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Course/Section:CPE31S2	**Date Submitted:**
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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

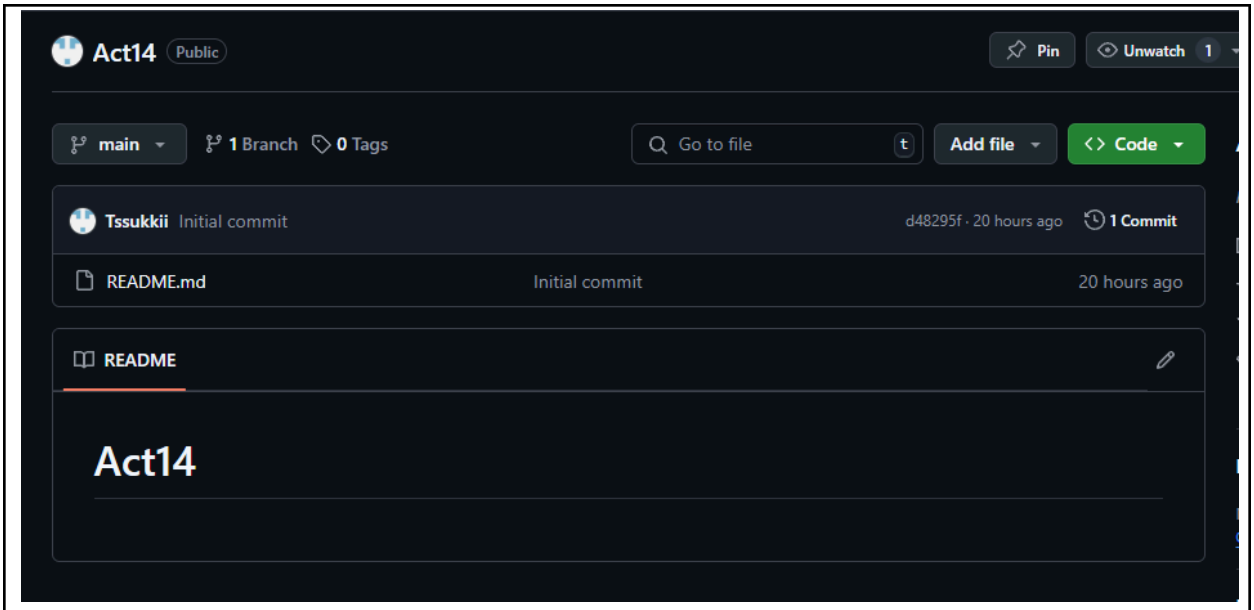
Oracle VirtualBox (Hypervisor)

