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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

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

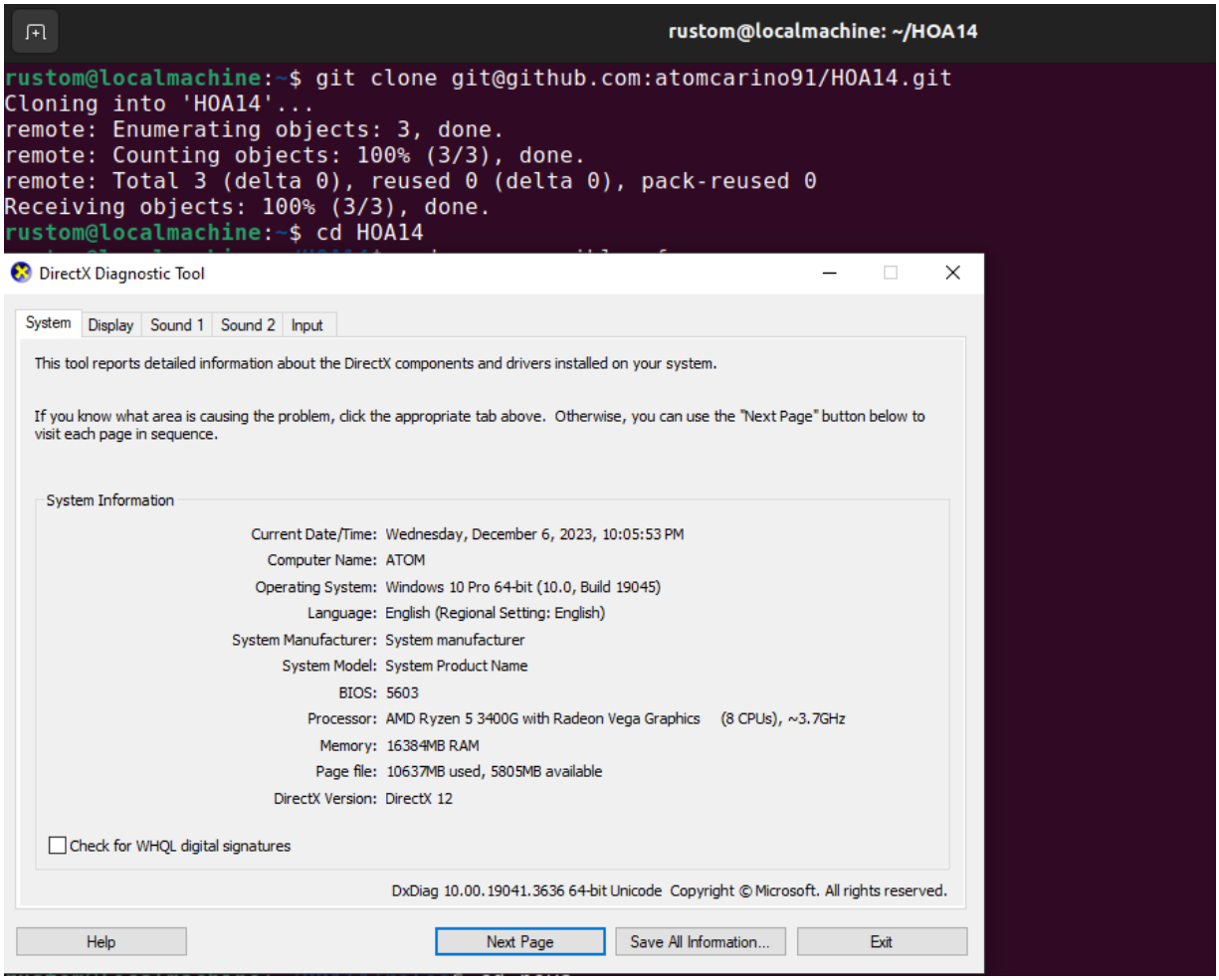
Oracle VirtualBox (Hypervisor)

