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Course/Section: CPE31S5	Date Submitted: 12/02/2023
Instructor: Engr. Roman Richard	Semester and SY: 1st Sem 2023-2024

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)

1. Create a new repository for this activity.

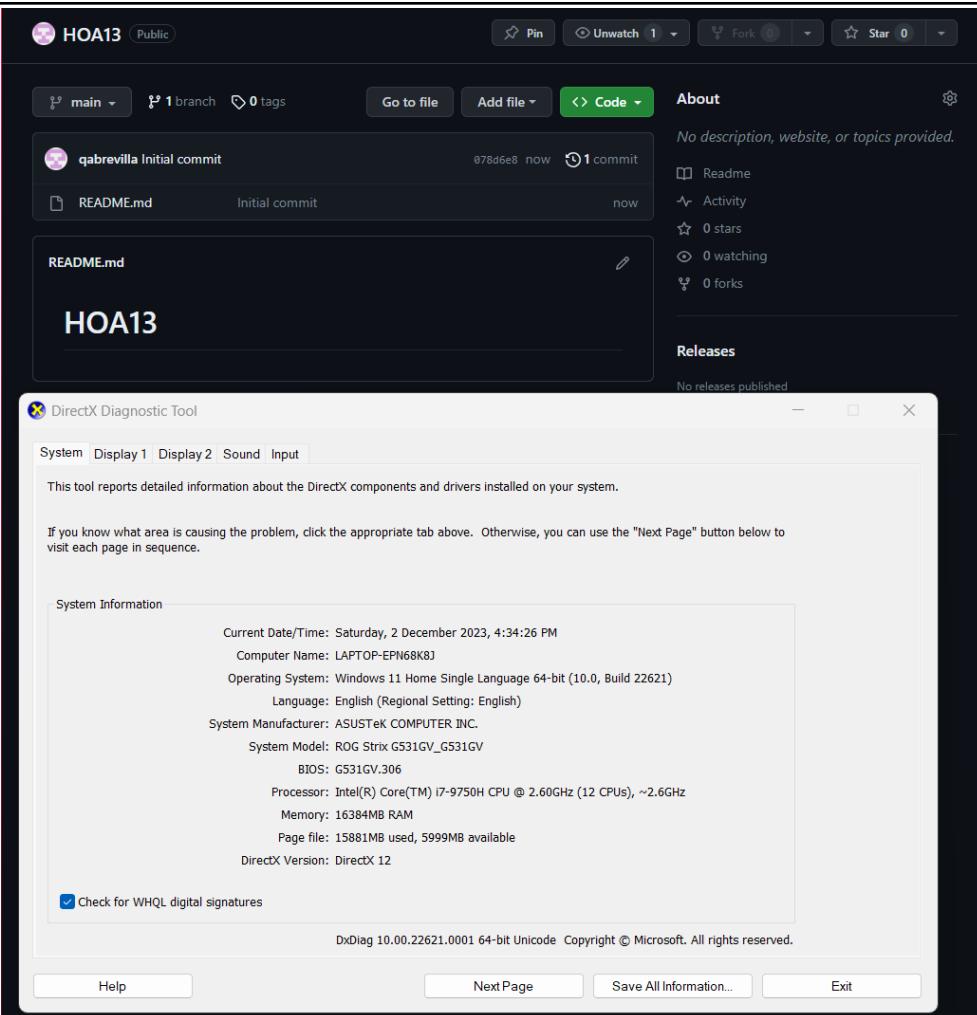


Figure 1.1 github repository
On the github website, I created a new repository for me to use for this activity.

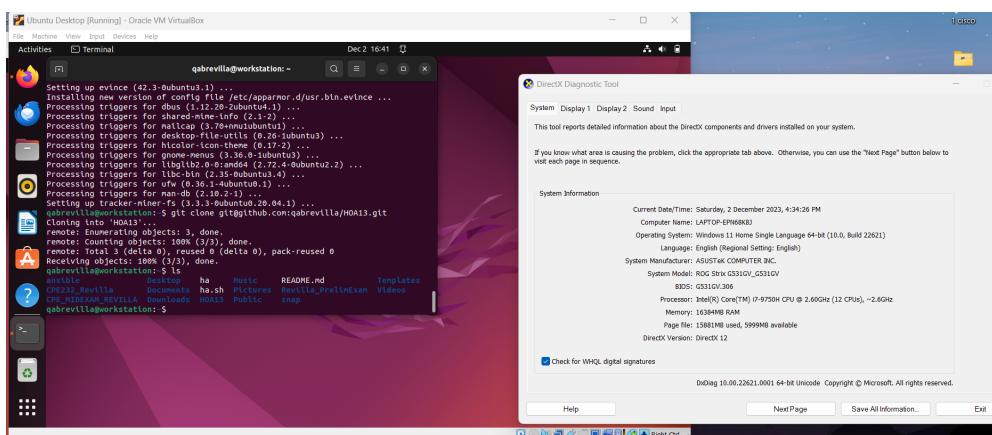
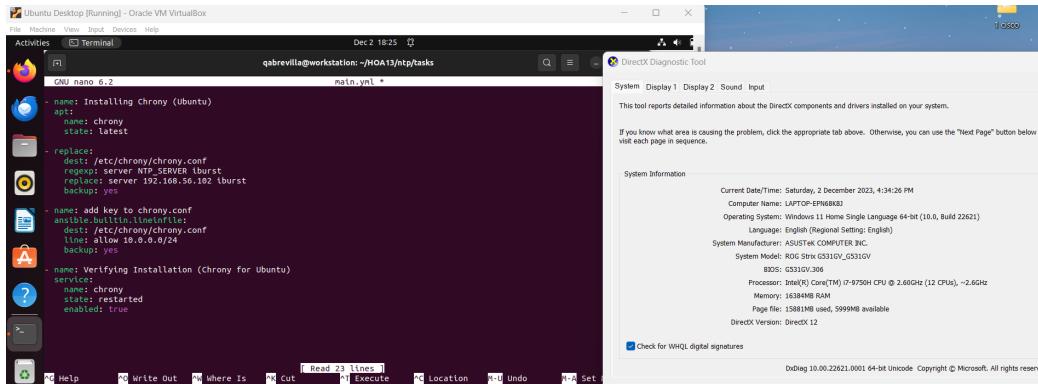


