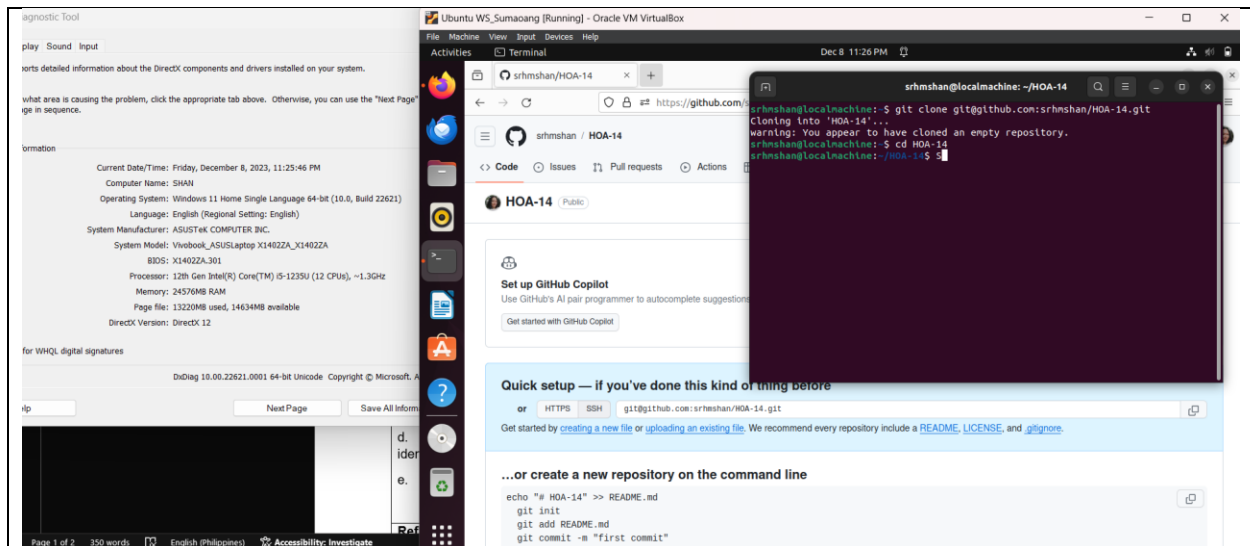
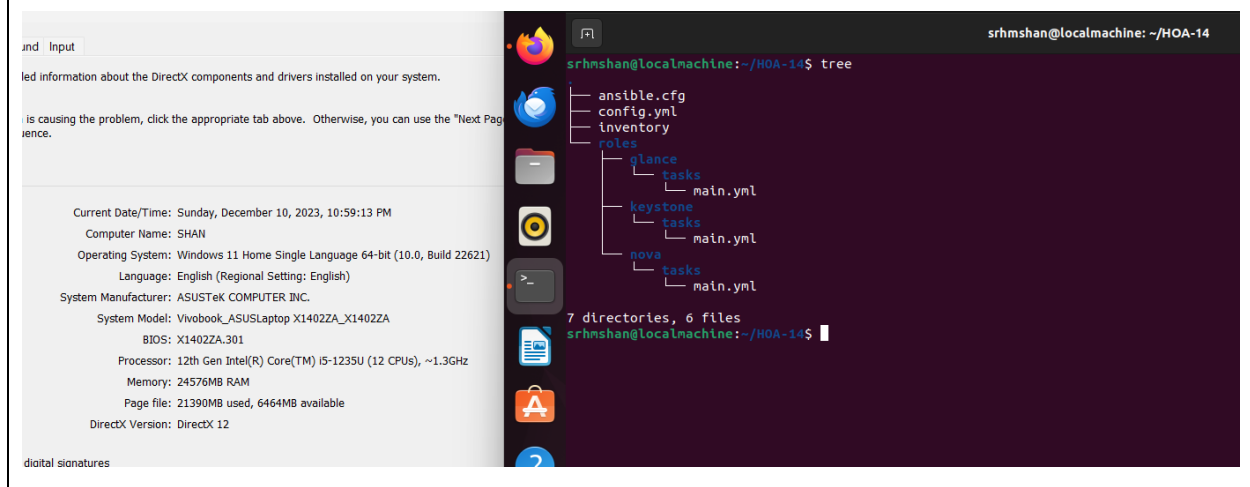


<b>Name: Shaniah Rose Hope M. Sumaoang</b>	<b>Date Performed: December 8, 2023</b>
<b>Course/Section: CPE 232-CPE31S5</b>	<b>Date Submitted: December 11, 2023</b>
<b>Instructor: Engr. Roman Richard</b>	<b>Semester and SY: 1<sup>st</sup> Sem. 23-24</b>
<b>Activity 14: OpenStack Installation (Keystone, Glance, Nova)</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. Keystone (Identity Service)</li> <li>b. Glance (Imaging Service)</li> <li>c. Nova (Compute Service)</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)	
<ol style="list-style-type: none"> <li>1. Create a new repository for this activity.</li> </ol>	

