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Activity 13: OpenStack Prerequisite Installation	

1. Objectives

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

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)

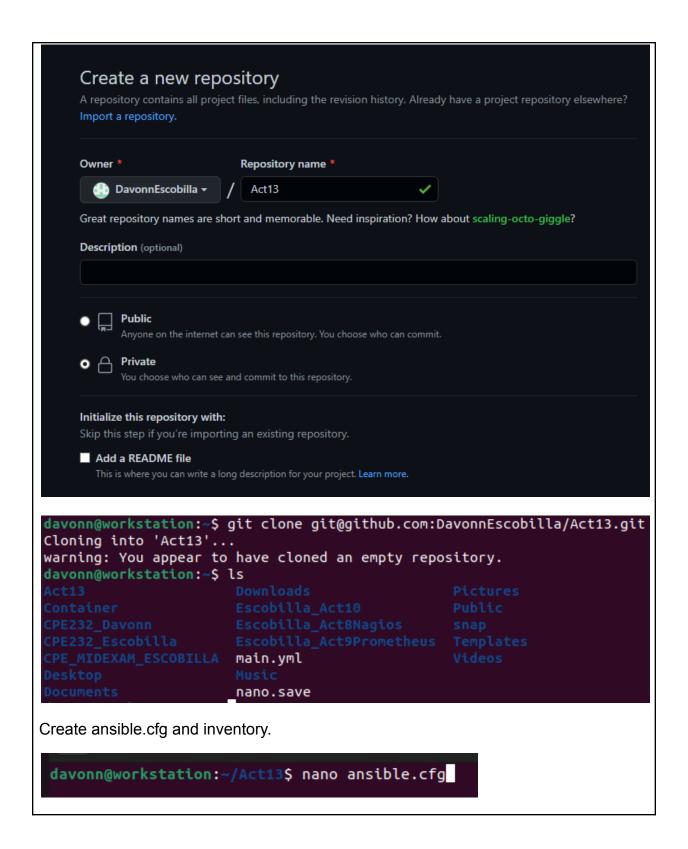
1x Ubuntu VM or Centos VM

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)

First, create a repository for the activity and clone.



```
GNU nano 6.2

[defaults]

deprecation_warnings=False

command_warnings=False

inventory=inventory

private_key_file = ~/.ssh/ansible
```

Here, I created a group to install some specifically.

```
GNU nano 6.2 inventory *

[controller]
192.168.56.106
[compute]
192.168.56.106
```

Next, we create the main.yml

```
davonn@workstation: ~/Act13
 J∓l
  GNU nano 6.2
                                        main.yml *
  hosts: all
  become: true
  pre_tasks:
  - name: install updates Ubuntu
    tags: always
    apt:
      upgrade: dist
      update_cache: yes
    changed when: false
    when: ansible_distribution == "Ubuntu"
  hosts: controller
  become: true
  roles:
    - NTP
    - OpenStack
    - SQL
  hosts: compute
  beocme: true
  roles:
    - Message
    - memcached
    - etcd
Next, create roles for each installation together with the task assigned.
```

davonn@workstation:~/Act13/roles\$ mkdir -p {NTP,OpenStack,SQL,Message,memcached

,etcd}/tasks

Enter each directories and edit each task assigned to them.

Etcd

```
- name: install etcd
apt:
    name: etcd
    state: latest
    update_cache: yes
    when: ansible_distribution == "Ubuntu"

- name: enable etcd
    systemd:
    name: etcd
    enabled: yes
```

Memcached

```
- name: Install memcached
apt:
    name:
        - memcached
        - python3-memcache
        state: latest
        update_cache: yes
    when: ansible_distribution == "Ubuntu"

- name: Restart the memcached
    systemd:
    name: memcached
    state: restarted
```

Message queue

```
---
- name: Install Message Queue
apt:
    name: rabbitmq-server
    state: latest
    update_cache: yes
    when: ansible_distribution == "Ubuntu"
```

NTP

```
- name: Install the chrony
apt:
    name: chrony
    state: latest
    update_cache: yes

- name: Start the chrony
    systemd:
    name: chrony
    state: started

- name: Enable the chrony
    systemd:
    name: chrony
    enabled: yes
```

OpenStack

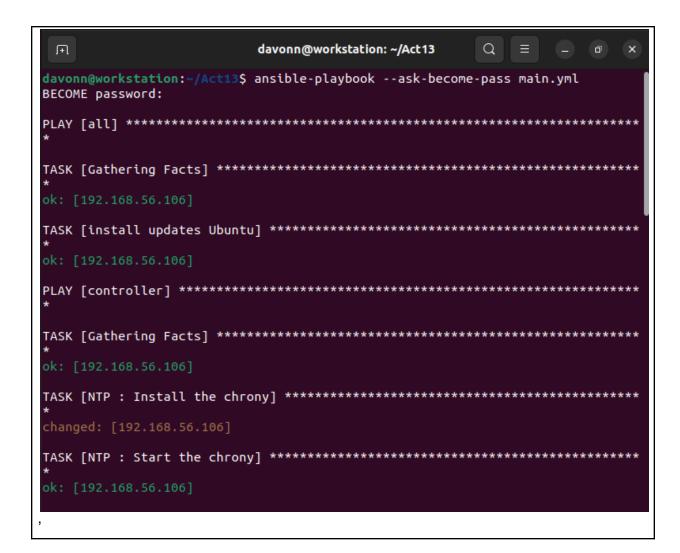
```
---
- name: Install the OpenStack
apt:
    name:
    - nova-compute
    - python3-openstackclient
    state: latest
    update_cache: yes
when: ansible_distribution == "Ubuntu"
```

