

<b>Name:</b> Andaya, Lyka C.	<b>Date Performed:</b> December 2, 223
<b>Course/Section:</b> CPE31S4	<b>Date Submitted:</b> December 8, 2023
<b>Instructor:</b> Dr. Taylar	<b>Semester and SY:</b> 2023-2024
<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)	

The screenshot shows the GitHub interface for a repository named 'HOA14.1' owned by 'andayalyka'. The repository is public and has one commit. The commit message is 'Initial commit' with the hash '031ee96' and was made '1 minute ago'. The commit includes a file named 'README.md'. The README content is 'HOA14.1'. The interface includes navigation tabs for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, and Insights. There are also buttons for Pin, Unwatch, and a search bar at the top.

**Explanation:** New created repository named as HOA14.1

```
lykaandaya@managenode: ~/HOA14.1
lykaandaya@managenode:~$ git clone git@github.com:andayalyka/HOA14.1.git
Cloning into 'HOA14.1'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (3/3), done.
```

**Explanation:** The created repository HOA14.1 has been cloned in the managenode

## INPUT

```
GNU nano 6.2
--
- hosts: all
  become: true
  pre_tasks:

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

- hosts: controller
  become: true
  roles:
    - keystone
    - glance
    - nova
```

lykaandaya@managenode: ~/HOA14.1/roles/keystone/tasks

GNU nano 6.2 install.yml

```
- name: Installing keystone and its prerequisites in CentOS
  yum:
    name:
      - openstack-keystone
      - httpd
      - mod_wsgi
      - openstack-utils
    when: ansible_distribution == "CentOS"

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

lykaandaya@managenode: ~/HOA14.1/roles/glance/tasks

GNU nano 6.2 install.yml

```
- 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"
```

	<pre> lykaandaya@managenode: ~/HOA14.1/roles/nova/tasks GNU nano 6.2 install.yml - name: Install nova and its dependencies in CentOS   yum:     name:       - openstack-nova-api       - openstack-nova-conductor       - openstack-nova-novncproxy       - 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" </pre>
<p><b>Explanation:</b> The server 1 in linux and the server in CentOS will install the keystone, glance and nova.</p>	

<p><b>PROCESS</b></p>	<pre> lykaandaya@managenode:~/HOA14.1\$ ansible-playbook --ask-become-pass installer.yml BECOME password:  PLAY [all] *****  TASK [Gathering Facts] ***** ok: [192.168.56.116] ok: [192.168.56.113]  TASK [Ubuntu Update] ***** skipping: [192.168.56.116] ok: [192.168.56.113]  PLAY [controller] *****  TASK [Gathering Facts] ***** ok: [192.168.56.116] ok: [192.168.56.113]  TASK [keystone : Creating keystone database] ***** skipping: [192.168.56.113] ok: [192.168.56.116]  TASK [keystone : Installing keystone and its prerequisites in CentOS] ***** skipping: [192.168.56.113] ok: [192.168.56.116]  TASK [keystone : Install Keystone in Ubuntu] ***** skipping: [192.168.56.116] ok: [192.168.56.113]  TASK [keystone : Verifying if apache status] ***** skipping: [192.168.56.113] changed: [192.168.56.116]  TASK [glance : Installing Glance in CentOS] ***** skipping: [192.168.56.113] ok: [192.168.56.116]  TASK [glance : Installation Glance in Ubuntu] ***** </pre>
-----------------------	---

```

TASK [glance : Installation Glance in Ubuntu] *****
skipping: [192.168.56.116]
ok: [192.168.56.113]

TASK [nova : Install nova and its dependencies in CentOS] *****
skipping: [192.168.56.113]
ok: [192.168.56.116]

TASK [nova : Installation Nova in Ubuntu] *****
skipping: [192.168.56.116]
ok: [192.168.56.113]

PLAY RECAP *****
192.168.56.113      : ok=6    changed=0    unreachable=0    failed=0    skipped=5    rescued=0
192.168.56.116      : ok=7    changed=1    unreachable=0    failed=0    skipped=4    rescued=0

```

**Explanation:** It shows that It executed the tasks that I created in the playbook

## OUTPUT

### UBUNTU

```

lykaandaya@controlnode2:~$ keystone-manage --version
21.0.1

```

```

Unit glance.service could not be found.
lykaandaya@controlnode2:~$ sudo 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 Sat 2023-12-02 23:35:06 PST; 1min 33s ago
     Docs: man:glance-api(1)
    Main PID: 32736 (glance-api)
      Tasks: 2 (limit: 1136)
    Memory: 2.7M
         CPU: 1min 33.027s
    CGroup: /system.slice/glance-api.service
            └─32736 /usr/bin/python3 /usr/bin/glance-api --conf=/etc/glance-api.conf
              └─32787 /usr/bin/python3 /usr/bin/glance-api --conf=/etc/glance-api.conf

Dec 02 23:35:06 controlnode2 systemd[1]: Started OpenStack Image Service API.
lines 1-13/13 (END)

```

```

lykaandaya@controlnode2:~$ sudo systemctl status nova-compute
● nova-compute.service - OpenStack Compute
   Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor preset: enabled)
   Active: active (running) since Sat 2023-12-02 23:36:09 PST; 1min 33s ago
     Docs: man:nova-compute(1)
    Main PID: 35648 (nova-compute)
      Tasks: 2 (limit: 1136)
    Memory: 9.8M
         CPU: 4.024s
    CGroup: /system.slice/nova-compute.service
            └─35648 /usr/bin/python3 /usr/bin/nova-compute --conf=/etc/nova/nova.conf