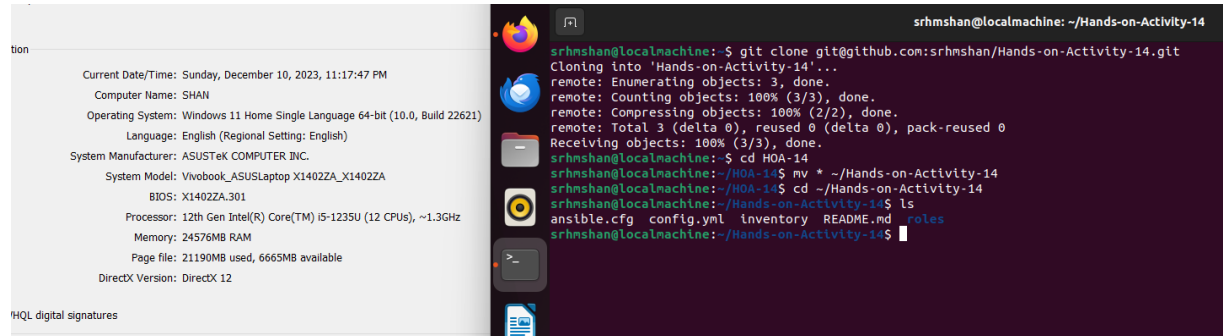


I have created a new repository named “HOA-14” and cloned it to my workstation.

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.



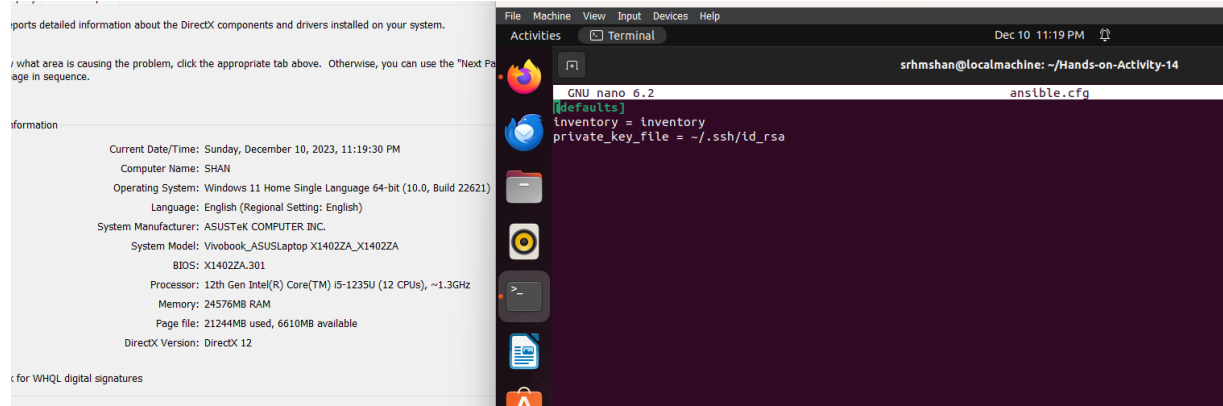
I used the “tree” command to show the HOA-14 directory’s contents. This includes the ansible.cfg and inventory files, as well as the config.yml playbook. I also added the roles in which it is named corresponding to the ones that I put in config.yml.



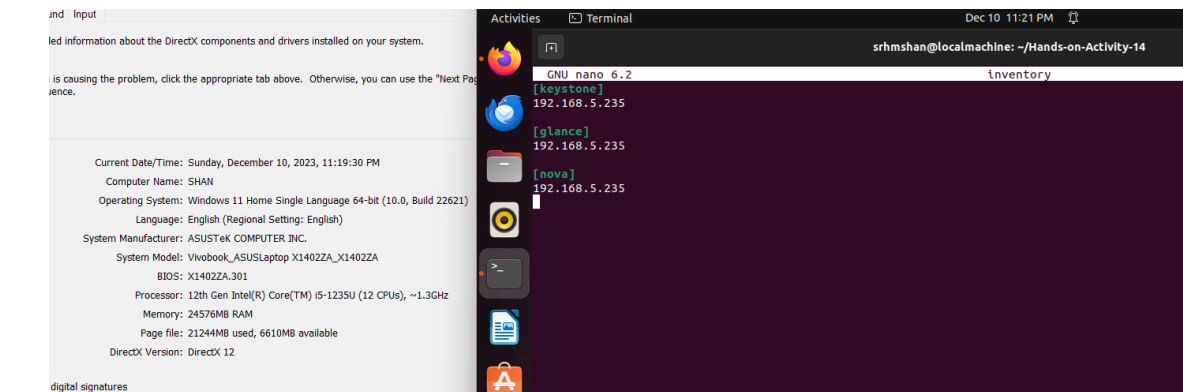
This is not necessary but I moved the contents of my HOA-14 to another repository connected to my Final Project for easier access.

