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Course/Section:	**Date Submitted:**
Instructor: Dr. Jonathan Tylar	**Semester and SY:** 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

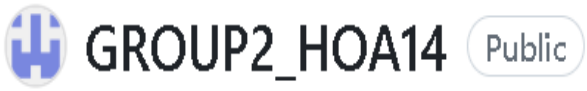
1. Create a new repository for this activity.
2. Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/
   a. Keystone (Identity Service)
   b. Glance (Imaging Service)
   c. Nova (Compute Service)
   d. Create different plays in installing per server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

inventory:

```
[Ubuntu]
192.168.56.105  ansible_python_interpreter=/usr/bin/python3
```

we created the repository for this activity




```
joshua@ManagedNode:~/GROUP2_HOA14$
```

here we created sub directories under GROUP2_HOA14 where we have roles for the main.yml of glance, nova and keystone each and the install.yml and show it using tree command.

```
joshua@ManagedNode:~/GROUP2_HOA14$ sudo nano /etc/ansible/hosts
joshua@ManagedNode:~/GROUP2_HOA14$ tree
.
├── installer.yml
└── roles
    ├── glance
    │   └── tasks
    │       └── main.yml
    ├── keystone
    │   └── tasks
    │       └── main.yml
    └── nova
        └── tasks
            └── main.yml

8 directories, 4 files
joshua@ManagedNode:~/GROUP2_HOA14$
```

note: before the installation, i have already done the prerequisites for glance, nova and keystone from this guide https://docs.openstack.org/install-guide/ .

main.yml for installation of nova-compute:

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

main.yml for installation of glance:

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

main.yml for installation of keystone-manage:

```
- name: Install Keystone
  apt:
    name:
      - keystone
      - apache2
      - php
      - libapache2-mod-php
    state: latest
    update_cache: yes
  when: ansible_distribution == "Ubuntu"
```

installer.yml is the main yml to run the main.yml of nova, glance and keystone

```yaml
---

- hosts: all
  become: true
  pre_tasks:

  - name: Ubuntu Update
    tags: always
    apt:
      update_cache: yes
      upgrade: dist
    when: ansible_distribution == "ubuntu"


- hosts: Ubuntu
  become: true
  roles:
    - role: keystone
    - role: glance
    - role: nova
```

using the command: ansible-playbook –ask-become-pass installer.yml,

We will run the playbook and install the main.yml of every roles using installer.yml.

results by running the playbook: the installation was successful.

```
joshua@ManagedNode:~/GROUP2_HOA14$ ansible-playbook --ask-become-pass installer.
yml
BECOME password:

PLAY [all] *********************************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.103]

TASK [Ubuntu Update] ***********************************************************
skipping: [192.168.56.103]

PLAY [Ubuntu] ******************************************************************

TASK [Gathering Facts] *********************************************************
ok: [192.168.56.103]
```

```
TASK [keystone : Install Keystone] *********************************************
changed: [192.168.56.101]

TASK [glance : Installation Glance] ********************************************
changed: [192.168.56.101]

TASK [nova : Installation Nova] ************************************************
changed: [192.168.56.101]

PLAY RECAP *********************************************************************
192.168.56.101             : ok=5    changed=3    unreachable=0    failed=0    skipped=1    rescued=0
 ignored=0
```

here we just did a verification of installation.

Nova-compute:

```
joshua@ManagedNode:~/GROUP2_HOA14$ nova-compute --version
28.0.1
joshua@ManagedNode:~/GROUP2_HOA14$
```

```
joshua@ManagedNode:~/GROUP2_HOA14$ sudo systemctl status nova-compute
● nova-compute.service - OpenStack Compute
     Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; preset:>
     Active: active (running) since Tue 2024-04-30 22:05:06 PST; 1h 24min ago
   Main PID: 3716 (nova-compute)
      Tasks: 1 (limit: 4608)
     Memory: 111.7M
        CPU: 3.628s
     CGroup: /system.slice/nova-compute.service
             └─3716 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/n>

Apr 30 22:05:06 ManagedNode systemd[1]: Started nova-compute.service - OpenStac>
lines 1-11/11 (END)
```

