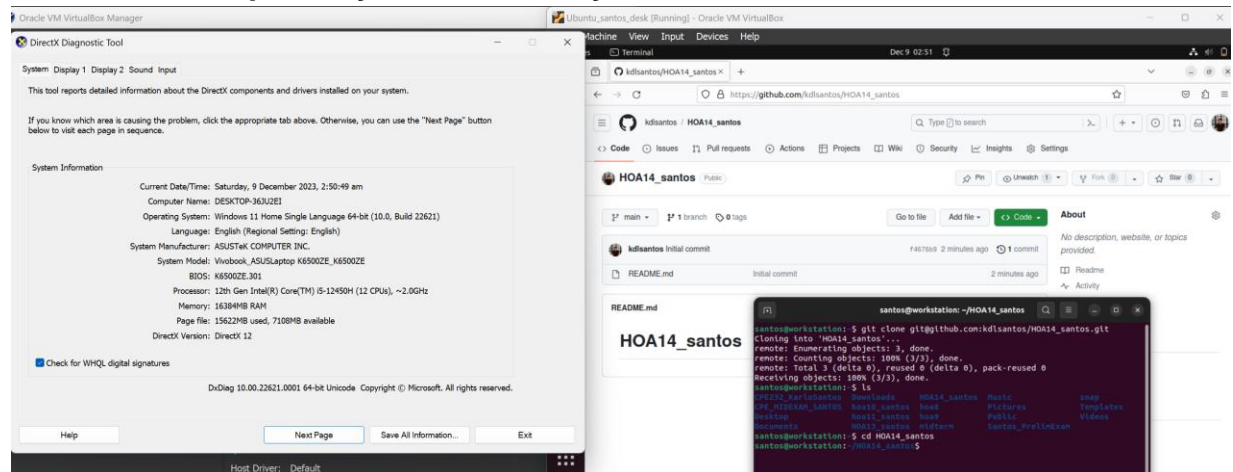
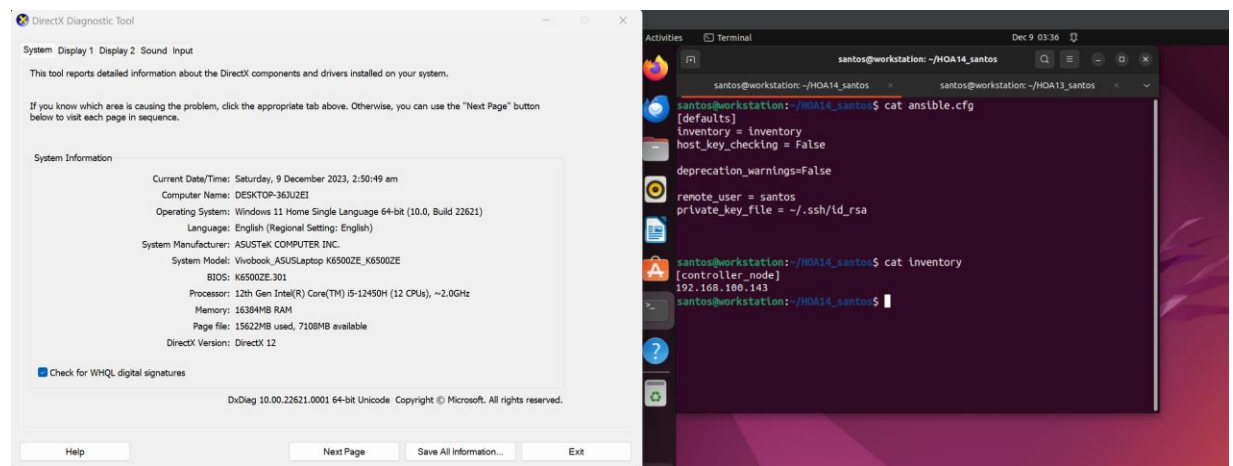


Name: Karlo D. Santos	Date Performed: 12/10/2023
Course/Section: CPE31S5	Date Submitted: 12/15/2023
Instructor: Engr. Roman Richard	Semester and SY: 1st sem 23-24
Activity 14: OpenStack Installation (Keystone, Glance, Nova)	
1. Objectives	
Create a workflow to install OpenStack using Ansible as your Infrastructure as Code (IaC).	
2. Intended Learning Outcomes	
<ol style="list-style-type: none"> 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	
<p>Oracle VirtualBox (Hypervisor)</p> <p>1x Ubuntu VM or Centos VM</p>	
4. Tasks	
<ol style="list-style-type: none"> 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/ <ol style="list-style-type: none"> a. Keystone (Identity Service) b. Glance (Imaging Service) c. Nova (Compute Service) d. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in the Inventory file. e. Add, commit and push it to your GitHub repo. 	
5. Output (screenshots and explanations)	