## Contents of each file

### 1. ansible.cfg

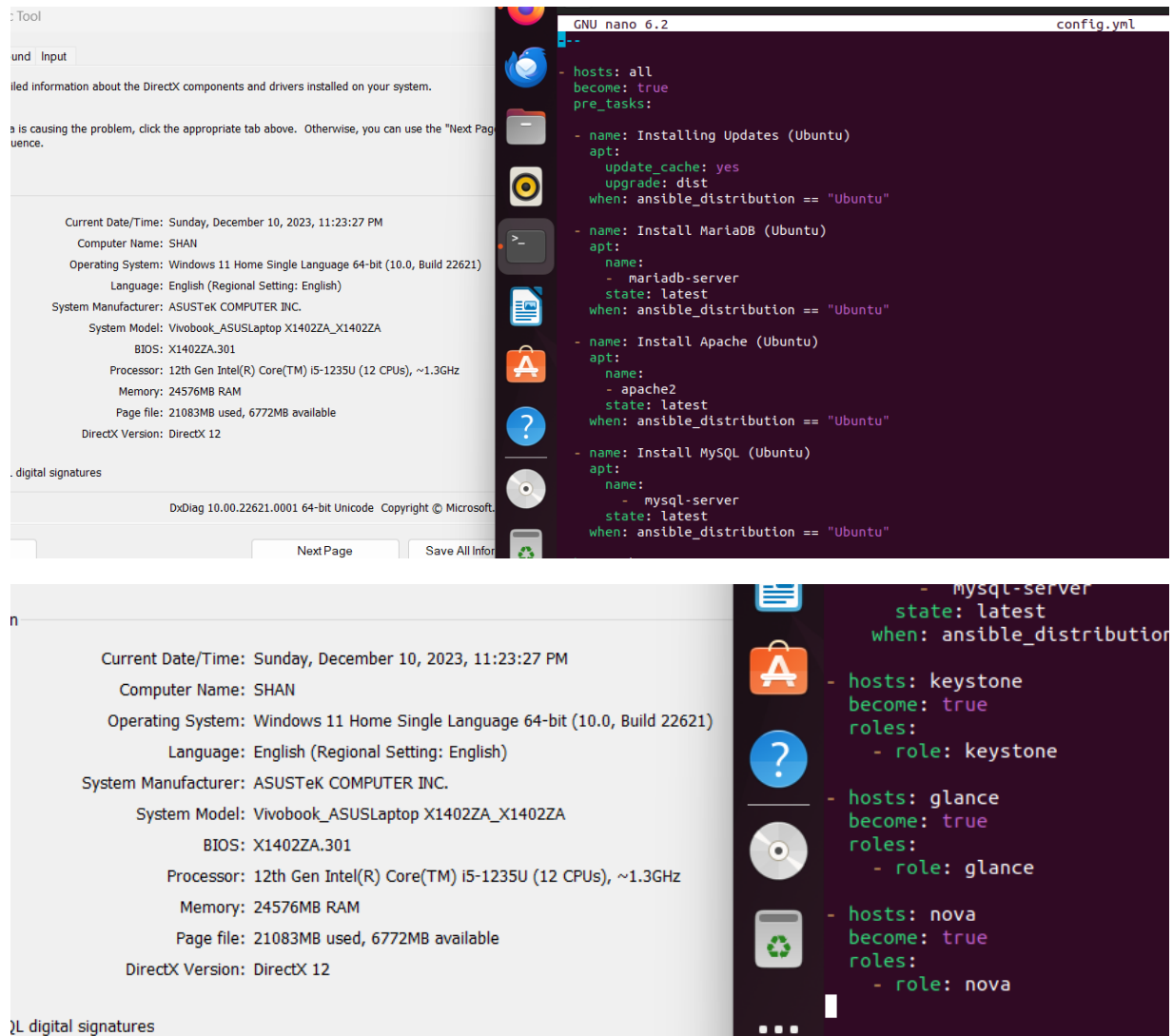


### 2. inventory



I used the same Ubuntu server for each role indicated above.

### 3. config.yml



### Creating tasks for each role (playbooks)

#### 1. Keystone

Diagnostic Tool

Play Sound Input

ports detailed information about the DirectX components and drivers installed on your system.

What area is causing the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button in sequence.