Figure 1.2 git clone
I copy the ssh link to clone the repository on my workstation.

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

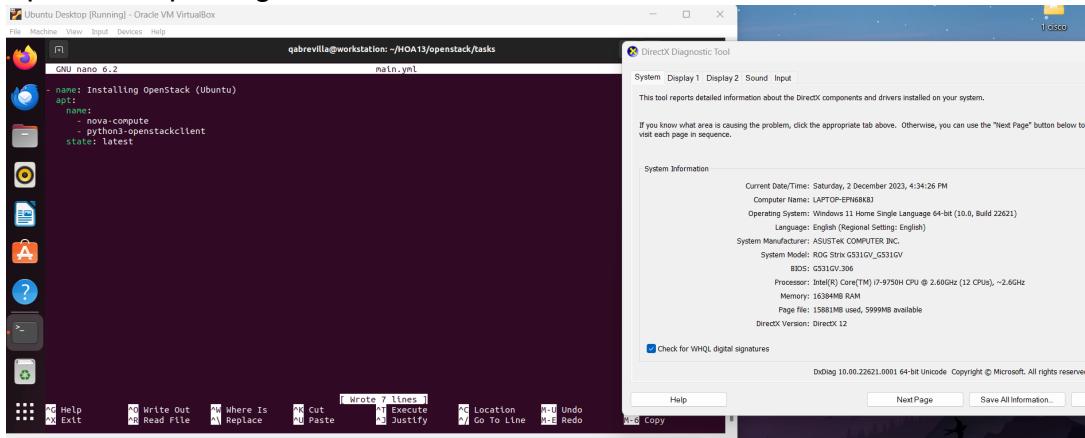
a. NTP



```
Ubuntu Desktop [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal qabrevilla@workstation: ~/NOA13/ntp/tasks
GNU nano 6.2 main.yml *
- name: Installing Chrony (ubuntu)
  apt:
    name: chrony
    state: latest
- replace:
    dest: /etc/chrony/chrony.conf
    regexp: server NTP_SERVER tburst
    replace: server 192.168.56.102 tburst
    backup: yes
- name: add 192.168.56.102 to chrony.conf
  shell:
    cmd: echo "server 192.168.56.102 tburst" > /etc/chrony/chrony.conf
    args:
      - dest: /etc/chrony/chrony.conf
      - regexp: allow 10.0.0.0/24
      - replace: allow 10.0.0.0/24
      - backup: yes
- name: Verifying Installation (chrony for Ubuntu)
  service:
    name: chrony
    state: restarted
    enabled: true
qabrevilla@workstation: ~/NOA13/ntp/tasks
File Machine View Input Devices Help
Activities Terminal qabrevilla@workstation: ~/NOA13/ntp/tasks
GNU nano 6.2 main.yml *
System Display 1 Display 2 Sound Input
This tool reports detailed information about the DirectX components and drivers installed on your system.
If you know what area is causing the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button below to visit each page in sequence.
System Information
Current Date/Time: Saturday, 2 December 2023, 4:34:26 PM
Computer Name: LAPTOP-EPH6K8K3
Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22621)
Language: English (Regional Setting: English)
System Manufacturer: ASUSTek COMPUTER INC.
System Model: ROG Strix GS310V_GS310V
BIOS: GS310V.306
Processor: Intel(R) Core(TM) i7-9750H CPU @ 2.60GHz (12 CPUs), ~2.6GHz
Memory: 16384MB RAM
Page file: 15881MB used, 5999MB available
DirectX Version: DirectX 12
Check for WHQL digital signatures
DxDiag 10.00.22621.0001 64-bit Unicode Copyright © Microsoft. All rights reserved.
```

This is the main.yml in the role of installing NTP. It is a package to manage time synchronization

b. OpenStack packages



```
Ubuntu Desktop [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal qabrevilla@workstation: ~/NOA13/openstack/tasks
GNU nano 6.2 main.yml *
- name: Installing OpenStack (Ubuntu)
  apt:
    name:
      - nova-compute
      - python3-openstackclient
    state: latest
qabrevilla@workstation: ~/NOA13/openstack/tasks
File Machine View Input Devices Help
Activities Terminal qabrevilla@workstation: ~/NOA13/openstack/tasks
GNU nano 6.2 main.yml *
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Check for WHQL digital signatures
DxDiag 10.00.22621.0001 64-bit Unicode Copyright © Microsoft. All rights reserved.
```