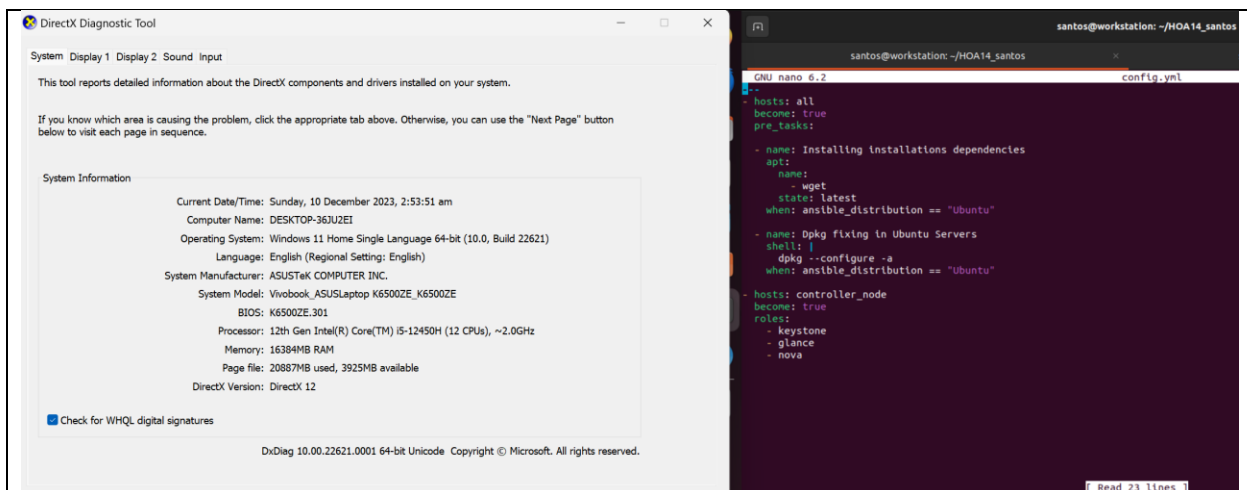
Create a new repository for this activity.



This is the screenshot of cloning the new repository into the terminal.

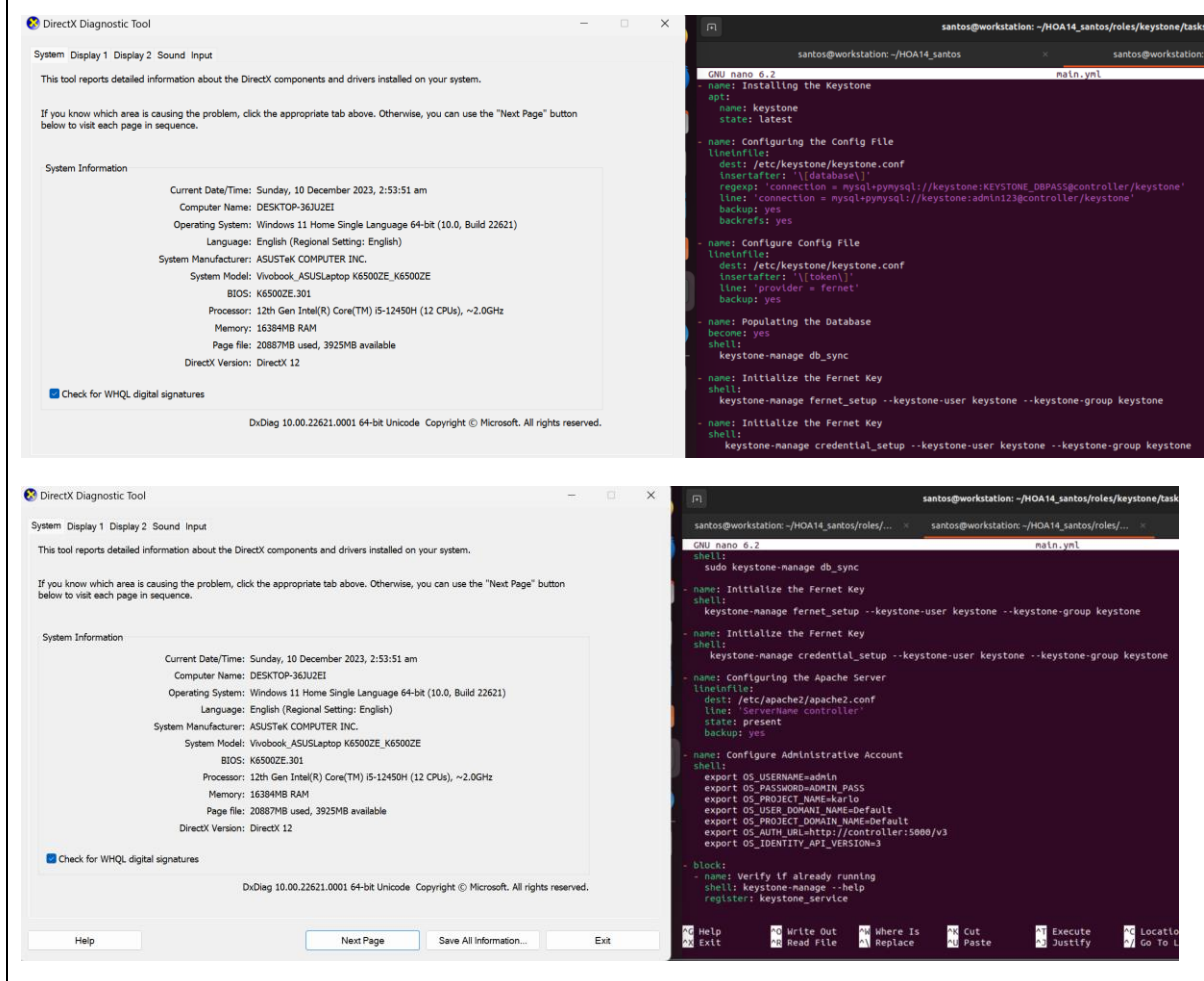


The screenshot shows the content of ansible.cfg that will be going to use in this activity. It also shows the content of inventory where we can see the ip address of the remote server.



