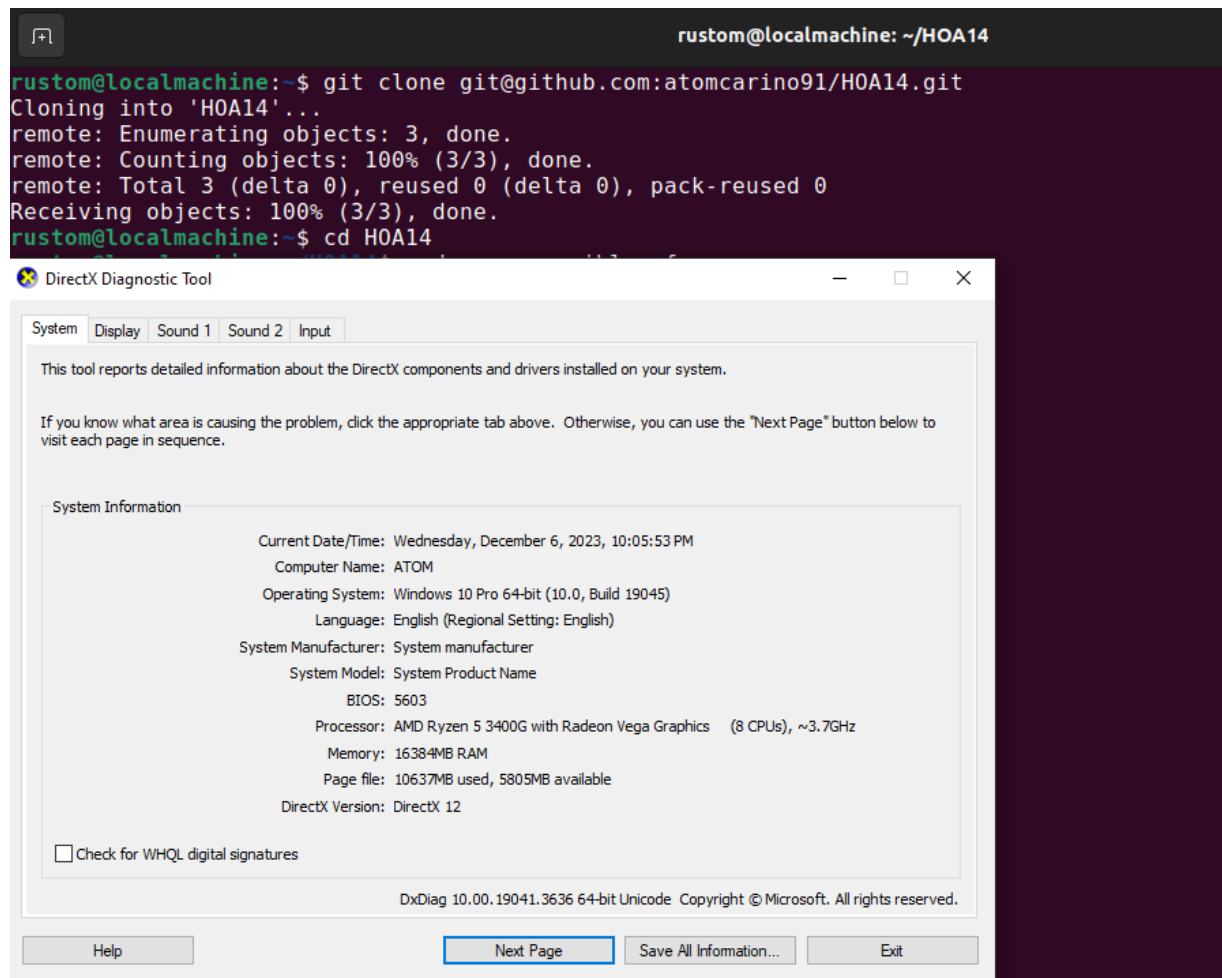
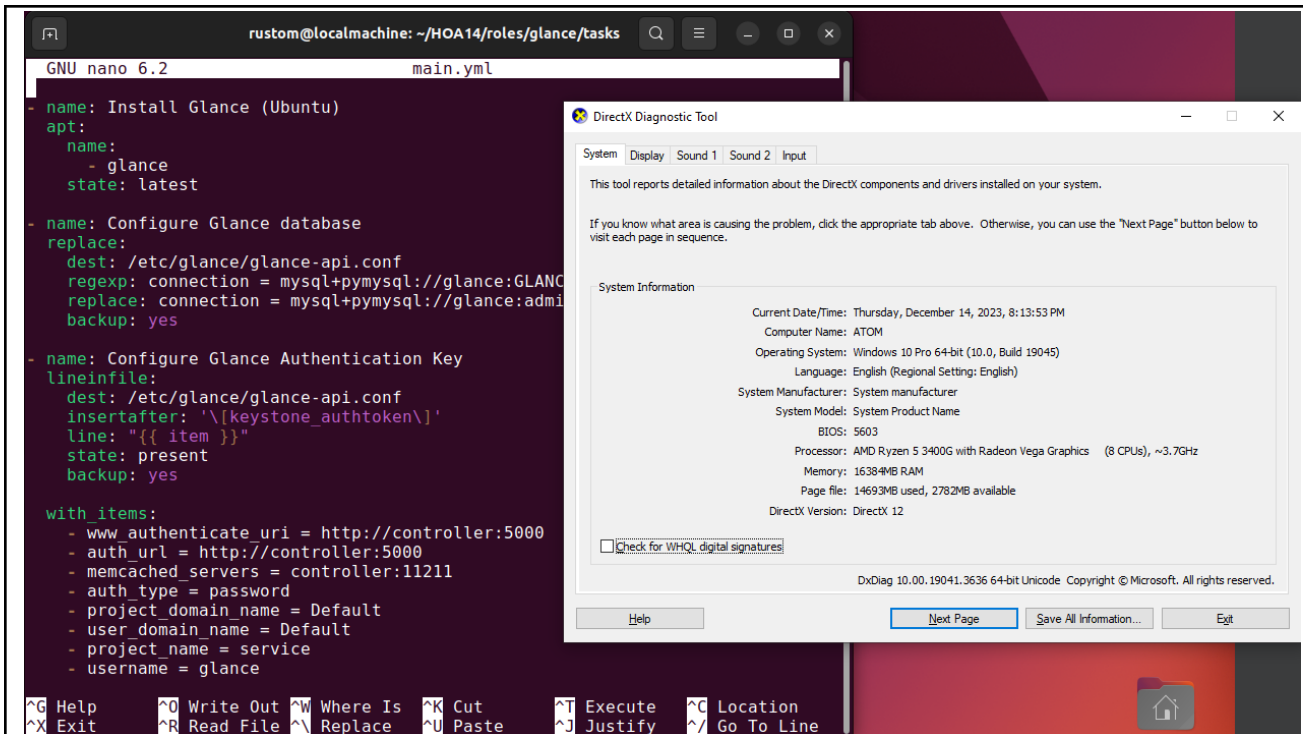


