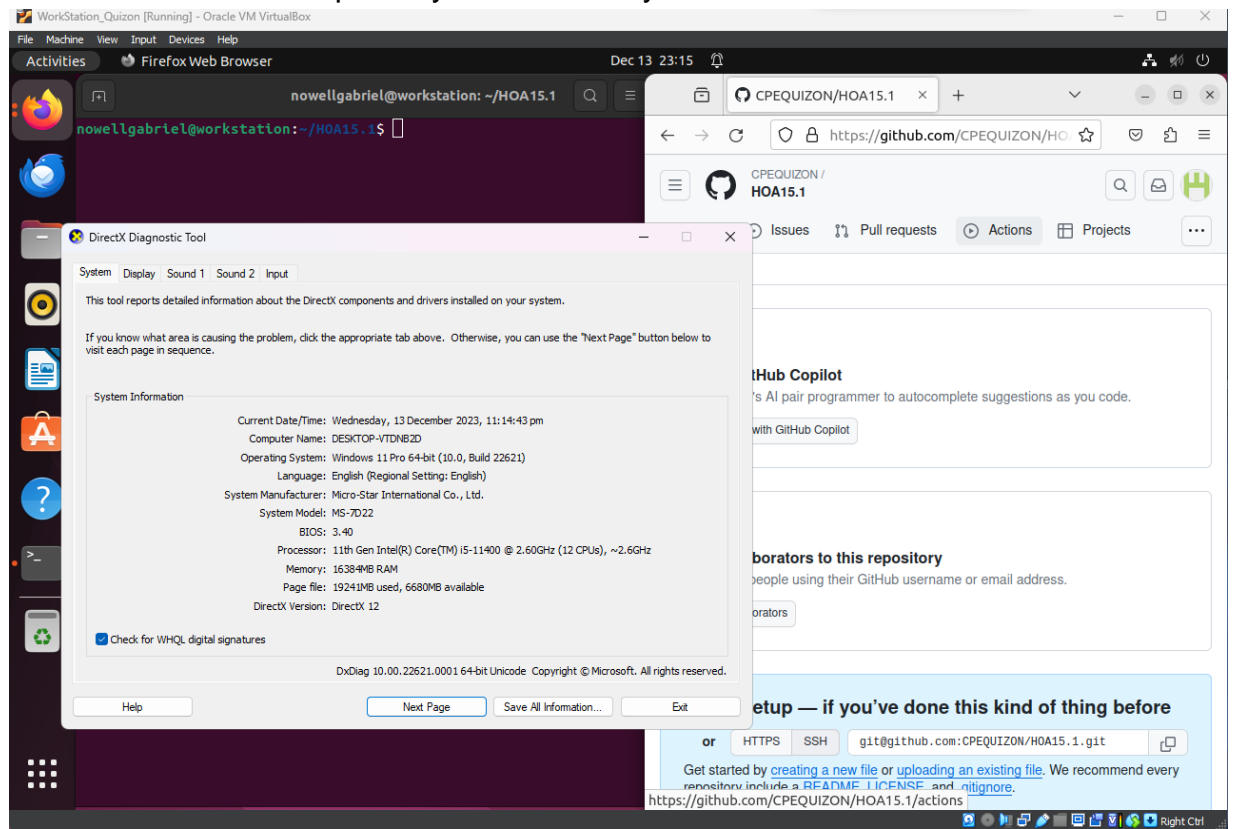
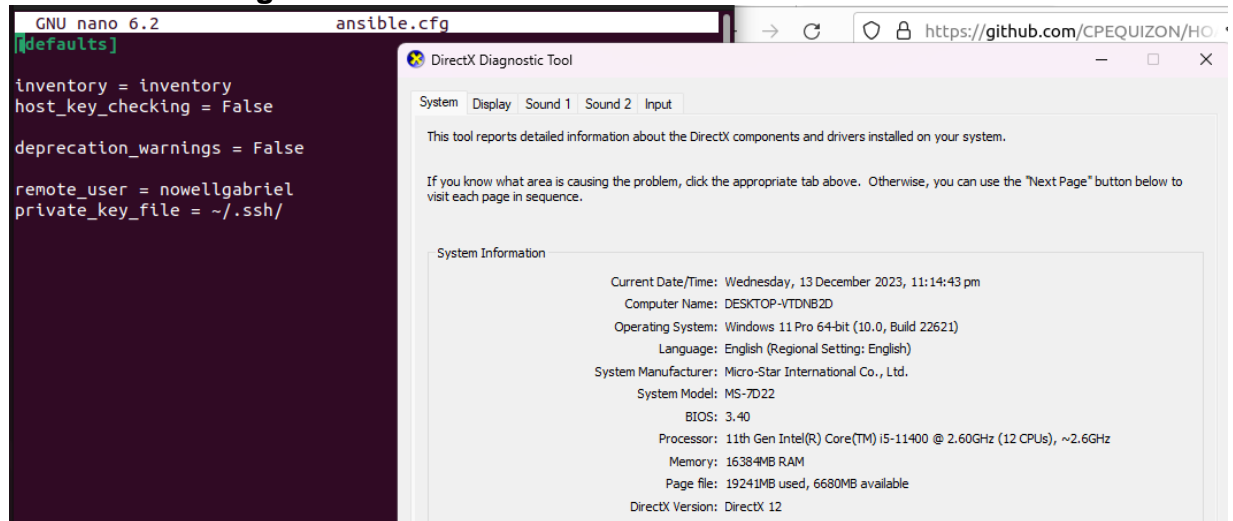


<b>Name:</b> Quizon, Nowell Gabriel C.	<b>Date Performed:</b> 12/13/2023
<b>Course/Section:</b> CPE31S5	<b>Date Submitted:</b> 12/14/2023
<b>Instructor:</b> Engr. Roman Richard	<b>Semester and SY:</b> 1 <sup>st</sup> and 2023 - 2024
<b>Activity 15: OpenStack Installation (Neutron, Horizon, Cinder)</b>	
<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. Neutron</li> <li>b. Horizon</li> <li>c. Cinder</li> <li>d. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in the Inventory file.</li> <li>e. Add, commit and push it to your GitHub repo.</li> </ol> </li> </ol>	
<b>5. Output</b> (screenshots and explanations)	

- Create a new repository for this activity.