This is the content of config.yml, it first run the pre-tasks where it contains the installation of dependencies. After that it will call the different roll for installation.

Keystone



The screenshot above is the main.yml of keystone role. Contain the installation of keystone and also configuring of it to the remote server. It will help to properly install the keystone.

Glance

The image displays three screenshots of a remote server session, showing the installation and configuration of Glance on a CentOS 6.2 system. The left side of each screenshot shows the DirectX Diagnostic Tool window, which is open to the 'System Information' tab. The right side shows the terminal output of the Glance installation process.

System Information (from all screenshots):

- Current Date/Time: Sunday, 10 December 2023, 2:53:51 am
- Computer Name: DESKTOP-36JUZ2I
- 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 K6500ZE_K6500ZE
- BIOS: K6500ZE.301
- Processor: 12th Gen Intel(R) Core(TM) i5-12450H (12 CPUs), ~2.0GHz
- Memory: 16384MB RAM
- Page file: 20887MB used, 3925MB available
- DirectX Version: DirectX 12

Glance Installation (main.yml):

```
name: Install Glance
apt:
  name:
    - glance
  state: latest

name: Configure database access
replace:
  dest: /etc/glance/glance-api.conf
  regexp: connection = mysql+pymysql://glance:GLANCE_DBPASS@controller/glance
  replace: connection = mysql+pymysql://glance:admin123@controller/glance
  backup: yes

name: Configure Glance Authentication Key for database
lineinfile:
  dest: /etc/glance/glance-api.conf
  insertafter: '[keystone_authtoken]'
  line: '[keystone_authtoken]'
  state: present
  backup: yes

loop:
  - www_authenticate_url = http://controller:5000
  - auth_url = http://controller:5000
  - memcached_servers = controller:11211
  - auth_type = password
  - project_domain_name = Default
  - user_domain_name = Default
  - project_name = service
  - username = glance
  - password = admin123
```

Glance Configuration (glance.yml):

```
name: Configure Glance paste_deploy
lineinfile:
  dest: /etc/glance/glance-api.conf
  insertafter: '[paste_deploy]'
  line: 'flavor = keystone'
  backup: yes

name: Configure Glance glance_store
lineinfile:
  dest: /etc/glance/glance-api.conf
  insertafter: '[glance_store]'
  line: '[glance_store]'
  state: present
  backup: yes

loop:
  - stores = file:http
  - default_store = file
  - filesystem_store_datadir = /var/lib/glance/images/

name: Configure Glance oslo_limit
lineinfile:
  dest: /etc/glance/glance-api.conf
  insertafter: '[oslo_limit]'
  line: '[oslo_limit]'
  state: present
  backup: yes

loop:
  - auth_url = http://controller:5000
  - auth_type = password
  - user_domain_id = default

name: Configure the default of Glance
lineinfile:
  dest: /etc/glance/glance-api.conf
  insertafter: '[DEFAULT]'
  line: 'use_keystone_limits = True'
  backup: yes

name: Populating the Image Service Database
become: yes
shell:
  sudo glance-manage db_sync
```

This is the content of main.yml for the glance. It contain the installation of glance and other task like configuring its access into database. Those things are needed to have a properly working glance.

Nova

The image displays three screenshots of a system diagnostic tool and a terminal window, illustrating the configuration of Nova.

Top Screenshot: The DirectX Diagnostic Tool window shows system information. The terminal window displays the initial configuration of Nova in main.yml, including installing Nova, configuring the Nova API, and configuring the Nova Database.

Middle Screenshot: The DirectX Diagnostic Tool window shows system information. The terminal window displays the configuration of Nova Authentication Token and Nova VNC.

Bottom Screenshot: The DirectX Diagnostic Tool window shows system information. The terminal window displays the configuration of Nova placement and Nova Glance.

System Information (from all screenshots):

- Current Date/Time: Sunday, 10 December 2023, 2:53:51 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: ASUSTeK 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: 20887MB used, 3925MB available
- DirectX Version: DirectX 12

