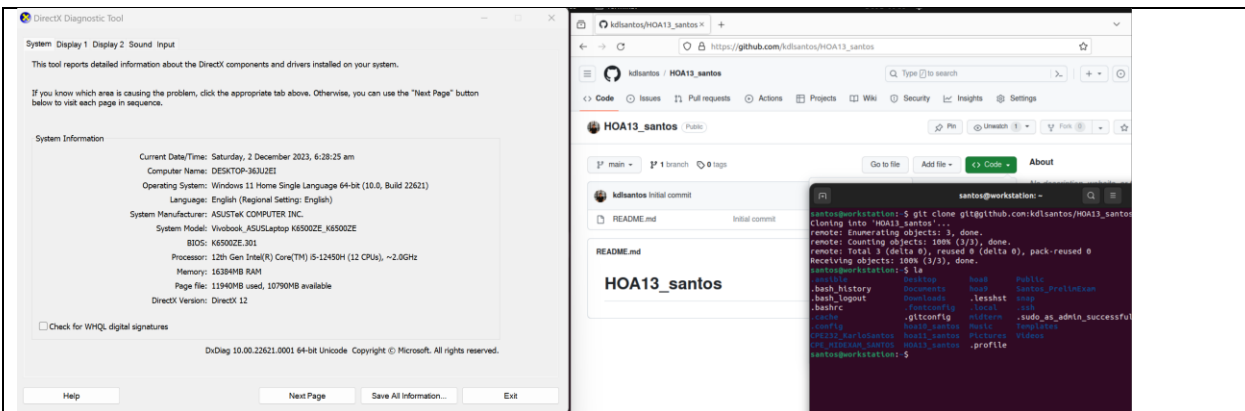
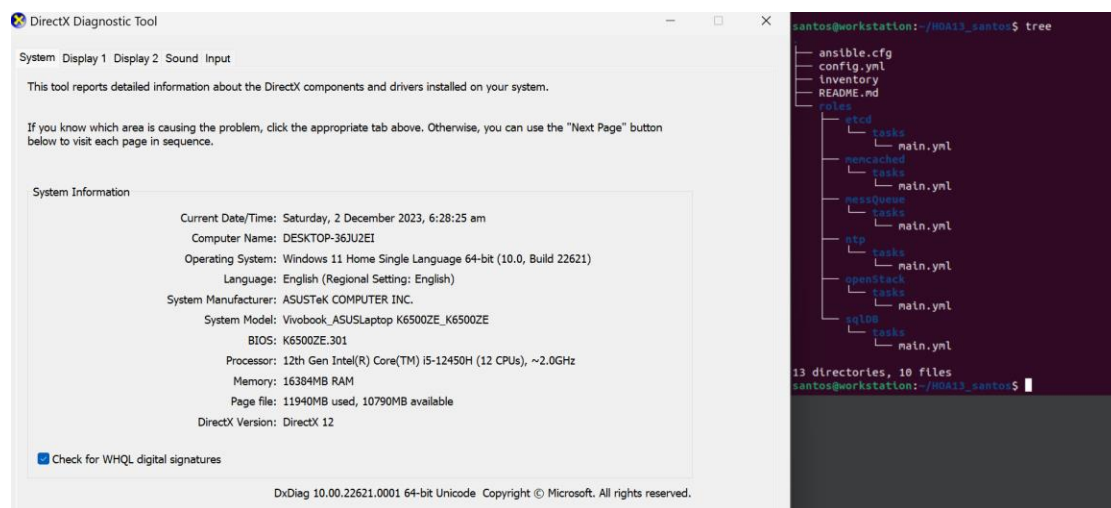