Name: Rustom C. Cariño	Date Performed:12/11/2023
Course/Section: CPE31S5	Date Submitted:12/14/2023
Instructor: Engr. Roman Richard	Semester and SY: 1st semester/2023-2024
Activity 14: OpenStack Installation (Keystone, Glance, Nova)	
1. Objectives	
Create a workflow to install OpenStack using Ansible 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. 	

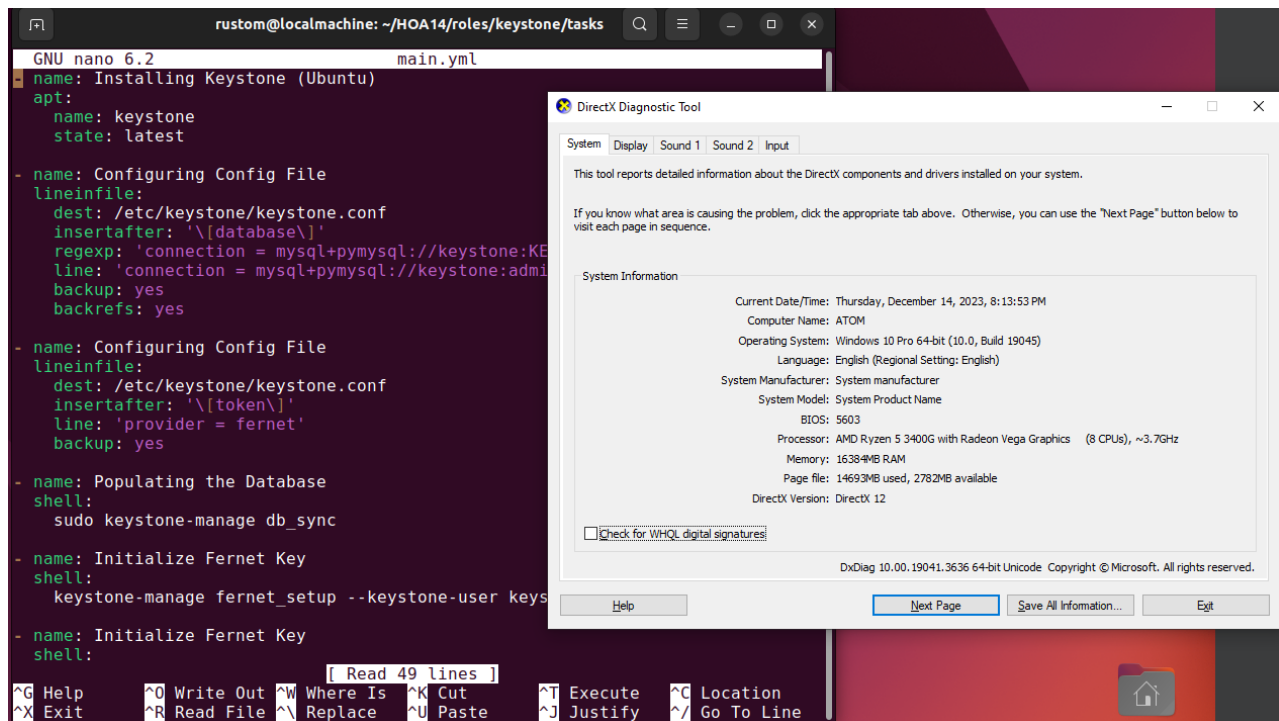
5. Output (screenshots and explanations)



- Creating a new repository and cloning to ubuntu.



- playbook that install the glance.



- playbook that install the keystone.

