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Course/Section:	Date Submitted:29/11/2024
Instructor:	Semester and SY: 2024-2025

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.

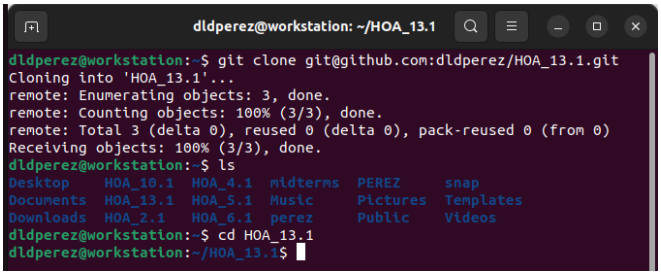
3. Resources

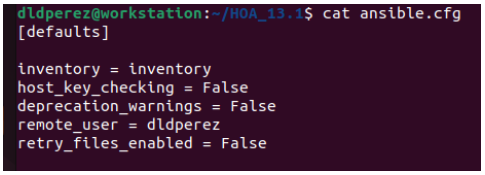
Oracle VirtualBox (Hypervisor)

1x Ubuntu VM or Centos VM

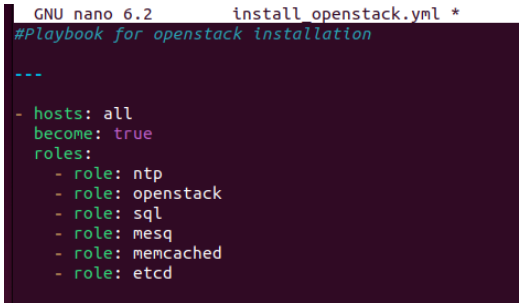
4. Tasks

1. Create a new repository for this activity.

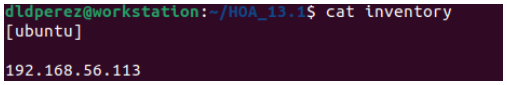




Ansible

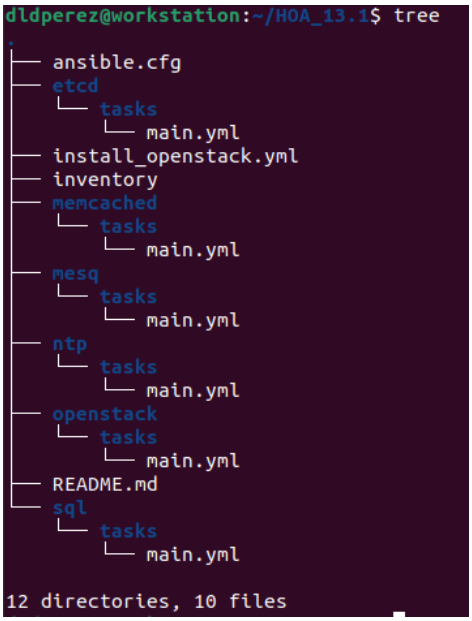


roles



inventory

2. Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/



Created directories and playbook files for each item.

a. NTP

```
  GNU nano 6.2          ntp/tasks/main.yml *
- name: Installing Chrony (Ubuntu)
  apt:
    name: chrony
    state: latest

- replace:
    dest: /etc/chrony/chrony.conf
    regexp: server NTP_SERVER iburst
    replace: server 192.168.56.112 iburst
    backup: yes

- name: add key to chrony.conf
  ansible.builtin.lineinfile:
    dest: /etc/chrony/chrony.conf
    line: allow 10.0.0.0/24
    backup: yes

- name: Verifying Installation (Chrony for Ubuntu)
  service:
    name: chrony
    state: restarted
    enabled: true
```

b. OpenStack packages

```
 GNU nano 6.2      openstack/tasks/main.yml *
- name: Installing OpenStack (Ubuntu)
  apt:
    name:
      - nova-compute
      - python3-openstackclient
    state: latest
```

