56 +08; 6s ago
 Main PID: 25871 (cinder-volume)
    Tasks: 1 (limit: 4653)
   CGroup: /system.slice/cinder-volume.service
           └─25871 /usr/bin/python2 /usr/bin/cinder-volume --config-file=/etc/ci
lines 1-7/7 (END)
```

Neutron:

```
punopaughey@server1:~$ systemctl status neutron-server
● neutron-server.service - OpenStack Neutron Server
   Loaded: loaded (/lib/systemd/system/neutron-server.service; enabled; vendor p
   Active: active (running) since Fri 2024-12-13 00:40:22 +08; 3s ago
 Main PID: 5122 (neutron-server)
    Tasks: 1 (limit: 4653)
   CGroup: /system.slice/neutron-server.service
           └─5122 /usr/bin/python2 /usr/bin/neutron-server --config-file=/etc/ne
lines 1-7/7 (END)
```

Horizon:

```
punopaughey@server1:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset:
  Drop-In: /lib/systemd/system/apache2.service.d
           └─apache2-systemd.conf
   Active: active (running) since Fri 2024-12-13 00:51:27 +08; 1min 53s ago
  Process: 25627 ExecStop=/usr/sbin/apachectl stop (code=exited, status=0/SUCCES
  Process: 25711 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCC
 Main PID: 25728 (apache2)
    Tasks: 65 (limit: 4653)
   CGroup: /system.slice/apache2.service
           ├─25728 /usr/sbin/apache2 -k start
           ├─25730 (wsgi:horizon)    -k start
           ├─25731 (wsgi:horizon)    -k start
           ├─25732 (wsgi:horizon)    -k start
           ├─25734 (wsgi:keystone-pu -k start
           ├─25750 (wsgi:keystone-pu -k start
           ├─25751 (wsgi:keystone-pu -k start
           ├─25753 (wsgi:keystone-pu -k start
           ├─25754 (wsgi:keystone-pu -k start
           ├─25755 /usr/sbin/apache2 -k start
           ├─25756 /usr/sbin/apache2 -k start
           ├─25781 /usr/sbin/apache2 -k start
           ├─25784 /usr/sbin/apache2 -k start
           └─25803 /usr/sbin/apache2 -k start
lines 1-24/24 (END)
```

- Add, commit and push it to your GitHub repo.

```
punopaughey@workstation:~/CPE212_Activity15$ git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)

        new file:   ansible.cfg
        new file:   inventory
        new file:   roles/cinder/tasks/main.yml
        new file:   roles/horizon/tasks/main.yml
        new file:   roles/neutron/tasks/main.yml
        new file:   setup.yml
```

```
punopaughey@workstation:~/CPE212_Activity15$ git commit -m "Activity 15"
[master (root-commit) 8aa6a65] Activity 15
 6 files changed, 76 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 roles/cinder/tasks/main.yml
 create mode 100644 roles/horizon/tasks/main.yml
 create mode 100644 roles/neutron/tasks/main.yml
 create mode 100644 setup.yml
punopaughey@workstation:~/CPE212_Activity15$ git push
Counting objects: 15, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (9/9), done.
Writing objects: 100% (15/15), 1.48 KiB | 758.00 KiB/s, done.
Total 15 (delta 0), reused 0 (delta 0)
To github.com:KHLVN/CPE212_Activity15.git
 * [new branch]      master -> master
punopaughey@workstation:~/CPE212_Activity15$
```

Reflections:

Answer the following:

1. Describe Neutron, Horizon and Cinder services

Neutron:

- This is the networking service in OpenStack. It handles all networking-related tasks, such as creating virtual networks, routers, and subnets. Neutron enables connectivity between virtual machines (VMs) and external networks, manages IP address assignments, and supports advanced networking features like load balancing, firewall services, and VPNs.

Horizon:

- Horizon is the web-based user interface for OpenStack. It acts as a dashboard that allows administrators and users to interact with OpenStack services. Through Horizon, users can manage instances, storage, networking, and other resources without relying on the command-line interface. It provides a graphical user interface to perform operations such as launching VMs, attaching storage volumes, or configuring networks.

Cinder:

- This service provides block storage in OpenStack. It allows users to create, manage, and attach persistent storage volumes to VMs. Unlike ephemeral storage (which is lost when a VM is deleted), Cinder volumes persist independently of the VM lifecycle. This makes it suitable for applications requiring consistent and long-term data storage.

Conclusions:

In this last activity, we have installed again three openstack services that are related to the past two activities, which are namely: Neutron, Horizon, and Cinder. These services are commonly used for cloud computing purposes especially the Horizon which sets up an interface where you can interact with your other Openstack services. Moreover, this activity serves as a sneak peek for our third elective subject next semester, and I am excited to delve into another environment for a challenge in systems administration.