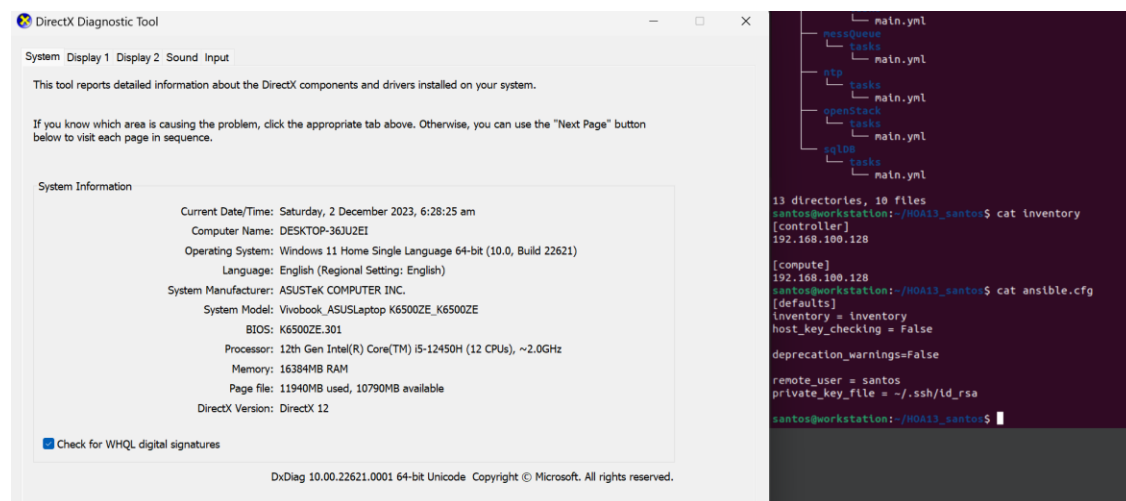
<b>Name: Karlo Santos</b>	<b>Date Performed: 12/02/2023</b>
<b>Course/Section: CPE31S5</b>	<b>Date Submitted: 12/02/2023</b>
<b>Instructor: Engr. Roman Richard</b>	<b>Semester and SY: 1<sup>st</sup> sem, 23-24</b>
<b>Activity 13: OpenStack Prerequisite Installation</b>	
<b>1. Objectives</b>	
Create a workflow to install OpenStack using Ansible as your Infrastructure as Code (IaC).	
<b>2. Intended Learning Outcomes</b>	
<ol style="list-style-type: none"> <li>1. Analyze the advantages and disadvantages of cloud services</li> <li>2. Evaluate different Cloud deployment and service models</li> <li>3. Create a workflow to install and configure OpenStack base services using Ansible as documentation and execution.</li> </ol>	
<b>3. Resources</b>	
<p>Oracle VirtualBox (Hypervisor)</p> <p>1x Ubuntu VM or Centos VM</p>	
<b>4. Tasks</b>	
<ol style="list-style-type: none"> <li>1. Create a new repository for this activity.</li> <li>2. Create a playbook that converts the steps in the following items in <a href="https://docs.openstack.org/install-guide/">https://docs.openstack.org/install-guide/</a> <ol style="list-style-type: none"> <li>a. NTP</li> <li>b. OpenStack packages</li> <li>c. SQL Database</li> <li>d. Message Queue</li> <li>e. Memcached</li> <li>f. Etcd</li> <li>g. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in Inventory file.</li> <li>h. Add, commit and push it to your GitHub repo.</li> </ol> </li> </ol>	
<b>5. Output</b> (screenshots and explanations)	
<p><b>Create a new repository for this activity.</b></p>	