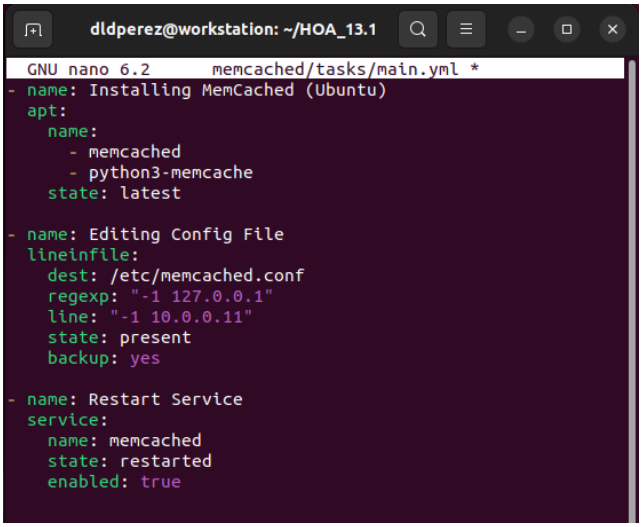
c. SQL Database

```
 GNU nano 6.2                                  sql/tasks/main.yml
- name: Install the SQL Database
  apt:
    name:
      - mariadb-server
      - python3-pymysql
    state: present
    update_cache: yes

- name: Edit the maria-db.conf file
  copy:
    content: |
      default-storage-engine = innodb
      innodb_file_per_table = on
      max_conenctions = 4096
      collation-server = utf_general_ci
      character-set-server = utf8
    dest: /etc/mysql/mariadb.conf.d/99-openstack.cnf
    mode: "0755"

- name: Restart the mariadb-server
  service:
     name: mysql
     state: restarted
     enabled: yes
```

d. Message Queue

```
  GNU nano 6.2                mesq/tasks/main.yml *
- name: Install Message Queue
  apt:
    name: rabbitmq-server
    state: present
    update_cache: yes

- name: Starting service
  service:
    name: rabbitmq-server.service
    state: started
    enabled: true
```

e. Memcached

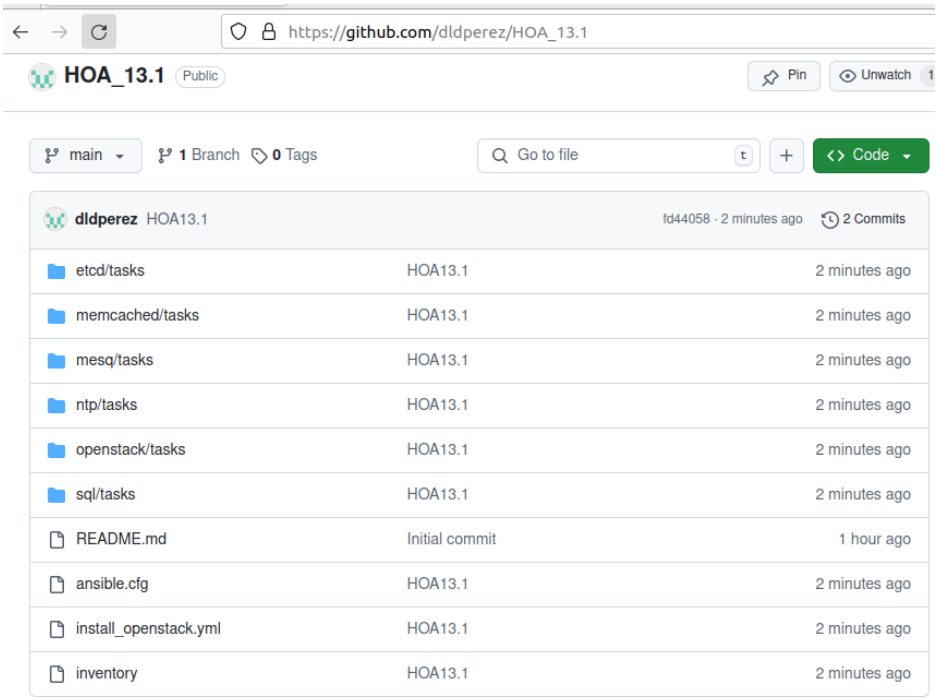


f. Etcd

g. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in Inventory file.