Information

Current Date/Time: Sunday, December 10, 2023, 11:28:22 PM

Computer Name: SHAN

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 X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

Memory: 24576MB RAM

Page file: 21097MB used, 6758MB available

DirectX Version: DirectX 12

or WHQL digital signatures

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ip

Next Page

Save All Information

digital signatures

srhmschan@localmachine: ~/Hands-on-Activity-14/roles/keystone/tasks

GNU nano 6.2 main.yml

name: Installing Keystone (Ubuntu)

apt:

name: keystone

state: latest

- name: Configuring Keystone Config File Database Connection

lineinfile:

dest: /etc/keystone/keystone.conf

insertafter: '[database:]'

regexp: 'connection = mysql+pymysql://keystone:KEYSTONE\_DBPASS@controller/keystone'

line: 'connection = mysql+pymysql://keystone:admin123@controller/keystone'

backup: yes

backrefs: yes

- name: Configuring Keystone Config File Token Provider

lineinfile:

dest: /etc/keystone/keystone.conf

insertafter: '[token:]'

line: 'provider = fernet'

backup: yes

- name: Populating Keystone Database

shell:

sudo keystone-manage db\_sync

- name: Initialize Keystone Fernet Key

shell:

keystone-manage fernet\_setup --keystone-user keystone --keystone-group keystone

- name: Initialize Keystone Fernet Key (Credential Setup)

shell:

keystone-manage credential\_setup --keystone-user keystone --keystone-group keystone

- name: Configure Apache (HTTP) Server for Keystone

lineinfile:

dest: /etc/apache2/apache2.conf

line: 'ServerName controller'

state: present

backup: yes

Wrote 50 lines

Help

Exit

Write Out

Read File

Where Is

Replace

Cut

Paste

Execute

Justify

Location

Go To Line

keystone-manage credential\_setup --keystone-user keystone --ke

- name: Configure Apache (HTTP) Server for Keystone

lineinfile:

dest: /etc/apache2/apache2.conf

line: 'ServerName controller'

state: present

backup: yes

- name: Configure Administrative Account Environmental Variables

shell:

export OS\_USERNAME=admin

export OS\_PASSWORD=ADMIN\_PASS

export OS\_PROJECT\_NAME=admin

export OS\_USER\_DOMAIN\_NAME=Default

export OS\_PROJECT\_DOMAIN\_NAME=Default

export OS\_AUTH\_URL=http://controller:5000/v3

export OS\_IDENTITY\_API\_VERSION=3

## 1. Glance

Diagnostic Tool

Sound Input

etailed information about the DirectX components and drivers installed on your system.

area is causing the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button in sequence.

Information

Current Date/Time: Sunday, December 10, 2023, 11:31:03 PM

Computer Name: SHAN

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 X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

Memory: 24576MB RAM

Page file: 21131MB used, 6724MB available

DirectX Version: DirectX 12

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Next Page

Save All Information

srhmschan@localmachine: ~/Hands-on-Activity-14/roles/glance/tasks

GNU nano 6.2 main.yml

name: Install Glance (Ubuntu)

apt:

name: glance

state: latest

- name: Configure Glance database

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

lineinfile:

dest: /etc/glance/glance-api.conf

insertafter: '[keystone\_authtoken:]'

line: "[[ token ]]"

state: present

backup: yes

with\_items:

- www\_authenticate\_uri = 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

Tool

nd Input

nd information about the DirectX components and drivers installed on your system.

is causing the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button.

Current Date/Time: Sunday, December 10, 2023, 11:31:03 PM

Computer Name: SHAN

Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22621)

Language: English (Regional Setting: English)

System Manufacturer: ASUSTeK COMPUTER INC.

System Model: Vivobook\_ASUSLaptop X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

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DirectX Version: DirectX 12

Digital signatures

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Save All Information

srhmsan@localmachine: ~/Hands-on

GNU nano 6.2

main.

- 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: '{{ item }}'  
state: present  
backup: yes  
with\_items:  
- 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: '{{ item }}'  
state: present  
backup: yes  
with\_items:  
- auth\_url = http://controller:5000  
- auth\_type = password  
- user\_domain\_id = default  
- username = MY\_SERVICE  
- system\_scope = all  
- password = MY\_PASSWORD  
- endpoint\_id = ENDPOINT\_ID  
- region\_name = RegionOne

region\_name = RegionOne

- name: Configure Glance DEFAULT  
lineinfile:  
dest: /etc/glance/glance-api.conf  
insertafter: '[DEFAULT]'  
line: 'use\_keystone\_limits = True'  
backup: yes

- name: Populating Image Service Database  
shell:  
sudo glance-manage db\_sync

Help

Write Out

Where Is

Exit

Read File

Replace

Current Date/Time: Sunday, December 10, 2023, 11:31:03 PM

Computer Name: SHAN

Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22621)

Language: English (Regional Setting: English)

System Manufacturer: ASUSTeK COMPUTER INC.

System Model: Vivobook\_ASUSLaptop X1402ZA\_X1402ZA

BIOS: X1402ZA.301

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### 3. Nova

Input

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Computer Name: SHAN

Operating System: Windows 11 Home Single Language 64-bit (10.0, Build 22621)

Language: English (Regional Setting: English)

System Manufacturer: ASUSTeK COMPUTER INC.