## ansible.cfg



## Inventory

The terminal window shows the output of the 'Inventory' command in a GNU nano 6.2 editor. The output lists three hosts: cinder, horizon, and neutron, all with IP address 192.168.56.111. The DirectX Diagnostic Tool window is open, showing system information for a Windows 11 Pro 64-bit system with 16GB RAM and DirectX 12.

```
GNU nano 6.2 inventory
[cinder]
192.168.56.111

[horizon]
192.168.56.111

[neutron]
192.168.56.111
```

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: Wednesday, 13 December 2023, 11:14:43 pm  
Computer Name: DESKTOP-VTDNB2D  
Operating System: Windows 11 Pro 64-bit (10.0, Build 22621)  
Language: English (Regional Setting: English)  
System Manufacturer: Micro-Star International Co., Ltd.  
System Model: MS-7D22  
BIOS: 3.40  
Processor: 11th Gen Intel(R) Core(TM) i5-11400 @ 2.60GHz (12 CPUs), ~2.6GHz  
Memory: 16384MB RAM  
Page file: 19241MB used, 6680MB available  
DirectX Version: DirectX 12

## install\_chn.yml

The terminal window shows the content of the 'install\_chn.yml' file in a GNU nano 6.2 editor. The file defines roles for neutron, horizon, and cinder. The DirectX Diagnostic Tool window is open, showing system information for a Windows 11 Pro 64-bit system with 16GB RAM and DirectX 12.

```
GNU nano 6.2 install_chn.yml *
---
- hosts: neutron
  become: true
  roles:
    - role: neutron

- hosts: horizon
  become: true
  roles:
    - role: horizon

- hosts: cinder
  become: true
  roles:
    - role: cinder
```

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: Wednesday, 13 December 2023, 11:14:43 pm  
Computer Name: DESKTOP-VTDNB2D  
Operating System: Windows 11 Pro 64-bit (10.0, Build 22621)  
Language: English (Regional Setting: English)  
System Manufacturer: Micro-Star International Co., Ltd.  
System Model: MS-7D22  
BIOS: 3.40  
Processor: 11th Gen Intel(R) Core(TM) i5-11400 @ 2.60GHz (12 CPUs), ~2.6GHz  
Memory: 16384MB RAM  
Page file: 19241MB used, 6680MB available  
DirectX Version: DirectX 12

☒ Check for WHQL digital signatures

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Help Next Page Save All Information... Exit

## cinder.conf.j2

The terminal window shows the content of the 'cinder.conf.j2' file in a GNU nano 6.2 editor. The file contains configuration for the cinder service, including transport\_url, auth\_strategy, database connection, keystone authentication, and oslo concurrency settings. The DirectX Diagnostic Tool window is open, showing system information for a Windows 11 Pro 64-bit system with 16GB RAM and DirectX 12.

```
GNU nano 6.2 cinder.conf.j2 *
DEFAULT
transport_url = rabbit://guest:guest@localhost
auth_strategy = keystone

[database]
connection = sqlite:///var/lib/cinder/cinder.sqlite

[keystone_authtoken]
auth_uri = http://controller:5000
auth_url = http://controller:35357
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = cinder
password = CINDER_PASS

[oslo_concurrency]
lock_path = /var/lib/cinder/tmp
```

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: Wednesday, 13 December 2023, 11:14:43 pm  
Computer Name: DESKTOP-VTDNB2D  
Operating System: Windows 11 Pro 64-bit (10.0, Build 22621)  
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System Model: MS-7D22  
BIOS: 3.40  
Processor: 11th Gen Intel(R) Core(TM) i5-11400 @ 2.60GHz (12 CPUs), ~2.6GHz  
Memory: 16384MB RAM  
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DirectX Version: DirectX 12

☒ Check for WHQL digital signatures

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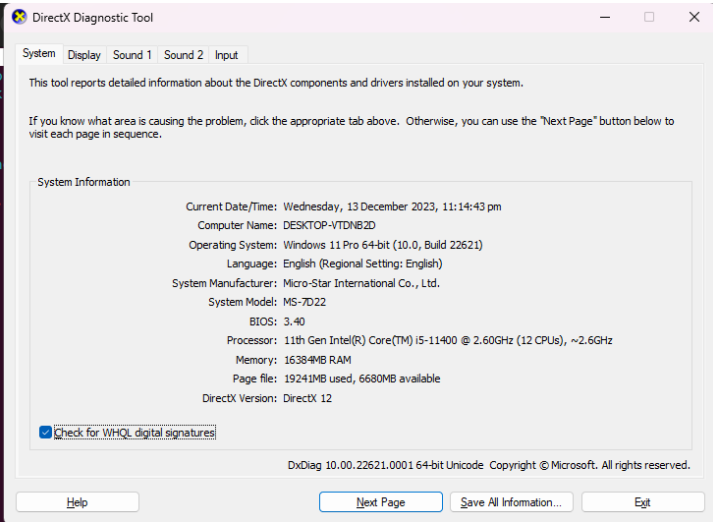
Help Next Page Save All Information... Exit

## local\_setting.py.j2

```
nowellgabriel@workstation: ~/HOA15.1
GNU nano 6.2 local_settings.py.j2 *
# The file is automatically created by the ansible role o
# during the installation of the openstack-dashboard pack

# Please use the "template" module for updates.

# Modifications to this file will be overwritten by the n
from openstack_dashboard.settings import * # noqa: F403,
```