1x Ubuntu VM or Centos VM

4. Tasks

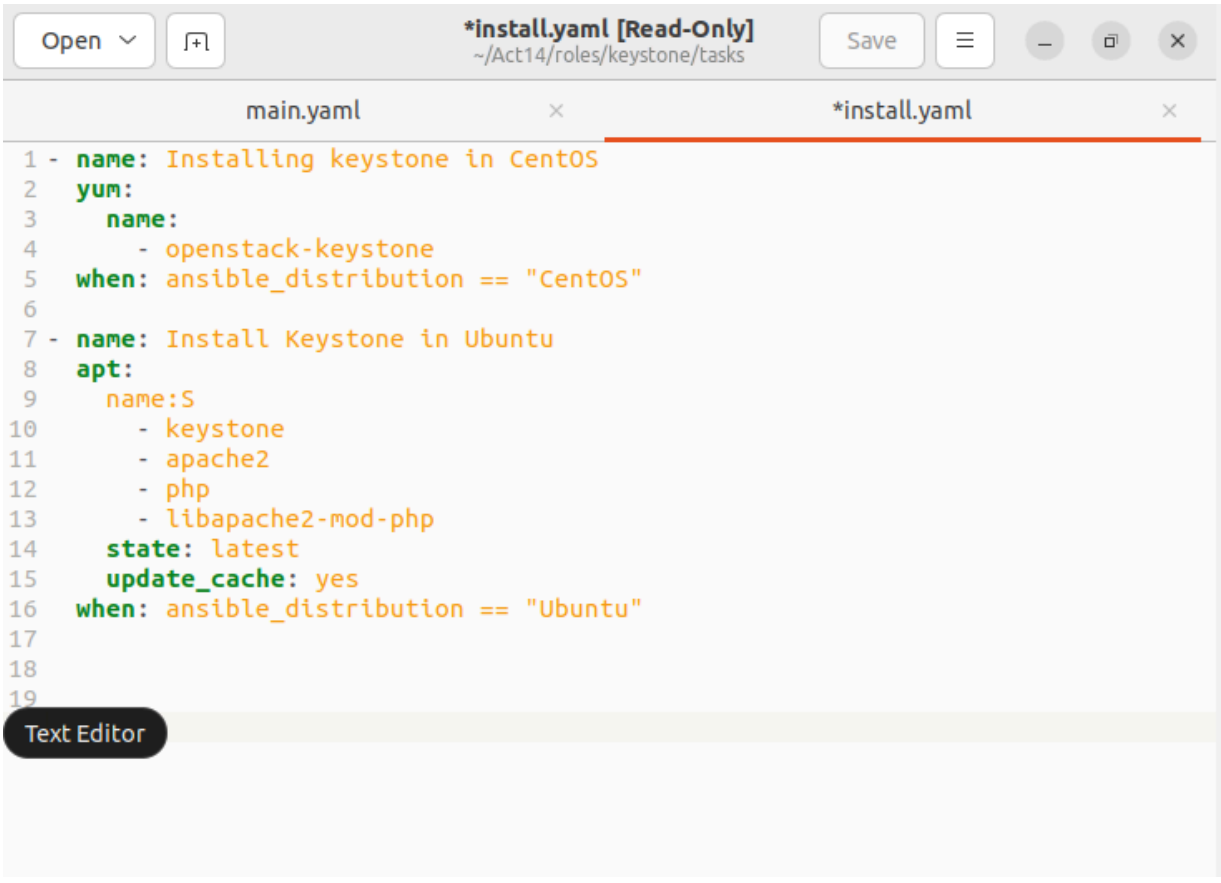
1. Create a new repository for this activity.
2. Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/
    a. Keystone (Identity Service)
    b. Glance (Imaging Service)
    c. Nova (Compute Service)
    d. Create different plays in installing per 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.

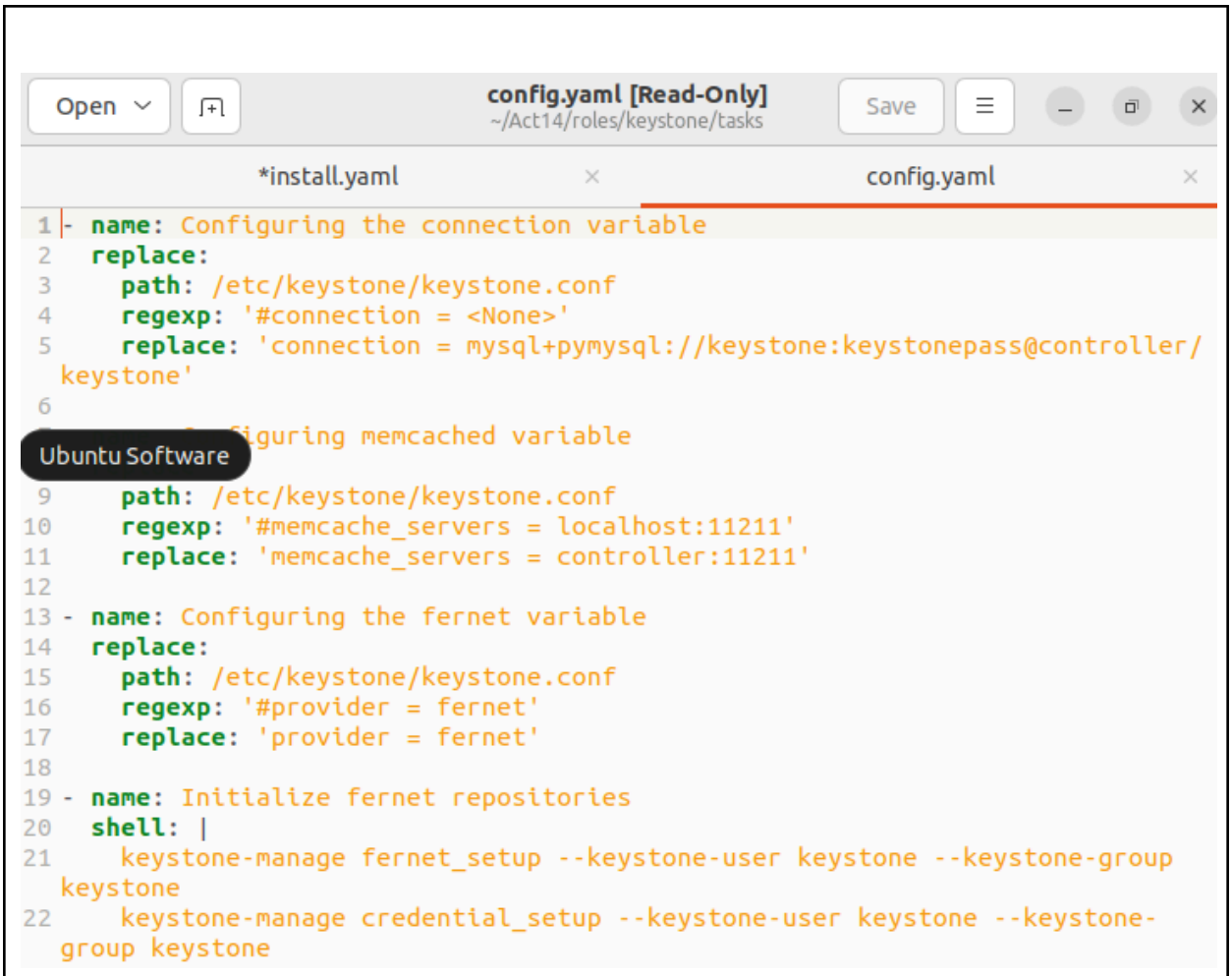
5. Output (screenshots and explanations)