1x Ubuntu VM or Centos VM

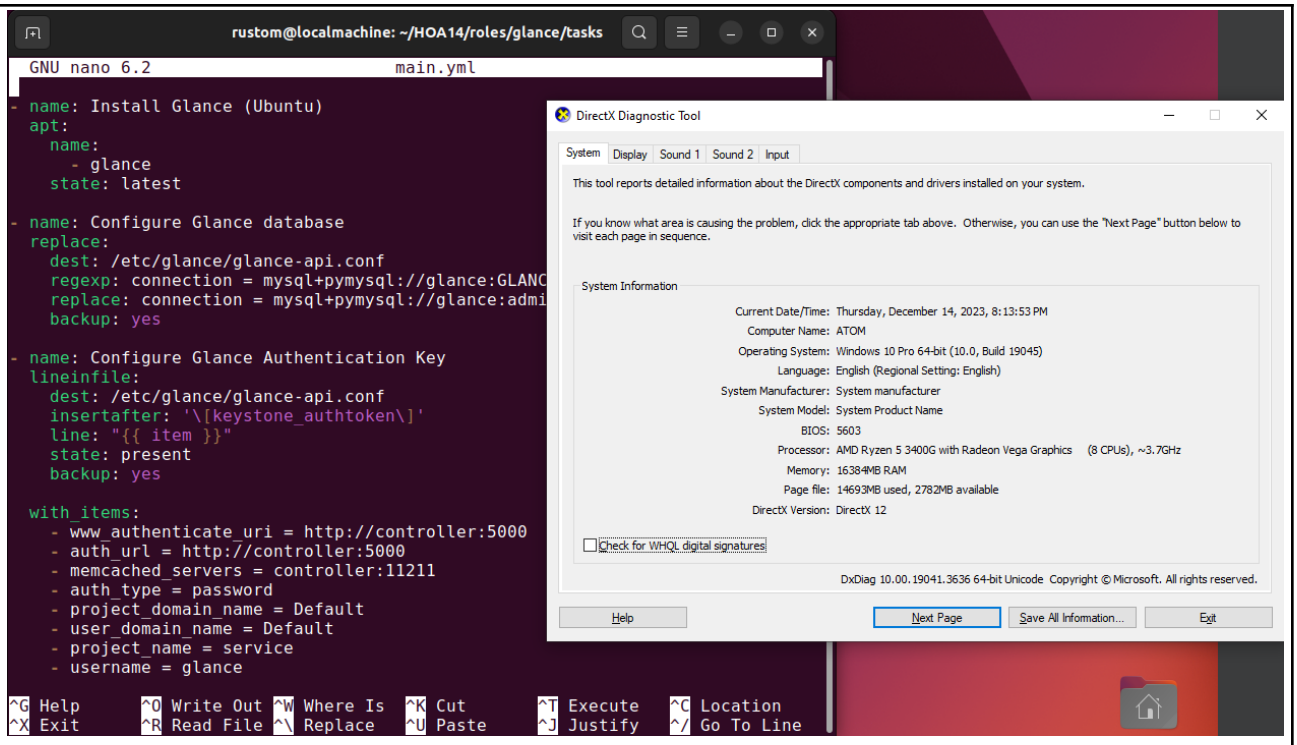
4. Tasks

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. 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.

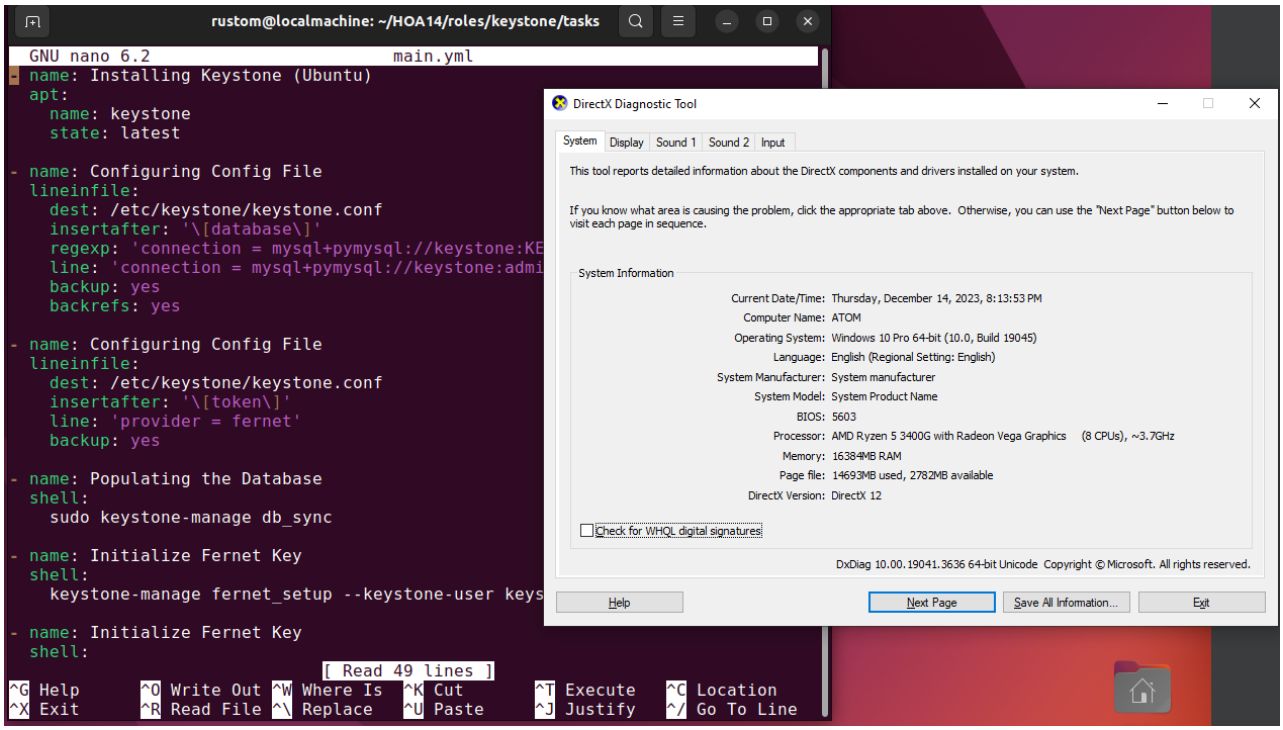
5. Output (screenshots and explanations)