main.yml Configuration (from all screenshots):

```
---
- name: Installing Nova
  apt:
    name:
      - nova-api
      - nova-conductor
      - nova-novncproxy
      - nova-scheduler
    state: latest

- name: Configuring Nova API
  lineinfile:
    dest: /etc/nova/nova.conf
    regexp: connection = mysql+pymysql://nova:NOVA_DBPASS@controller/nova_api
    line: connection = mysql+pymysql://nova:admin123@controller/nova_api
    backup: yes
    backrefs: yes

- name: Configure Nova API
  lineinfile:
    dest: /etc/nova/nova.conf
    lineafter: '[api]'
    line: 'auth_strategy = keystone'
    state: present
    backup: yes

- name: Configuring the Nova Database
  lineinfile:
    dest: /etc/nova/nova.conf
    regexp: mysql+pymysql://nova:NOVA_DBPASS@controller/nova
    line: mysql+pymysql://nova:admin123@controller/nova
    backup: yes
    backrefs: yes

- name: Configure Nova Authentication Token
  lineinfile:
    dest: /etc/glance/glance-api.conf
    lineafter: '[keystone_authtoken]'
    line: '[keystone_authtoken]'
    state: present
    backup: yes

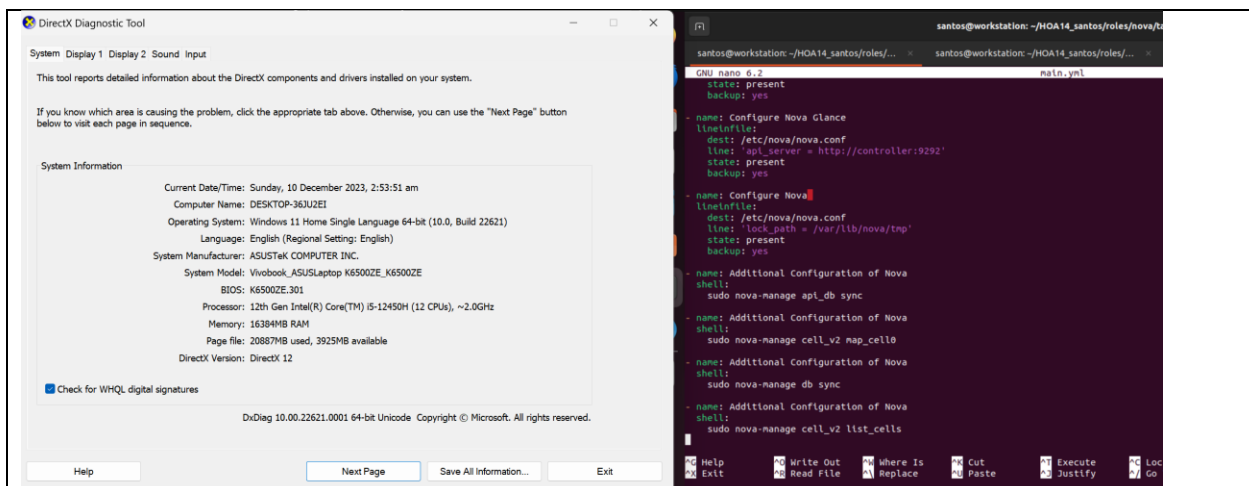
- name: Configure Nova VNC
  lineinfile:
    dest: /etc/glance/glance-api.conf
    lineafter: '[vnc]'
    line: '[vnc]'
    state: present
    backup: yes

- name: Configure Nova placement
  lineinfile:
    dest: /etc/glance/glance-api.conf
    lineafter: '[placement]'
    line: '[placement]'
    state: present
    backup: yes

- name: Configure Nova Default
  lineinfile:
    dest: /etc/nova/nova.conf
    line: 'my_ip = 10.0.0.11'
    state: present
    backup: yes

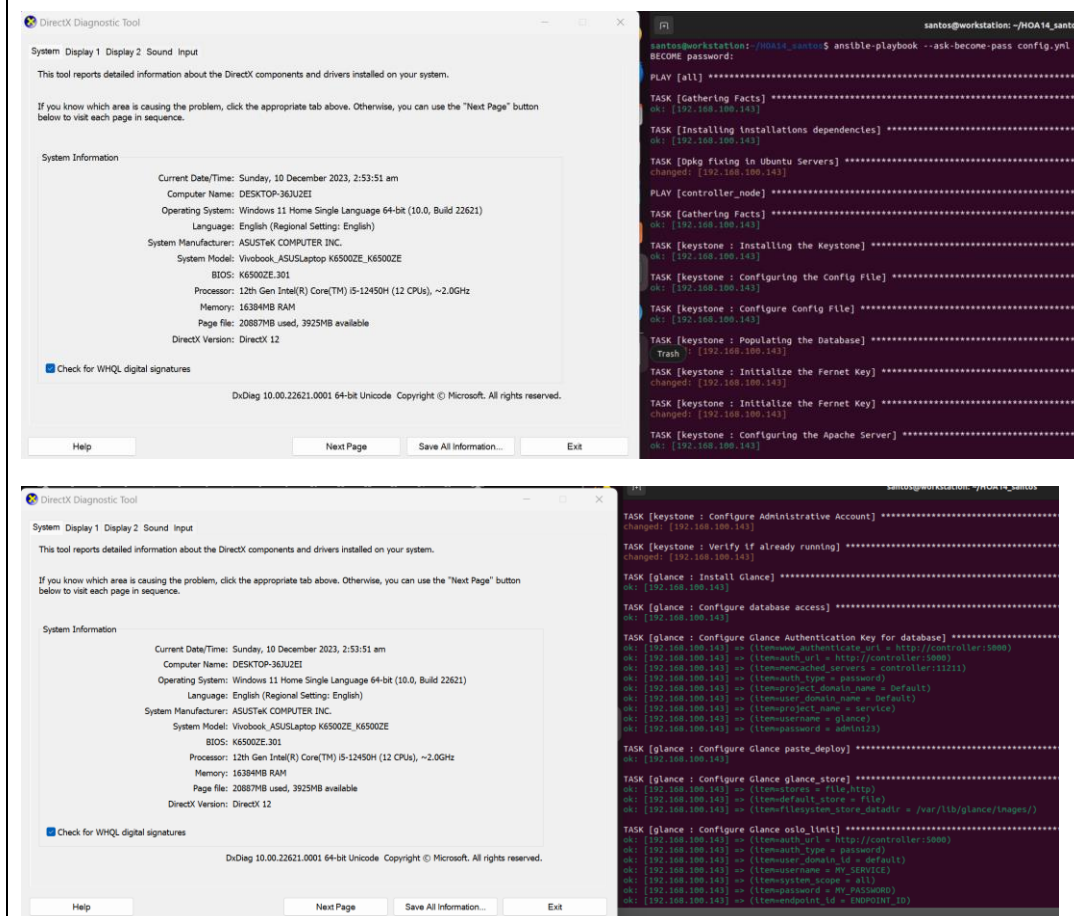
- name: Configure Nova Glance
  lineinfile:
    dest: /etc/nova/nova.conf
    line: 'api_server = http://controller:9292'
    state: present
    backup: yes

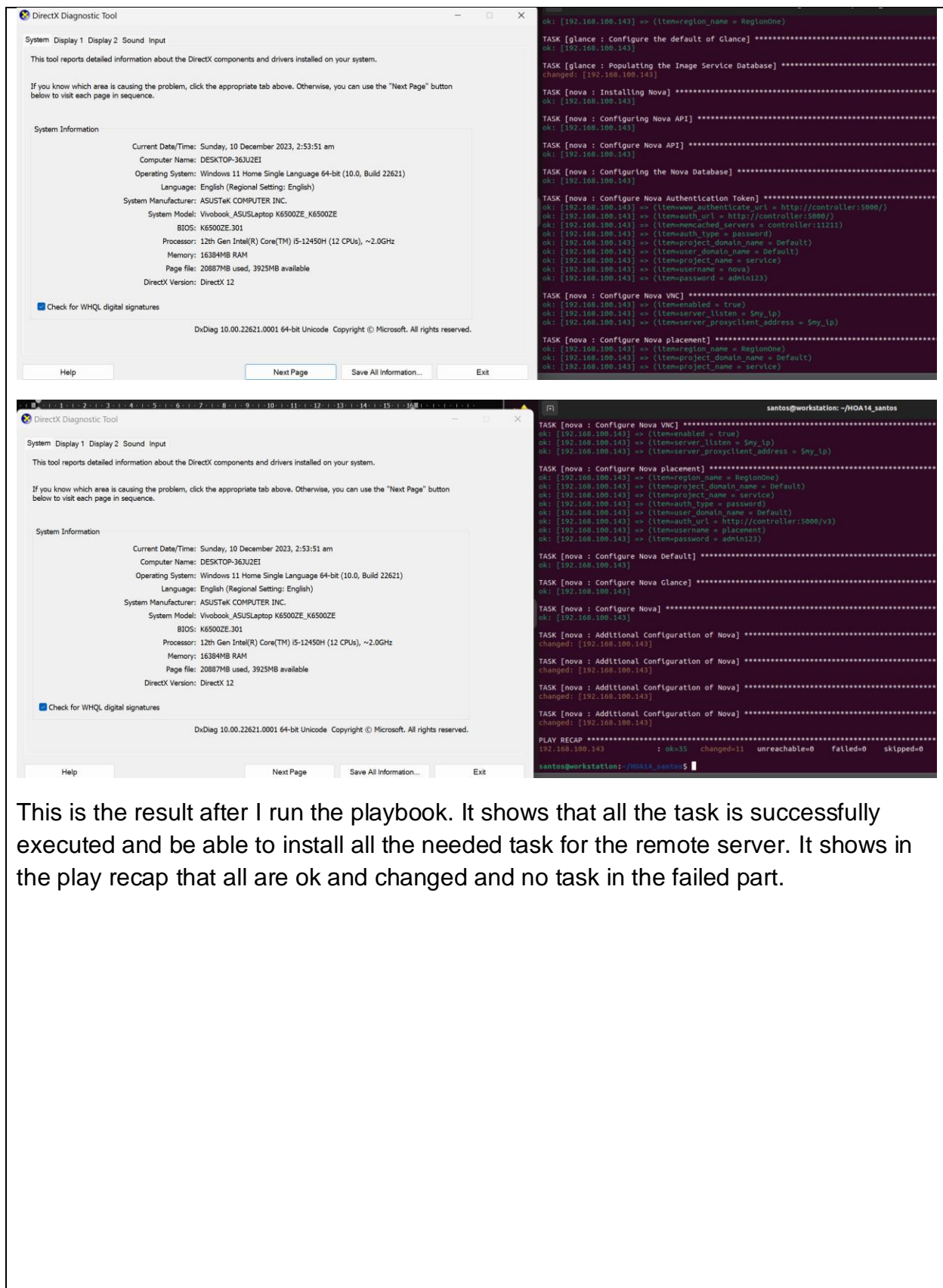
- name: Configure Nova
```