## Showing the full tree directory

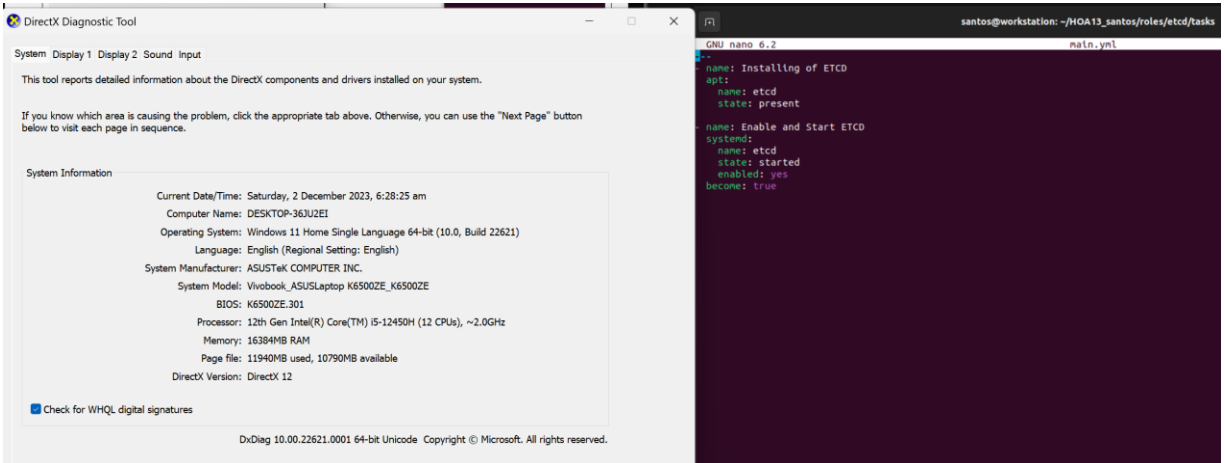


## Ansible.cfg and inventory



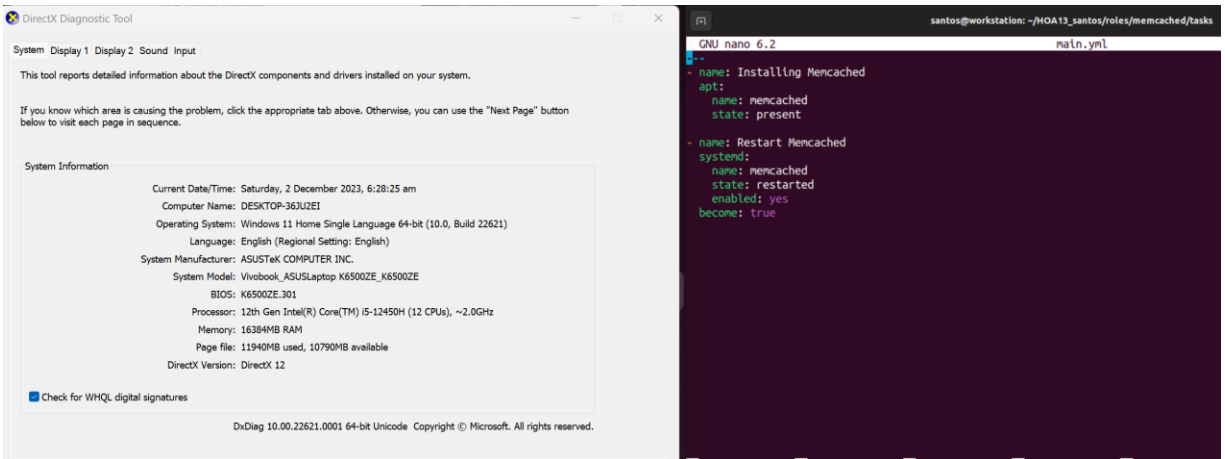
This is the content of the ansible.cfg that will be use in the playbook in this activity. The inventory contain 2 groups but it only contain 1 server which is ubuntu server.

## ETCD



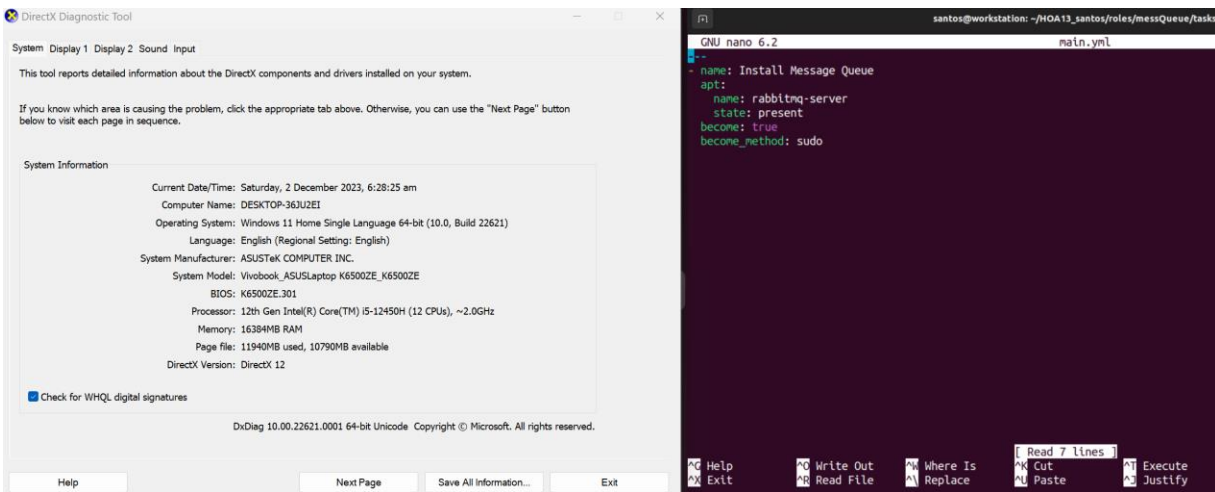
The screenshot shows the tasks under etcd. It will help to install the etcd in the target node. Also, I ensure that it will enable and start it after installing.

## Memcached



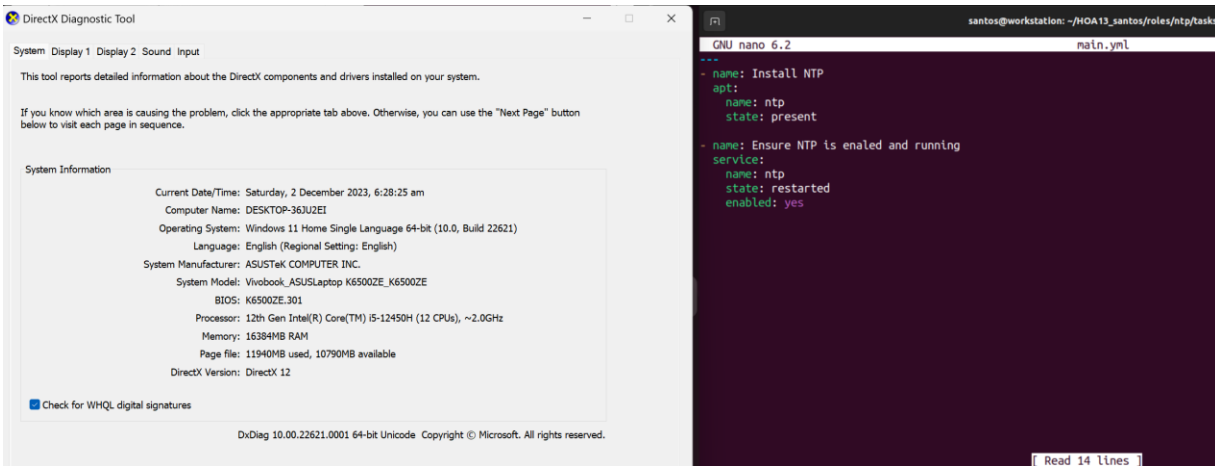
This is the command for the installation of Memcached in the ubuntu server. I also add restart command after installing the Memcached.