created a repo for activity 14

this is the inside of the install.yaml in the keystone





inside of the config.yaml

*install.yaml | config.yaml | preq.yaml

```yaml
- name: Creating keystone database
  mysql_query:
    login_user: root
    login_password: mysqlpass
    login_unix_socket: /var/lib/mysql/mysql.sock
    query:
      - CREATE DATABASE keystone;
      - GRANT ALL PRIVILEGES ON keystone.* TO 'keystone'@'localhost'
IDENTIFIE>
      - GRANT ALL PRIVILEGES ON keystone.* TO 'keystone'@'%' IDENTIFIED BY
'ke>
    single_transaction: yes
  failed_when: false
  no_log: true
  when: ansible_distribution == "CentOS"
```

Text Editor

and inside for the preq.yaml

```
vboxuser@server1:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pres>
     Active: active (running) since Mon 2024-12-09 15:46:36 CST; 1h 44min ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 1035 (apache2)
      Tasks: 26 (limit: 2270)
     Memory: 31.1M
        CPU: 933s
     CGroup: /system.slice/apache2.service
             ├─1035 /usr/sbin/apache2 -k start
             ├─1070 "(wsgi:keystone-pu" -k start
             ├─1076 "(wsgi:keystone-pu" -k start
             ├─1077 "(wsgi:keystone-pu" -k start
             ├─1091 "(wsgi:keystone-pu" -k start
             ├─1095 "(wsgi:keystone-pu" -k start
             ├─1097 /usr/sbin/apache2 -k start
             ├─1111 /usr/sbin/apache2 -k start
             ├─1117 /usr/sbin/apache2 -k start
             ├─1144 /usr/sbin/apache2 -k start
             └─1183 /usr/sbin/apache2 -k start

Dec 09 15:46:35 server1 systemd[1]: Starting The Apache HTTP Server...
Dec 09 15:46:36 server1 apachectl[963]: AH00558: apache2: Could not reliably d>
Dec 09 15:46:36 server1 systemd[1]: Started The Apache HTTP Server.
lines 1-24/24 (END)
```

Ubuntu Software

this shows the keystone works

and for the glance this is the inside for the install.yaml and config

Open

config.yaml [Read-Only]
~/Act14/roles/glance/tasks

Save

```yaml
- name: Copying the config file
  copy:
    src: glance-api.conf
    dest: /etc/glance/glance-api.conf
    owner: root
    group: glance
    mode: 0640
  when: ansible_distribution == "CentOS"

- name: Populating the database
  command: su -s /bin/sh -c "glance-manage db_sync" glance
  [illegible]: false
  [illegible]ue
  when: ansible_distribution == "CentOS"

- name: Restarting glance-api
  service:
    name: openstack-glance-api.service
    state: started
    enabled: true
  when: ansible_distribution == "CentOS"
```