GNU nano 6.2main.yml

```
- name: Installing Nova (Ubuntu)
  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
    line: connection = mysql+pymysql://nova:admin123@controller/nova
    backup: yes
    backrefs: yes

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

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

Read 119 lines

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^V Replace ^U Paste ^J Justify ^_ Go To Line

DirectX Diagnostic Tool

SystemDisplaySound 1Sound 2Input

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: Thursday, December 14, 2023, 8:13:53 PM
Computer Name: ATOM
Operating System: Windows 10 Pro 64-bit (10.0, Build 19045)
Language: English (Regional Setting: English)
System Manufacturer: System manufacturer
System Model: System Product Name
BIOS: 5603
Processor: AMD Ryzen 5 3400G with Radeon Vega Graphics (8 CPUs), ~3.7GHz
Memory: 16384MB RAM
Page file: 14693MB used, 2782MB available
DirectX Version: DirectX 12

☐ Check for WHQL digital signatures

DxDiag 10.00.19041.3636 64-bit Unicode Copyright © Microsoft. All rights reserved.

HelpNext PageSave All Information...Exit

- playbook that install nova.

```
rustom@localmachine:~/HOA14$ ansible-playbook --ask-become-pass playbook.yml
BECOME password:
```

```
PLAY [keystone] *****
```

```
TASK [Gathering Facts] *****
ok: [192.168.56.121]
```

```
TASK [keystone : Installing Keystone (Ubuntu)] ****
changed: [192.168.56.121]
```

```
TASK [keystone : Configuring Config File] *****
ok: [192.168.56.121]
```

```
TASK [keystone : Configuring Config File] *****
changed: [192.168.56.121]
```

```
TASK [keystone : Populating the Database] *****
changed: [192.168.56.121]
```

```
TASK [keystone : Initialize Fernet Key] *****
changed: [192.168.56.121]
```

```
TASK [keystone : Initialize Fernet Key] *****
changed: [192.168.56.121]
```

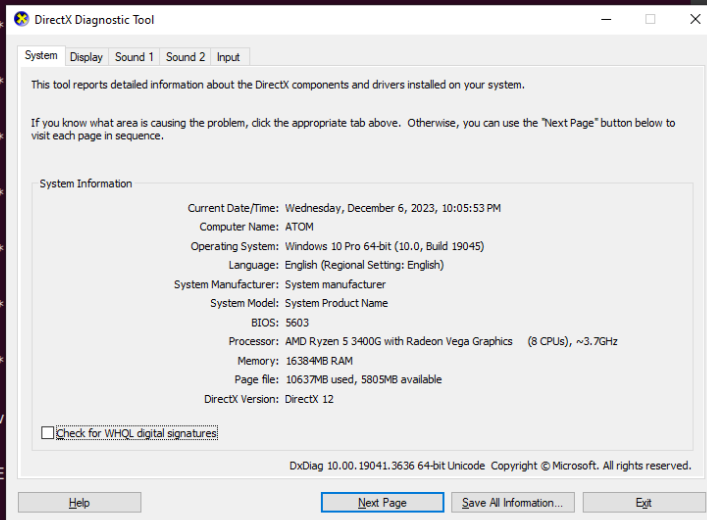
```
TASK [keystone : Configuring the Apache (HTTP) Serv
changed: [192.168.56.121]
```

```
TASK [keystone : Configure Administrative Account E
changed: [192.168.56.121]
```

```
PLAY [glance] *****
```

```
TASK [Gathering Facts] *****
ok: [192.168.56.121]
```

```
TASK [glance : Install Glance (Ubuntu)] *****
```



```
rustom@localmachine: ~/HOA14
TASK [glance : Configure Glance database] *****
ok: [192.168.56.121]
```