## Message Queue



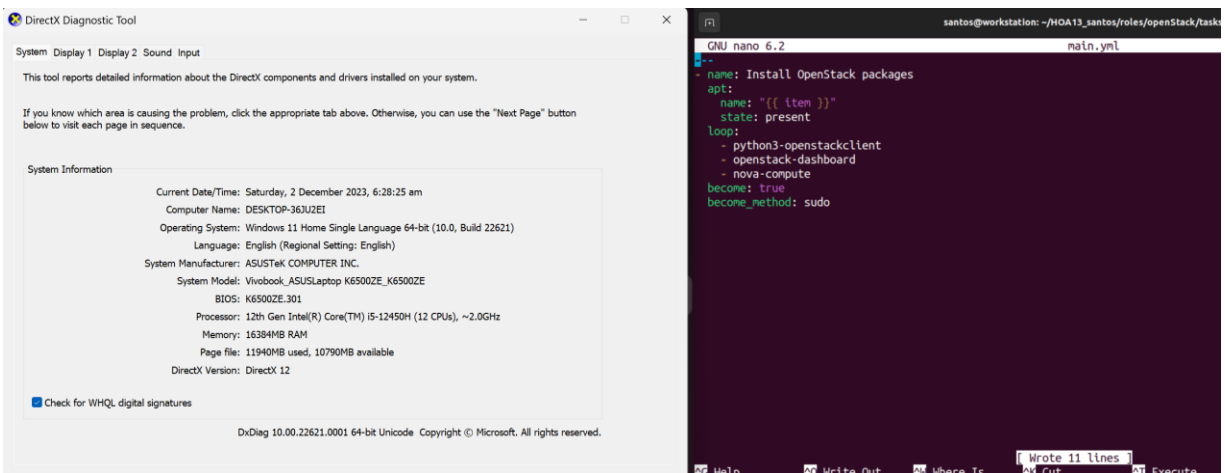
This is the installation of kind of message queue in the target node. It will install the rabbitmq-server and make sure it is running.

## NTP



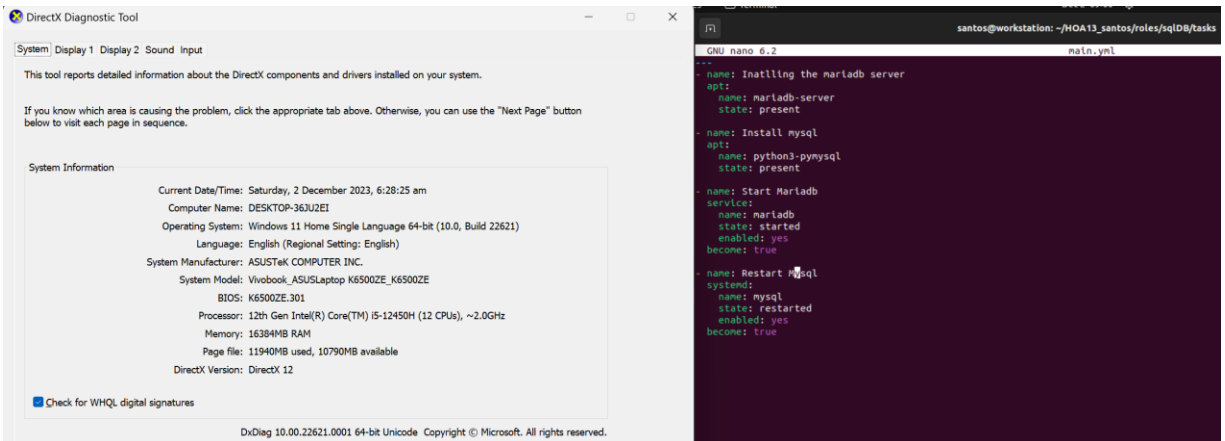
In this part is the task for the installation of NTP. It shows that it will install first the ntp then it will ensure that it is running and enabled in the target node.

# OpenStack



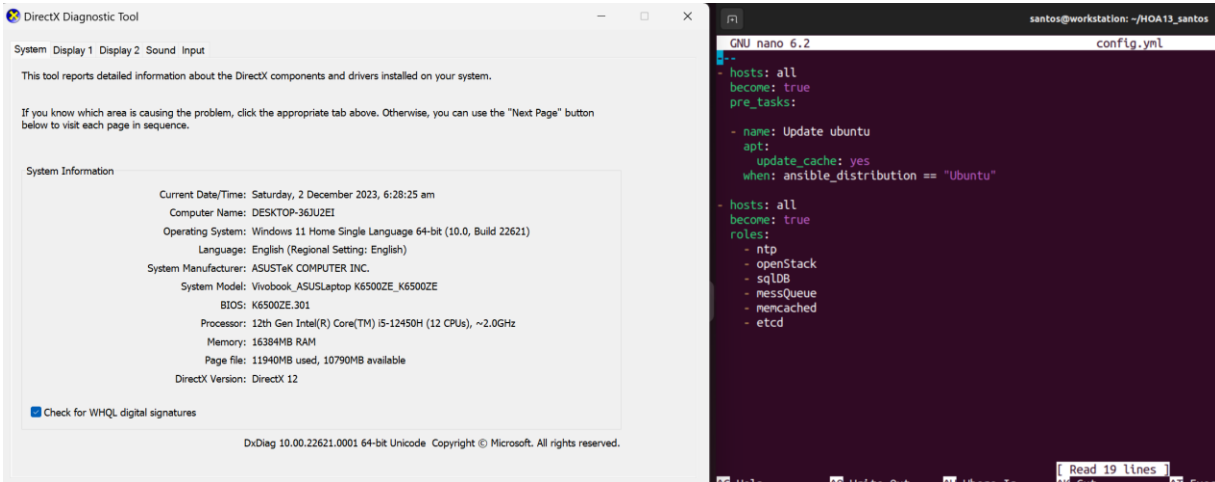
This is the tasks for the OpenStack, it will install the different packages that is needed. It shows that I put 3 packaged to install in the target node.