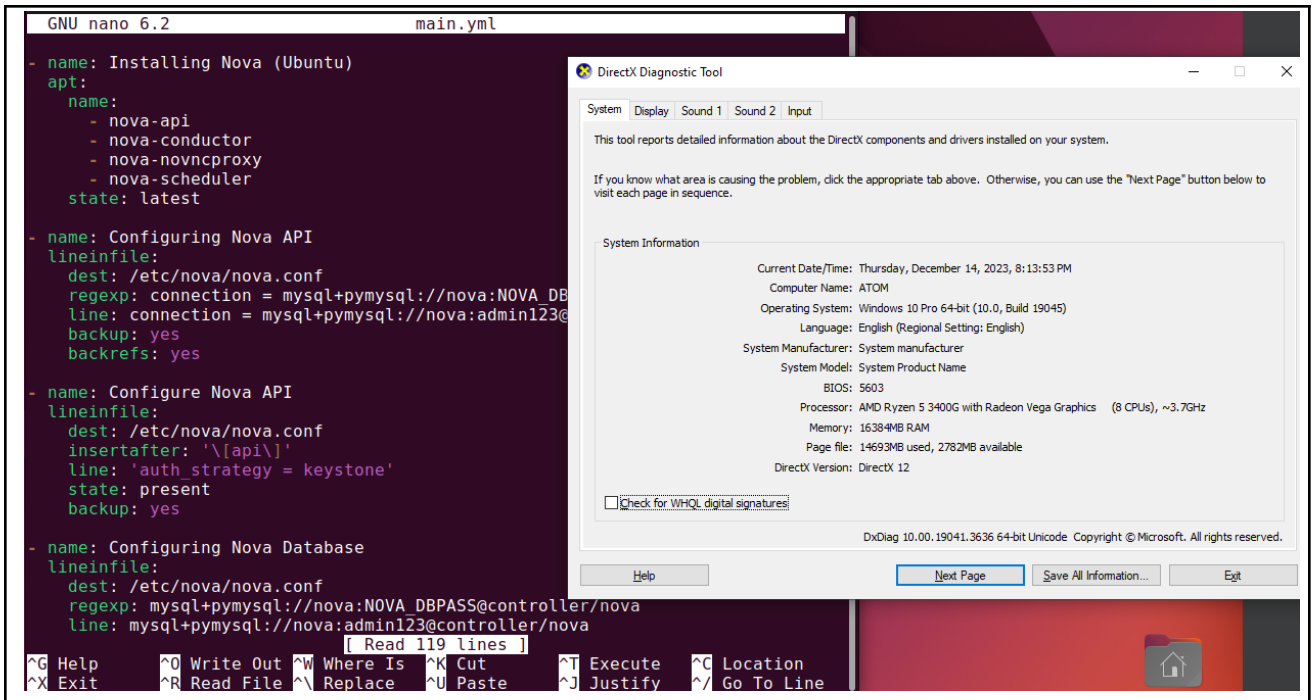
- Creating a new repository and cloning to ubuntu.



- playbook that install the glance.

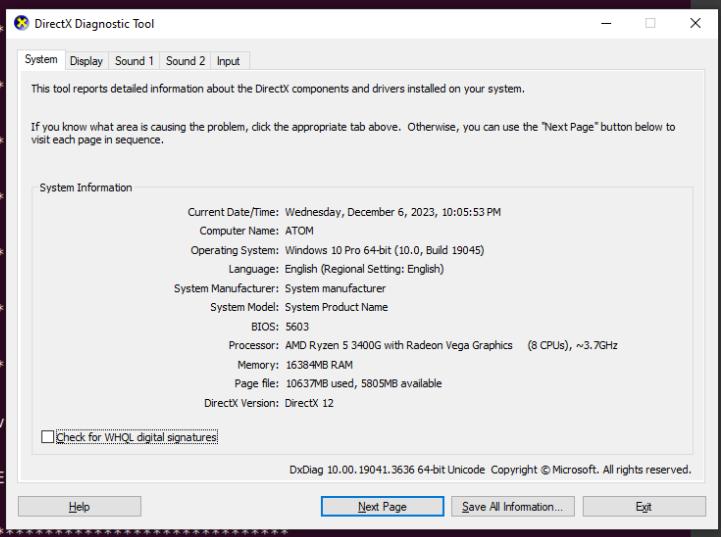


- playbook that install the keystone.

