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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

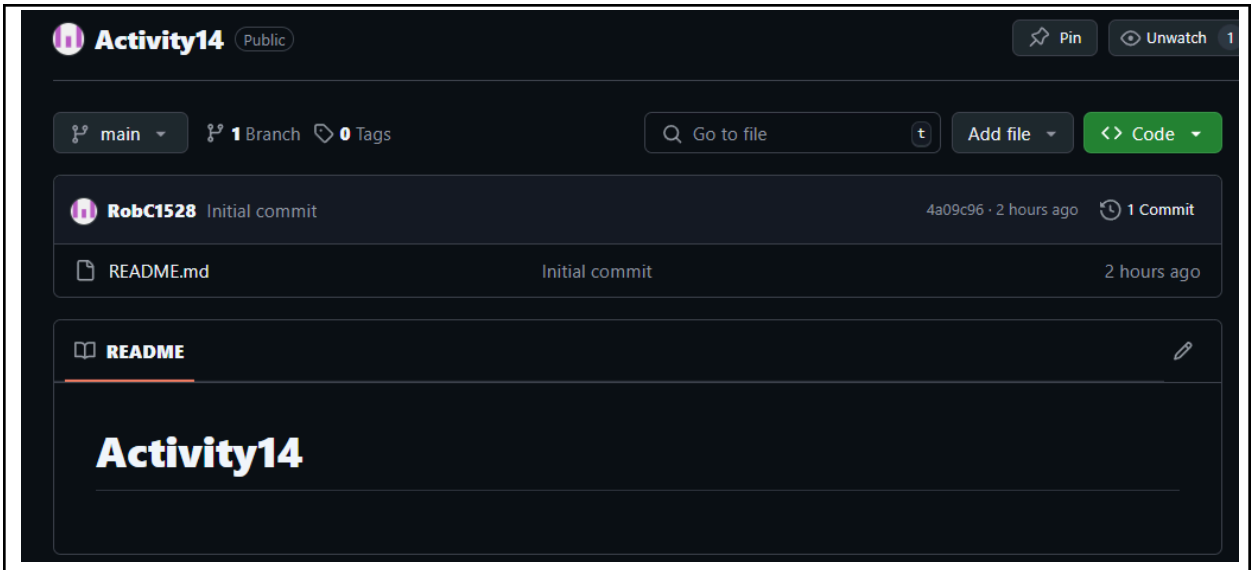
Oracle VirtualBox (Hypervisor)

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)




```
catapang@Workstation:~$ git clone git@github.com:RobC1528/Activity14.git
Cloning into 'Activity14'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
Receiving objects: 100% (3/3), done.
```