System Model: Vivobook\_ASUSLaptop X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

Memory: 24576MB RAM

Page file: 21116MB used, 6738MB available

DirectX Version: DirectX 12

digital signatures

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GNU nano 6.2

main.yml

name: Installing Nova (Ubuntu)

apt:

name:

- nova-api

- nova-conductor

- nova-novncproxy

- nova-scheduler

state: latest

name: Configuring Nova API Database Connection

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 for Keystone

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

backup: yes

backrefs: yes

name: Configure Nova Authentication Token (for Keystone)

lineinfile:

dest: /etc/nova/nova.conf

insertafter: '[keystone\_auth\_token:]'

line: "[[ item ]]"

state: present

backup: yes

with\_items:

- www\_authenticate\_uri = 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 = nova

- password = admin123

name: Configure Nova VNC

lineinfile:

dest: /etc/nova/nova.conf

insertafter: '[vnc:]'

line: "[[ item ]]"

state: present

backup: yes

with\_items:

- enabled = true

- server\_listen = \$my\_ip

- server\_proxyclient\_address = \$my\_ip

name: Configure Nova Placement

lineinfile:

dest: /etc/nova/nova.conf

insertafter: '[placement:]'

line: "[[ item ]]"

state: present

backup: yes

with\_items:

- region\_name = RegionOne

- project\_domain\_name = Default

- project\_name = service

- auth\_type = password

- user\_domain\_name = Default

- auth\_url = http://controller:5000/v3

- username = placement

- password = admin123

name: Configure Nova Default IP

lineinfile:

dest: /etc/nova/nova.conf

line: 'my\_ip = 10.0.0.11'

state: present

backup: yes

name: Configure Nova Glance API Server

lineinfile:

dest: /etc/nova/nova.conf

line: 'api\_server = http://controller:9292'

state: present

backup: yes

Sound Input

ed information about the DirectX components and drivers installed on your system.

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System Manufacturer: ASUSTeK COMPUTER INC.

System Model: Vivobook\_ASUSLaptop X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

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Language: English (Regional Setting: English)

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System Model: Vivobook\_ASUSLaptop X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

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Computer Name: SHAN  
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 X1402ZA\_X1402ZA  
BIOS: X1402ZA.301  
Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz  
Memory: 24576MB RAM  
Page file: 21116MB used, 6738MB available  
DirectX Version: DirectX 12

ital signatures

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Terminal

```
backup: yes
- name: Configure Nova oslo_concurrency
  lineinfile:
    dest: /etc/nova/nova.conf
    line: 'lock_path = /var/lib/nova/tmp'
    state: present
    backup: yes
- name: Additional Configuration of Nova (API DB Sync)
  shell:
    sudo nova-manage api_db sync
- name: Additional Configuration (Cell V2 Mapping)
  shell:
    sudo nova-manage cell_v2 map_cell0
- name: Additional Configuration (DB Sync)
  shell:
    sudo nova-manage db sync
- name: Additional Configuration (Cell V2 List Cells)
  shell:
    sudo nova-manage cell_v2 list_cells
```

## Running “config.yml”

← → December 2023

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Input

Information about the DirectX components and drivers installed on your system.

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Current Date/Time: Sunday, December 10, 2023, 11:55:37 PM  
Computer Name: SHAN  
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 X1402ZA\_X1402ZA  
BIOS: X1402ZA.301  
Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz  
Memory: 24576MB RAM  
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DirectX Version: DirectX 12

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Terminal

```
srhmshan@localmachine: ~/Hands-on-Activity-14
BECOME password:
PLAY [all] *****
TASK [Gathering Facts] *****
ok: [192.168.5.235]
TASK [Installing Updates (Ubuntu)] *****
changed: [192.168.5.235]
TASK [Install MariaDB (Ubuntu)] *****
ok: [192.168.5.235]
TASK [Install Apache (Ubuntu)] *****
changed: [192.168.5.235]
TASK [Install MySQL (Ubuntu)] *****
changed: [192.168.5.235]
PLAY [keystone] *****
TASK [Gathering Facts] *****
ok: [192.168.5.235]
TASK [keystone : Installing Keystone (Ubuntu)] *****
changed: [192.168.5.235]
TASK [keystone : Configuring Keystone Config File Database Connection] *****
ok: [192.168.5.235]
TASK [keystone : Configuring Keystone Config File Token Provider] *****
changed: [192.168.5.235]
TASK [keystone : Populating Keystone Database] *****
[WARNING]: Consider using 'become', 'become_method', and 'become_user' rather than running sudo
changed: [192.168.5.235]
TASK [keystone : Initialize Keystone Fernet Key] *****
changed: [192.168.5.235]
```



tool

nd Input

id information about the DirectX components and drivers installed on your system.

is causing the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button.