This is the main.yml code for openstack packages for ubuntu.

c. SQL Database

```

GNU nano 6.2                               main.yml
- name: Installing Packages (SQL for Ubuntu)
  apt:
    name:
      - mariadb-server
      - python3-pymysql
    state: latest

- name: Create Config File
  file:
    path: /etc/mysql/mariadb.conf.d/99-openstack.cnf
    state: touch
    owner: root
    group: root
    mode: 0777

- name: Editing Config File
  lineinfile:
    dest: /etc/mysql/mariadb.conf.d/99-openstack.cnf
    state: present
    backup: yes
    with_file: < /etc/mysql/mariadb.conf.d/99-openstack.cnf
    regexp: '^bind-address = 10.0.0.11'
    line: 'bind-address = 10.0.0.11'
    create: yes
    mode: 0644
    owner: root
    group: root
    encoding: utf8_general_ci
    character-set-server = utf8

- name: Starting service
  service:
    name: rabbitmq-server
    state: present
    update_cache: yes

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

```

In SQL database, as we can see it has a lot of prerequisites for it to install.

d. Message Queue

```

GNU nano 6.2                               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

```

Message queue systems more specifically RabbitM is installed using this task.

e. Memcached

```

GNU nano 6.2                               main.yml
- name: Installing MemCached (Ubuntu)
  apt:
    name:
      - memcached
      - python3-memcache
    state: latest

- name: Editing Config File
  lineinfile:
    dest: /etc/memcached.conf
    regexp: '^1 127.0.0.1'
    line: '1 10.0.0.11'
    state: present
    backup: yes

- name: Restart Service
  service:
    name: memcached
    state: restarted
    enabled: true

```

This is the main.yml for the task of installing memcached

f. Etcd

```

Ubuntu Desktop [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal Dec 2 16:52
gnome-terminal qabrevilla@workstation: ~/HOA13/etcfd/tasks
GNU nano 6.2 main.yml
---
- name: Installing Packages (etcd for Ubuntu)
  apt:
    name:
      - etcd
    state: latest

- name: Editing Config File
  lineinfile:
    dest: /etc/default/etcd
    regexp: '(item.regexp )'
    line: {{ item.line }}
    state: present
    backup: yes

  with_items:
    - { regexp: 'ETCD_INITIAL_CLUSTER=' , line: 'ETCD_INITIAL_CLUSTER="controller=http://10.0.0.11:2380"' }
    - { regexp: 'ETCD_ADVERTISE_CLIENT_URLS=' , line: 'ETCD_ADVERTISE_CLIENT_URLS="http://10.0.0.11:2379"' }
    - { regexp: 'ETCD_LISTEN_PEER_URLS=' , line: 'ETCD_LISTEN_PEER_URLS="http://0.0.0.0:2380 "' }
    - { regexp: 'ETCD_LISTEN_CLIENT_URLS=' , line: 'ETCD_LISTEN_CLIENT_URLS="http:// 10.0.0.11:2379 "' }

  #!/bin/bash
  - name: Start etcd service
    command: systemctl start etcd
    sudo: yes

```

DirectX Diagnostic Tool

This tool reports detailed information about the DirectX components and drivers installed on your system.

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Page file: 15881MB used, 5999MB available
DirectX Version: DirectX 12

Check for WHQL digital signatures

Help Next Page Save All Info

This is the main.yml for the task of installing etcd and its prerequisites

The main playbook:

```

Ubuntu Desktop [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal
gnome-terminal qabrevilla@workstation: ~/HOA13
openstack.yml
GNU nano 6.2
---
- hosts: all
  become: true
  roles:
    - role: ntp
    - role: memcache
    - role: etcd
    - role: mesq
    - role: sql

```

DirectX Diagnostic Tool

This tool reports detailed information about the DirectX components and drivers installed on your system.

If you know what area is causing the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button below to visit each page in sequence.

System Information

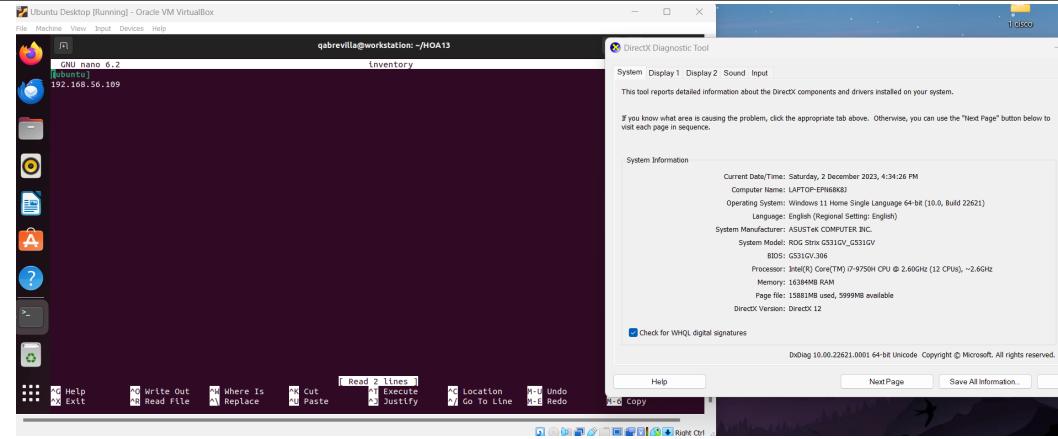
Current Date/Time: Saturday, 2 December 2023, 4:34:26 PM
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Check for WHQL digital signatures