## ml2\_conf.ini.2

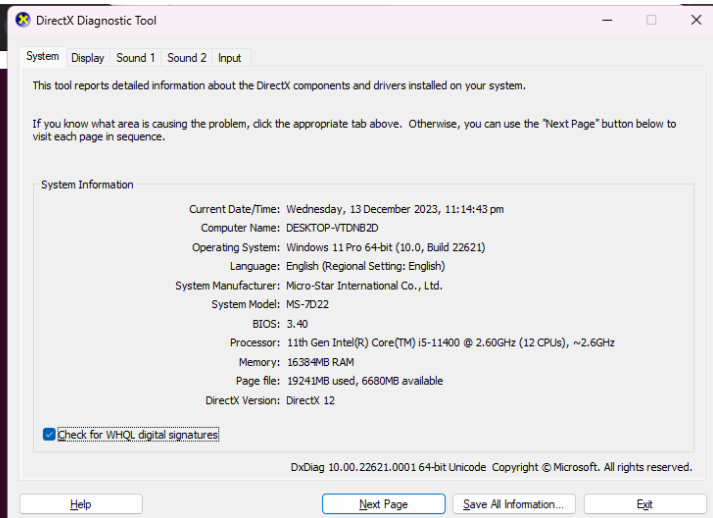
```
nowellgabriel@workstation: ~/HOA15.1
GNU nano 6.2 ml2_conf.ini.j2 *
[ml2]
type_drivers = flat,vlan,vxlan
tenant_network_types = vxlan
mechanism_drivers = linuxbridge,l2population
extension_drivers = port_security

[ml2_type_flat]
flat_networks = provider

[ml2_type_vlan]
network_vlan_ranges = physnet1:1000:2999

[ml2_type_vxlan]
vni_ranges = 1:1000

[securitygroup]
enable_ipset = True
```

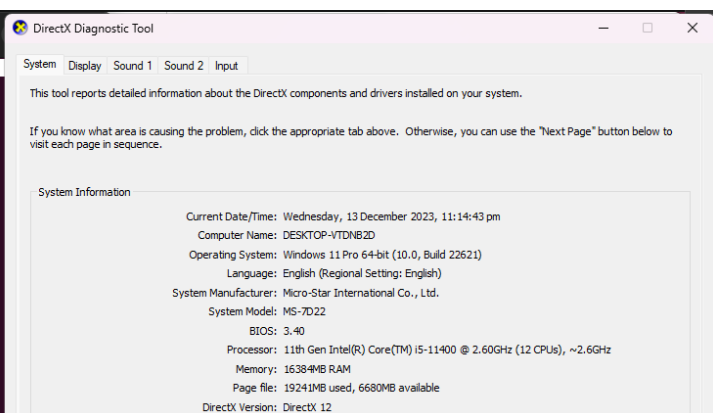


## neutron.conf.j2

```
nowellgabriel@workstation: ~/HOA15.1
GNU nano 6.2 neutron.conf.j2 *
[DEFAULT]
core_plugin = ml2
service_plugins = router
allow_overlapping_ips = True
transport_url = rabbit://guest:guest@localhost

[database]
connection = sqlite:///var/lib/neutron/neutron.sqlite

[keystone_authtoken]
auth_url = http://controller:5000
auth_url = http://controller:35357
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = neutron
password = NEUTRON_PASS
```



## openstack-dashboard.conf.j2

The terminal window shows the configuration of `openstack-dashboard.conf.j2` using `GNU nano 6.2`. The configuration includes setting the `ServerName` to `your_horizon_server_domain_or_ip`, defining the `WSGIDaemonProcess` for `horizon`, and setting up logging. The `DirectX Diagnostic Tool` window is open, showing system information such as the current date/time, computer name, operating system, and hardware details.

```
GNU nano 6.2 openstack-dashboard.conf.j2 *
<VirtualHost *:80>
  ServerName your_horizon_server_domain_or_ip

  WSGIDaemonProcess horizon user=www-data group=www-data
  WSGIProcessGroup horizon
  WSGIScriptAlias / /usr/share/openstack-dashboard/openst
  WSGIPassAuthorization On

  <IfModule mod_ssl.c>
    SSLEngine Off
  </IfModule>

  ErrorLog ${APACHE_LOG_DIR}/horizon_error.log
  CustomLog ${APACHE_LOG_DIR}/horizon_access.log combined
</VirtualHost>
```

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

The terminal window shows the Ansible playbook `main.yml` for installing and configuring Neutron. The playbook includes tasks for installing Neutron packages, configuring Neutron and the ML2 plugin, and restarting the Neutron service. The `DirectX Diagnostic Tool` window is also visible, showing system information and a checkbox for checking WHQL digital signatures.