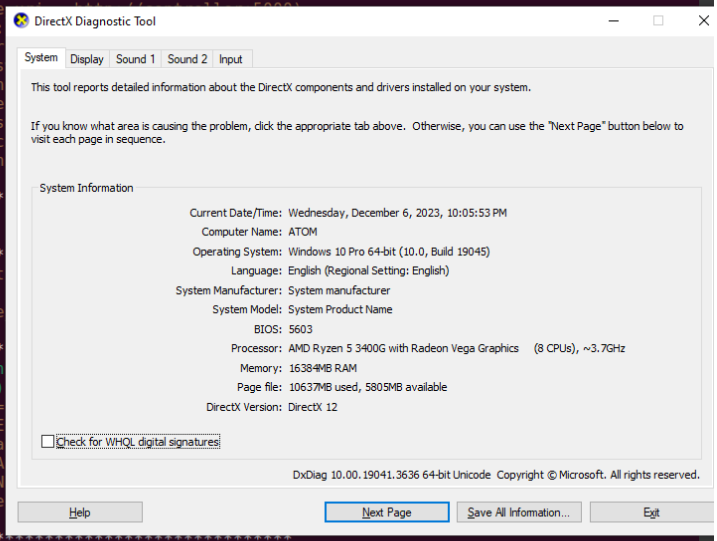


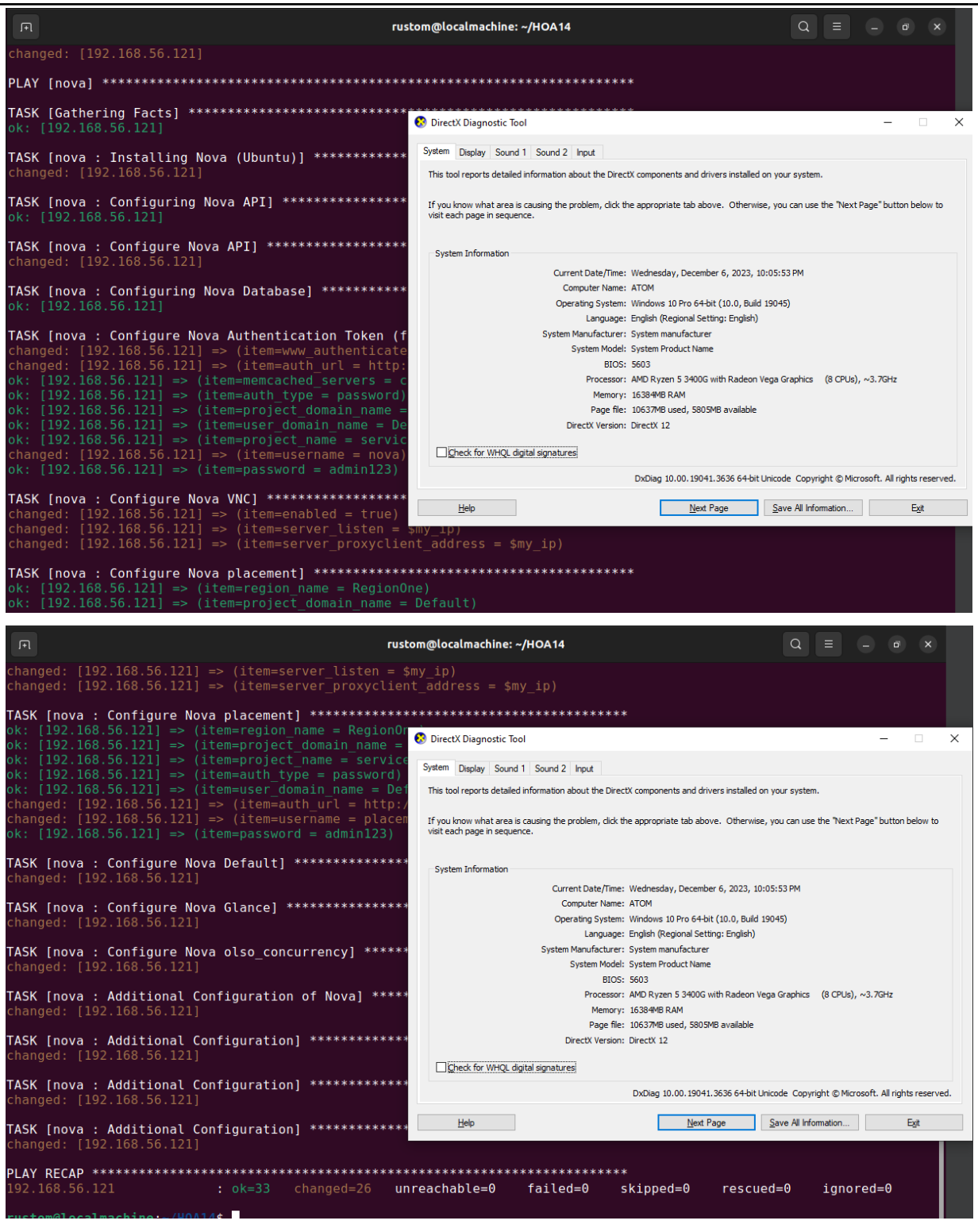
- playbook that install nova.

```
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]
```