Current Date/Time: Sunday, December 10, 2023, 11:55:37 PM

Computer Name: SHAN

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 X1402ZA\_X1402ZA

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Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

Memory: 24576MB RAM

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Current Date/Time: Sunday, December 10, 2023, 11:55:37 PM

Computer Name: SHAN

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TASK [keystone : Initialize Keystone Fernet Key (Credential Setup)] \*\*\*\*\*  
changed: [192.168.5.235]

TASK [keystone : Configure Apache (HTTP) Server for Keystone] \*\*\*\*\*  
changed: [192.168.5.235]

TASK [keystone : Configure Administrative Account Environmental Variables] \*\*\*\*\*  
changed: [192.168.5.235]

PLAY [glance] \*\*\*\*\*

TASK [Gathering Facts] \*\*\*\*\*  
ok: [192.168.5.235]

TASK [glance : Install Glance (Ubuntu)] \*\*\*\*\*  
changed: [192.168.5.235]

TASK [glance : Configure Glance database] \*\*\*\*\*  
ok: [192.168.5.235]

TASK [glance : Configure Glance Authentication Key] \*\*\*\*\*  
changed: [192.168.5.235] => (item=www\_authenticate\_url = http://controller:5000)  
changed: [192.168.5.235] => (item=auth\_url = http://controller:5000)  
changed: [192.168.5.235] => (item=memcached\_servers = controller:11211)  
changed: [192.168.5.235] => (item=auth\_type = password)  
changed: [192.168.5.235] => (item=project\_domain\_name = Default)  
changed: [192.168.5.235] => (item=user\_domain\_name = Default)  
changed: [192.168.5.235] => (item=project\_name = service)  
changed: [192.168.5.235] => (item=username = glance)  
changed: [192.168.5.235] => (item=password = admin123)

TASK [glance : Configure Glance paste\_deploy] \*\*\*\*\*  
changed: [192.168.5.235]

TASK [glance : Configure Glance glance\_store] \*\*\*\*\*  
changed: [192.168.5.235] => (item=stores = file,http)  
changed: [192.168.5.235] => (item=default\_store = file)  
changed: [192.168.5.235] => (item=filesystem\_store\_datadir = /var/lib/glance/images/)

TASK [glance : Configure Glance oslo\_limit] \*\*\*\*\*  
ok: [192.168.5.235] => (item=auth\_url = http://controller:5000)  
ok: [192.168.5.235] => (item=auth\_type = password)  
changed: [192.168.5.235] => (item=user\_domain\_id = default)  
changed: [192.168.5.235] => (item=username = MY\_SERVICE)  
changed: [192.168.5.235] => (item=system\_scope = all)  
changed: [192.168.5.235] => (item=password = MY\_PASSWORD)  
changed: [192.168.5.235] => (item=endpoint\_id = ENDPOINT\_ID)  
changed: [192.168.5.235] => (item=region\_name = RegionOne)

TASK [glance : Configure Glance DEFAULT] \*\*\*\*\*  
changed: [192.168.5.235]

TASK [glance : Populating Image Service Database] \*\*\*\*\*  
changed: [192.168.5.235]

PLAY [nova] \*\*\*\*\*

TASK [Gathering Facts] \*\*\*\*\*  
ok: [192.168.5.235]

TASK [nova : Installing Nova (Ubuntu)] \*\*\*\*\*  
changed: [192.168.5.235]

TASK [nova : Configuring Nova API Database Connection] \*\*\*\*\*  
ok: [192.168.5.235]

TASK [nova : Configure Nova API for Keystone] \*\*\*\*\*  
changed: [192.168.5.235]

TASK [nova : Configuring Nova Database] \*\*\*\*\*  
ok: [192.168.5.235]

TASK [nova : Configure Nova Authentication Token (for Keystone)] \*\*\*\*\*  
changed: [192.168.5.235] => (item=www\_authenticate\_url = http://controller:5000/)  
changed: [192.168.5.235] => (item=auth\_url = http://controller:5000/)  
changed: [192.168.5.235] => (item=memcached\_servers = controller:11211)  
changed: [192.168.5.235] => (item=auth\_type = password)  
changed: [192.168.5.235] => (item=project\_domain\_name = Default)  
changed: [192.168.5.235] => (item=user\_domain\_name = Default)

changed: [192.168.5.235] => (item=project\_name = service)  
changed: [192.168.5.235] => (item=username = nova)  
changed: [192.168.5.235] => (item=password = admin123)

Input

Information about the DirectX components and drivers installed on your system.

using the problem, click the appropriate tab above. Otherwise, you can use the "Next Page" button.

Current Date/Time: Sunday, December 10, 2023, 11:55:37 PM

Computer Name: SHAN

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 X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

Memory: 24576MB RAM

Page file: 21608MB used, 6247MB available

DirectX Version: DirectX 12

al signatures

DxDiag 10.00.22621.0001 64-bit Unicode Copyright © Microsoft

Next Page Save All Info

TASK [nova : Configure Nova VNC] \*\*\*\*\*

changed: [192.168.5.235] => (item=enabled = true)

changed: [192.168.5.235] => (item=server\_listen = \$my\_ip)

changed: [192.168.5.235] => (item=server\_proxyclient\_address = \$my\_ip)