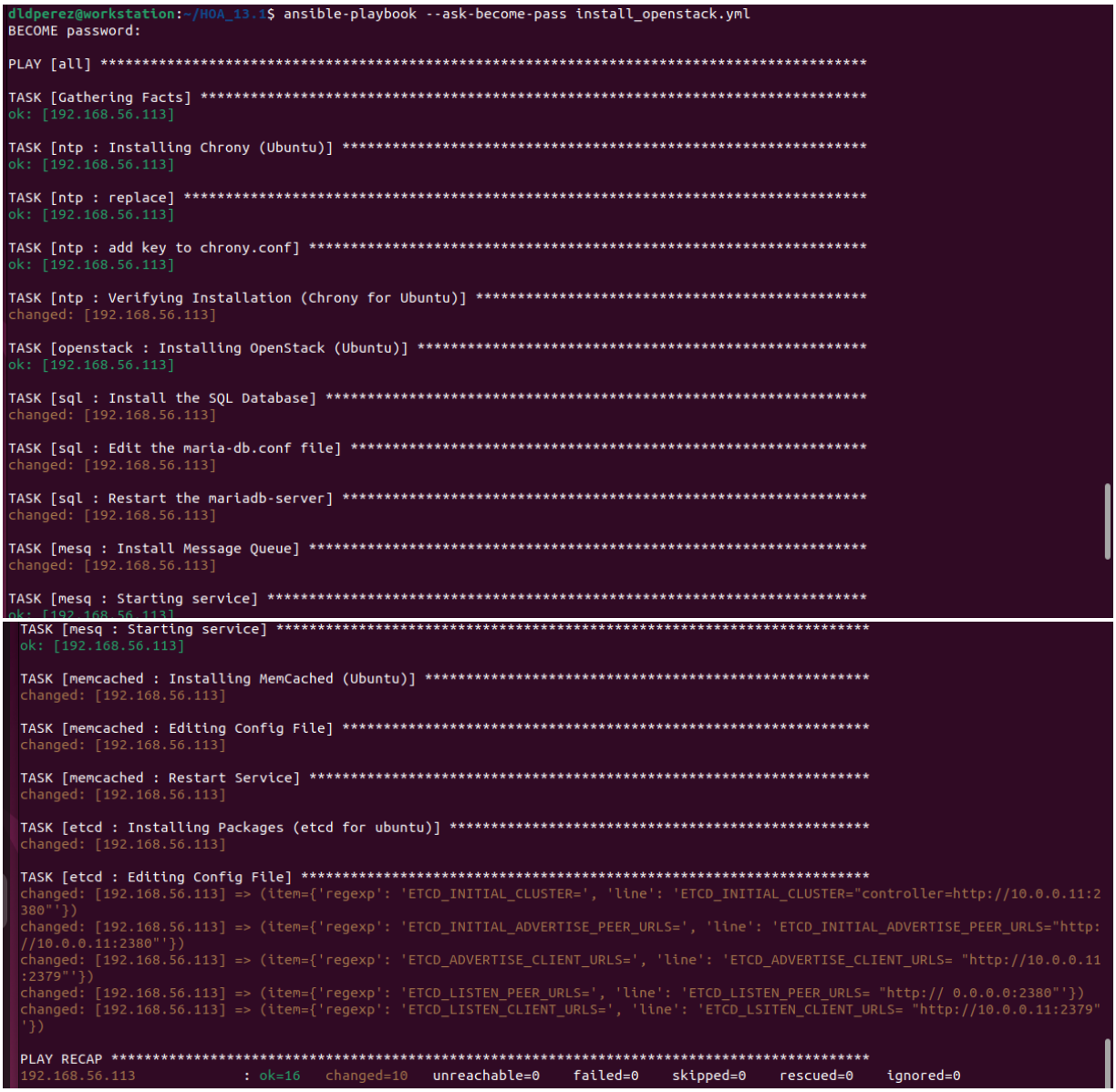
h. Add, commit and push it to your GitHub repo.

```
dldperez@workstation:~/HOA_13.1$ git add .
dldperez@workstation:~/HOA_13.1$ git commit -m "HOA13.1"
[main fd44058] HOA13.1
 9 files changed, 158 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 etcd/tasks/main.yml
 create mode 100644 install_openstack.yml
 create mode 100644 inventory
 create mode 100644 memcached/tasks/main.yml
 create mode 100644 mesq/tasks/main.yml
 create mode 100644 ntp/tasks/main.yml
 create mode 100644 openstack/tasks/main.yml
 create mode 100644 sql/tasks/main.yml
dldperez@workstation:~/HOA_13.1$ git push origin main
Enumerating objects: 24, done.
Counting objects: 100% (24/24), done.
Compressing objects: 100% (10/10), done.
Writing objects: 100% (23/23), 2.62 KiB | 2.62 MiB/s, done.
Total 23 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:dldperez/HOA_13.1.git
   8e428b8..fd44058  main -> main
dldperez@workstation:~/HOA_13.1$
```