## SQL Database



In this part is for the installation of a kind of sql database. I use the MySQL, so it shows that I install the mysql-server and also the python3-pymysql for the installation of MySQL and its server. Next is the tasks to start and restart it in the target server.

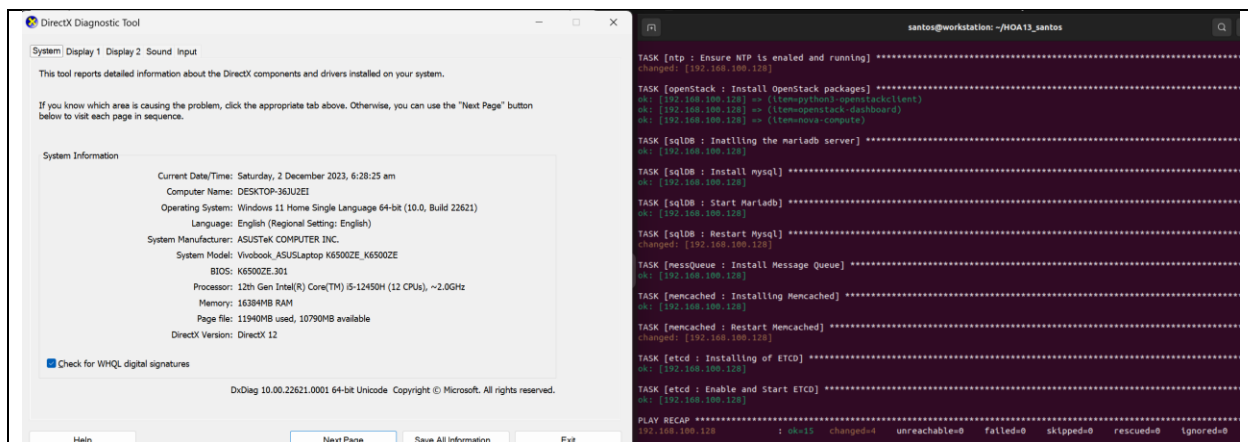
## Content of config.yml



This is the content of the config.yml, it shows the pre-tasks where it will update the ubuntu first. After that it will call the different roles that I made earlier.

## Running the config.yml

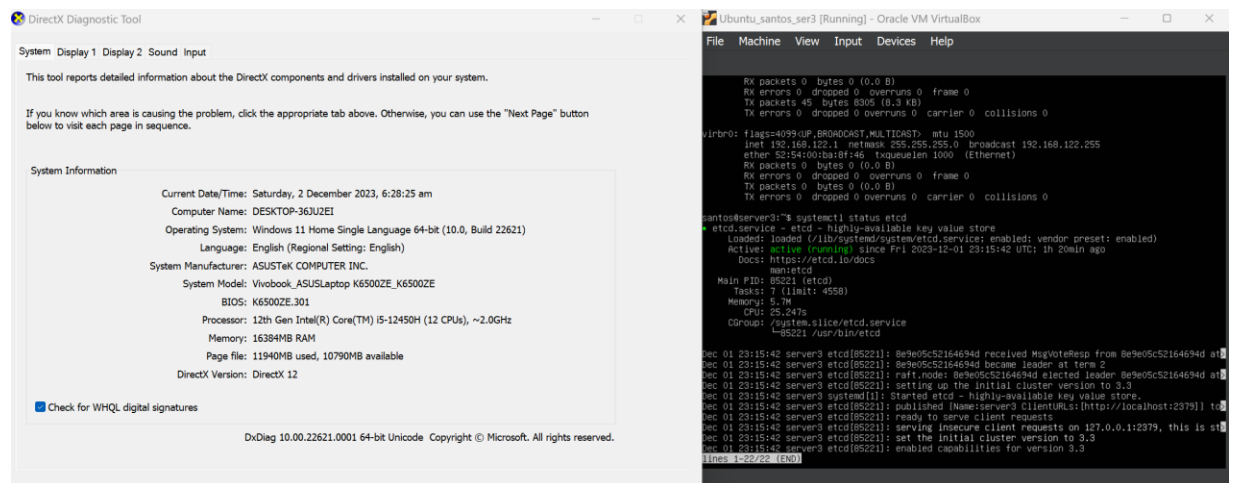




It shows that all the tasks are successfully executed. In the play recap we can see the number of ok and changed, also it shows 0 in the failed.