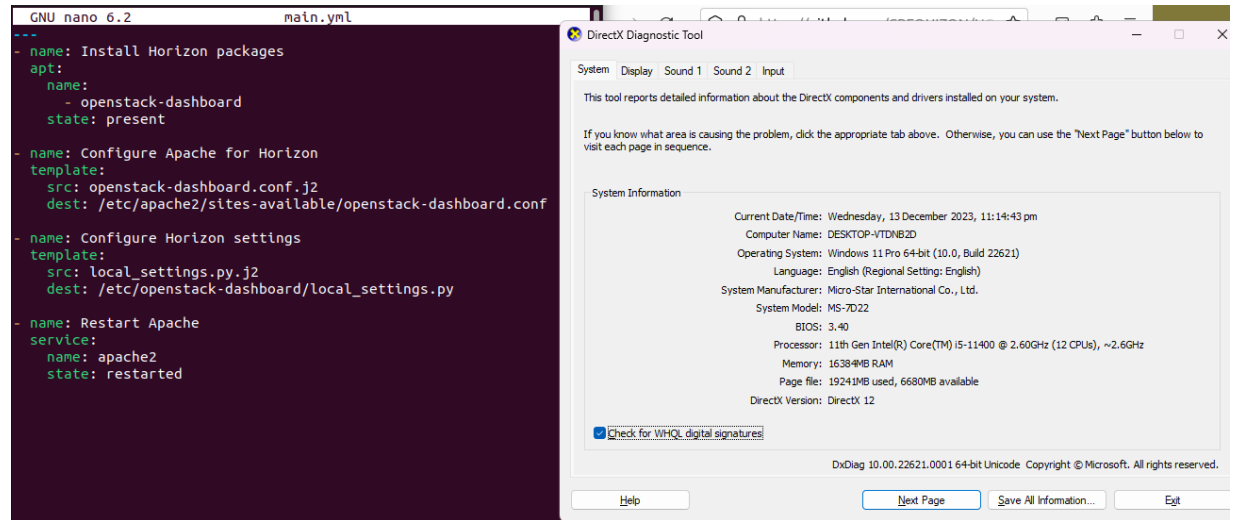
```
GNU nano 6.2 main.yml
---
- name: Install Neutron packages
  apt:
    name:
      - neutron-server
      - neutron-plugin-ml2
      - neutron-linuxbridge-agent
      - neutron-l3-agent
      - neutron-dhcp-agent
      - neutron-metadata-agent
    state: present

- name: Configure Neutron
  template:
    src: neutron.conf.j2
    dest: /etc/neutron/neutron.conf

- name: Configure ML2 plugin
  template:
    src: ml2_conf.ini.j2
    dest: /etc/neutron/plugins/ml2/ml2_conf.ini

- name: Restart Neutron
  service:
    name: neutron-server
    state: restarted
```

## b.) Horizon



The screenshot shows a terminal window with the GNU nano 6.2 editor editing main.yml. The file contains an Ansible playbook for installing and configuring Horizon. To the right, the DirectX Diagnostic Tool is open, displaying system information.

```
---
- name: Install Horizon packages
  apt:
    name:
      - openstack-dashboard
    state: present

- name: Configure Apache for Horizon
  template:
    src: openstack-dashboard.conf.j2
    dest: /etc/apache2/sites-available/openstack-dashboard.conf

- name: Configure Horizon settings
  template:
    src: local_settings.py.j2
    dest: /etc/openstack-dashboard/local_settings.py

- name: Restart Apache
  service:
    name: apache2
    state: restarted
```

**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**

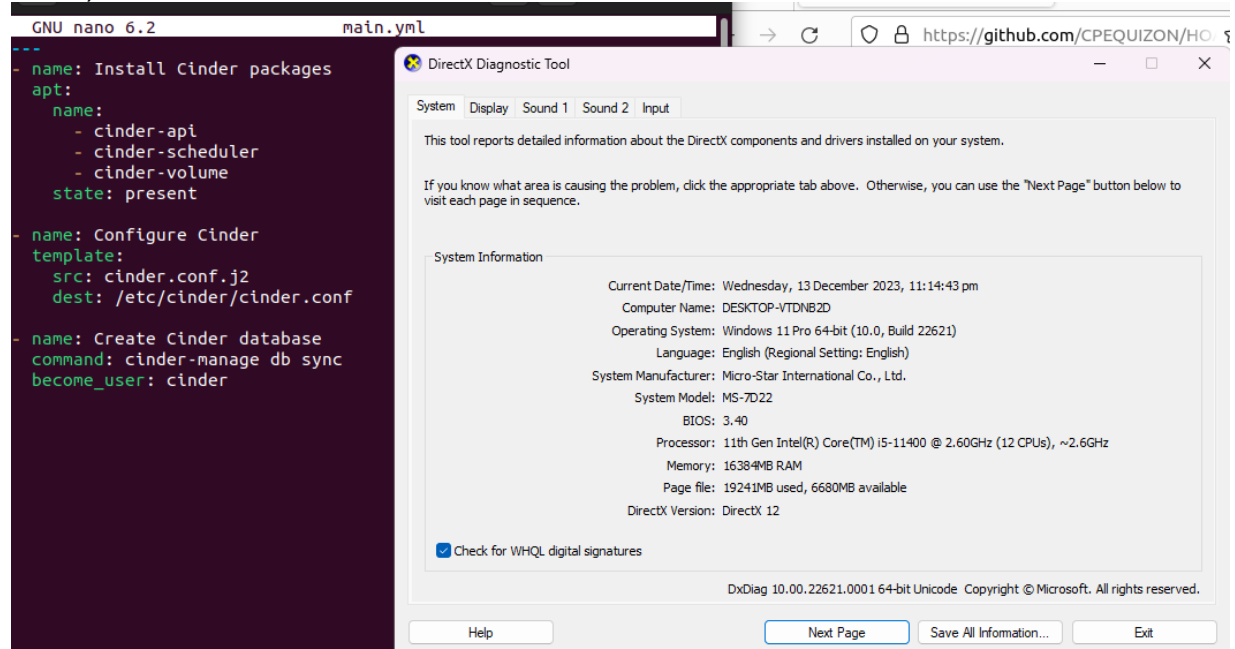
- Current Date/Time: Wednesday, 13 December 2023, 11:14:43 pm
- Computer Name: DESKTOP-VTDNB2D
- Operating System: Windows 11 Pro 64-bit (10.0, Build 22621)
- Language: English (Regional Setting: English)
- System Manufacturer: Micro-Star International Co., Ltd.
- System Model: MS-7D22
- BIOS: 3.40
- Processor: 11th Gen Intel(R) Core(TM) i5-11400 @ 2.60GHz (12 CPU), ~2.6GHz
- Memory: 16384MB RAM
- Page file: 19241MB used, 6680MB available
- DirectX Version: DirectX 12