glance-api:

```
joshua@ManagedNode:~/GROUP2_HOA14$ glance-api --version
27.0.0
joshua@ManagedNode:~/GROUP2_HOA14$
```

```
joshua@ManagedNode:~/GROUP2_HOA14$ sudo systemctl status glance-api
● glance-api.service - OpenStack Image Service API
     Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; preset: e>
     Active: active (running) since Tue 2024-04-30 22:05:06 PST; 1h 26min ago
       Docs: man:glance-api(1)
   Main PID: 3715 (glance-api)
      Tasks: 3 (limit: 4608)
     Memory: 91.9M
        CPU: 50.615s
     CGroup: /system.slice/glance-api.service
             ├─3715 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gla>
             ├─3740 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gla>
             └─3741 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gla>

Apr 30 22:05:06 ManagedNode systemd[1]: Started glance-api.service - OpenStack >
lines 1-14/14 (END)
```

keystone-manage:

```
joshua@ManagedNode:~/GROUP2_HOA14$ keystone-manage --version
24.0.0
```

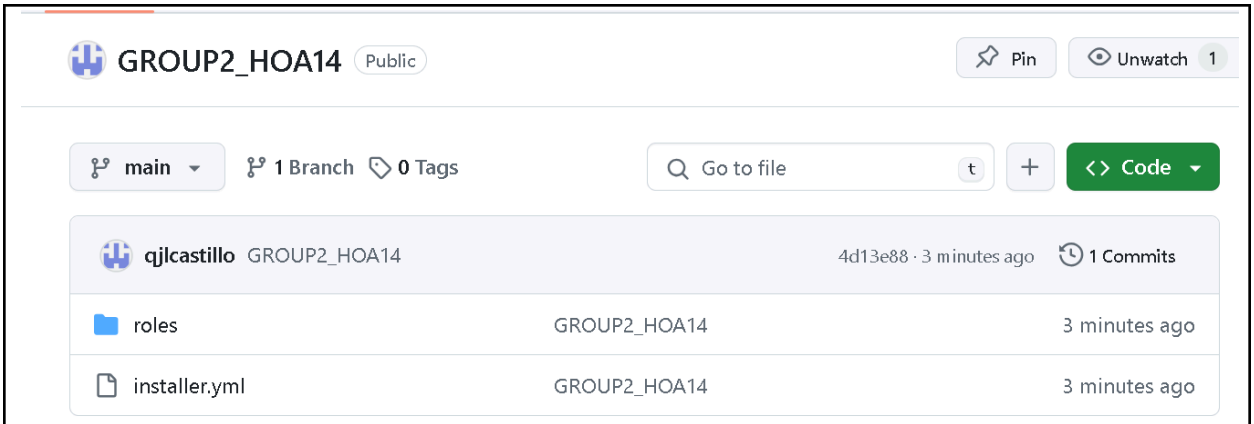
After completing the task, push everything to the repository.

```
joshua@ManagedNode:~/GROUP2_HOA14$ git status
On branch main

No commits yet

Untracked files:
  (use "git add <file>..." to include in what will be committed)
        installer.yml
        roles/

nothing added to commit but untracked files present (use "git add" to track)
joshua@ManagedNode:~/GROUP2_HOA14$ git add .
joshua@ManagedNode:~/GROUP2_HOA14$ git commit -m "GROUP2_HOA14"
[main (root-commit) 4d13e88] GROUP2_HOA14
 4 files changed, 45 insertions(+)
 create mode 100644 installer.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
joshua@ManagedNode:~/GROUP2_HOA14$ git push
Enumerating objects: 13, done.
Counting objects: 100% (13/13), done.
Delta compression using up to 2 threads
Compressing objects: 100% (7/7), done.
Writing objects: 100% (13/13), 1.15 KiB | 1.15 MiB/s, done.
Total 13 (delta 0), reused 0 (delta 0), pack-reused 0
```



Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services

   Keystone, Glance, and Nova collectively form the backbone of OpenStack's infrastructure. Keystone focuses on identity and access management, Glance streamlines the handling of VM and disk images, while Nova provides the necessary compute capabilities to seamlessly create and manage virtual machines within the OpenStack cloud environment.

Conclusions:

In conclusion, utilizing Ansible to install Nova, Glance, and Keystone provides a streamlined and automated approach to deploying these crucial services in the OpenStack environment. This simplifies the installation process and ensures consistency and efficiency in setting up the necessary components for identity management, image storage, and virtual machine provisioning.

Collaboration/progress report

HOA13(DONE) - CALDERON
HOA14(DONE) - CASTILLO
HOA15(ON GOING) - CUYUGAN