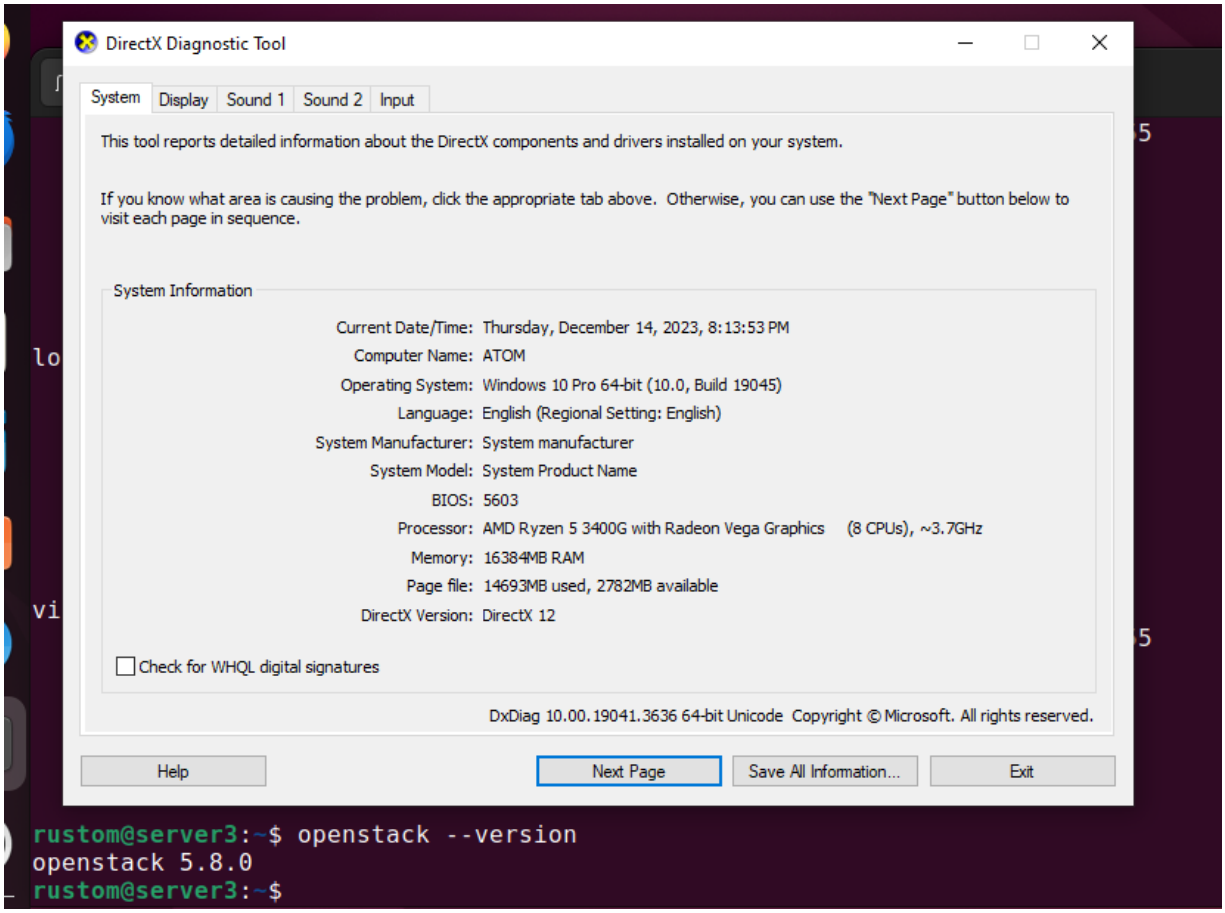




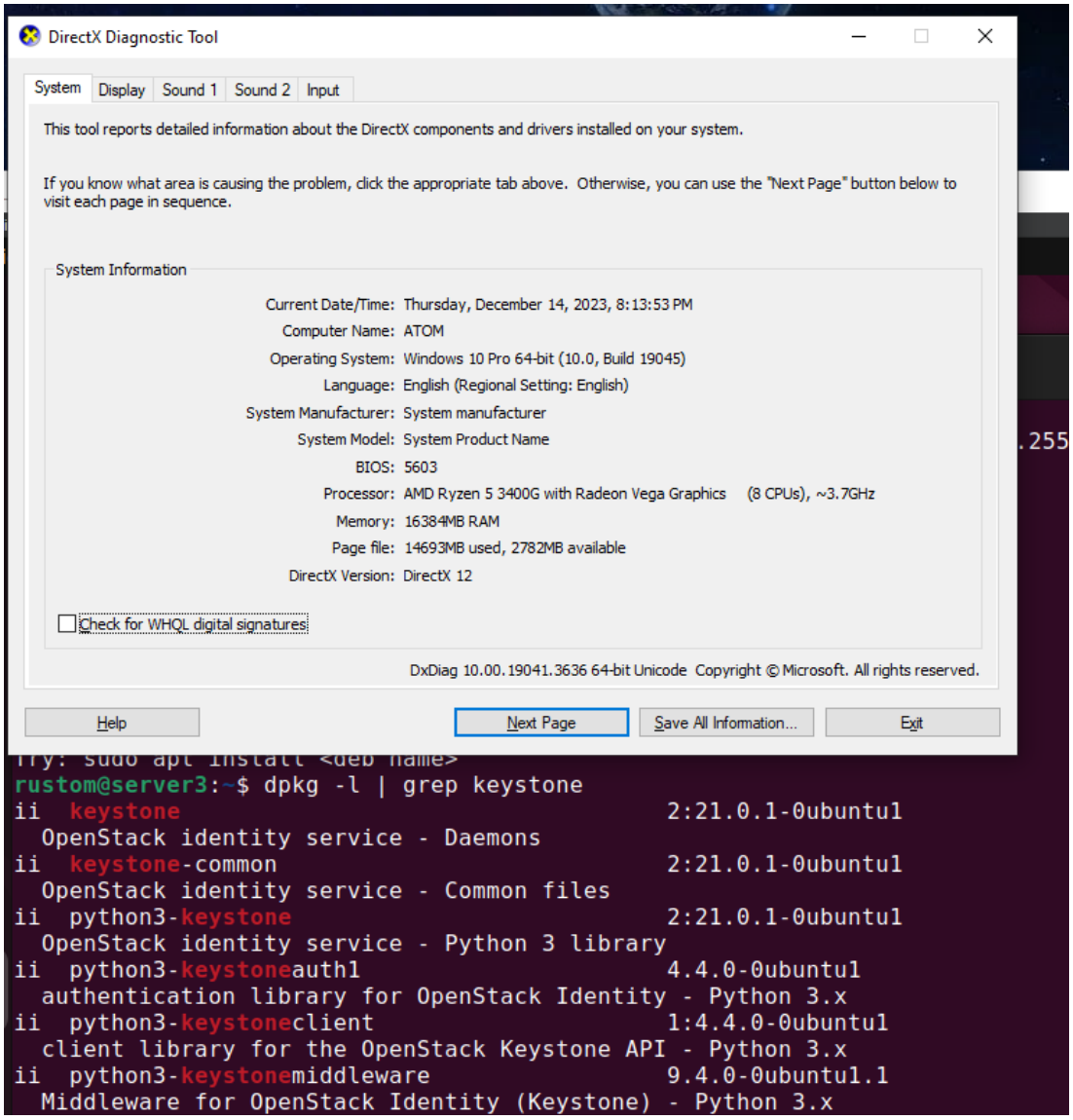
- Output of the playbook

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

