| Name: Pacinos, Angela Monique A. | Date Performed: 11-26-23 |
|------------------------------------|-------------------------------------|
| Course/Section: CPE232 - CPE31S4 | Date Submitted: 11-28-23 |
| Instructor: Dr. Jonathan V. Taylar | Semester and SY: 1st Sem: '23 - '24 |
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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

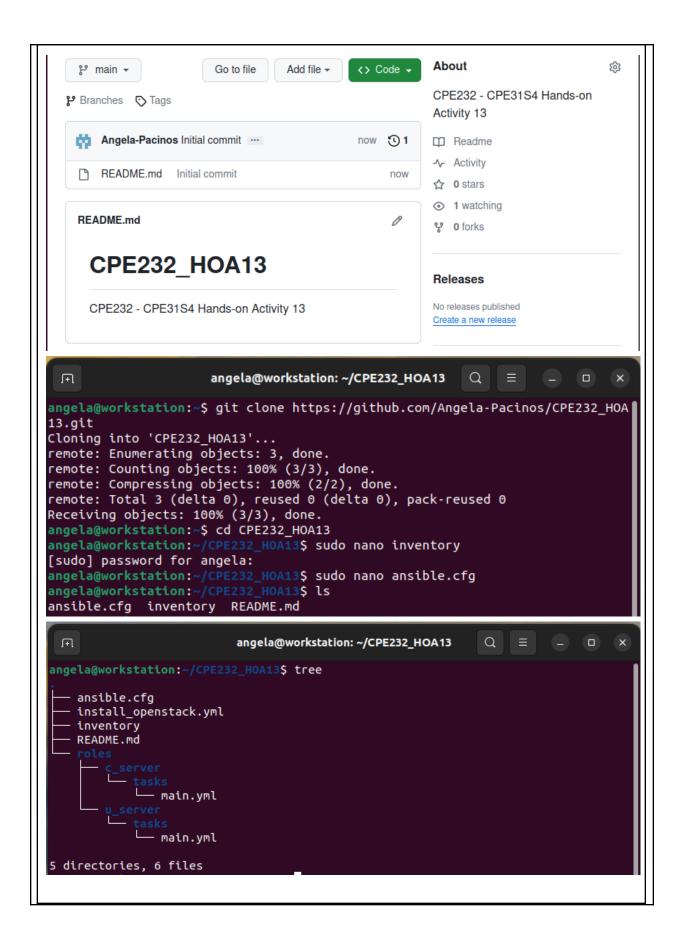
Oracle VirtualBox (Hypervisor)

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)

| INPUT |
|---|
| 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/

for Ubuntu

```
angela@workstation: ~/CPE232_HOA13
 GNU nano 6.2
                              roles/u_server/tasks/main.yml *
 name: Install NTP package
   name: chrony
   state: latest
 name: Edit chrony.conf file
 lineinfile:
   dest: /etc/chrony/chrony.conf
   regexp: "server NTP_SERVER iburst"
line: "server 192.168.56.117 iburst"
 name: Chrony Daemon
   dest: /etc/chrony/chrony.conf
line: "allow 10.0.0.0/24"
   backup: yes
name: NTP Restarting / Enabling
 service:
   name: chrony
   state: restarted
- name: Install Nova-compute
   name: nova-compute
   state: latest
- name: Install OpenStack Client
   name: python3-openstackclient
   state: latest
- name: Install SQL packages
      - mariadb-server
      - python3-pymysql
 name: Create file (SQL)
   dest: /etc/mysql/mariadb.conf.d/99-openstack.cnf
   state: touch
 name: Edit file (SQL)
```

```
ame: Edit file (SQL)
   path: /etc/mysql/mariadb.conf.d/99-openstack.cnf
   state: present
line: "{{ item }}
with_items:
   [mysqld]
bind-address = 10.0.0.11
   default-storage-engine = innodb
- innodb_file_per_table = on

- max_connections = 4096

- collation-server = utf8_general_ci

- character-set-server = utf
name: MySQL Restarting
   name: mysql
   state: restarted
enabled: true
name: Install Message Queue package
   name: rabbitmq-server
state: latest
name: Add RabbitMQ user
command: rabbitmqctl add_user openstack pacinos_tip
name: Permit configuration command: rabbitmqctl set_permissions openstack ".*" ".*" ".*"
name: Install memcached packages
      - memcached
       - python3-memcache
   state: latest
name: Edit file (memcached)
lineinfile:
  path: /etc/memcached.conf
   regexp: "-1 127.0.0.1
line: "-1 10.0.0.11"
name: memcached Restarting
```