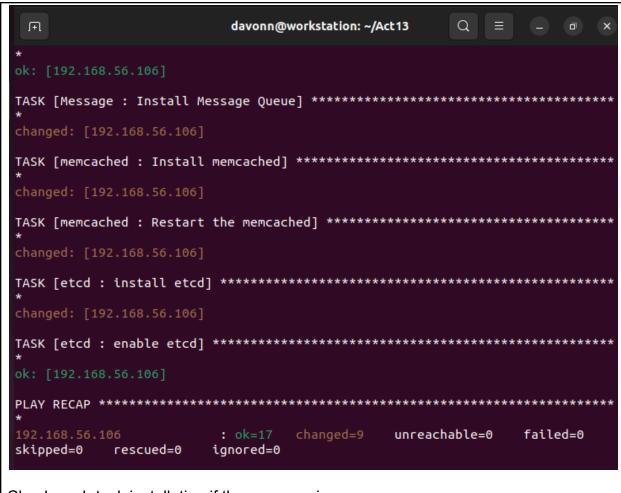
SQL

```
GNU nano 6.2
                                   tasks.yml *
- name: Install the SQL
  apt:
   name:
     - mariadb-server
     python3-pymysql
    state: latest
    update cache: yes
  when: ansible_distribution == "Ubuntu"
- name: Edit mariadb file
  copy:
    content:
      default-storage-engine = innodb
     innodb_file_per_table = on
     max_connections = 4096
     collation-server = utf_general_ci
      character-set-server = utf8
    dest: /etc/mysql/mariadb.conf.d/99-openstack.cnf
    mode: "0755"
- name: Enable the mariadb
  systemd:
     name: mariadb
     enabled: yes
```

```
tasks.yml *
GNU nano 6.2
   state: latest
   update_cache: yes
 when: ansible_distribution == "Ubuntu"
- name: Edit mariadb file
  copy:
   content:
      default-storage-engine = innodb
     innodb file per table = on
      max_connections = 4096
      collation-server = utf_general_ci
      character-set-server = utf8
   dest: /etc/mysql/mariadb.conf.d/99-openstack.cnf
   mode: "0755"
- name: Enable the mariadb
  systemd:
    name: mariadb
    enabled: yes
- name: Restart the mariadb
  systemd:
   name: mariadb
   state: restarted
```

Next, run the main.yml created earlier to perform all the assigned tasks.