```
TASK [glance : Configure Glance Authentication Key] *****
changed: [192.168.56.121] => (item=www_authenticate
changed: [192.168.56.121] => (item=auth_url = http:
changed: [192.168.56.121] => (item=memcached_server
changed: [192.168.56.121] => (item=auth_type = pass
changed: [192.168.56.121] => (item=project_domain n
changed: [192.168.56.121] => (item=user_domain_name
changed: [192.168.56.121] => (item=project_name = s
changed: [192.168.56.121] => (item=username = glanc
changed: [192.168.56.121] => (item=password = admin
```

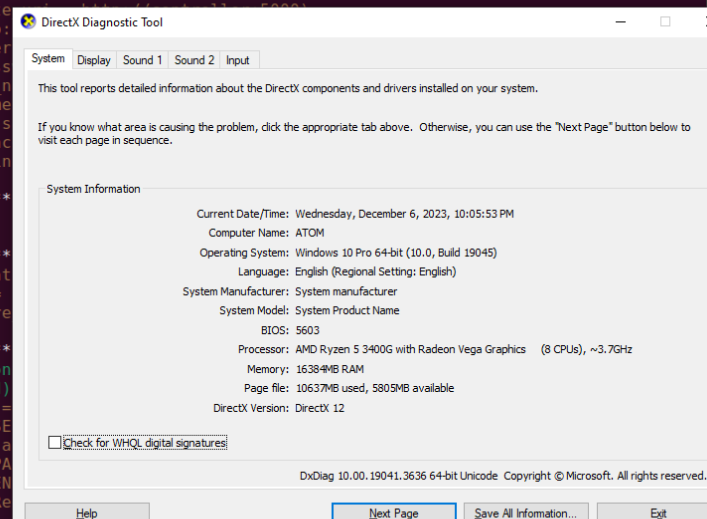
```
TASK [glance : Configure Glance paste_deploy] ****
changed: [192.168.56.121]
```

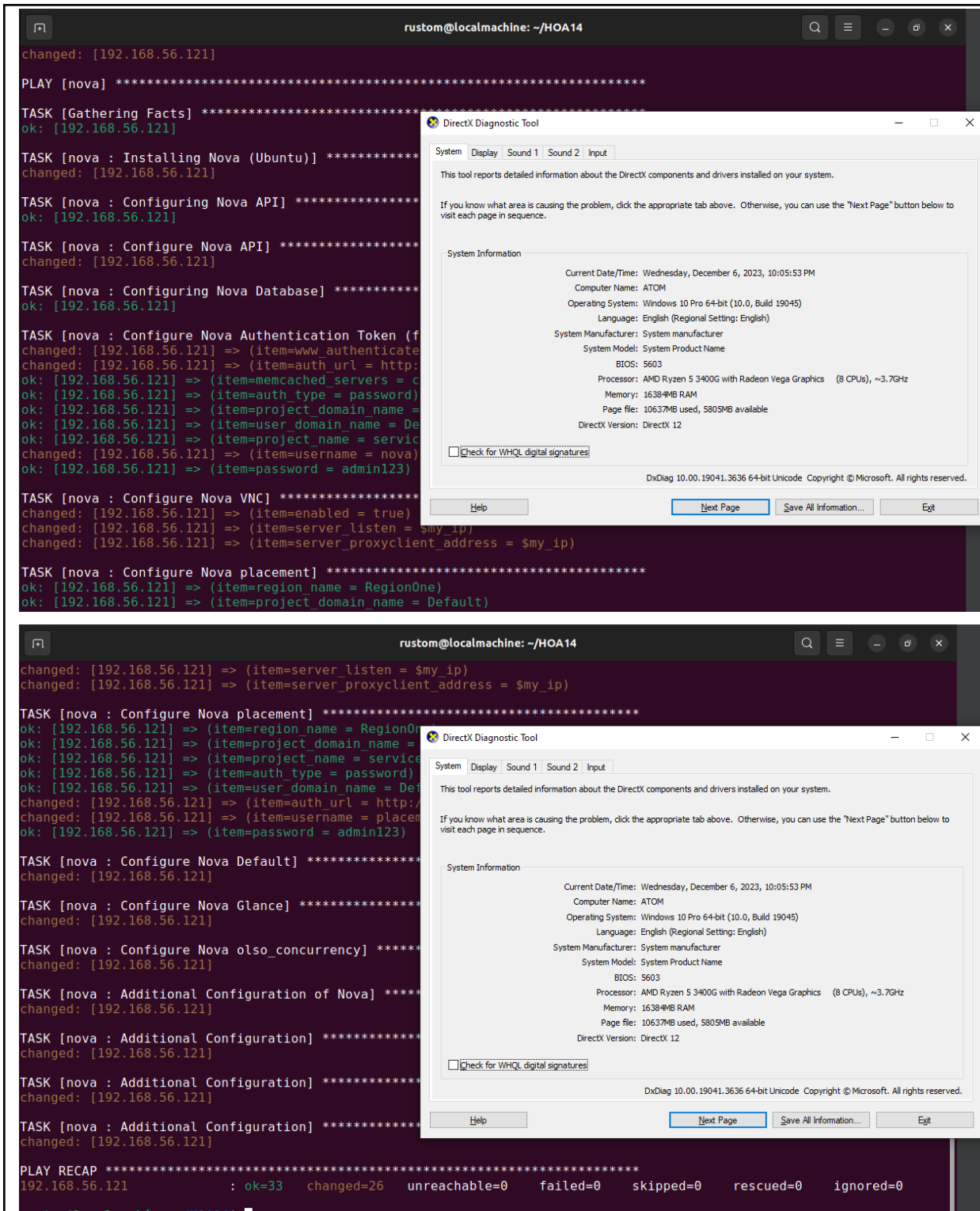
```
TASK [glance : Configure Glance glance_store] ****
changed: [192.168.56.121] => (item=stores = file,ht
changed: [192.168.56.121] => (item=default_store =
changed: [192.168.56.121] => (item=filesystem_store
```

```
TASK [glance : Configure Glance oslo_limit] *****
ok: [192.168.56.121] => (item=auth_url = http://con
ok: [192.168.56.121] => (item=auth_type = password)
changed: [192.168.56.121] => (item=user_domain id =
changed: [192.168.56.121] => (item=username = MY_SE
changed: [192.168.56.121] => (item=system_scope = a
changed: [192.168.56.121] => (item=password = MY_PA
changed: [192.168.56.121] => (item=endpoint_id = EN
changed: [192.168.56.121] => (item=region_name = Re
```