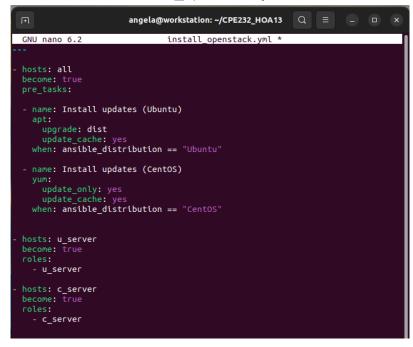
```
for CentOS
                          angela@workstation: ~/CPE232_HOA13
                                                             Q = - -
                                                                                 ×
 GNU nano 6.2
                            roles/c_server/tasks/main.yml *
 name: Install NTP package
   name: chrony
   state: latest
name: Edit chrony.conf file
 lineinfile:
   dest: /etc/chrony.conf
   regexp: "server NTP_SERVER iburst"
line: "server 192.168.56.115 iburst"
name: Chrony Daemon
 lineinfile:
   dest: /etc/chrony.conf
   line: "allow 10.0.0.0/24"
   backup: yes
 name: NTP Starting / Enabling
 service:
   name: chronyd
   state: started
   enabled: yes

    name: Install subscription manager

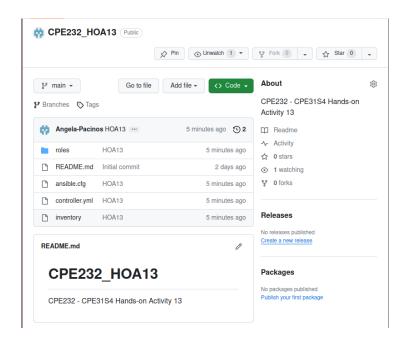
 yum:
   name: subscription-manager
   state: present
name: Enable repositories (openstack)
 command: "subscription-manager repos --enable=rhel-7-server-optional-rpms"
 ignore_errors: true
- name: Add RDO repository
 apt_repository:
   url: https://rdoproject.org/repos/rdo-release.rpm
   state: present
 name: Install OpenStack Client
 yum:
   name: python-openstackclient
- name: Install SQL packages
 yum:
   name:
     - mariadb

    mariadb-server
```