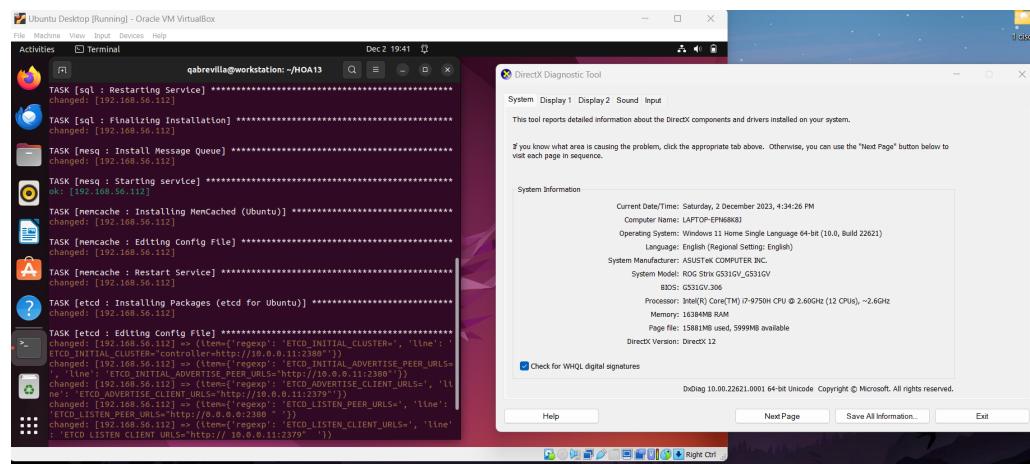
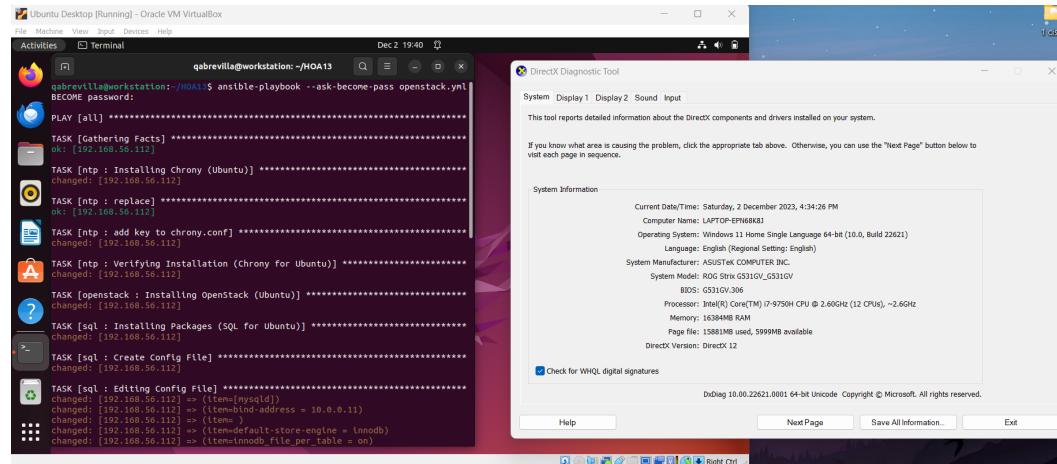
Help Next Page Save All Info

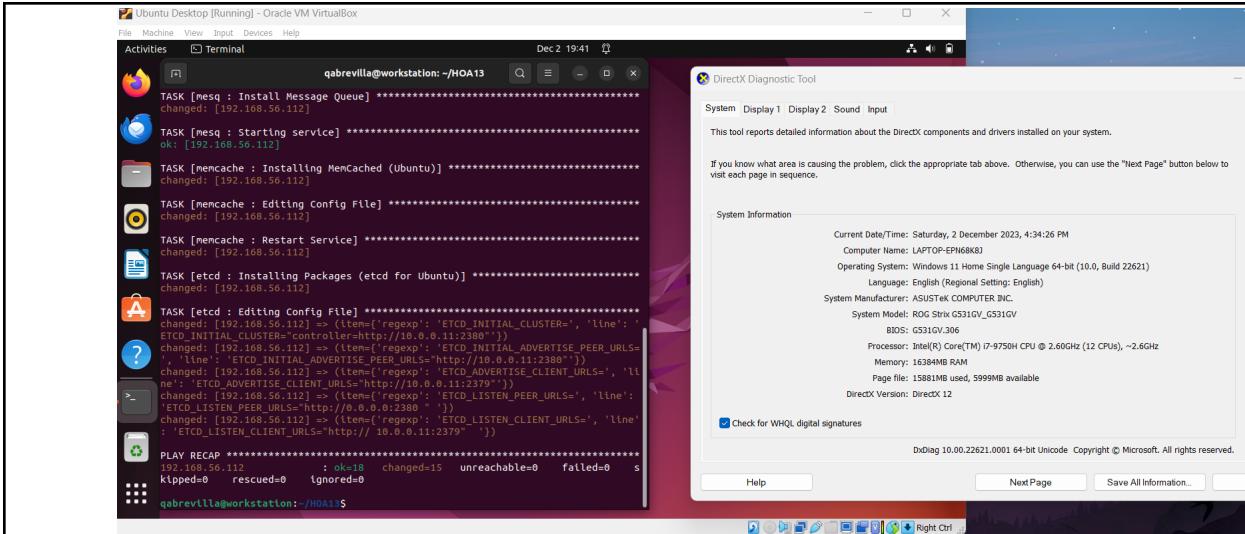
The playbook is simple because of the use of roles and tasks in ansible playbook.