```
TASK [glance : Configure Glance DEFAULT] *****
changed: [192.168.56.121]
```

```
TASK [glance : Populating Image Service Database] *****
changed: [192.168.56.121]
```

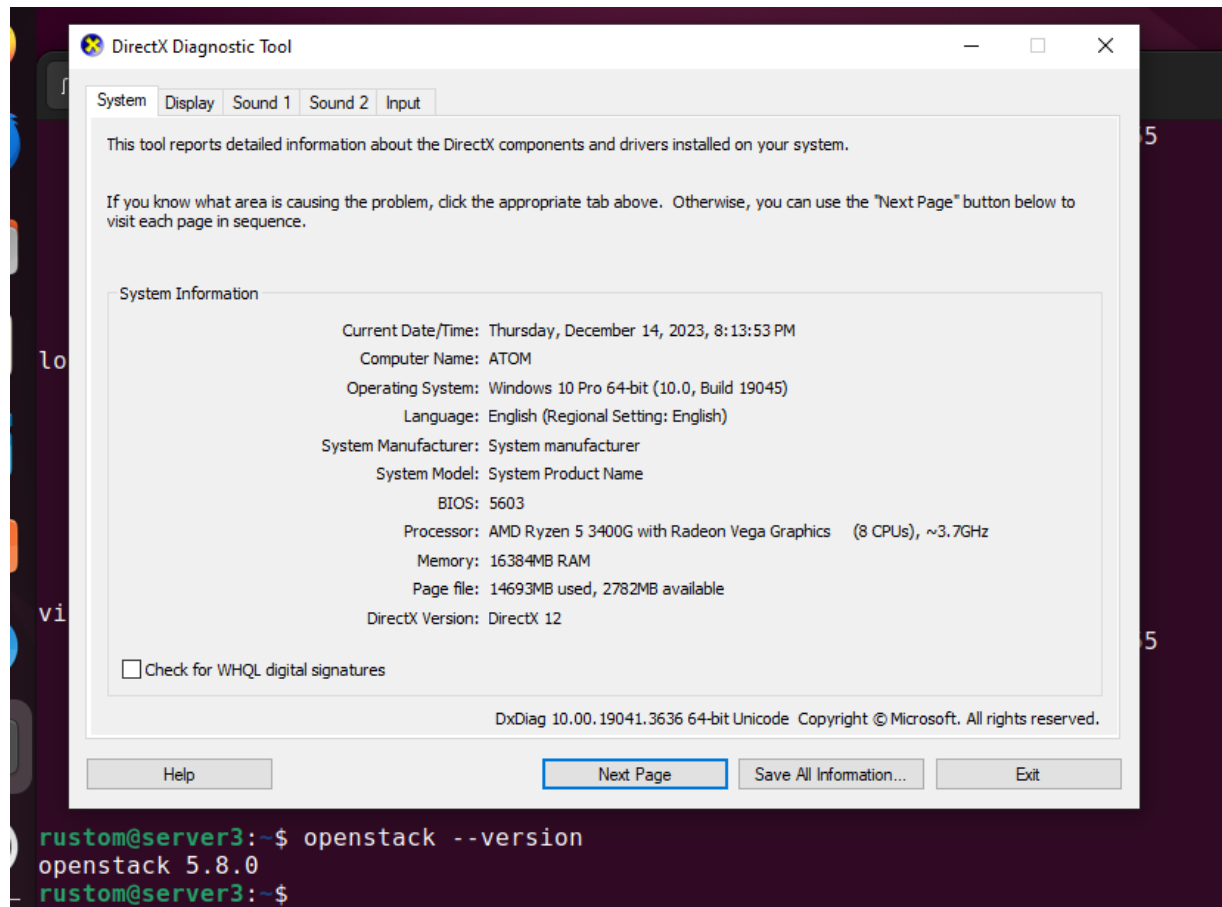




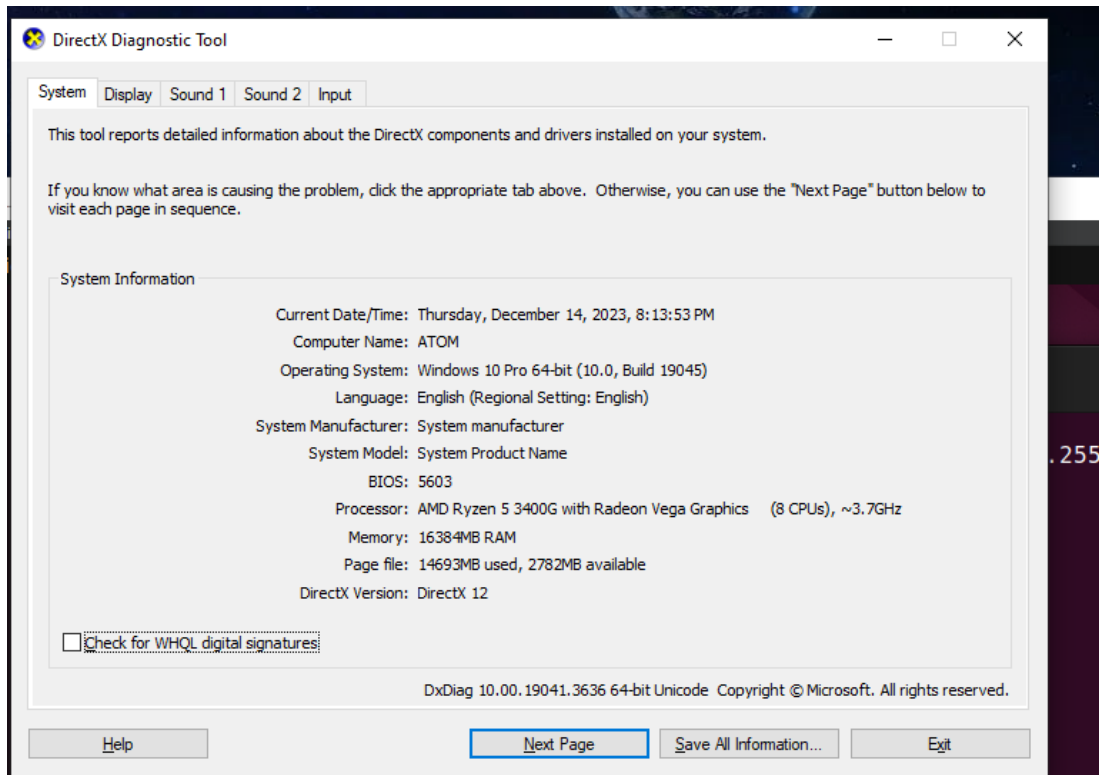
- Output of the playbook

Proof that Openstack, Keystone, Nova, and Glance was installed:

Openstack:



Keystone:



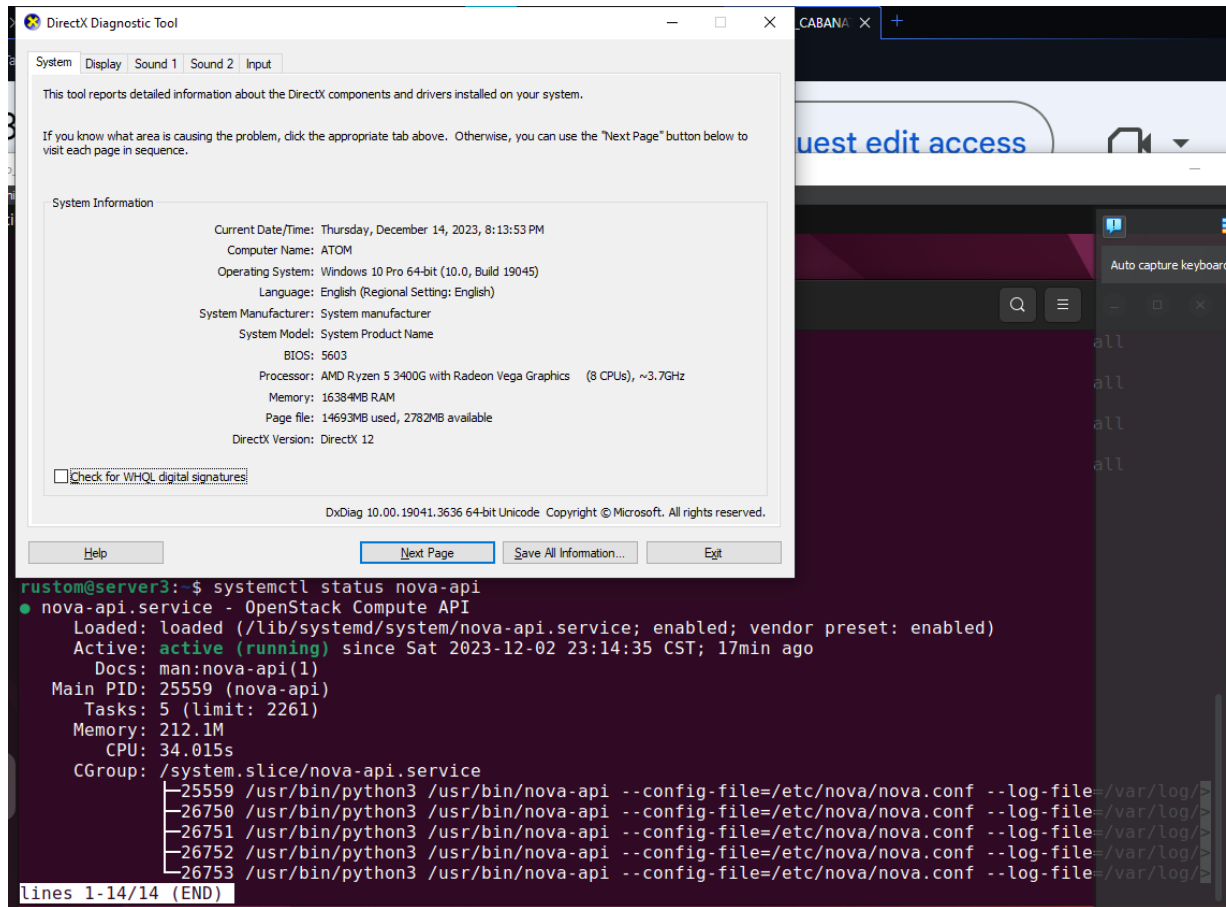
The screenshot shows the DirectX Diagnostic Tool window. The 'System' tab is selected. The window displays the following system information:

- Current Date/Time: Thursday, December 14, 2023, 8:13:53 PM
- Computer Name: ATOM
- Operating System: Windows 10 Pro 64-bit (10.0, Build 19045)
- Language: English (Regional Setting: English)
- System Manufacturer: System manufacturer
- System Model: System Product Name
- BIOS: 5603
- Processor: AMD Ryzen 5 3400G with Radeon Vega Graphics (8 CPUs), ~3.7GHz
- Memory: 16384MB RAM
- Page file: 14693MB used, 2782MB available
- DirectX Version: DirectX 12

At the bottom of the window, there is a checkbox labeled 'Check for WHQL digital signatures' which is currently unchecked. Below the checkbox, the text 'DxDiag 10.00.19041.3636 64-bit Unicode Copyright © Microsoft. All rights reserved.' is displayed. At the very bottom of the window, there are four buttons: 'Help', 'Next Page', 'Save All Information...', and 'Exit'.