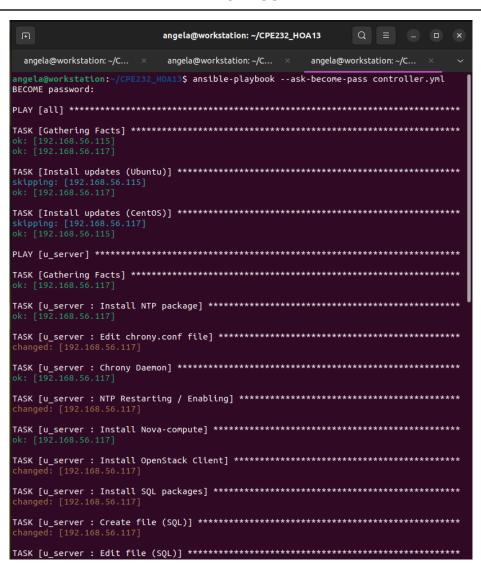
install_openstack.yml



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



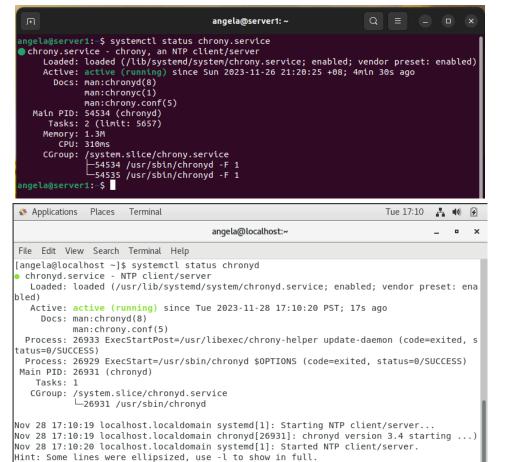
PROCESS



```
(item=mysqld)
(item=bind-address = 10.0.0.11)
  changed: [192.168.56.117] => (item=bind-address = 10.0.0.11)
changed: [192.168.56.117] => (item=)
changed: [192.168.56.117] => (item=default-storage-engine = innodb)
changed: [192.168.56.117] => (item=innodb_file_per_table = on)
changed: [192.168.56.117] => (item=max_connections = 4096)
changed: [192.168.56.117] => (item=collation-server = utf8_general_ci)
changed: [192.168.56.117] => (item=character-set-server = utf8)
TASK [u_server : Install Message Queue package] *********************************
TASK [u_server : Install memcached packages] ***********************************
hanged: [192.168.56.117]
This [0_301.1.4] it is a control of the control of 
 changed: [192.168.56.117] => (item={\regexp\: 'ETCD_ADVERTISE_CLIENT_URLS\, 'line\: 'ETCD_ADVERTISE_CLIENT_URLS\, 'line\: 'ETCD_ADVERTISE_CLIENT_URLS\, 'line\: 'ETCD_ADVERTISE_CLIENT_URLS\, 'line\: 'ETCD_CLIENT_URLS\, 'line\: 'ETCD_LISTEN_CLIENT_URLS\, 'line\: 
ok: [192.168.56.115]
 ok: [192.168.56.115]
 changed: [192.168.56.115]
 changed: [192.168.56.115]
 changed: [192.168.56.115] => (item=mysqld)
changed: [192.168.56.115] => (item=bind-address = 10.0.0.11)
 changed: [192.168.56.115] => (tem=)
changed: [192.168.56.115] => (item=default-storage-engine = innodb)
changed: [192.168.56.115] => (item=innodb_file_per_table = on)
changed: [192.168.56.115] => (item=max_connections = 4096)
changed: [192.168.56.115] => (item=collation-server = utf8_general_ci)
```

OUTPUT

NTP



OpenStack packages

```
angela@server1:~ $ systemctl status nova-compute

nova-compute.service - OpenStack Compute

Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor preset: e>
Active: active (running) since Sun 2023-11-26 21:29:02 +08; 1min 30s ago

Main PID: 67691 (nova-compute)

Tasks: 1 (limit: 5657)

Memory: 140.5M

CPU: 11.295s

CGroup: /system.slice/nova-compute.service

67691 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/nova/nova>

[2]+ Stopped

systemctl status nova-compute

angela@server1:~$
```

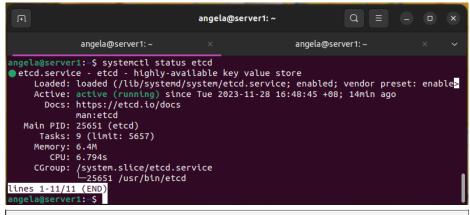
SQL Database

```
angela@server1: ~
angela@server1:~$ systemctl status mariadb
mariadb.service - MariaDB 10.6.12 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enable>
     Active: active (running) since Sun 2023-11-26 21:30:50 +08; 6min ago
       Docs: man:mariadbd(8)
              https://mariadb.com/kb/en/library/systemd/
   Main PID: 68977 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 8 (limit: 5657)
     Memory: 61.0M
        CPU: 1.539s
     CGroup: /system.slice/mariadb.service
└─68977 /usr/sbin/mariadbd
[3]+ Stopped
                                systemctl status mariadb
angela@server1:~S
```

```
angela@localhost:~
File Edit View Search Terminal Help
[angela@localhost ~]$ systemctl status mariadb
mariadb.service - MariaDB database server
  Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; vendor preset: dis
  Active: active (running) since Tue 2023-11-28 18:15:46 PST; 4min 11s ago
Main PID: 22844 (mysqld_safe)
   Tasks: 20
   CGroup: /system.slice/mariadb.service
            —22844 /bin/sh /usr/bin/mysqld_safe --basedir=/usr
           __23008 /usr/libexec/mysqld --basedir=/usr --datadir=/var/lib/mysql --plu...
Nov 28 18:15:44 localhost.localdomain mariadb-prepare-db-dir[22808]: error: Found op...
Nov 28 18:15:44 localhost.localdomain mariadb-prepare-db-dir[22808]: Database MariaD...
Nov 28 18:15:44 localhost.localdomain mariadb-prepare-db-dir[22808]: If this is not ...
Nov 28 18:15:44 localhost.localdomain mariadb-wait-ready[22845]: error: Found option...
Nov 28 18:15:44 localhost.localdomain mariadb-wait-ready[22845]: error: Found option...
Nov 28 18:15:44 localhost.localdomain mysqld_safe[22844]: error: Found option withou...
Nov 28 18:15:44 localhost.localdomain mysqld_safe[22844]: error: Found option withou...
Nov 28 18:15:44 localhost.localdomain mysqld safe[22844]: 231128 18:15:44 mysqld saf...
Nov 28 18:15:44 localhost.localdomain mysqld safe[22844]: 231128 18:15:44 mysqld saf...
Nov 28 18:15:46 localhost.localdomain systemd[1]: Started MariaDB database server.
Hint: Some lines were ellipsized, use -l to show in full.
[angela@localhost ~]$
```