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



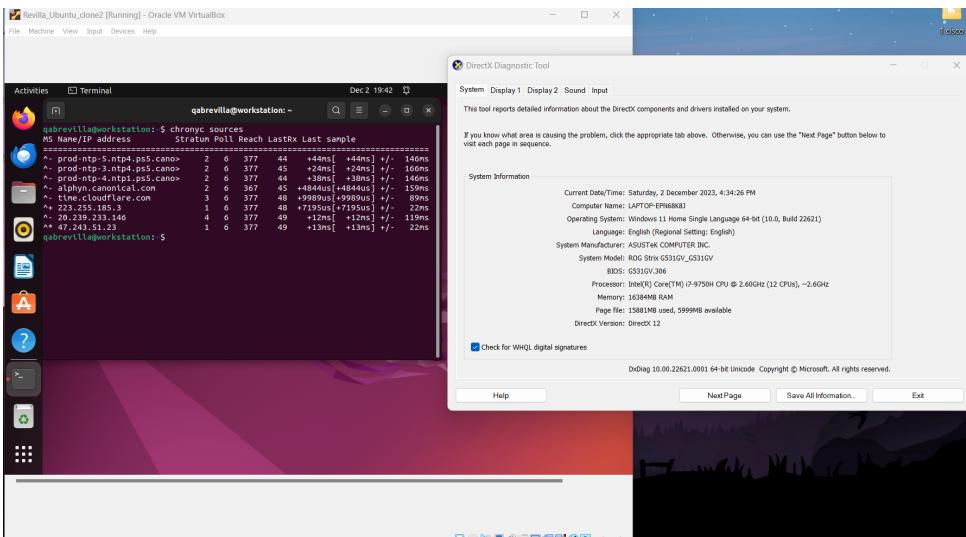
running



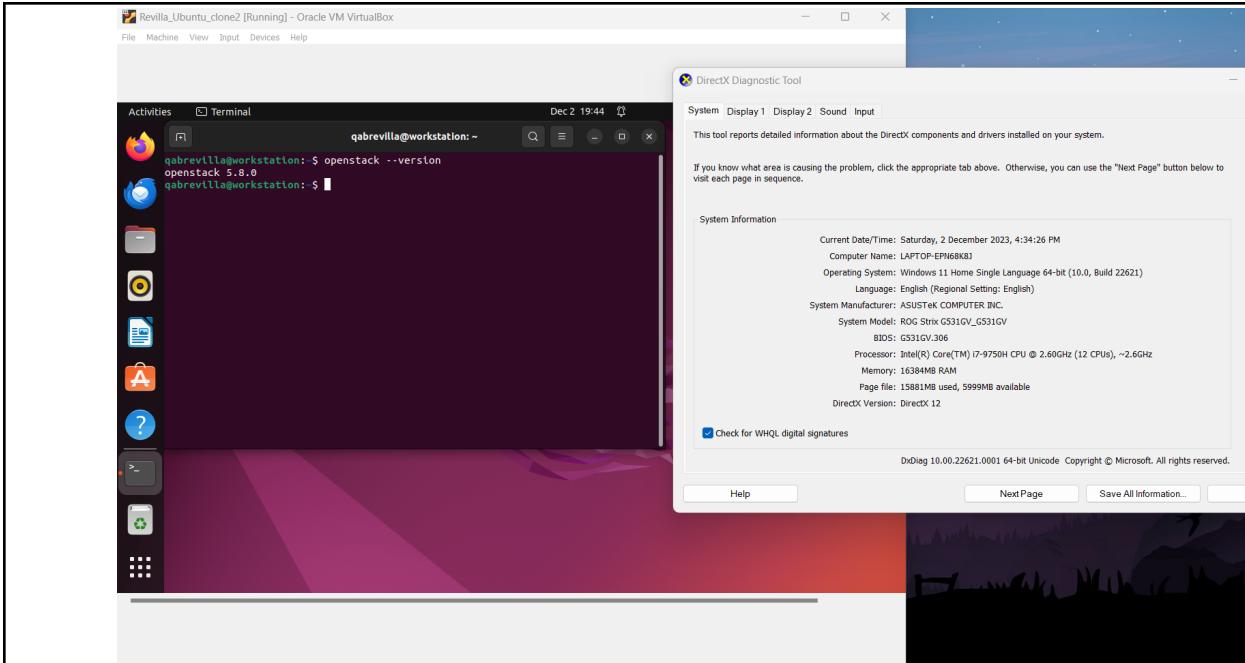


proof of installation in the remote server (UBUNTU)