## Verification (will use the command systemctl status)

### ETCD





# Memcached

DirectX Diagnostic Tool

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 which 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, 6:28:25 am

Computer Name: DESKTOP-36JUZEI

Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22H2)

Language: English (Regional Setting: English)

System Manufacturer: ASUS/TEK COMPUTER INC.

System Model: Vivobook\_ASUSLaptop K6500ZE\_K6500ZE

BIOS: K6500ZE.301

Processor: 12th Gen Intel(R) Core(TM) i5-12450H (12 CPUs), ~2.0GHz

Memory: 16384MB RAM

Page file: 11940MB used, 10790MB available

DirectX Version: DirectX 12

☒ Check for WHQL digital signatures

DxDiag 10.00.22621.0001 64-bit Unicode Copyright © Microsoft. All rights reserved.

```
etcd.service - etcd - highly-available key value store
Loaded: loaded (/lib/systemd/system/etcd.service; enabled; vendor preset: enabled)
Active: active (running) since Fri 2023-12-01 23:15:42 UTC; 1h 24min ago
Docs: https://etcd.io/docs
       man:etcd
Main PID: 85221 (etcd)
Tasks: 7 (limit: 4558)
Memory: 5.7M
CPU: 27.053s
CGroup: /system.slice/etcd.service
       └─85221 /usr/bin/etcd

Dec 01 23:15:42 server3 etcd[85221]: 8e9e5c52164694d received MsgVoteResp from 8e9e5c52164694d at
Dec 01 23:15:42 server3 etcd[85221]: raft.node: 8e9e5c52164694d elected leader 8e9e5c52164694d at
Dec 01 23:15:42 server3 etcd[85221]: setting up the initial cluster version to 3.3
Dec 01 23:15:42 server3 system[1]: Started etcd - highly-available key value store.
Dec 01 23:15:42 server3 etcd[85221]: published {Name:server3 ClientURLs:[http://localhost:2379]} to
Dec 01 23:15:42 server3 etcd[85221]: ready to serve client requests
Dec 01 23:15:42 server3 etcd[85221]: serving insecure client requests on 127.0.0.1:2379, this is st
Dec 01 23:15:42 server3 etcd[85221]: set the initial cluster version to 3.3
Dec 01 23:15:42 server3 etcd[85221]: enabled capabilities for version 3.3
santos@server3:~$ systemctl status memcached
● memcached.service - memcached daemon
Loaded: loaded (/lib/systemd/system/memcached.service; enabled; vendor preset: enabled)
Active: active (running) since Fri 2023-12-01 23:49:52 UTC; 50min ago
Docs: man:memcached(1)
Main PID: 87276 (memcached)
Tasks: 10 (limit: 4558)
Memory: 1.7M
CPU: 72ms
CGroup: /system.slice/memcached.service
       └─87276 /usr/bin/memcached -m 64 -p 11211 -u memcache -l 127.0.0.1 -P /var/run/memcac

Dec 01 23:49:52 server3 system[1]: Stopped memcached daemon.
Dec 01 23:49:52 server3 system[1]: Started memcached daemon.
santos@server3:~$
```

# Message Queue

DirectX Diagnostic Tool

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 which 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, 6:28:25 am

Computer Name: DESKTOP-36JUZEI

Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22H2)

Language: English (Regional Setting: English)

System Manufacturer: ASUS/TEK COMPUTER INC.