TASK [nova : Configure Nova Placement] \*\*\*\*\*

changed: [192.168.5.235] => (item=region\_name = RegionOne)

ok: [192.168.5.235] => (item=project\_domain\_name = Default)

ok: [192.168.5.235] => (item=project\_name = service)

ok: [192.168.5.235] => (item=auth\_type = password)

ok: [192.168.5.235] => (item=user\_domain\_name = Default)

changed: [192.168.5.235] => (item=auth\_url = http://controller:5000/v3)

changed: [192.168.5.235] => (item=username = placement)

ok: [192.168.5.235] => (item=password = admin123)

TASK [nova : Configure Nova Default IP] \*\*\*\*\*

changed: [192.168.5.235]

TASK [nova : Configure Nova Glance API Server] \*\*\*\*\*

changed: [192.168.5.235]

TASK [nova : Configure Nova oslo\_concurrency] \*\*\*\*\*

changed: [192.168.5.235]

TASK [nova : Additional Configuration of Nova (API DB Sync)] \*\*\*\*\*

changed: [192.168.5.235]

TASK [nova : Additional Configuration (Cell V2 Mapping)] \*\*\*\*\*

changed: [192.168.5.235]

TASK [nova : Additional Configuration (DB Sync)] \*\*\*\*\*

changed: [192.168.5.235]

TASK [nova : Additional Configuration (Cell V2 List Cells)] \*\*\*\*\*

changed: [192.168.5.235]

PLAY RECAP \*\*\*\*\*

192.168.5.235 : ok=38 changed=29 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

## Verification of successful installations

### 1. Keystone

Current Date/Time: Monday, December 11, 2023, 12:08:19 AM

Computer Name: SHAN

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 X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

Memory: 24576MB RAM

Page file: 21565MB used, 6289MB available

DirectX Version: DirectX 12

al signatures

DxDiag 10.00.22621.0001 64-bit Unicode Copyright © Microsoft

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srhmshan@server1: ~

srhmshan@server1:~\$ pip show keystone

Name: keystone

Version: 21.0.1

Summary: OpenStack Identity

Home-page: https://docs.openstack.org/keystone/latest

Author: OpenStack

Author-email: openstack-discuss@lists.openstack.org

License: UNKNOWN

Location: /usr/lib/python3/dist-packages

Requires:

Required-by:

srhmshan@server1:~\$

### 2. Glance

Current Date/Time: Monday, December 11, 2023, 12:08:19 AM

Computer Name: SHAN

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 X1402ZA\_X1402ZA

BIOS: X1402ZA.301

Processor: 12th Gen Intel(R) Core(TM) i5-1235U (12 CPUs), ~1.3GHz

Memory: 24576MB RAM

Page file: 21565MB used, 6289MB available

DirectX Version: DirectX 12

al signatures

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srhmshan@server1: ~

srhmshan@server1:~\$ 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 23:45:26 PST; 24min ago

Docs: man:glance-api(1)

Main PID: 16911 (glance-api)

Tasks: 3 (limit: 4594)

Memory: 118.3M

CPU: 26.16%

CGroup: /system.slice/glance-api.service

└─16911 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance-api.conf --config-dir=/etc/glance/ --

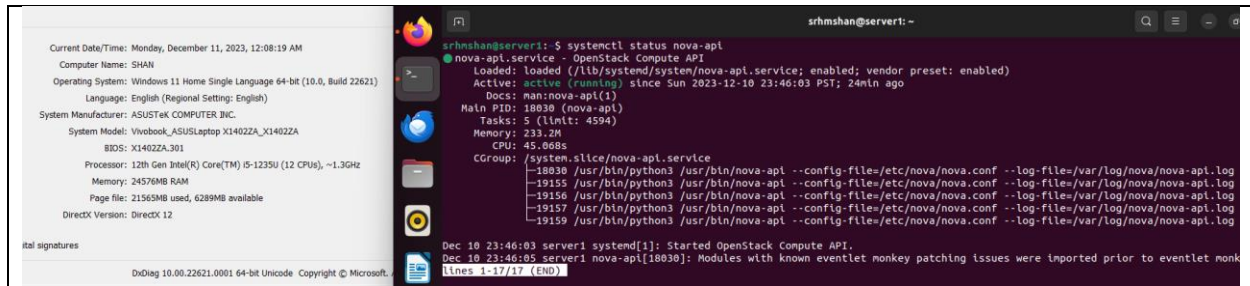
└─17013 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance-api.conf --config-dir=/etc/glance/ --

└─17014 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance-api.conf --config-dir=/etc/glance/ --