Ubuntu Software

Open

*install.yaml [Read-Only]
~/Act14/roles/glance/tasks

Save

```yaml
- name: Installing Glance in CentOS
  yum:
    name: openstack-glance
  when: ansible_distribution == "CentOS"

- name: Installation Glance in Ubuntu
  apt:
    name:
      - glance
    state: latest
    update_cache: yes
  when: ansible_distribution == "Ubuntu"
```

and this is the proof that the glance works

```
vboxuser@server1:~$ sudo systemctl status glance-api
● glance-api.service - OpenStack Image Service API
     Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor p>
     Active: active (running) since Mon 2024-12-09 15:46:39 CST; 1h 44min ago
       Docs: man:glance-api(1)
   Main PID: 1299 (glance-api)
      Tasks: 3 (limit: 2270)
     Memory: 26.6M
        CPU: 2min 4.629s
     CGroup: /system.slice/glance-api.service
             ├─1299 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gl>
             ├─2050 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gl>
             └─2051 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gl>
```

this is the inside of the config.yaml and install.yaml for nova

Open | config.yaml [Read-Only] ~/Act14/roles/nova/tasks | Save

*install.yaml | config.yaml

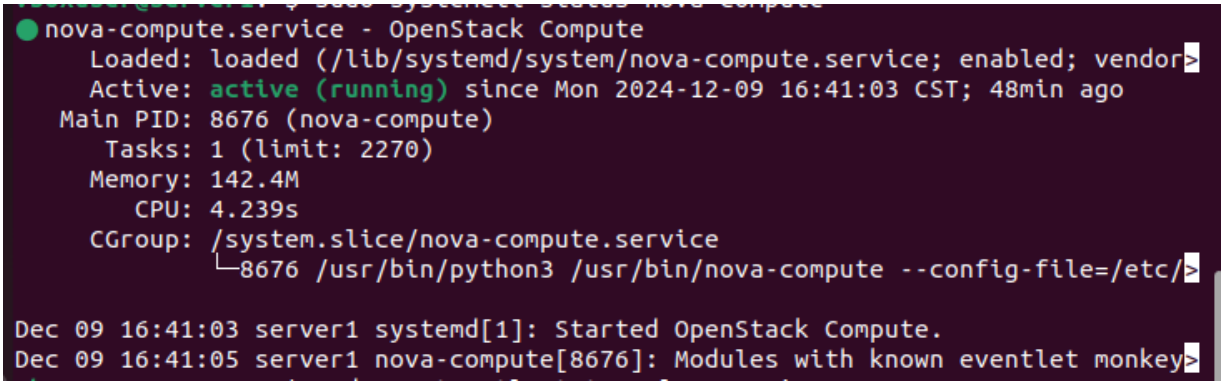
```
1  - name: Copying the config file
2    copy:
3      src: nova.conf
4      dest: /etc/nova/nova.conf
5      owner: root
6      group: nova
7      mode: 0640
8
9  - name: Populating the database
10   command:
11     su -s /bin/sh -c "nova-manage api_db sync" nova
12     su -s /bin/sh -c "nova-manage cell_v2 map_cell0" nova
13     su -s /bin/sh -c "nova-manage cell_v2 create_cell --name=cell1 --verbose"
   nova
14     su -s /bin/sh -c "nova-manage db sync" nova
15   failed_when: false
16   no_log: true
17
18 - name: Restarting nova services
       e:
       name:
21       - openstack-nova-api.service
22       - openstack-nova-scheduler.service
23       - openstack-nova-conductor.service
24       - openstack-nova-novncproxy.service
```