Dec 02 23:36:09 controlnode2 systemd[1]: Started OpenStack Compute Service.
Dec 02 23:36:12 controlnode2 nova-compute[35648]: Modules with keystoneauth1 are deprecated and will be removed in the future. Please use the keystoneclient module instead.
lines 1-12/12 (END)

```

## CENTOS

```
bash: keystone: command not found
[lykaandaya@workstation ~]$ keystone-manage --version
16.0.2

[lykaandaya@workstation ~]$ sudo systemctl status openstack-glance-api
● openstack-glance-api.service - OpenStack Image Service (code-named Glance) API
  server
    Loaded: loaded (/usr/lib/systemd/system/openstack-glance-api.service; enabled;
  vendor preset: disabled)
    Active: active (running) since Tue 2023-12-05 01:17:05 PST; 14s ago
    Main PID: 29760 (glance-api)
    CGroup: /system.slice/openstack-glance-api.service
            └─29760 /usr/bin/python2 /usr/bin/glance-api
              └─29785 /usr/bin/python2 /usr/bin/glance-api
                └─29786 /usr/bin/python2 /usr/bin/glance-api

Dec 05 01:17:05 workstation systemd[1]: Started OpenStack Image Service (cod...
Dec 05 01:17:05 workstation glance-api[29760]: /usr/lib/python2.7/site-packa...
Dec 05 01:17:05 workstation glance-api[29760]: return pkg_resources.EntryPoi...)
Hint: Some lines were ellipsized, use -l to show in full.

[lykaandaya@workstation nova]$ systemctl status openstack-nova-api
● openstack-nova-api.service - OpenStack Nova API Server
    Loaded: loaded (/usr/lib/systemd/system/openstack-nova-api.service; enabled;
  vendor preset: disabled)
    Active: active (running) since Tue 2023-12-05 22:20:16 PST; 3s ago
    Main PID: 9241 (nova-api)
    Tasks: 1
    CGroup: /system.slice/openstack-nova-api.service
            └─9241 /usr/bin/python2 /usr/bin/nova-api

Dec 05 22:20:16 workstation systemd[1]: openstack-nova-api.service holdoff time
over, scheduling restart.
Dec 05 22:20:16 workstation systemd[1]: Started OpenStack Nova API Server.
Dec 05 22:20:16 workstation systemd[1]: Started OpenStack Nova API Server...
```

**Explanation:** In the linux server 1 it shows that the glance and nova are installed and the service is currently active and running. and the installed keystone is 21.0.1 version . In the CentOS server it shows that glance and nova are installed and the service is currently active and running and the installed keystone are 16.0.2 version

```

lykaandaya@managenode:~/HOA14.1$ git add *
lykaandaya@managenode:~/HOA14.1$ git commit -m "HOA14"
[main fdace5c] HOA14
17 files changed, 18511 insertions(+)
create mode 100644 ansible.cfg
create mode 100644 installer.yml
create mode 100644 inventory
create mode 100644 roles/glance/glance-api.conf
create mode 100644 roles/glance/tasks/configure.yml
create mode 100644 roles/glance/tasks/install.yml
create mode 100644 roles/glance/tasks/main.yml
create mode 100644 roles/keystone/admin-openrc
create mode 100644 roles/keystone/handlers/main.yml
create mode 100644 roles/keystone/tasks/configure.yml
create mode 100644 roles/keystone/tasks/install.yml
create mode 100644 roles/keystone/tasks/main.yml
create mode 100644 roles/keystone/tasks/prereq.yml
create mode 100644 roles/nova/nova.conf
create mode 100644 roles/nova/tasks/configure.yml
create mode 100644 roles/nova/tasks/install.yml
create mode 100644 roles/nova/tasks/main.yml
lykaandaya@managenode:~/HOA14.1$ git push
Enumerating objects: 28, done.
Counting objects: 100% (28/28), done.
Compressing objects: 100% (25/25), done.
Writing objects: 100% (27/27), 144.33 KiB | 687.00 KiB/s, done.
Total 27 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), done.
To github.com:andayalyka/HOA14.1.git
031ee96..fdace5c main -> main

```

## Reflections:

Answer the following:

### 1. Describe Keystone, Glance and Nova services

- Keystone, Glance, and Nova play essential roles within the OpenStack cloud computing platform. Keystone functions as the identity service, overseeing authentication and authorization across all OpenStack services. Glance serves as the image service, streamlining the storage and retrieval of virtual machine images. It serves as a centralized repository, permitting users to effortlessly create, share, and deploy images. Conversely, Nova serves as the compute service, responsible for coordinating and overseeing virtual machines. It manages tasks like instance lifecycle, resource scheduling, and connectivity, empowering users to initiate and scale instances within the OpenStack infrastructure. Collectively, Keystone, Glance, and Nova constitute the

cornerstone for constructing and overseeing cloud resources within the OpenStack ecosystem.

**Conclusions:**

In conclusion, implementing a workflow for OpenStack installation using Ansible as the Infrastructure as Code (IaC) solution presents a strategic method for cloud deployment. This approach leverages the robust cloud computing capabilities of OpenStack alongside Ansible's automation proficiency. With IaC, the deployment process becomes more efficient, uniform, and easily replicable. Ansible's role in orchestrating OpenStack installation not only boosts efficiency through task automation but also ensures a standardized and dependable infrastructure. This strategy facilitates smooth management, adaptability, and scalability for future needs. In essence, the adoption of Ansible for OpenStack deployment reflects a dedication to agility, efficiency, and the sustained manageability of cloud infrastructure.