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Course/Section: CPE31S6	Date Submitted: 12/09/2023
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Activity 13: OpenStack Prerequisite Installation

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

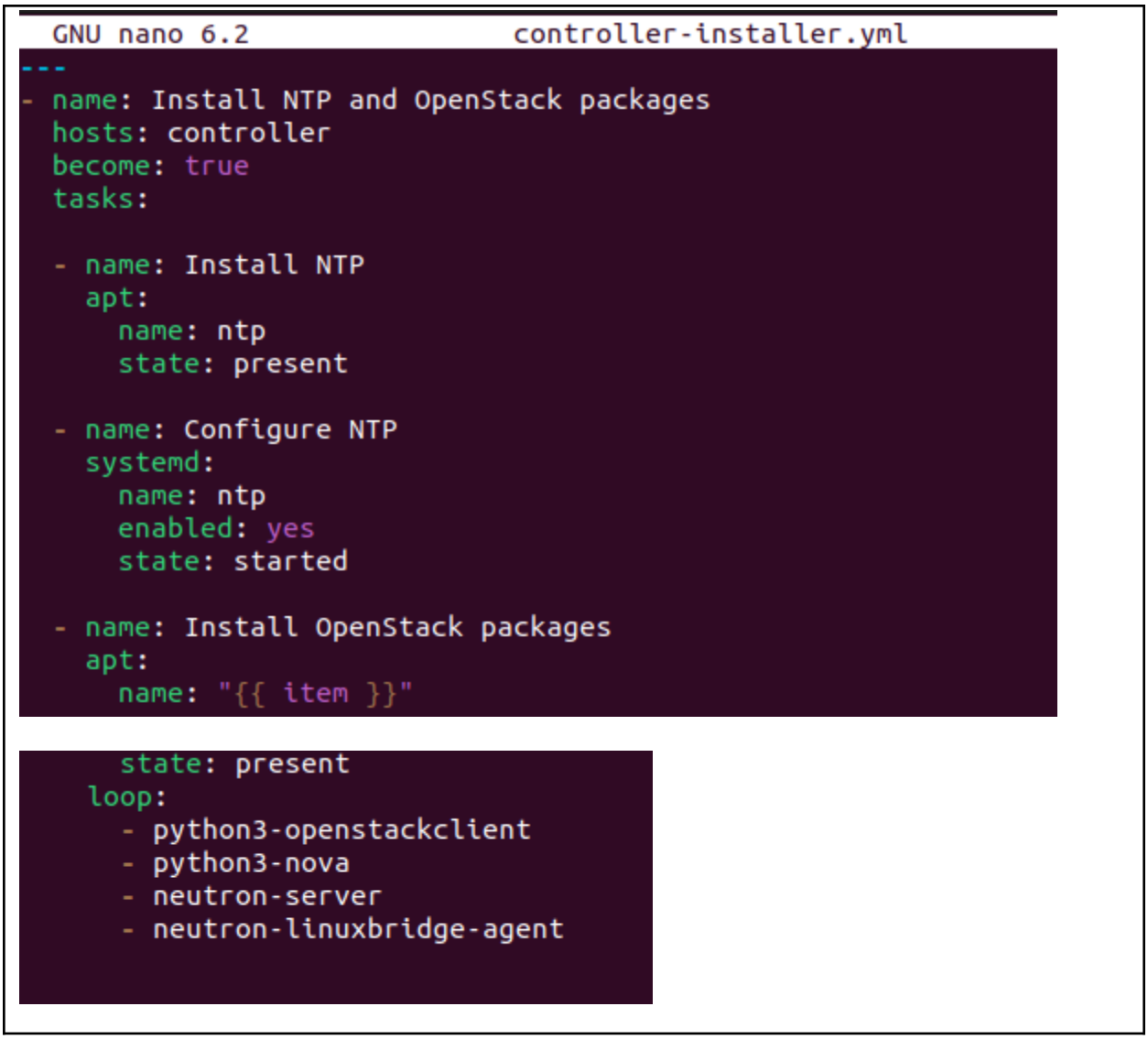
1. Create a new repository for this activity.
2. Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/
    a. NTP
    b. OpenStack packages
    c. SQL Database
    d. Message Queue
    e. Memcached
    f. Etcd
    g. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in Inventory file.
    h. Add, commit and push it to your GitHub repo.