☒ Check for WHQL digital signatures

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Help Next Page Save All Information... Exit

## c.) Cinder



The screenshot shows a terminal window with the GNU nano 6.2 editor editing main.yml. The file contains an Ansible playbook for installing and configuring Cinder. To the right, the DirectX Diagnostic Tool is open, displaying system information.

```
---
- name: Install Cinder packages
  apt:
    name:
      - cinder-api
      - cinder-scheduler
      - cinder-volume
    state: present

- name: Configure Cinder
  template:
    src: cinder.conf.j2
    dest: /etc/cinder/cinder.conf

- name: Create Cinder database
  command: cinder-manage db sync
  become_user: cinder
```

**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: Wednesday, 13 December 2023, 11:14:43 pm
- Computer Name: DESKTOP-VTDNB2D
- Operating System: Windows 11 Pro 64-bit (10.0, Build 22621)
- Language: English (Regional Setting: English)
- System Manufacturer: Micro-Star International Co., Ltd.
- System Model: MS-7D22
- BIOS: 3.40
- Processor: 11th Gen Intel(R) Core(TM) i5-11400 @ 2.60GHz (12 CPUs), ~2.6GHz
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- DirectX Version: DirectX 12

☒ Check for WHQL digital signatures

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Help Next Page Save All Information... Exit

# Installation

```
nowellgabriel@workstation:~/HOA15.1$ ansible-playbook --ask-become-pass install_chn.yml
BECOME password:
```

```
PLAY [neutron] *****
```

```
TASK [Gathering Facts] *****
ok: [192.168.56.111]
```

```
TASK [neutron : Install Neutron packages] *****
changed: [192.168.56.111]
```

```
TASK [neutron : Configure Neutron] *****
changed: [192.168.56.111]
```

```
TASK [neutron : Configure ML2 plugin] *****
changed: [192.168.56.111]
```

```
TASK [neutron : Restart Neutron] *****
changed: [192.168.56.111]
```

```
nowellgabriel@workstation: ~/HOA15.1
```

```
PLAY [horizon] *****
```

```
TASK [Gathering Facts] *****
ok: [192.168.56.111]
```

```
TASK [horizon : Install Horizon packages] *****
changed: [192.168.56.111]
```

```
TASK [horizon : Configure Apache for Horizon] *****
changed: [192.168.56.111]
```

```
TASK [horizon : Configure Horizon settings] *****
changed: [192.168.56.111]
```

```
TASK [horizon : Restart Apache] *****
changed: [192.168.56.111]
```

```
PLAY [cinder] *****
```

```
TASK [Gathering Facts] *****
ok: [192.168.56.111]
```

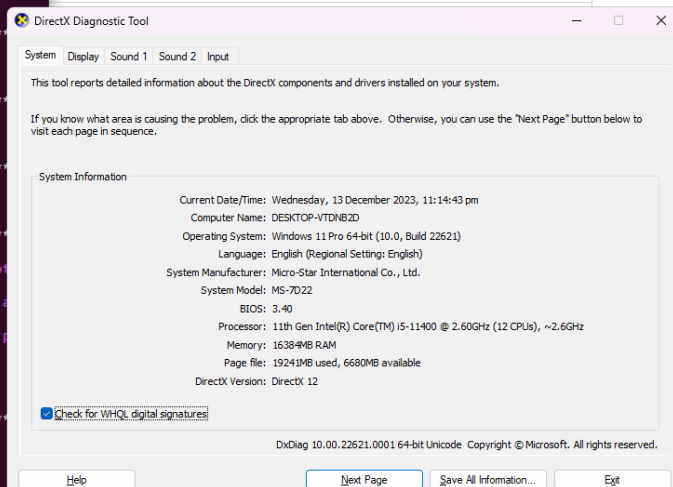
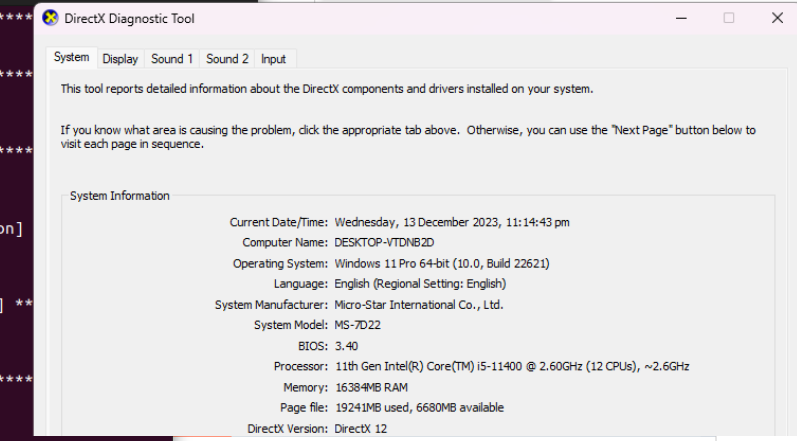
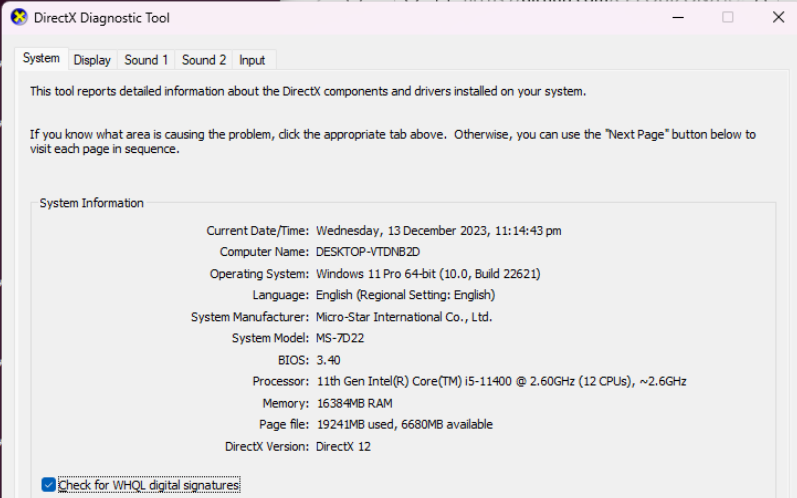
```
TASK [cinder : Install Cinder packages] *****
changed: [192.168.56.111]
```

```
TASK [cinder : Configure Cinder] *****
changed: [192.168.56.111]
```

```
TASK [cinder : Create Cinder database] *****
```

```
[WARNING]: Module remote_tmp /var/lib/cinder/.ansible/tmp did not exist and was created with a mode of 0700, this may cause issues when running as another user. To avoid this, create the remote_tmp dir with the correct permissions manually
changed: [192.168.56.111]
```

```
PLAY RECAP *****
192.168.56.111 : ok=14 changed=11 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
```