Text Editor

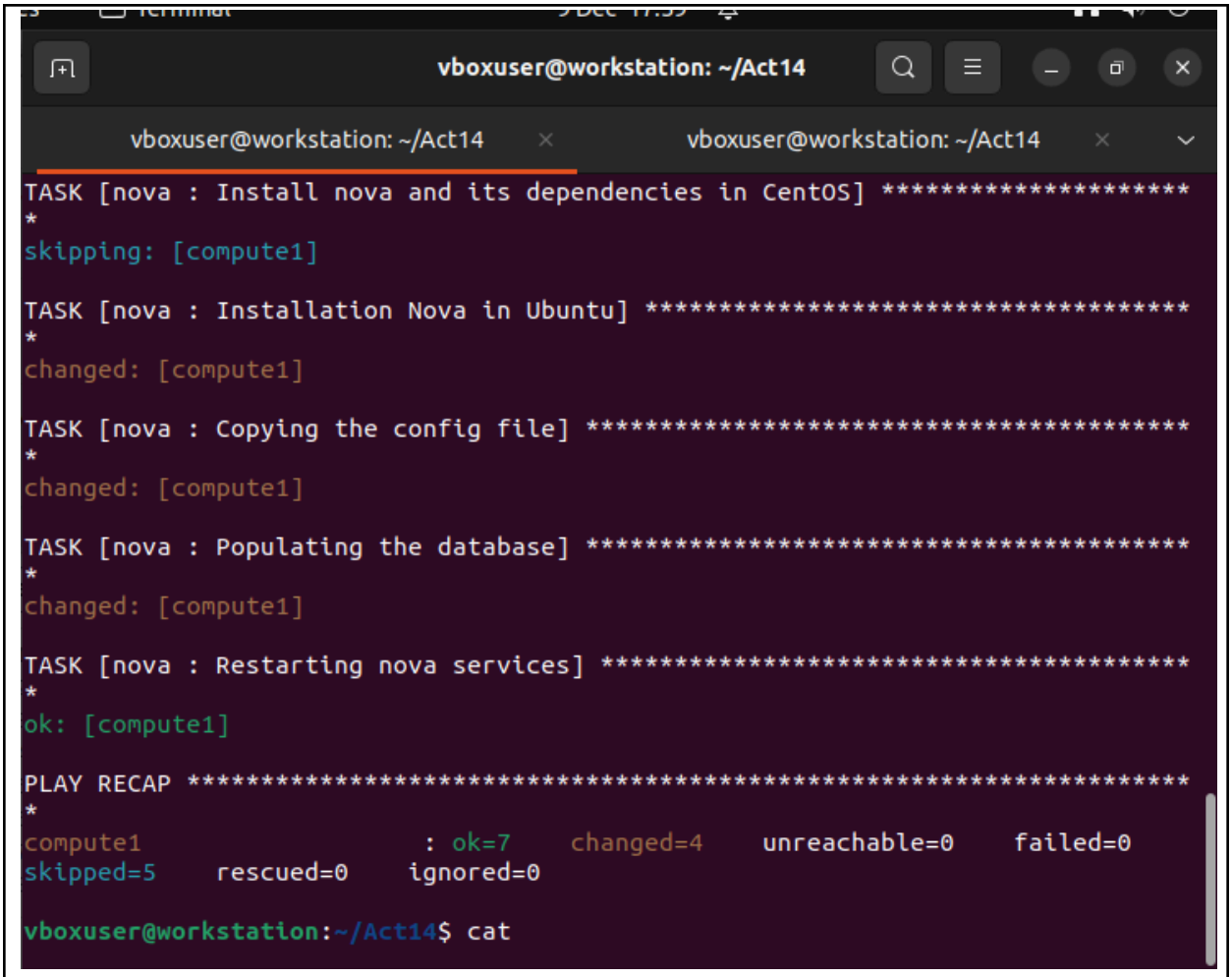
```yaml
- name: Install nova and its dependencies in CentOS
  yum:
     name:
      - openstack-nova-api
      - openstack-nova-conductor
      - openstack-nova-scheduler
  when: ansible_distribution == "CentOS"

- name: Installation Nova in Ubuntu
  apt:
    name:
      - nova-compute
      - python3-openstackclient
    state: latest
    update_cache: yes
  when: ansible_distribution == "Ubuntu"
```

this shows the nova works



and this shows that the playbook works



Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services

   Keystone is the identity service in OpenStack responsible for authentication and authorization, managing users, projects, and roles to ensure secure access to other OpenStack services. Glance is the image service that provides discovery, registration, and storage of virtual machine disk images, allowing users to upload, manage, and retrieve images for use in instances. Nova is the compute service

that manages and provisions virtual machines, handling the lifecycle of instances, scheduling, and interacting with hypervisors to allocate resources.

Conclusions:

Keystone, Glance, and Nova form the core services of OpenStack, enabling secure authentication, image management, and compute resource provisioning, respectively. Together, they provide a scalable cloud infrastructure that supports building, deploying, and managing virtualized workloads efficiently. Proper configuration and integration of these services ensure a robust cloud environment tailored to various enterprise needs.