System Model: Vivobook\_ASUSLaptop K6500ZE\_K6500ZE

BIOS: K6500ZE.301

Processor: 12th Gen Intel(R) Core(TM) i5-12450H (12 CPUs), ~2.0GHz

Memory: 16384MB RAM

Page file: 11940MB used, 10790MB available

DirectX Version: DirectX 12

☒ Check for WHQL digital signatures

DxDiag 10.00.22621.0001 64-bit Unicode Copyright © Microsoft. All rights reserved.

```
Process: 92365 ExecStartPost=/bin/sh -c systemctl unset-environment _KGREP_START_POSITION (code=
Process: 92367 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
Status: "Taking your SQL requests now..."
Tasks: 11 (limit: 4558)
Memory: 80.7M
CPU: 329ms
CGroup: /system.slice/mariadb.service
       └─92365 /usr/sbin/mariadbd

Dec 02 00:58:20 server3 mariadbd[92365]: Version: '10.6.12-MariaDB-odubuntu-22.04.1' socket: '/run
Dec 02 00:58:20 server3 system[1]: Started MariaDB 10.6.12 database server.
Dec 02 00:58:20 server3 /etc/mysql/debian-start[92367]: Upgrading MySQL tables if necessary.
Dec 02 00:58:20 server3 /etc/mysql/debian-start[92372]: Looking for 'mariadb' as: /usr/bin/mariadb
Dec 02 00:58:20 server3 /etc/mysql/debian-start[92372]: Looking for 'mariadb-check' as: /usr/bin/mari
Dec 02 00:58:20 server3 /etc/mysql/debian-start[92372]: This installation of MariaDB is already usi
Dec 02 00:58:20 server3 /etc/mysql/debian-start[92372]: There is no need to run mysql_upgrade agai
Dec 02 00:58:20 server3 /etc/mysql/debian-start[92372]: You can use --force if you still want to ru
Dec 02 00:58:20 server3 /etc/mysql/debian-start[92380]: Checking for insecure root accounts.
Dec 02 00:58:20 server3 /etc/mysql/debian-start[92393]: Triggering mysql-recover for all MySQL ta
santos@server3:~$ 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 2023-12-01 23:15:28 UTC; 1h 50min ago
Docs: man:rabbitmq-server(8)
Main PID: 84783 (beam.smp)
Tasks: 21 (limit: 4558)
Memory: 87.5M
CPU: 41.244s
CGroup: /system.slice/rabbitmq-server.service
       └─84783 /usr/lib/erlang/erts-12.2.1/bin/beam.smp -H w -Mbas agefcfcbf -Mbas agefcfcbf -H
       └─84784 erl_init_setup 65536
       └─84841 inet_gethost 4
       └─84842 inet_gethost 4

Dec 01 23:15:25 server3 system[1]: Starting RabbitMQ Messaging Server...
Dec 01 23:15:28 server3 system[1]: Started RabbitMQ Messaging Server.
santos@server3:~$
```

# NTP

DirectX Diagnostic Tool

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 which 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, 6:28:25 am

Computer Name: DESKTOP-36JUZEI

Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22H2)

Language: English (Regional Setting: English)

System Manufacturer: ASUS/TEK COMPUTER INC.

System Model: Vivobook\_ASUSLaptop K6500ZE\_K6500ZE

BIOS: K6500ZE.301

Processor: 12th Gen Intel(R) Core(TM) i5-12450H (12 CPUs), ~2.0GHz

Memory: 16384MB RAM

Page file: 11940MB used, 10790MB available

DirectX Version: DirectX 12

☒ Check for WHQL digital signatures

DxDiag 10.00.22621.0001 64-bit Unicode Copyright © Microsoft. All rights reserved.

```
memcached.service - memcached daemon
Loaded: loaded (/lib/systemd/system/memcached.service; enabled; vendor preset: enabled)
Active: active (running) since Fri 2023-12-01 23:49:52 UTC; 50min ago
Docs: man:memcached(1)
Main PID: 87276 (memcached)
Tasks: 10 (limit: 4558)
Memory: 1.7M
CPU: 72ms
CGroup: /system.slice/memcached.service
       └─87276 /usr/bin/memcached -m 64 -p 11211 -u memcache -l 127.0.0.1 -P /var/run/memcac

Dec 01 23:49:52 server3 system[1]: Stopped memcached daemon.
Dec 01 23:49:52 server3 system[1]: Started memcached daemon.
santos@server3:~$ systemctl status ntp
● ntp.service - Network Time Service
Loaded: loaded (/lib/systemd/system/ntp.service; enabled; vendor preset: enabled)
Active: active (running) since Fri 2023-12-01 23:49:42 UTC; 51min ago
Docs: man:ntpd(8)
Process: 87041 ExecStart=/usr/lib/ntp/ntp-systemd-wrapper (code=exited, status=0/SUCCESS)
Main PID: 87047 (ntpd)
Tasks: 2 (limit: 4558)
Memory: 1.5M
CPU: 557ms
CGroup: /system.slice/ntp.service
       └─87047 /usr/sbin/ntpd -p /var/run/ntpd.pid -g -u 116:122

Dec 01 23:49:48 server3 ntpd[87047]: Soliciting pool server 163.47.9.135
Dec 01 23:49:56 server3 ntpd[87047]: Soliciting pool server 2001:14b:f0cf:8777:227c:14ff:fe1f:5f70
Dec 01 23:49:56 server3 ntpd[87047]: Soliciting pool server 23.106.249.200
Dec 01 23:49:56 server3 ntpd[87047]: Soliciting pool server 195.125.190.57
Dec 01 23:50:25 server3 ntpd[87047]: kernel reports TIME_ERROR: 0x2041: Clock unsynchronized
Dec 02 00:00:02 server3 ntpd[87047]: 23.106.249.200 local addr 192.168.100.128 -> <null>
Dec 02 00:00:32 server3 ntpd[87047]: 106.10.186.200 local addr 192.168.100.128 -> <null>
Dec 02 00:12:28 server3 ntpd[87047]: 112.104.44.120 local addr 192.168.100.128 -> <null>
Dec 02 00:13:26 server3 ntpd[87047]: 52.148.114.168 local addr 192.168.100.128 -> <null>
santos@server3:~$
```



The screenshot shows the 'System Information' tab of the DirectX Diagnostic Tool. It provides a comprehensive overview of the system's configuration, including the operating system version (Windows 11), hardware manufacturer (ASUS), and specific components like the processor, memory, and storage. The tool also lists installed drivers and their status, such as the network and audio drivers. The interface is clean and organized, with a sidebar on the left for navigation and a main content area for details.