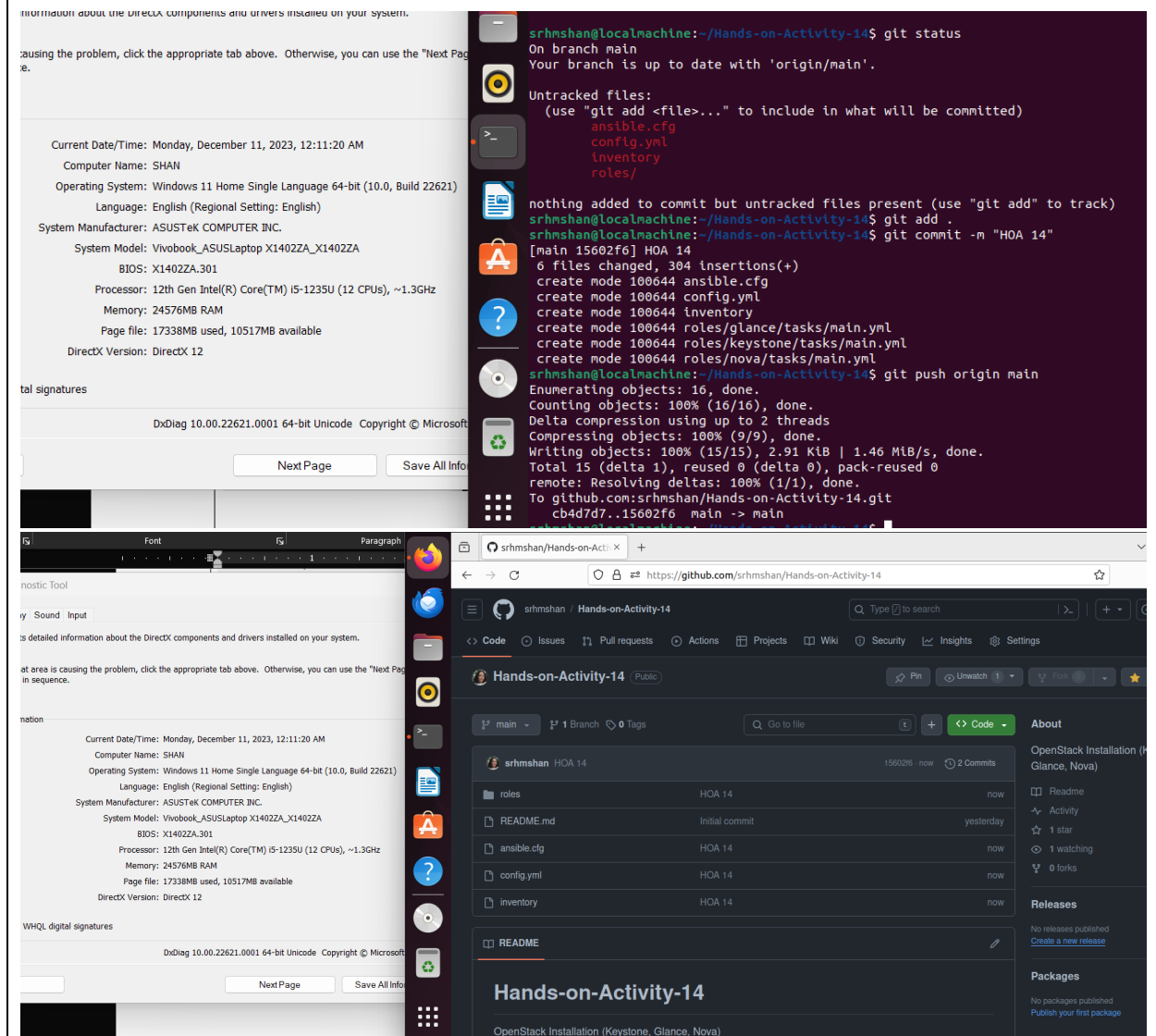
Dec 10 23:45:26 server1 systemd[1]: Started OpenStack Image Service API.

lines 1-14/14 (END)

### 3. Nova



## Add, commit and pushing to GitHub repository



<https://github.com/srhmshan/Hands-on-Activity-14>

**Reflections:**

Answer the following:

1. Describe Keystone, Glance and Nova services

Keystone, Glance and Nova play roles in the OpenStack cloud computing platform. Keystone acts as the identity service ensuring access, to OpenStack resources by managing authentication and authorization. Glance serves as the image service simplifying the process of creating instances in the cloud by organizing and retrieving virtual machine images. Nova on the hand is responsible for orchestrating, on demand compute resources through managing virtual machine instances. Working together these services create an infrastructure where Keystone handles identity management Glance takes care of image handling. Nova oversees compute resources. The result is an adaptable cloud computing environment that offers capabilities.

**Conclusions:**

**In this activity, I was able to create a step-by-step process for setting up OpenStack using Ansible as my chosen tool for Infrastructure as Code (IaC). The main focus of the activity was on deploying the services of OpenStack, such as Keystone (Identity Service) Glance (Imaging Service) and Nova (Compute Service). To ensure readability and ease of maintenance I organized the playbook into sections, for each service using roles. After running the playbook, I confirmed that Keystone, Glance and Nova services were successfully installed and documented the outcomes with explanations and screenshots. Finally, I. Uploaded the code to a GitHub repository. By following this approach and effectively utilizing roles, I demonstrated my proficiency in IaC principles while establishing an efficient, scalable and easily manageable workflow for installing OpenStack.**