5. Output (screenshots and explanations)

```
 GNU nano 6.2                        compute-installer.yml
---
 name: OpenStack Installation Playbook
 hosts: compute
 become: true
 tasks:

 - name: Install SQL Database (example for MySQL)
   yum:
     name: "{{ item }}"
     state: present
   loop:
     - mariadb-server
     - python3-PyMySQL

 - name: Install Message Queue (example for RabbitMQ)
   yum:
     name: "{{ item }}"
     state: present
   loop:
     - rabbitmq-server
```

```
workstation@workstation:~/hoa13$ ansible-playbook --ask-become-pass compute-inst
aller.yml
BECOME password:

PLAY [OpenStack Installation Playbook] *************************************

TASK [Gathering Facts] *****************************************************
ok: [192.168.56.106]

TASK [Install SQL Database (example for MySQL)] ****************************
changed: [192.168.56.106] => (item=mariadb-server)
changed: [192.168.56.106] => (item=python3-PyMySQL)

TASK [Install Message Queue (example for RabbitMQ)] ************************
changed: [192.168.56.106] => (item=rabbitmq-server)

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

- This playbook allows you to install SQL database and Message queue in CentOS.


GNU nano 6.2 controller-installer.yml

- name: Install NTP and OpenStack packages
hosts: controller
become: true
tasks:
- name: Install NTP
apt:
name: ntp
state: present
- name: Configure NTP
systemd:
name: ntp
enabled: yes
state: started
- name: Install OpenStack packages
apt:
name: "{{ item }}"
state: present
loop:
- python3-openstackclient
- python3-nova
- neutron-server
- neutron-linuxbridge-agent

```
workstation@workstation:~/hoa13$ ansible-playbook --ask-become-pass  controller-in
staller.yml
BECOME password:

PLAY [Install NTP and OpenStack packages] ***********************************

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

TASK [Install NTP] **********************************************************
changed: [192.168.56.105]

TASK [Configure NTP] ********************************************************
ok: [192.168.56.105]

TASK [Install OpenStack packages] *******************************************
changed: [192.168.56.105] => (item=python3-openstackclient)
changed: [192.168.56.105] => (item=python3-nova)
changed: [192.168.56.105] => (item=neutron-server)
changed: [192.168.56.105] => (item=neutron-linuxbridge-agent)

PLAY RECAP ******************************************************************
192.168.56.105             : ok=4    changed=2    unreachable=0    failed=0    ski
pped=0    rescued=0    ignored=0

workstation@workstation:~/hoa13$
```

- this is the playbook that will install NTP and openstack packages on ubuntu.

```
workstation@workstation:~/hoa13$ ansible-playbook --ask-become-pass  etc-installer
.yml
BECOME password:

PLAY [OpenStack Installation Playbook] *************************************

TASK [Gathering Facts] *****************************************************
ok: [192.168.56.106]
ok: [192.168.56.105]

TASK [Install Memcached] ***************************************************
skipping: [192.168.56.106]
changed: [192.168.56.105]

TASK [Install Memcached] ***************************************************
skipping: [192.168.56.105]
changed: [192.168.56.106]

TASK [Install Etcd] ********************************************************
skipping: [192.168.56.106]
changed: [192.168.56.105]

TASK [Install Etcd] ********************************************************
skipping: [192.168.56.105]
changed: [192.168.56.106]

PLAY RECAP *****************************************************************
192.168.56.105             : ok=3    changed=2    unreachable=0    failed=0    ski
pped=2    rescued=0    ignored=0
192.168.56.106             : ok=3    changed=2    unreachable=0    failed=0    ski
pped=2    rescued=0    ignored=0

workstation@workstation:~/hoa13$
```

```
  GNU nano 6.2                          etc-installer.yml
---
- name: OpenStack Installation Playbook
  hosts: etc
  become: true
  tasks:

  - name: Install Memcached
    apt:
      name: memcached
      state: present
    when: ansible_distribution == "Ubuntu"

  - name: Install Memcached
    yum:
      name: memcached
      state: present
    when: ansible_distribution == "CentOS"

  - name: Install Etcd
    apt:
      name: etcd
      state: present
    when: ansible_distribution == "Ubuntu"

  - name: Install Etcd
    yum:
      name: etcd
      state: present
    when: ansible_distribution == "CentOS"
```

- This playbook will install the etcd and memached in the ubuntu and centos servers.

```
workstation@workstation:~/hoa13$ git push origin main
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Compressing objects: 100% (3/3), done.
Writing objects: 100% (3/3), 293 bytes | 293.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To github.com:yorehh/hoa13.git
   5824d97..f399d87  main -> main
workstation@workstation:~/hoa13$
```

- This is the code that will push and commit the playbook into the github repository.

Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?
   - Implementing OpenStack offers various benefits. Firstly, Openstack is an open-source platform which allows you to freely customize it to the needs of the code. Another is its scalability since Openstack is designed to be highly scalable which allows organizations to easily scale their infrastructure.

Conclusions:

In this activity, I was able to create a workflow that will install the OpenStack using ansible playbook as my infrastructure. I was also able to see the different cloud deployment and service models. Overall, this activity helped me gain knowledge when implementing Openstack. It also broaden my knowledge when it comes to managing servers.