The image shows two side-by-side windows. The left window is the 'DirectX Diagnostic Tool' with the 'System' tab selected, displaying system information such as Date/Time, Computer Name, Operating System, Language, System Manufacturer, System Model, BIOS, Processor, Memory, Page file, and DirectX Version. The right window is a terminal titled 'Ubuntu\_santos\_ser3 [Running] - Oracle VM VirtualBox'. It shows the command 'systemctl status mysql' being executed, with output indicating that the MySQL service is active and running.

The screenshot displays the DirectX Diagnostic Tool window, which is divided into two main panes. The left pane, titled 'System Information', contains a tree view on the left with 'System Information' selected, and a detailed text area on the right. The right pane, titled 'Check for WHQL digital signatures', contains a 'Check for WHQL digital signatures' button and a list of digital signatures.

**System Information**

Current Date/Time: Saturday, 2 December 2023, 6:28:25 am  
Computer Name: DESKTOP-36J2UEI  
Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22H2)  
Language: English (Regional Setting: English)  
System Manufacturer: ASUSTek COMPUTER INC.  
System Model: Vivobook\_ASUSLaptop K6502ZE\_K6500ZE  
BIOS: K6500ZE.301  
Processor: 12th Gen Intel(R) Core(TM) i5-12450H (12 CPUs), ~2.0Ghz  
Memory: 16384MB RAM  
Page file: 11940MB used, 10790MB available  
DirectX Version: DirectX 12

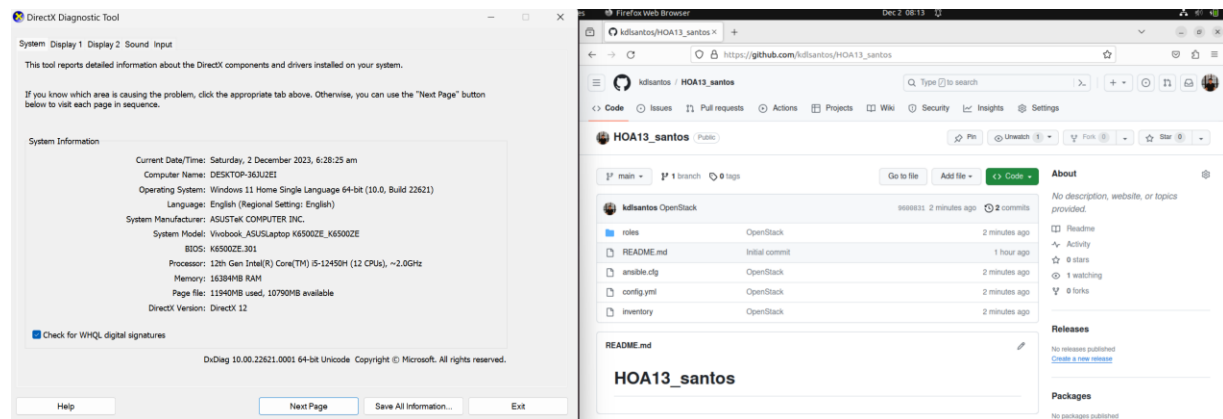
☒ Check for WHQL digital signatures

**Check for WHQL digital signatures**

Diag 10.00.22621.0001 64-bit Unicode Copyright © Microsoft. All rights reserved.

I use the git add. to add all the files and I check it using git status. After that I use git commit -m and add description of it which OpenStack. After that I push it using git push origin add.

## Screenshot of GitHub Repository



## GitHub Repository link

[https://github.com/kdlsantos/HOA13\\_santos](https://github.com/kdlsantos/HOA13_santos)

## Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?
  - **Implementing the OpenStack can give various benefits to the system. One of this is it can help to manage your scalability, since it will help to scale up or down based on the needs. Another one is it will help in terms of security and compliance, since it has those features. It also includes the access controls, audit trails and also encryption. Being cost efficient is also one of the benefits we will get in OpenStack. Since, it will help to optimize the hardware and also utilize it that will lead in reducing the needs for excess physical server. Flexibility is also one of the features of OpenStack since it is versatile and supports different hypervisors and networking options. It will help to pick the right equipment and technology that will match to the needs. All in all, we can say that implementing OpenStack can gives multiple benefits that can improve the system.**

**Conclusions:**

This activity focus on installation the different prerequisites of OpenStack. Knowing it and be able to properly configure those prerequisites will give you a proper operational OpenStack cloud. In the given task we are able to install the different thing in the remote server using ansible. To make sure that it is properly organize I user different roles for each needed task. Aside from that I learn the different benefits that we can able to get when I implement the OpenStack with the help of the reflection after doing the activity. It's important to know those things since it can help your system to be more flexible, cost efficient and also manage it properly. It's also important to check the different needs for OpenStack like hardware and software related requirements to be able to implement it smoothly. I can say that this activity really help to expand my knowledge and be able to dig more about OpenStack and I hope to use this in the future.