Proof:  
Neutron

```

nowellgabriel@workstation: ~
nowellgabriel@workstation: ~$ sudo systemctl status neutron-server
● neutron-server.service - OpenStack Neutron Server
   Loaded: loaded (/lib/systemd/system/neutron-server.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2023-12-14 01:22:24 +08; 49ms ago
     Docs: man:neutron-server(1)
   Main PID: 34375 (neutron-server)
    Tasks: 1 (limit: 4593)
   Memory: 6.9M
      CPU: 44ms
   CGroup: /system.slice/neutron-server.service
            └─34375 /usr/bin/python3 /usr/bin/neutron-server --config-file=/etc/

Dec 14 01:22:24 workstation systemd[1]: neutron-server.service: Scheduled restart job, restart planned.
Dec 14 01:22:24 workstation systemd[1]: Stopped OpenStack Neutron Server.
Dec 14 01:22:24 workstation systemd[1]: neutron-server.service: Consumed 2.448s CPU time.
Dec 14 01:22:24 workstation systemd[1]: Started OpenStack Neutron Server.
lines 1-15/15 (END)

nowellgabriel@workstation: ~$ dpkg -l | grep neutron
ii  neutron-common                2:20.4.0-0ubuntu1
ack - common                    all          Neutron is a virtual network service for OpenStack
ii  neutron-dhcp-agent            2:20.4.0-0ubuntu1
ack - dhcp-agent               all          Neutron is a virtual network service for OpenStack
ii  neutron-l3-agent              2:20.4.0-0ubuntu1
ack - l3-agent                 all          Neutron is a virtual network service for OpenStack
ii  neutron-linuxbridge-agent     2:20.4.0-0ubuntu1
ack - linuxbridge-agent       all          Neutron is a virtual network service for OpenStack
ii  neutron-metadata-agent       2:20.4.0-0ubuntu1
ack - metadata-agent          all          Neutron is a virtual network service for OpenStack
ii  neutron-plugin-ml2            2:20.4.0-0ubuntu1
ack - ml2 plugin              all          Neutron is a virtual network service for OpenStack
ii  neutron-server                2:20.4.0-0ubuntu1
ack - server                  all          Neutron is a virtual network service for OpenStack
ii  python3-neutron               2:20.4.0-0ubuntu1
ack - Python library          all          Neutron is a virtual network service for OpenStack
ii  python3-neutron-lib           2:20.0-0ubuntu1
ack - neutron-lib             all          Neutron shared routines and utilities - Python 3.x
3.x
ii  python3-neutronclient        1:7.8.0-0ubuntu1
ack - neutronclient           all          client API library for Neutron - Python 3.x

```

The image displays two screenshots of Windows system information and diagnostic tools. The top screenshot shows the 'System Information' window with the following details: Current Date/Time: Wednesday, 13 December 2023, 11:14:43 pm; Computer Name: DESKTOP-4TDNBZD; Operating System: Windows 11 Pro 64-bit (10.0, Build 22621); Language: English (Regional Setting: English); System Manufacturer: Micro-Star International Co., Ltd.; System Model: MS-7D22; BIOS: 3.40; Processor: 11th Gen Intel(R) Core(TM) i5-11400 @ 2.60GHz (12 CPUs), ~2.6GHz; Memory: 16384MB RAM; Page file: 19241MB used, 6680MB available; DirectX Version: DirectX 12. Below the system information, there is a checkbox labeled 'Check for WHQL digital signatures' which is checked. The bottom screenshot shows the 'DirectX Diagnostic tool' window. It has tabs for 'System', 'Display', 'Sound 1', 'Sound 2', and 'Input', with 'System' selected. The system information displayed is identical to the top screenshot. At the bottom of the window, there is a checkbox labeled 'Check for WHQL digital signatures' which is also checked. Below the screenshots, there is a footer for 'DxDiag 10.00.22621.0001 64-bit Unicode Copyright (C) Microsoft. All rights reserved.' and three buttons: 'Help', 'Next Page', and 'Save All Information...'. The 'Next Page' button is highlighted with a blue border.