Check each task installation if they are running.

```
davonn@server3:~$ systemctl status chrony
chrony.service - chrony, an NTP client/server
     Loaded: loaded (/lib/systemd/system/chrony.service; enabled; vendor prese>
     Active: active (running) since Fri 2022-12-02 15:09:21 PST; 8min ago
       Docs: man:chronyd(8)
             man:chronyc(1)
             man:chrony.conf(5)
   Main PID: 28497 (chronyd)
      Tasks: 2 (limit: 1640)
     Memory: 1.3M
        CPU: 80ms
     CGroup: /system.slice/chrony.service
              -28497 /usr/sbin/chronyd -F 1
             _28498 /usr/sbin/chronyd -F 1
Dec 02 15:09:21 server3 systemd[1]: Starting chrony, an NTP client/server...
Dec 02 15:09:21 server3 chronyd[28497]: chronyd version 4.2 starting (+CMDMON >
Dec 02 15:09:21 server3 chronyd[28497]: Initial frequency 27.118 ppm
Dec 02 15:09:21 server3 chronyd[28497]: Using right/UTC timezone to obtain lea>
Dec 02 15:09:21 server3 chronyd[28497]: Loaded seccomp filter (level 1)
Dec 02 15:09:21 server3 systemd[1]: Started chrony, an NTP client/server.
Dec 02 15:09:26 server3 chronyd[28497]: Selected source 162.159.200.123 (0.ubu>
Dec 02 15:09:26 server3 chronyd[28497]: System clock TAI offset set to 37 seco>
Dec 02 15:09:29 server3 chronyd[28497]: Source 185.125.190.58 replaced with 18>
lines 1-23/23 (END)
davonn@server3:~$ systemctl status nova-compute.service
nova-compute.service - OpenStack Compute
     Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor>
     Active: active (running) since Fri 2022-12-02 15:13:26 PST; 5min ago
   Main PID: 42048 (nova-compute)
     Tasks: 2 (limit: 1640)
     Memory: 122.4M
        CPU: 4.124s
     CGroup: /system.slice/nova-compute.service
              -42048 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc
Dec 02 15:13:26 server3 systemd[1]: Started OpenStack Compute.
Dec 02 15:13:45 server3 nova-compute[42048]: Modules with known eventlet monke
lines 1-12/12 (END)
```

```
davonn@server3:~$ systemctl status rabbitmq-server.service
🔵 rabbitmq-server.service - RabbitMQ Messaging Server
     Loaded: loaded (/lib/systemd/system/rabbitmq-server.service; enabled; ven>
     Active: active (running) since Fri 2022-12-02 15:15:23 PST; 4min 8s ago
   Main PID: 43945 (beam.smp)
      Tasks: 21 (limit: 1640)
     Memory: 79.6M
        CPU: 5.646s
     CGroup: /system.slice/rabbitmg-server.service
              -43945 /usr/lib/erlang/erts-12.2.1/bin/beam.smp -W w -MBas ageff
              -43956 erl_child_setup 65536
              -44003 inet_gethost 4
             └─44004 inet_gethost 4
Dec 02 15:15:19 server3 systemd[1]: Starting RabbitMQ Messaging Server...
Dec 02 15:15:23 server3 systemd[1]: Started RabbitMQ Messaging Server.
lines 1-15/15 (END)
davonn@server3:~$ systemctl status etcd
etcd.service - etcd - highly-available key value store
     Loaded: loaded (/lib/systemd/system/etcd.service; enabled; vendor preset:>
     Active: active (running) since Fri 2022-12-02 15:15:49 PST; 4min 9s ago
       Docs: https://etcd.io/docs
             man:etcd
   Main PID: 45092 (etcd)
      Tasks: 7 (limit: 1640)
     Memory: 5.2M
        CPU: 1.028s
     CGroup: /system.slice/etcd.service
              └─45092 /usr/bin/etcd
Dec 02 15:15:49 server3 etcd[45092]: 8e9e05c52164694d received MsgVoteResp fro
Dec 02 15:15:49 server3 etcd[45092]: 8e9e05c52164694d became leader at term 2
Dec 02 15:15:49 server3 etcd[45092]: raft.node: 8e9e05c52164694d elected leade>
Dec 02 15:15:49 server3 etcd[45092]: setting up the initial cluster version to>
Dec 02 15:15:49 server3 etcd[45092]: set the initial cluster version to 3.3
Dec 02 15:15:49 server3 etcd[45092]: enabled capabilities for version 3.3
Dec 02 15:15:49 server3 etcd[45092]: published {Name:server3 ClientURLs:[http:>
Dec 02 15:15:49 server3 etcd[45092]: ready to serve client requests
Dec 02 15:15:49 server3 etcd[45092]: serving insecure client requests on 127.0>
Dec 02 15:15:49 server3 systemd[1]: Started etcd - highly-available key value >
lines 1-22/22 (END)
```

```
memcached.service - memcached daemon
     Loaded: loaded (/lib/systemd/system/memcached.service; enabled; vendor pr
     Active: active (running) since Fri 2022-12-02 15:15:38 PST; 4min 56s ago
       Docs: man:memcached(1)
  Main PID: 44612 (memcached)
     Tasks: 10 (limit: 1640)
     Memory: 2.0M
        CPU: 131ms
     CGroup: /system.slice/memcached.service
              -44612 /usr/bin/memcached -m 64 -p 11211 -u memcache -l 127.0.0.>
Dec 02 15:15:38 server3 systemd[1]: memcached.service: Deactivated successfull>
Dec 02 15:15:38 server3 systemd[1]: Stopped memcached daemon.
Dec 02 15:15:38 server3 systemd[1]: Started memcached daemon.
lines 1-14/14 (END)
davonn@server3:~$ systemctl status mariadb.service
 mariadb.service - MariaDB 10.6.11 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor pres>
     Active: active (running) since Fri 2022-12-02 15:14:56 PST; 6min ago
       Docs: man:mariadbd(8)
              https://mariadb.com/kb/en/library/systemd/
   Main PID: 43168 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 7 (limit: 1640)
     Memory: 60.7M
        CPU: 468ms
     CGroup: /system.slice/mariadb.service

└─43168 /usr/sbin/mariadbd
Dec 02 15:14:56 server3 systemd[1]: Started MariaDB 10.6.11 database server.
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43185]: Upgrading MySQL tables>
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43188]: error: Found option wi
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43188]: Looking for 'mariadb'
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43188]: Looking for 'mariadb-c
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43188]: This installation of M
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43188]: There is no need to ru
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43188]: You can use --force if
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43219]: Checking for insecure
Dec 02 15:14:56 server3 /etc/mysql/debian-start[43223]: Triggering myisam-reco>
lines 1-23/23 (END)
```

Perform git commands to save the work in the repository.

davonn@server3:~\$ systemctl status memcached.service

Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?

OpenStack provides scalability, easy automation, fast development, and it has a strong community. It is also popular since it can be accessed by many people due to its free use and open-source capability.

Conclusions:

This activity provides the prerequisites about the tools that are needed in order to set up OpenStack. I have performed these various installations via grouping each task assigned to their designated purpose upon navigating into the inventory file. Also, this is performed with the optimization usage of roles to organize the task and distribute it properly on the Ubuntu environment. There are no probable cause to have an error as the configuration about the installation is already given in the link above.