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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

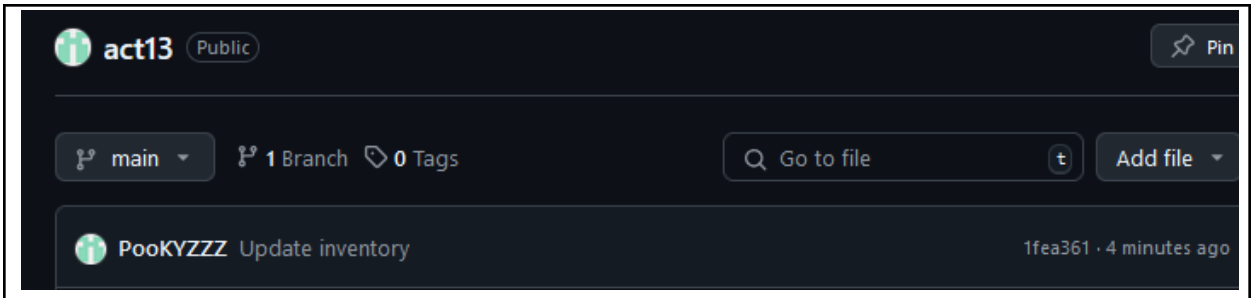
Oracle VirtualBox (Hypervisor)

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 the Inventory file.
    h. Add, commit and push it to your GitHub repo.

5. Output (screenshots and explanations)



- I made a new repository for this activity which I will use to push all my codes.

```
qfmgayao@workstation:~/activities/act13/roles$ ls
etc  ntp  openstack
qfmgayao@workstation:~/activities/act13/roles$
```

- I created roles to separate the codes which will make the codes clean and easy to debug.

```
qfmgayao@workstation: ~/activities/act13/roles/etc/tasks
 GNU nano 6.2                                                main.yml
- name: Install Memcached
  apt:
    name: memcached
    state: present
  when: ansible_os_family == "Debian"

- name: Install Etcd
  apt:
    name: etcd
    state: present
  when: ansible_os_family == "Debian"
```

- Here's my code for my etcd which contains the installation for memcached, and etcd.

qfmgayao@workstation: ~/activities/act13/roles/ntp/tasks

GNU nano 6.2 main.yml

```
- name: Install NTP
  apt:
    name: chrony
    state: present
  when: ansible_os_family == "Debian"

- name: Install SQL Database
  apt:
    name: mysql-server
    state: present
  when: ansible_os_family == "Debian"

- name: Install Message Queue
  apt:
    name: rabbitmq-server
    state: present
  when: ansible_os_family == "Debian"
```

- for this one, this contains the ntp,sql database, and message queue installation.

qfmgayao@workstation: ~/activities/act13/roles/openstack/tasks

GNU nano 6.2 main.yml

```
- name: Install OpenStack packages
  apt:
    name: "{{ item }}"
    state: present
  loop:
    - python3-openstackclient
    - nova-compute
    - neutron-server
    - glance
    - keystone
  when: ansible_os_family == "Debian"
```

- This role consists of openstack packages which we need to install.

```
qfmgayao@workstation:~/activities/act13$ ansible-playbook --ask-become-pass playbook.yml
BECOME password:

PLAY [Deploy OpenStack Components] *********************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [Server1]

TASK [etc : Install Memcached] *************************************************************************************
ok: [Server1]

TASK [etc : Install Etcd] ******************************************************************************************
ok: [Server1]

TASK [ntp : Install NTP] *******************************************************************************************
ok: [Server1]

TASK [ntp : Install SQL Database] **********************************************************************************
ok: [Server1]

TASK [ntp : Install Message Queue] *********************************************************************************
ok: [Server1]

TASK [openstack : Install OpenStack packages] **********************************************************************
ok: [Server1] => (item=python3-openstackclient)
ok: [Server1] => (item=nova-compute)
ok: [Server1] => (item=neutron-server)
ok: [Server1] => (item=glance)
ok: [Server1] => (item=keystone)

PLAY RECAP *********************************************************************************************************
Server1                    : ok=7    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

qfmgayao@workstation:~/activities/act13$
```

- this shows that my command and roles are correct which results in everything successfully installed.

https://github.com/PooKYZZZ/act13

Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?
   - OpenStack is a very cost-effective, open-source solution for managing our cloud infrastructure, which supports both public and private cloud environments, which also reduces licensing costs and offers hardware independence. OpenStack integrates with other third-party tools and provides self-service provisioning for users. It also features robust encryption, multi-tenancy, network isolation, and strong authentication mechanisms.

Conclusions:

- Working on this activity helps me understand the usage of openstack which helps manage our cloud infrastructure, I also understand how to apply ansible on it which can help massively when applying these packages in my other servers.