Message Queue angela@server1: ~ Q angela@server1: ~ angela@server1: ~ angela@server1:~\$ systemctl status rabbitmq-server rabbitmq-server.service - RabbitMQ Messaging Server Loaded: loaded (/lib/systemd/system/rabbitmq-server.service; enabled; vendor pre> Active: active (running) since Tue 2023-11-28 16:47:08 +08; 55s ago Main PID: 24675 (beam.smp) Tasks: 25 (limit: 5657) Memory: 95.3M CPU: 18.498s CGroup: /system.slice/rabbitmq-server.service -24675 /usr/lib/erlang/erts-12.2.1/bin/beam.smp -W w -MBas ageffcbf -MH> -24686 erl_child_setup 65536 -24741 inet_gethost 4 __24742 inet_gethost 4 [5]+ Stopped systemctl status rabbitmq-server angela@server1:~\$

Etcd



```
angela@localhost:~
File Edit View Search Terminal Help
[angela@localhost ~]$ systemctl status etcd

    etcd.service - Etcd Server

   Loaded: loaded (/usr/lib/systemd/system/etcd.service; enabled; vendor preset: disabl
ed)
   Active: active (running) since Tue 2023-11-28 18:16:07 PST; 5min ago
Main PID: 23963 (etcd)
    Tasks: 12
   CGroup: /system.slice/etcd.service L23963 /usr/bin/etcd --name=default --data-dir=/var/lib/etcd/default.etc...
Nov 28 18:16:07 localhost.localdomain etcd[23963]: 8e9e05c52164694d received MsgVot...2
Nov 28 18:16:07 localhost.localdomain etcd[23963]: 8e9e05c52164694d became leader a...2
Nov 28 18:16:07 localhost.localdomain etcd[23963]: raft.node: 8e9e05c52164694d elec...2
Nov 28 18:16:07 localhost.localdomain etcd[23963]: setting up the initial cluster v...3
Nov 28 18:16:07 localhost.localdomain etcd[23963]: set the initial cluster version ...3
Nov 28 18:16:07 localhost.localdomain etcd[23963]: enabled capabilities for version 3.3
Nov 28 18:16:07 localhost.localdomain etcd[23963]: published {Name:default ClientUR...2
Nov 28 18:16:07 localhost.localdomain etcd[23963]: ready to serve client requests
Nov 28 18:16:07 localhost.localdomain etcd[23963]: serving insecure client requests...!
Nov 28 18:16:07 localhost.localdomain systemd[1]: Started Etcd Server.
Hint: Some lines were ellipsized, use -l to show in full.
[angela@localhost ~]$
```

Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?

OpenStack is an open-source cloud operating system that provides a large set of services such as storage and networking services. There are many benefits in using OpenStack such as it allows infrastructure to upgrade their scale and provide more users with more storage and network needs. The users can also modify and only configure the things that they may need. There are types of clouds that can be customized based on what is needed in security and control. Overall, Openstack is a great system that has a lot of benefits and can provide a large scale of tools on users and on the infrastructure.

Conclusions:

For this activity we were tasked to install different OpenStack packages on our ubuntu and centos using an ansible playbook. There is a provided website where we can get the instructions on what are the needed steps and how to do it, we just had to convert it to a playbook. What I did first was compile all the steps and convert it into a structure for the playbook. I divided it into 2 roles, one for ubuntu and the other for centos. I then tried to create the repository and all the needed files and plug in my code and tried running it. There were a lot of errors, mostly indentation and missing arguments. I was able to run most of it because it was taking too long to install but I was having an issue with my VM. The VMs kept getting aborted and abruptly stopping that I needed to shut the laptop and tried again and again.