```
try: sudo apt install <deb name>
rustom@server3:~$ dpkg -l | grep keystone
ii  keystone                        2:21.0.1-0ubuntu1
    OpenStack identity service - Daemons
ii  keystone-common                2:21.0.1-0ubuntu1
    OpenStack identity service - Common files
ii  python3-keystone              2:21.0.1-0ubuntu1
    OpenStack identity service - Python 3 library
ii  python3-keystoneauth1         4.4.0-0ubuntu1
    authentication library for OpenStack Identity - Python 3.x
ii  python3-keystoneclient        1:4.4.0-0ubuntu1
    client library for the OpenStack Keystone API - Python 3.x
ii  python3-keystonemiddleware    9.4.0-0ubuntu1.1
    Middleware for OpenStack Identity (Keystone) - Python 3.x
```


Nova:



The screenshot displays a Windows desktop environment. In the foreground, the 'DirectX Diagnostic Tool' window is open, showing the 'System' tab. It provides detailed information about the system's hardware and software configuration. Below this, a terminal window is open, showing the command 'systemctl status nova-api' and its output, which indicates that the service is active and running. The background shows a web browser with a dark theme and a search bar.

DirectX Diagnostic Tool - System Information

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: Thursday, December 14, 2023, 8:13:53 PM
Computer Name: ATOM
Operating System: Windows 10 Pro 64-bit (10.0, Build 19045)
Language: English (Regional Setting: English)
System Manufacturer: System manufacturer
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BIOS: 5603
Processor: AMD Ryzen 5 3400G with Radeon Vega Graphics (8 CPUs), ~3.7GHz
Memory: 16384MB RAM
Page file: 14693MB used, 2782MB available
DirectX Version: DirectX 12

☐ Check for WHQL digital signatures

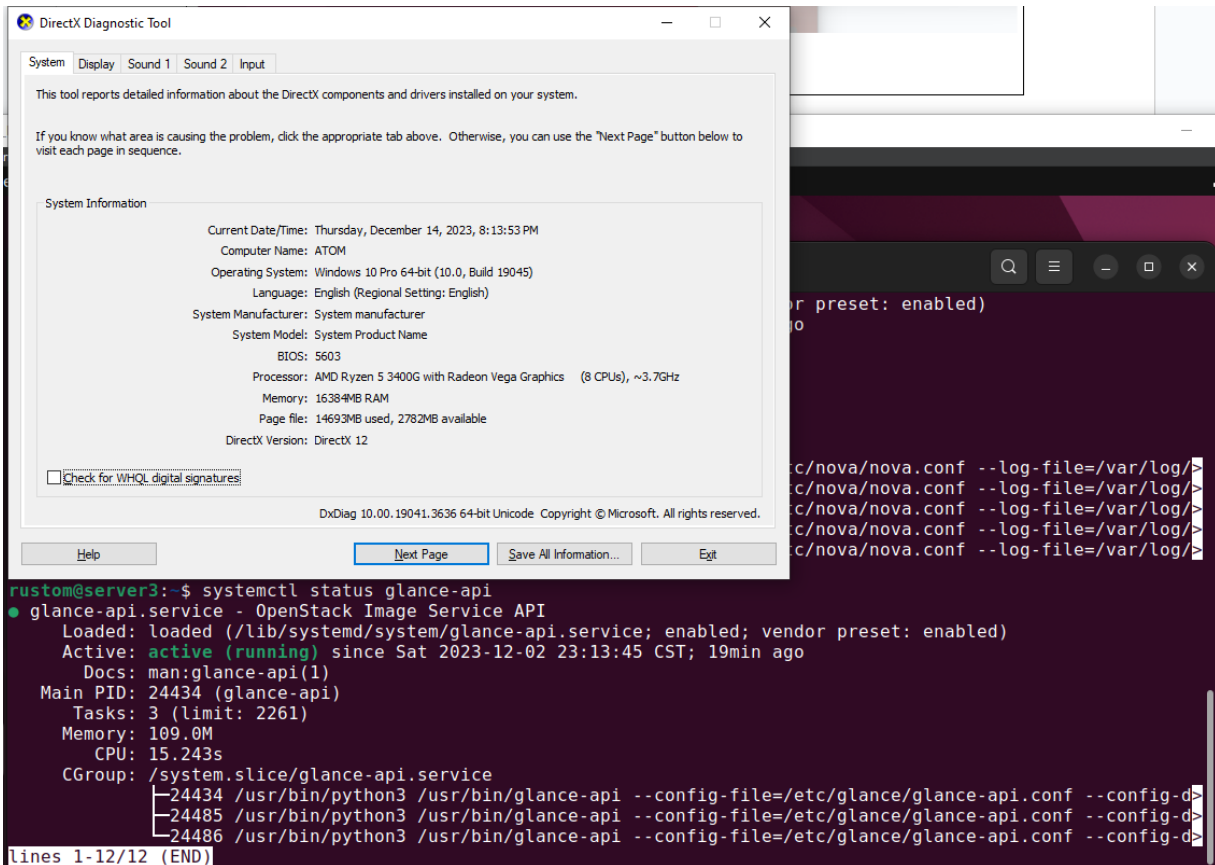
DxDiag 10.00.19041.3636 64-bit Unicode Copyright © Microsoft. All rights reserved.

Buttons: Help, Next Page, Save All Information..., Exit