This is about the installation of nova to the remote server. This include the different task that is needed for the installation. It include the configuration of nova API and some configuration for nova.

Run the playbook

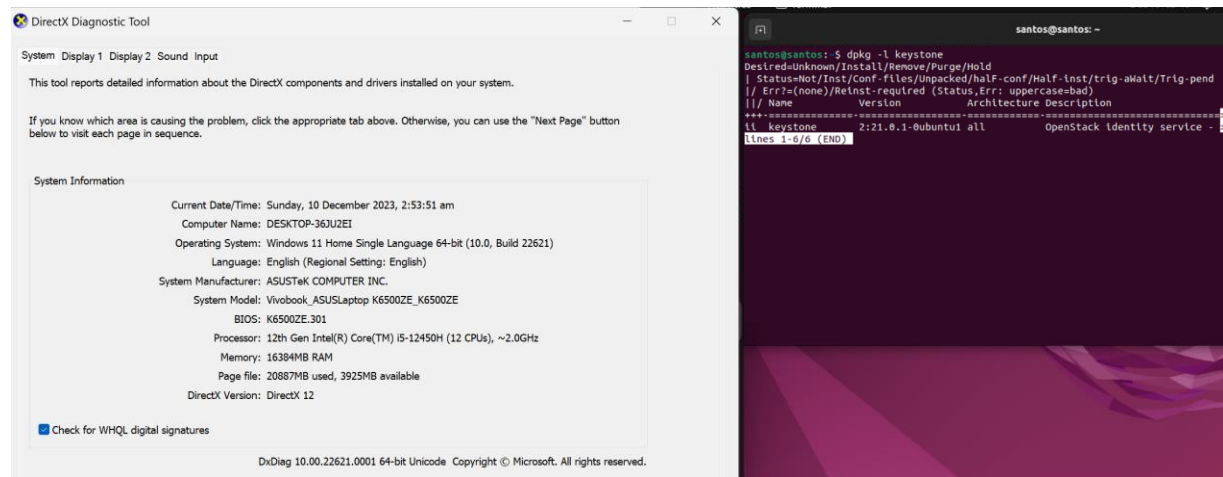




This is the result after I run the playbook. It shows that all the task is successfully executed and be able to install all the needed task for the remote server. It shows in the play recap that all are ok and changed and no task in the failed part.

Verification if all the things are installed properly

Keystone



The screenshot shows the DirectX Diagnostic Tool window on the left and a terminal window on the right. The DirectX Diagnostic Tool displays system information for a Windows 11 Home system. The terminal window shows the command `santosh@santosh:~$ dpkg -l keystone` and its output, which includes details about the keystone package and its dependencies.

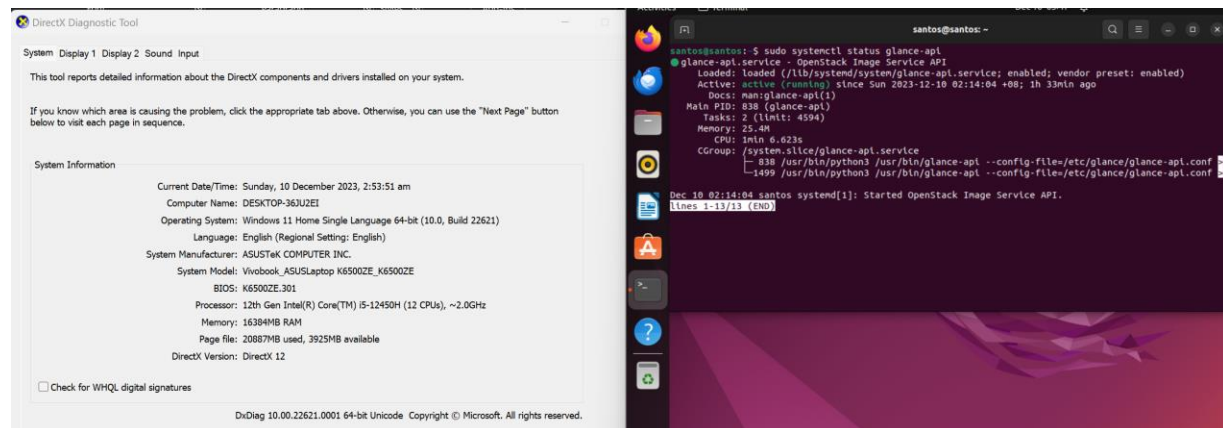
System Information:

- Current Date/Time: Sunday, 10 December 2023, 2:53:51 am
- Computer Name: DESKTOP-36J2EI
- Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22H2)
- Language: English (Regional Setting: English)
- System Manufacturer: ASUS/TAI 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: 20887MB used, 3925MB available
- DirectX Version: DirectX 12

Terminal Output:

```
santosh@santosh:~$ dpkg -l keystone
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Inst/Conf-files/Unpacked/halF-conf/Half-Inst/trig-await/Trig-pend
|/ Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
++-++ Name            Version             Architecture Description
++-++-----+-----+-----+-----+
ii keystone            2:21.0.1-0ubuntu1 all      OpenStack Identity service
lines 1-6/6 (END)
```

Glance



The screenshot shows the DirectX Diagnostic Tool window on the left and a terminal window on the right. The DirectX Diagnostic Tool displays system information for a Windows 11 Home system. The terminal window shows the command `santosh@santosh:~$ sudo systemctl status glance-api` and its output, which includes details about the glance-api service and its dependencies.

