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**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)

```
workstation@workstation:~/hoa15$ ansible-playbook --ask-become-pass controller-i
nstaller.yml
BECOME password:

PLAY [Install Neutron] *****************************************************

TASK [Gathering Facts] *****************************************************
ok: [192.168.56.105]

TASK [Install Neutron Packages] ********************************************
ok: [192.168.56.105] => (item=neutron-server)
ok: [192.168.56.105] => (item=neutron-plugin-ml2)

PLAY RECAP *****************************************************************
192.168.56.105             : ok=2    changed=0    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

workstation@workstation:~/hoa15$
```

- verifying that the playbook controller-installer.yml is working

```
  GNU nano 6.2                  controller-installer.yml
---
- name: Install Neutron
  hosts: controller
  become: true
  tasks:
    - name: Install Neutron Packages
      apt:
        name: "{{ item }}"
        state: present
      with_items:
        - neutron-server
        - neutron-plugin-ml2
```

- this is the playbook that will install neutron in ubuntu.

```
workstation@workstation:~/hoa15$ ansible-playbook --ask-become-pass compute-inst
aller.yml
BECOME password:

PLAY [Install Horizon in Ubuntu] ***********************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.105]

TASK [Install OpenStack Horizon] ***********************************************
changed: [192.168.56.105]

TASK [Start and enable Apache service] *****************************************
changed: [192.168.56.105]

PLAY RECAP *********************************************************************
192.168.56.105             : ok=3    changed=2    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

workstation@workstation:~/hoa15$
```

- verifying that the playbook etc-installer.yml is working

```
  GNU nano 6.2                    compute-installer.yml
---
- name: Install Horizon in Ubuntu
  hosts: compute
  become: true

  tasks:

    - name: Install OpenStack Horizon
      apt:
        name: openstack-dashboard
        state: present


    - name: Start and enable Apache service
      service:
        name: apache2
        state: restarted
      become: true
```

- playbook that will install horizon in ubuntu.

```
workstation@workstation:~/hoa15$ ansible-playbook --ask-become-pass etc-installe
r.yml
BECOME password:

PLAY [Install Cinder] ***************************************************

TASK [Gathering Facts] **************************************************
ok: [192.168.56.105]

TASK [Install Cinder Packages] ******************************************
ok: [192.168.56.105] => (item=cinder-api)
ok: [192.168.56.105] => (item=cinder-scheduler)

PLAY RECAP **************************************************************
192.168.56.105             : ok=2    changed=0    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

workstation@workstation:~/hoa15$
```

- verifying that the playbook etc-installer.yml is working

```
  GNU nano 6.2                        etc-installer.yml
---
- name: Install Cinder
  hosts: etc
  become: true
  tasks:
    - name: Install Cinder Packages
      when:
        - ansible_distribution == 'Ubuntu'
      apt:
        name: "{{ item }}"
        state: present
      with_items:
        - cinder-api
        - cinder-scheduler
```

- This is the playbook that will install the cinder package in ubuntu.

```
workstation@workstation:~/hoa15$ git add compute-installer.yml
workstation@workstation:~/hoa15$ git add etc-installer.yml
workstation@workstation:~/hoa15$ git add inventory
workstation@workstation:~/hoa15$ git commit -m hoa15
[main fd0611e] hoa15
 3 files changed, 22 insertions(+), 42 deletions(-)
 rewrite compute-installer.yml (73%)
workstation@workstation:~/hoa15$ git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
Compressing objects: 100% (5/5), done.
Writing objects: 100% (5/5), 700 bytes | 700.00 KiB/s, done.
Total 5 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:yorehh/hoa15.git
   570f17a..fd0611e  main -> main
workstation@workstation:~/hoa15$
```

- this is the code when I pushed and committed it to the github repository.

**Reflections:**

Answer the following:

1. Describe Neutron, Horizon and Cinder services
   - Neutron handles networking, Horizon provides a user interface for managing OpenStack resources, and Cinder offers block-level storage services. Together, these services contribute to the comprehensive set of capabilities provided by OpenStack for building and managing cloud infrastructure.

**Conclusions:**

- In this activity, I have installed 3 cloud services named Neutron, Horizon, and Cinder. These three are additional core services in the OpenStack ecosystem, providing networking, dashboard, and block storage functionalities, respectively. Overall, this activity helped me gain more knowledge on managing servers and installing cloud services.