```
rustom@server3:~$ 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 Sat 2023-12-02 23:14:35 CST; 17min ago
     Docs: man:nova-api(1)
   Main PID: 25559 (nova-api)
    Tasks: 5 (limit: 2261)
   Memory: 212.1M
      CPU: 34.015s
   CGroup: /system.slice/nova-api.service
           └─25559 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova/nova.conf --log-file=/var/log/
           └─26750 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova/nova.conf --log-file=/var/log/
           └─26751 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova/nova.conf --log-file=/var/log/
           └─26752 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova/nova.conf --log-file=/var/log/
           └─26753 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova/nova.conf --log-file=/var/log/
```

lines 1-14/14 (END)

Glance:



The screenshot shows a terminal window with the following output:

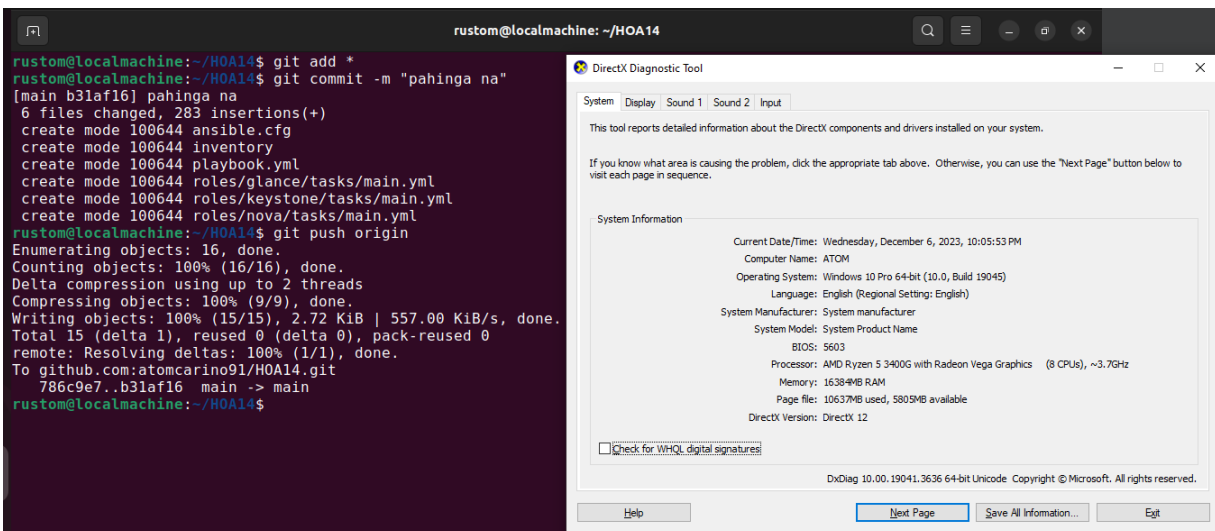
```
rustom@server3:~$ systemctl status glance-api
● glance-api.service - OpenStack Image Service API
   Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2023-12-02 23:13:45 CST; 19min ago
     Docs: man:glance-api(1)
   Main PID: 24434 (glance-api)
      Tasks: 3 (limit: 2261)
    Memory: 109.0M
         CPU: 15.243s
    CGroup: /system.slice/glance-api.service
            └─24434 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance-api.conf --config-d
            └─24485 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance-api.conf --config-d
            └─24486 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance-api.conf --config-d
```

Below the terminal output, the text "Lines 1-12/12 (END)" is visible.

Overlaid on the terminal is a Windows "DirectX Diagnostic Tool" window. The "System" tab is selected, showing the following information:

- Current Date/Time: Thursday, December 14, 2023, 8:13:53 PM
- Computer Name: ATOM
- Operating System: Windows 10 Pro 64-bit (10.0, Build 19045)
- Language: English (Regional Setting: English)
- System Manufacturer: System manufacturer
- System Model: System Product Name
- BIOS: 5603
- Processor: AMD Ryzen 5 3400G with Radeon Vega Graphics (8 CPUs), ~3.7GHz
- Memory: 16384MB RAM
- Page file: 14693MB used, 2782MB available
- DirectX Version: DirectX 12

At the bottom of the window, there is a checkbox for "Check for WHQL digital signatures" and buttons for "Help", "Next Page", "Save All Information...", and "Exit".



The screenshot shows a terminal window with the following output:

```
rustom@localmachine:~/HOA14$ git add *
rustom@localmachine:~/HOA14$ git commit -m "pahinga na"
[main b31af16] pahinga na
 6 files changed, 283 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 playbook.yml
 create mode 100644 roles/glance/tasks/main.yml
 create mode 100644 roles/keystone/tasks/main.yml
 create mode 100644 roles/nova/tasks/main.yml
rustom@localmachine:~/HOA14$ git push origin
Enumerating objects: 16, done.
Counting objects: 100% (16/16), done.
Delta compression using up to 2 threads
Compressing objects: 100% (9/9), done.
Writing objects: 100% (15/15), 2.72 KiB | 557.00 KiB/s, done.
Total 15 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), done.
To github.com:atomcarino91/HOA14.git
 786c9e7..b31af16 main -> main
rustom@localmachine:~/HOA14$
```

Overlaid on the terminal is a Windows "DirectX Diagnostic Tool" window, identical to the one in the previous screenshot, showing system information and a "Next Page" button.

- Add, commit and push it to my GitHub repo.

Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services

- Ubuntu and OpenStack utilize three key services: Keystone, Glance, and Nova. Keystone manages user accounts, domains, projects, and permissions, ensuring only authorized users access specific resources. It also enables multi-tenancy and serves as a central point of communication for other OpenStack services. Glance is the image repository for OpenStack, storing, managing, and distributing virtual machine images. Nova is the core of OpenStack's compute functionality, managing the entire lifecycle of virtual machines and ensuring smooth operation. Together, these services provide a comprehensive cloud computing experience.

Conclusions:

- In this activity I will be able to install openstack keystone, glance and nova in ansible as my infrastructure as code iac. I also analyzed the advantages and disadvantages of cloud services and different cloud deployment and service models. Cloud computing offers scalability, cost-effectiveness, accessibility, and innovation, but also presents challenges like vendor lock-in, security concerns, limited control, and connectivity dependence. OpenStack and Ansible are powerful tools for building and managing cloud infrastructure, offering flexibility and automation for efficient deployment. However, careful evaluation is essential to fully realize its transformative potential.