Cinder

```

nowellgabriel@workstation: ~
nowellgabriel@workstation:~$ sudo systemctl status cinder-scheduler
● cinder-scheduler.service - OpenStack Cinder Scheduler
    Loaded: loaded (/lib/systemd/system/cinder-scheduler.service; enabled; vendor preset: enabled)
    Active: active (running) since Thu 2023-12-14 00:55:25 +08; 29min ago
    Docs: man:cinder-scheduler(1)
    Main PID: 13060 (cinder-schedule)
    Tasks: 2 (limit: 4593)
    Memory: 99.9M
    CPU: 2.631s
    CGroup: /system.slice/cinder-scheduler.service
            └─13060 /usr/bin/python3 /usr/bin/cinder-scheduler --config-file=/etc/cinder/cinder.conf

Dec 14 00:55:25 workstation systemd[1]: Started OpenStack Cinder Scheduler.
Dec 14 00:55:27 workstation cinder-scheduler[13060]: /usr/lib/python3/dist-pack
Dec 14 00:55:27 workstation cinder-scheduler[13060]: last_heartbeat = column
Dec 14 00:55:27 workstation cinder-scheduler[13060]: /usr/lib/python3/dist-pack
Dec 14 00:55:27 workstation cinder-scheduler[13060]: num_hosts = column.prop
Dec 14 00:55:27 workstation cinder-scheduler[13060]: /usr/lib/python3/dist-pack
Dec 14 00:55:27 workstation cinder-scheduler[13060]: num_down_hosts = column
lines 1-18/18 (END)

nowellgabriel@workstation:~$ dpkg -l | grep cinder
ii cinder-api all 2:20.3.1-0ubuntu1
ii cinder-common all Cinder storage service - API server 2:20.3.1-0ubuntu1
ii cinder-scheduler all Cinder storage service - common files 2:20.3.1-0ubuntu1
ii cinder-volume all Cinder storage service - Scheduler server 2:20.3.1-0ubuntu1
ii python3-cinder all Cinder storage service - Volume server 2:20.3.1-0ubuntu1
ii python3-cinderclient all Cinder Python 3 libraries 1:8.3.0-0ubuntu1
ii python3-cinderclient all Python bindings to the OpenStack Volume API
python 3.x

```

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: Wednesday, 13 December 2023, 11:14:43 pm  
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System Manufacturer: Micro-Star International Co., Ltd.  
System Model: MS-7D22  
BIOS: 3.40  
Processor: 11th Gen Intel(R) Core(TM) i5-11400 @ 2.60GHz (12 CPUs), ~2.6GHz  
Memory: 16384MB RAM  
Page file: 19241MB used, 6680MB available  
DirectX Version: DirectX 12

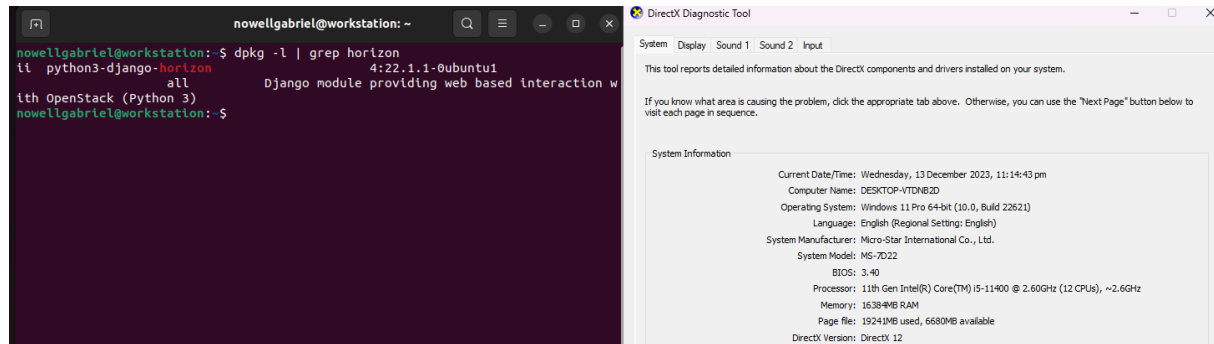
☒ Check for WHQL digital signatures

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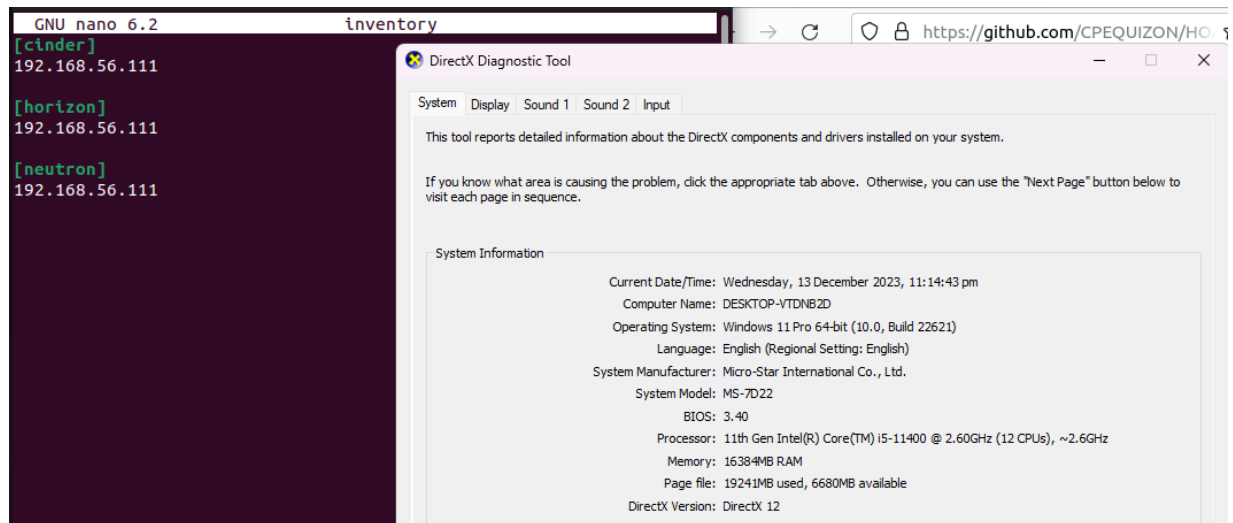
Current Date/Time: Wednesday, 13 December 2023, 11:14:43 pm  
Computer Name: DESKTOP-VTDNBZD  
Operating System: Windows 11 Pro 64-bit (10.0, Build 22621)  
Language: English (Regional Setting: English)  
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Page file: 19241MB used, 6680MB available  
DirectX Version: DirectX 12