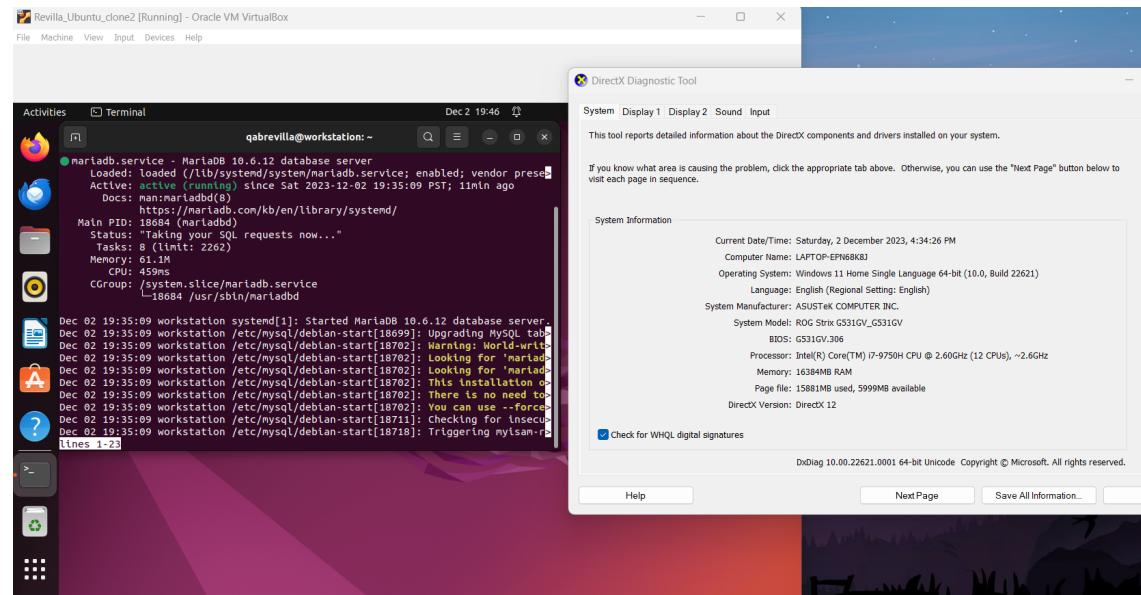
NTP



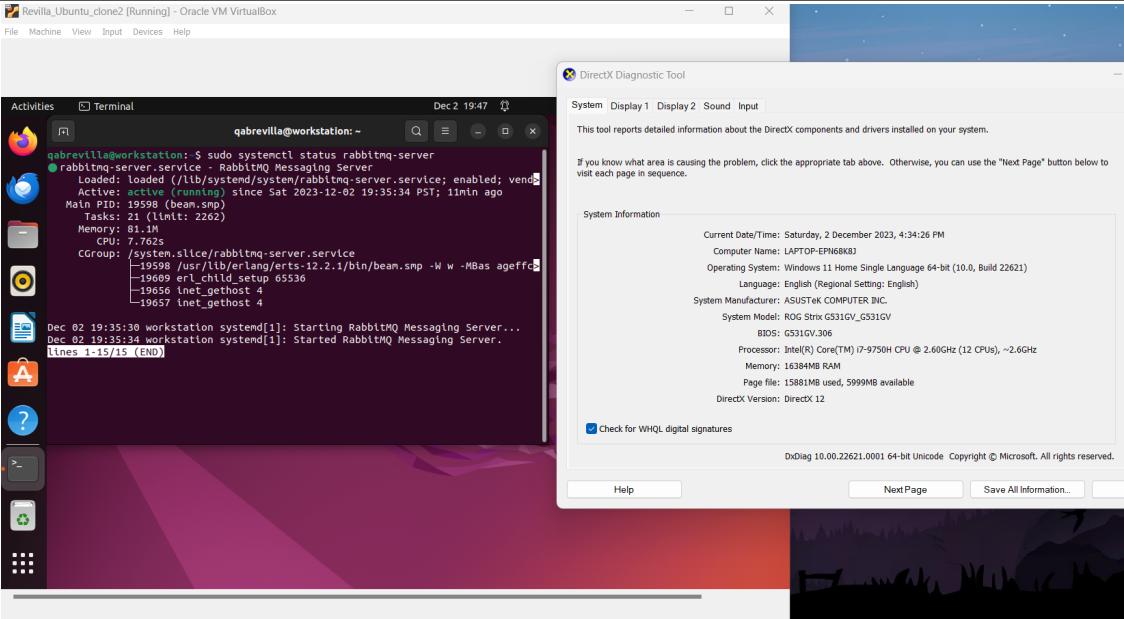
Openstack



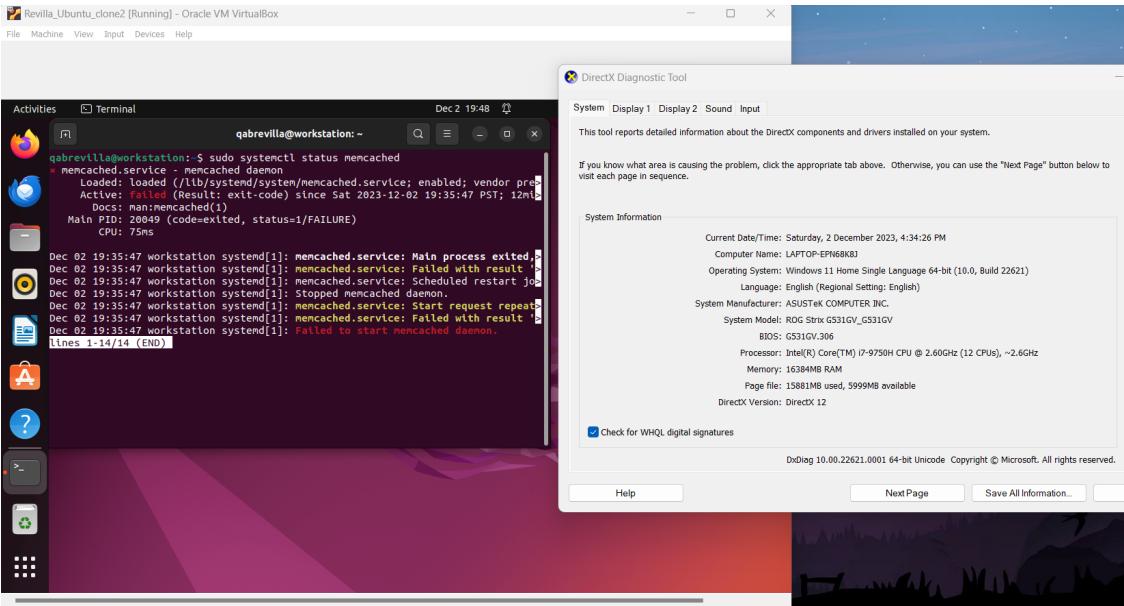
mariadb



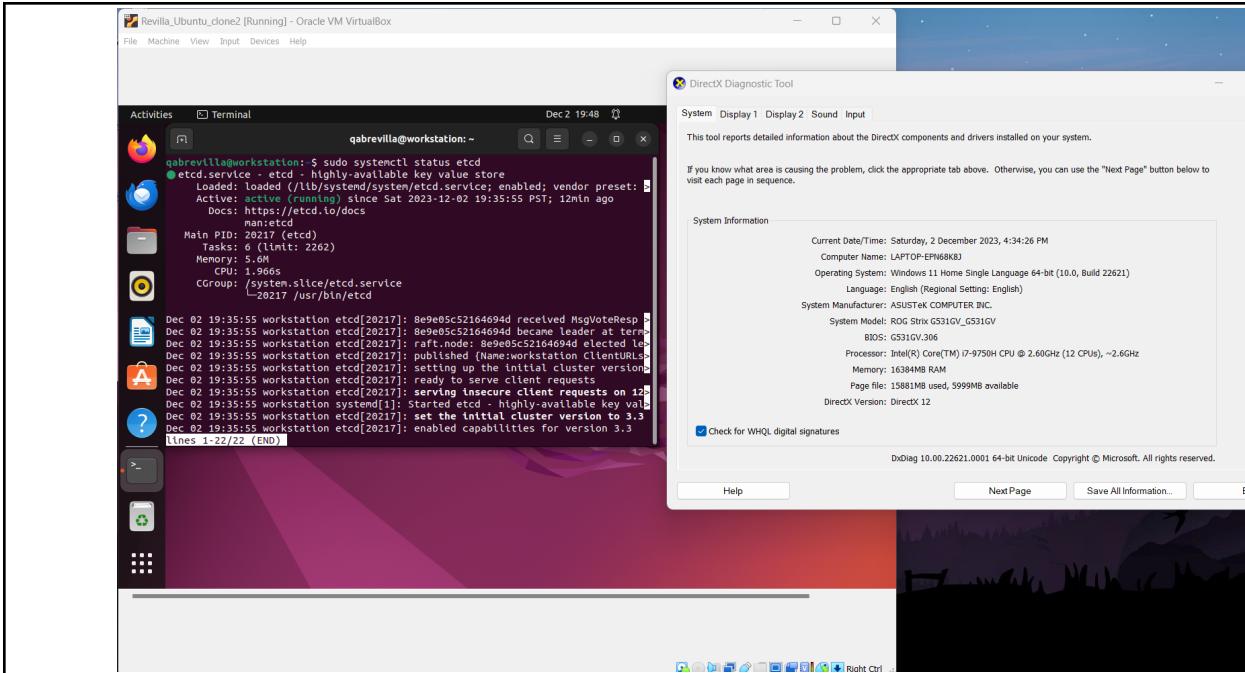
message queue



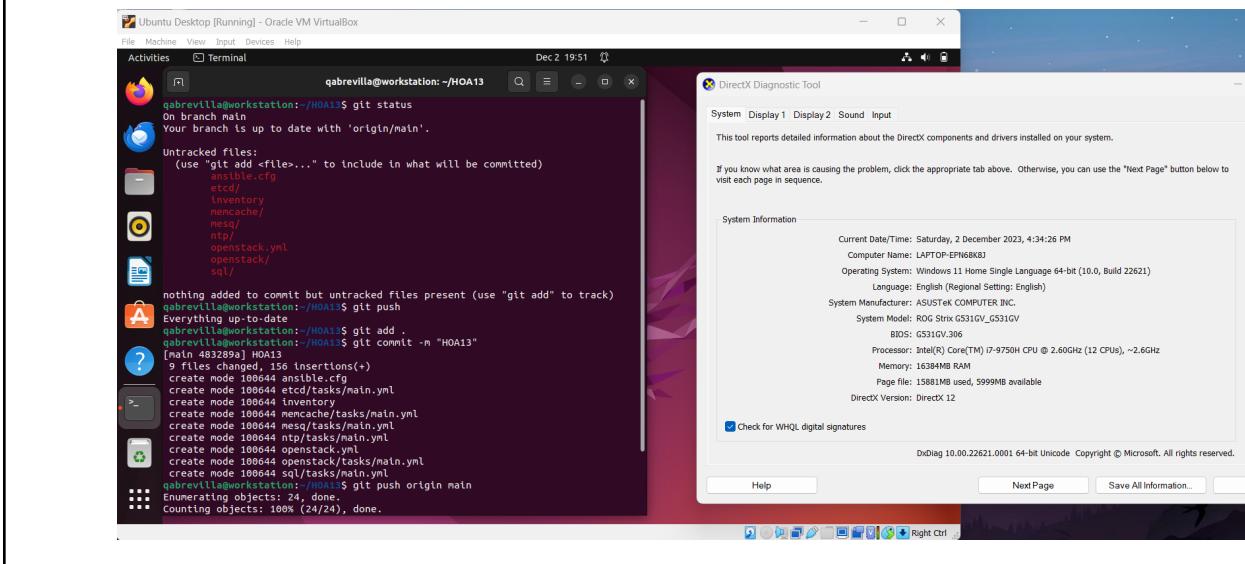
memcache

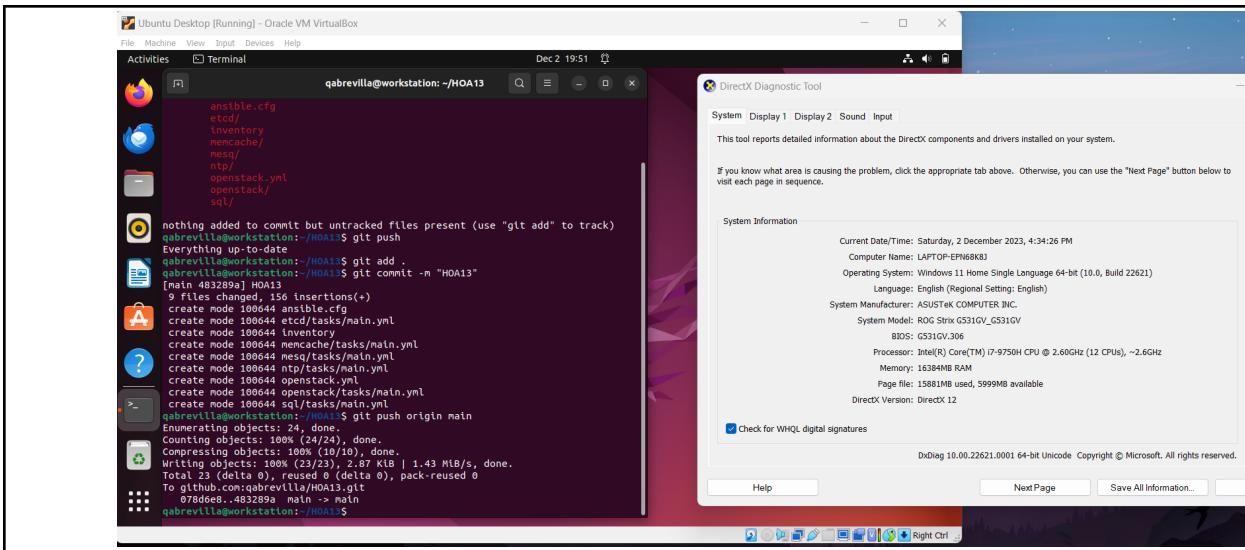


etcd



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





<https://github.com/qabrevilla/HOA13>

Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?

Implementing openstacks allows us to scale resources such as large scale deployments or small scale deployments to efficiently deploy them based on needed resources. Open stack work depends on the needs of the deployment. It offers resources that work based on the demand. They are also flexible meaning they can do in public, hybrid, and private clouds, and also supports other administrative tools.

Conclusions:

In this activity, we are tasked to create an ansible playbook that will install all the prerequisites of OpenStack. We had a small overview about the cloud services and were able to analyze the advantages and disadvantages of the cloud services. We are able to refresh about the various cloud deployment and service models, public cloud, private cloud, and hybrid cloud. Ansible playbook was used to install the services needed for OpenStack to work. This activity was easy because it focuses on the installation part of the services that will be used for organizing cloud services. I hope I can learn more about cloud and how it works because it requires specialization and expertise to work in this field.