System Information:

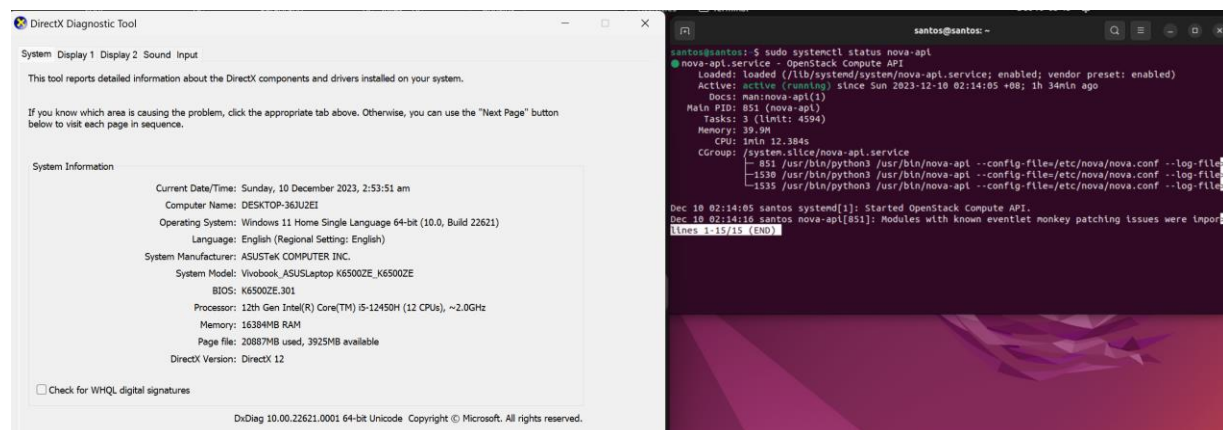
- Current Date/Time: Sunday, 10 December 2023, 2:53:51 am
- Computer Name: DESKTOP-36J2EI
- Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22H2)
- Language: English (Regional Setting: English)
- System Manufacturer: ASUS/TAI COMPUTER INC.
- System Model: Vivobook_ASUSLaptop K6500ZE_K6500ZE
- BIOS: K6500ZE.301
- Processor: 12th Gen Intel(R) Core(TM) i5-12450H (12 CPUs), ~2.0GHz
- Memory: 16384MB RAM
- Page file: 20887MB used, 3925MB available
- DirectX Version: DirectX 12

Terminal Output:

```
santosh@santosh:~$ sudo systemctl status glance-api
● glance-api.service - OpenStack Image Service API
   Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor preset: enabled)
   Active: active (running) since Sun 2023-12-10 02:14:04 +08; 1h 33min ago
     Docs: man:glance-api(1)
   Main PID: 838 (glance-api)
    Tasks: 2 (limit: 4594)
   Memory: 25.4M
      CPU: 1min 6.623s
   CGroup: /system.slice/glance-api.service
           └─ 838 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance-api.conf
             1499 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance-api.conf

Dec 10 02:14:04 santosh systemd[1]: Started OpenStack Image Service API.
lines 1-13/13 (END)
```

Nova



The screenshot shows the DirectX Diagnostic Tool window on the left and a terminal window on the right. The DirectX Diagnostic Tool displays system information for a Windows 11 Home system. The terminal window shows the command `santosh@santosh:~$ sudo systemctl status nova-api` and its output, which includes details about the nova-api service and its dependencies.

System Information:

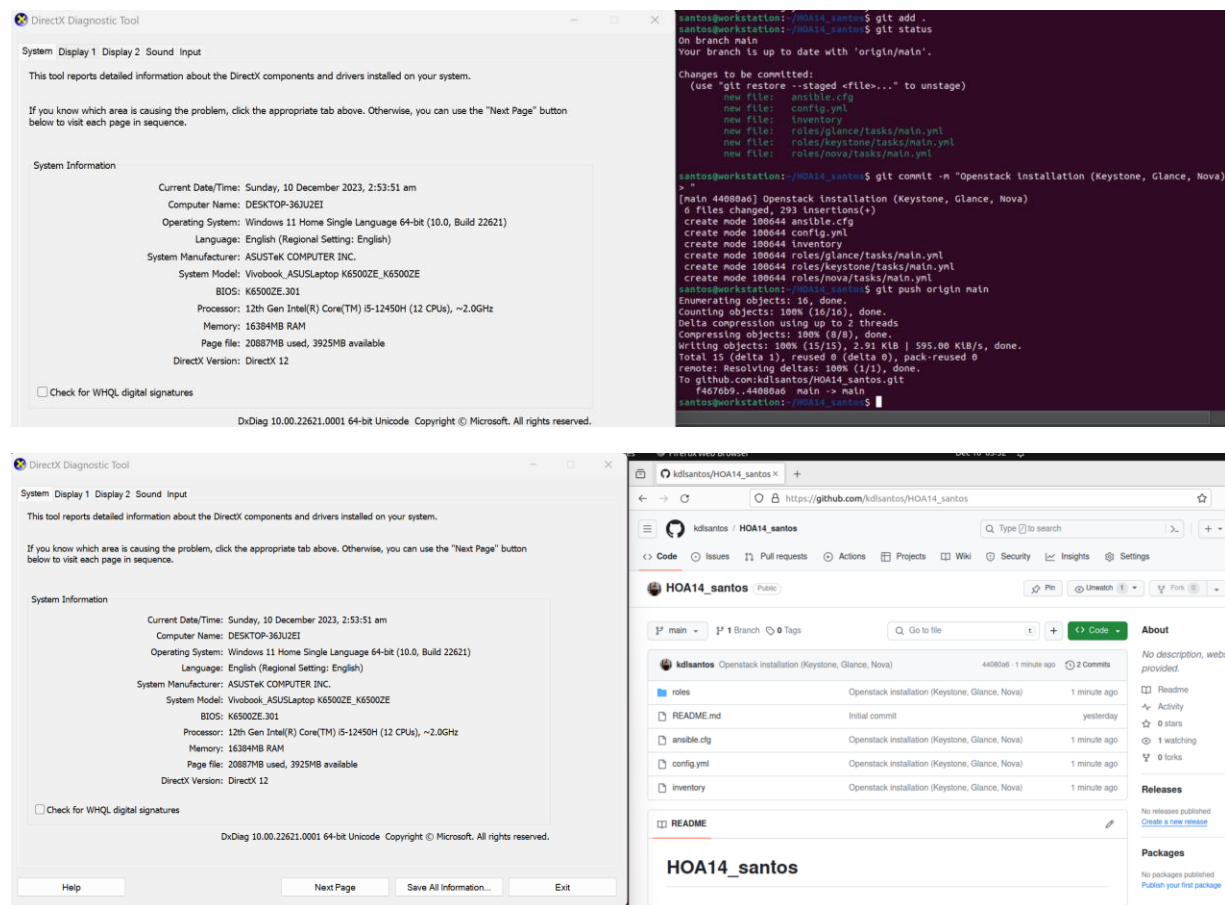
- Current Date/Time: Sunday, 10 December 2023, 2:53:51 am
- Computer Name: DESKTOP-36J2EI
- Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22H2)
- Language: English (Regional Setting: English)
- System Manufacturer: ASUS/TAI COMPUTER INC.
- System Model: Vivobook_ASUSLaptop K6500ZE_K6500ZE
- BIOS: K6500ZE.301
- Processor: 12th Gen Intel(R) Core(TM) i5-12450H (12 CPUs), ~2.0GHz
- Memory: 16384MB RAM
- Page file: 20887MB used, 3925MB available
- DirectX Version: DirectX 12

Terminal Output:

```
santosh@santosh:~$ sudo systemctl status nova-api
● nova-api.service - OpenStack Compute API
   Loaded: loaded (/lib/systemd/system/nova-api.service; enabled; vendor preset: enabled)
   Active: active (running) since Sun 2023-12-10 02:14:05 +08; 1h 34min ago
     Docs: man:nova-api(1)
   Main PID: 851 (nova-api)
    Tasks: 3 (limit: 4594)
   Memory: 39.4M
      CPU: 1min 12.384s
   CGroup: /system.slice/nova-api.service
           └─ 851 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova/nova.conf --log-file=/var/log/nova/nova-api.log
             1530 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova/nova.conf --log-file=/var/log/nova/nova-api.log
             1535 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova/nova.conf --log-file=/var/log/nova/nova-api.log

Dec 10 02:14:05 santosh systemd[1]: Started OpenStack Compute API.
Dec 10 02:14:16 santosh nova-api[851]: Modules with known eventlet monkey patching issues were imported
lines 1-15/15 (END)
```


Pushing to the github



This shows that my github repository contain all the files and directory I used in this activity. Using the git push origin main in the terminal.

GitHub repository link:

https://github.com/kdlsantos/HOA14_santos

Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services

- **Keystone:** It is identity service and its main purpose is to gives authentication and authorization services to the OpenStack services. It will manage the user and also the system data and make sure the security access to the OpenStack services.

- **Glance:** It is a computer service and its main role is to manage and categorized the virtual machine image used by OpenStack. Those images can be used in the virtual instances and also glance can enable the user to register a VM image.
- **Nova:** It is a computer service and its main purpose is to manage and also look after to the compute resources. It will help to allow the user to create and manage different virtual machine and gives feature for scaling.

Conclusions:

In this activity I able to expand my understanding and knowledge about OpenStack. In the procedure I are able to install the keystone, glance, and nova to the remoter server which is Ubuntu server. I able to install all the needed requirements and also be familiarize how to install those things and also troubleshoot an error if I encounter one. In the reflection, I able to learn the difference between the 3, like its role and also their individual purpose. I learned that keystone is more about identity and authentication, while glance is about managing the VMs and lastly the nova is about managing the compute resources. I hope to use this in the future activity and explore more about this topic.