GITHUB LINK: https://github.com/dldperez/HOA_13.1.git

5. Output (screenshots and explanations)



This playbook performed various tasks and all of it was successful. Nothing was skipped or failed.

CONFIRMATIONS

```
dldperez@server1:~$ systemctl status chrony
● chrony.service - chrony, an NTP client/server
     Loaded: loaded (/lib/systemd/system/chrony.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-11-29 20:44:20 +08; 10min ago
       Docs: man:chronyd(8)
             man:chronyc(1)
             man:chrony.conf(5)
   Main PID: 30851 (chronyd)
      Tasks: 2 (limit: 2270)
     Memory: 1.5M
        CPU: 289ms
     CGroup: /system.slice/chrony.service
             ├─30851 /usr/sbin/chronyd -F 1
             └─30852 /usr/sbin/chronyd -F 1
```

```
dldperez@server1:~$ systemctl status mariadb
● mariadb.service - MariaDB 10.6.18 database server
     Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-11-29 20:45:13 +08; 9min ago
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
   Main PID: 32223 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 8 (limit: 14983)
     Memory: 63.7M
        CPU: 1.024s
     CGroup: /system.slice/mariadb.service
             └─32223 /usr/sbin/mariadbd
```

```
dldperez@server1:~$ systemctl status rabbitmq-server
● rabbitmq-server.service - RabbitMQ Messaging Server
     Loaded: loaded (/lib/systemd/system/rabbitmq-server.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-11-29 20:46:06 +08; 12min ago
   Main PID: 33138 (beam.smp)
      Tasks: 26 (limit: 2270)
     Memory: 91.2M
        CPU: 36.294s
     CGroup: /system.slice/rabbitmq-server.service
             ├─33138 /usr/lib/erlang/erts-12.2.1/bin/beam.smp -W w -MBas ageffcbf -MHas ageffcbf -MBlmbcs 512 -MHlmbcs 512 -MMmcs >
             ├─33150 erl_child_setup 65536
             ├─33205 inet_gethost 4
             ├─33206 inet_gethost 4
             └─33211 /bin/sh -s rabbit_disk_monitor
lines 1-13/13 (END)
```

```
dldperez@server1:~$ systemctl status etcd
● etcd.service - etcd - highly-available key value store
     Loaded: loaded (/lib/systemd/system/etcd.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-11-29 20:46:44 +08; 13min ago
       Docs: https://etcd.io/docs
             man:etcd
   Main PID: 33808 (etcd)
      Tasks: 9 (limit: 2270)
     Memory: 6.3M
        CPU: 13.486s
     CGroup: /system.slice/etcd.service
             └─33808 /usr/bin/etcd
```

```
dldperez@server1:~$ systemctl status nova-compute
● nova-compute.service - OpenStack Compute
     Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor preset: enabled)
     Active: active (running) since Fri 2024-11-29 20:41:23 +08; 19min ago
   Main PID: 30325 (nova-compute)
      Tasks: 1 (limit: 2270)
     Memory: 128.2M
        CPU: 6.822s
     CGroup: /system.slice/nova-compute.service
             └─30325 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/nova/nova.conf --config-file=/etc/nova/nova-compute>
```

```
dldperez@server1:~$ openstack --version
openstack 5.8.0
```

Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?
   The benefits of implementing OpenStack include easy scalability, easy automation, fast development, strong community, ready-made. It improves business agility; it increases the efficiency of core processes and it enhance the availability of resources.

Conclusions:

This activity successfully shows us how we create a workflow and configure OpenStack using ansible as our documentation and execution. This exercise made us understand the key components of OpenStack such as ntp, sql, message queue, Memcached, and etcd. In conclusion, this activity helped us have a hands-on experience in deploying OpenStack and its components.