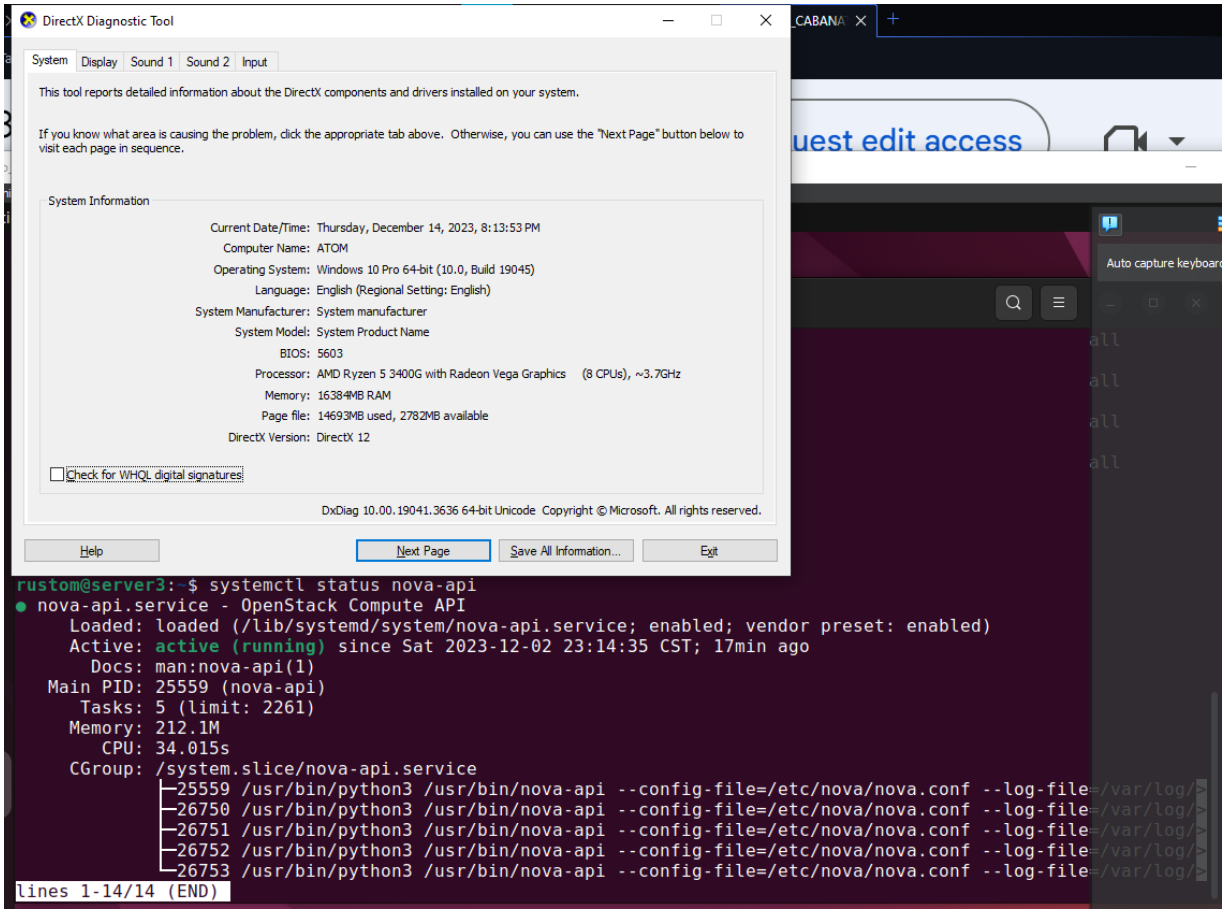
Openstack:



Keystone:


DirectX Diagnostic Tool
System
Display
Sound 1
Sound 2
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: 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.
Help
Next Page
Save All Information...
Exit
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:


DirectX Diagnostic Tool
System
Display
Sound 1
Sound 2
Input
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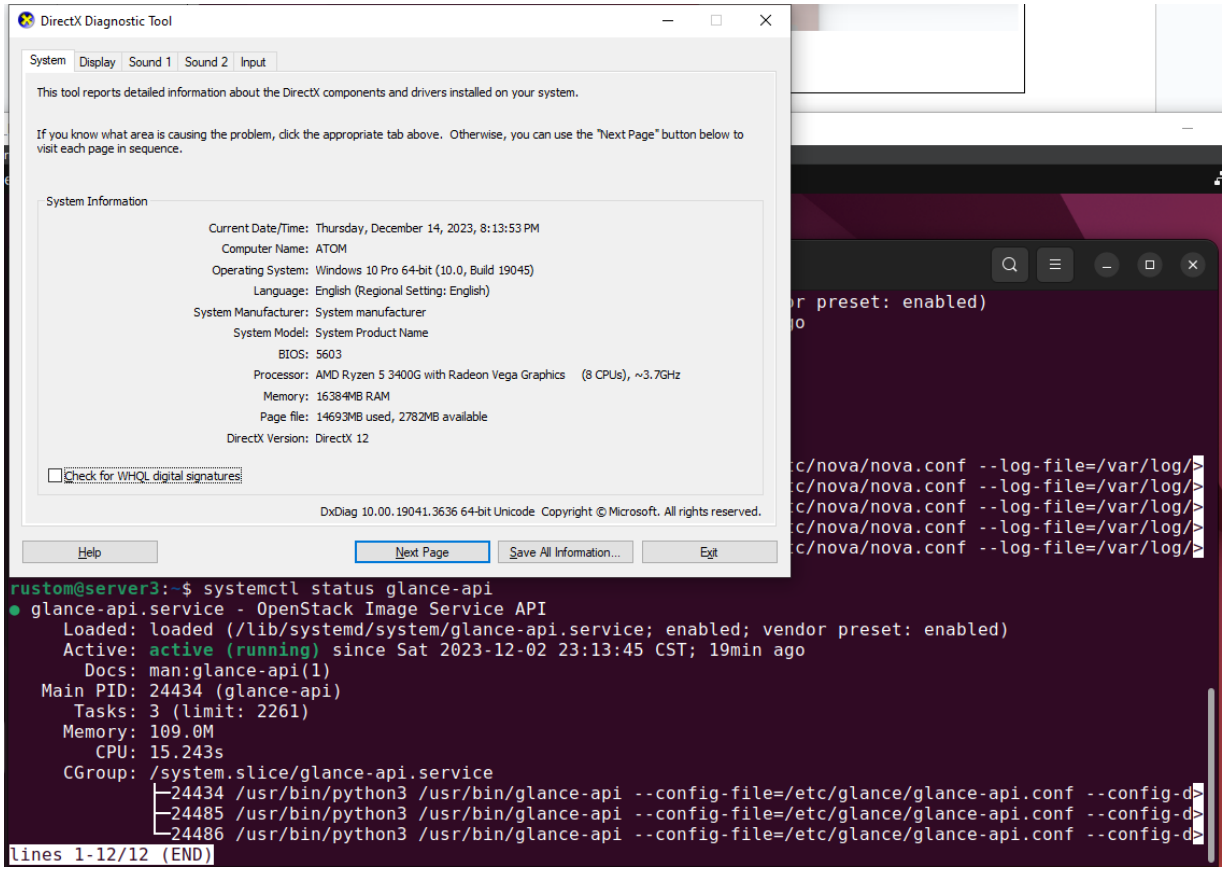
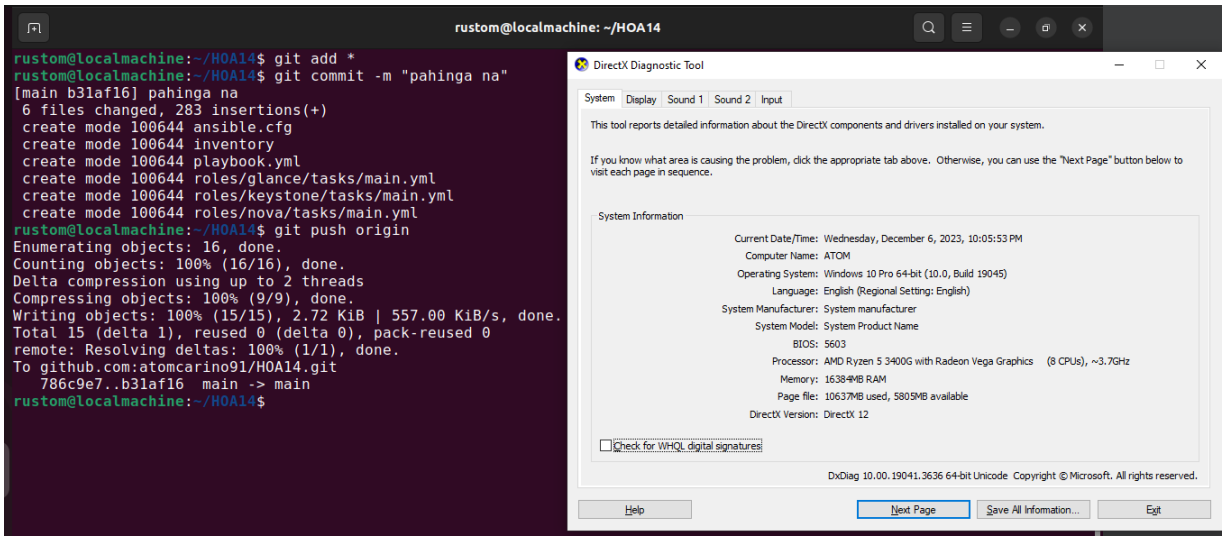
Memory: 16384MB RAM
Page file: 14693MB used, 2782MB available
DirectX Version: DirectX 12
Check for WHQL digital signatures
DxDiag 10.00.19041.3636 64-bit Unicode Copyright © Microsoft. All rights reserved.
Help
Next Page
Save All Information...
Exit
uest edit access
Auto capture keyboard
rustom@server3:~$ 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:





- 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 lac. 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.