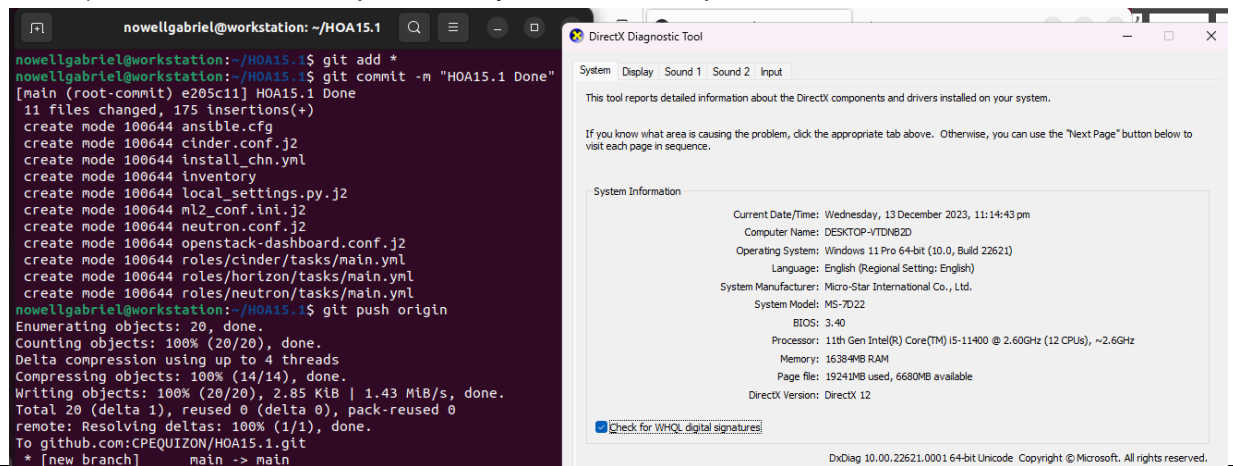
## Horizon

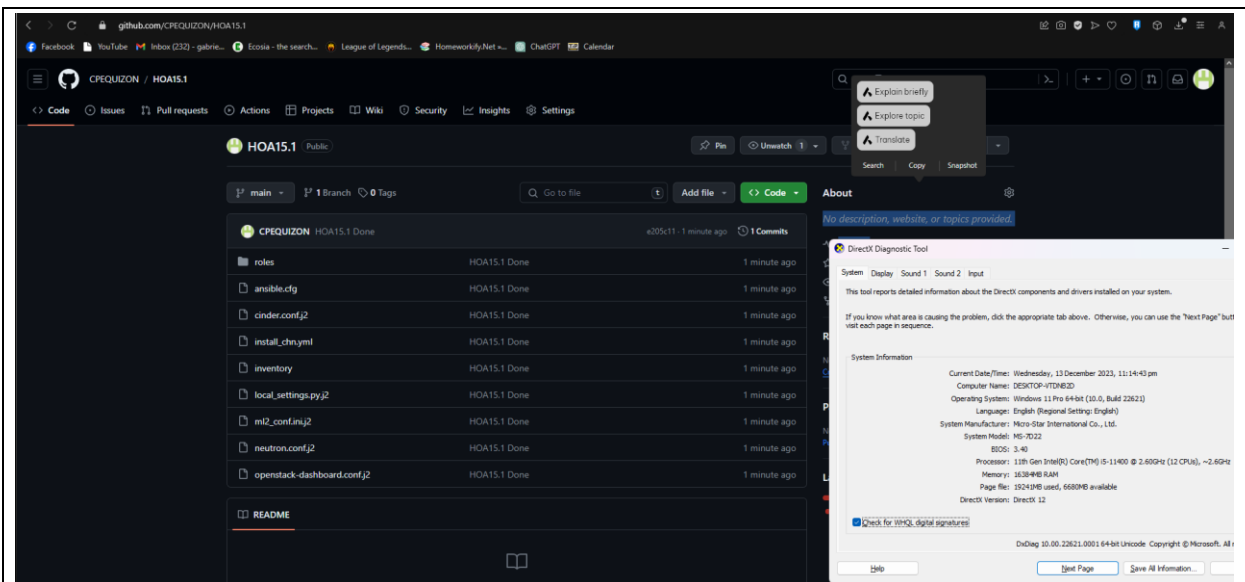


d.) Create different plays in installing per server type (controller, compute etc.) and identify it as a group in the Inventory file



e.) Add, commit and push it to your GitHub repo.





## Reflections:

Answer the following:

### 1. Describe Neutron, Horizon and Cinder services

- Neutron, Horizon, and Cinder are key services within the OpenStack cloud computing platform. Neutron, or the Networking service, enables the creation and management of diverse network architectures, facilitating data flow between virtual machines. Horizon serves as the web-based dashboard, providing a graphical user interface for users and administrators to easily manage and monitor their cloud resources. Cinder, the Block Storage service, focuses on storage needs by offering a mechanism to manage block storage volumes that can be attached to virtual machines, enhancing scalability and persistence. Together, these services contribute to the flexibility, accessibility, and efficiency of OpenStack cloud infrastructure.

## Conclusions:

- **This activity is about installing the three services which are Neutron, Horizon and Cinder services. I used all the learnings from the past activities efficiently install these services without error. I used the source provided in creating and building the playbook. In conclusion, there are plenty of ways in automating the installation of different services efficiently using many techniques.**