- First step I git cloned my repo into my localmachine.

```
PLAY RECAP *********************************************************************
192.168.56.11              : ok=14   changed=2    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
```

```yaml
---
- name: Install OpenStack Keystone (Identity Service) on controller
  hosts: all
  become: true
  vars:
    keystone_db_password: "password"
    keystone_db_host: "192.168.56.11"
    keystone_admin_token: "1202269fd19f8ce4a468025901e268da53bd5c4688b55d4d9d9a1342a541ef87"

  tasks:
    - name: Install Keystone and dependencies
      apt:
        name:
          - keystone
          - python3-keystoneclient
          - apache2
          - libapache2-mod-wsgi-py3
        state: present
        update_cache: yes

    - name: Start and enable Apache and Keystone
      service:
        name: apache2
        state: started
        enabled: true

#    - name: Configure Keystone API endpoint
#      template:
#        src: keystone_api_endpoint.j2
#        dest: /etc/keystone/keystone.conf

    - name: Restart Apache to apply Keystone settings
      service:
        name: apache2
        state: restarted

- name: Install OpenStack Glance (Imaging Service) on controller
```

```yaml
- name: Install OpenStack Glance (Imaging Service) on controller
  hosts: all
  become: true
  vars:
    glance_db_password: "password"
    glance_db_host: "192.168.56.11"
    glance_admin_token: "1202269fd19f8ce4a468025901e268da53bd5c4688b55d4d9d9a1342a541ef87"
    glance_service_password: "password"
  tasks:
    - name: Install Glance and dependencies
      apt:
        name:
          - glance
          - python3-glanceclient
        state: present
        update_cache: yes

    - name: Start and enable Glance services
      service:
        name: glance-api
        state: started
        enabled: true

#    - name: Configure Glance API endpoint
#      template:
#        src: glance_api_endpoint.j2
#        dest: /etc/glance/glance-api.conf

    - name: Restart Glance services
      service:
        name: glance-api
        state: restarted

- name: Install OpenStack Nova  on controller
  hosts: all
  become: true
  vars:
```

```
  vars:
    nova_db_password: "password"
    nova_db_host: "192.168.56.11"
    nova_admin_token: "1202269fd19f8ce4a468025901e268da53bd5c4688b55d4d9d9a1342a541ef87"
    nova_service_password: "password"

  tasks:
    - name: Install Nova and dependencies
      apt:
        name:
          - nova-api
          - nova-conductor
          - nova-scheduler
          - nova-compute
          - python3-novaclient
        state: present
        update_cache: yes

    - name: Start and enable Nova services
      service:
        name: nova-api
        state: started
        enabled: true

- name: Configure Nova API endpoint
  hosts: controller
  become: true
  vars:
    nova_db_password: "password"
    nova_db_host: "192.168.56.11"
    nova_admin_token: "1202269fd19f8ce4a468025901e268da53bd5c4688b55d4d9d9a1342a541ef87"
    nova_service_password: "password"
    rabbitmq_host: 192.168.56.11
    rabbitmq_password: "password"
    glance_host: 192.168.56.11
    keystone_host: 192.168.56.11
    nova_password: "password"
```

```
110     neutron_host: 192.168.56.11
111
112   tasks:
113     - name: Configure Nova API endpoint
114       template:
115         src: nova_api_endpoint.j2
116         dest: /etc/nova/nova.conf
117
118     - name: Restart Nova services
119       service:
120         name: nova-api
121         state: restarted
122
123 - name: Install OpenStack Nova on compute node
124   hosts: all
125   become: true
126   tasks:
127     - name: Install Nova and dependencies
128       apt:
129         name:
130           - nova-compute
131         state: present
132         update_cache: yes
133
134 #     - name: Configure Nova compute service
135 #       command: nova-compute --config-file /etc/nova/nova.conf
136
137     - name: Start and enable Nova compute service
138       service:
139         name: nova-compute
140         state: started
141         enabled: true
```

- Here as you can see on the screenshot these are my playbook for keystone, glance, and nova.

```
catapang@server1:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor prese>
     Active: active (running) since Fri 2024-12-06 18:26:37 +08; 6min ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 78460 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/S>
   Main PID: 78464 (apache2)
      Tasks: 85 (limit: 1062)
     Memory: 10.4M
        CPU: 2.333s
     CGroup: /system.slice/apache2.service
             ├─78464 /usr/sbin/apache2 -k start
             ├─78467 "(wsgi:cinder-wsgi" -k start
             ├─78468 "(wsgi:cinder-wsgi" -k start
             ├─78469 "(wsgi:cinder-wsgi" -k start
             ├─78470 "(wsgi:cinder-wsgi" -k start
             ├─78471 "(wsgi:cinder-wsgi" -k start
             ├─78472 "(wsgi:horizon)   " -k start
             ├─78473 "(wsgi:horizon)   " -k start
             ├─78474 "(wsgi:horizon)   " -k start
             ├─78475 "(wsgi:keystone-pu" -k start
             ├─78476 "(wsgi:keystone-pu" -k start
             ├─78477 "(wsgi:keystone-pu" -k start
             ├─78478 "(wsgi:keystone-pu" -k start
             ├─78479 "(wsgi:keystone-pu" -k start
             ├─78480 /usr/sbin/apache2 -k start
             ├─78481 /usr/sbin/apache2 -k start
             └─78482 /usr/sbin/apache2 -k start
```

```
catapang@server1:~$ systemctl status glance-api
● glance-api.service - OpenStack Image Service API
     Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor pr>
     Active: active (running) since Fri 2024-12-06 18:27:25 +08; 3min 37s ago
       Docs: man:glance-api(1)
   Main PID: 79258 (glance-api)
      Tasks: 5 (limit: 1062)
     Memory: 6.1M
        CPU: 11.392s
     CGroup: /system.slice/glance-api.service
             ├─79258 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gl>
             ├─79830 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gl>
             ├─79831 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gl>
             ├─79832 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gl>
             └─79833 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/gl>
```

```
catapang@server1:~$ systemctl status nova-api
● nova-api.service - OpenStack Compute API
     Loaded: loaded (/lib/systemd/system/nova-api.service; enabled; vendor pres>
     Active: active (running) since Fri 2024-12-06 18:01:32 +08; 28min ago
       Docs: man:nova-api(1)
   Main PID: 62566 (nova-api)
      Tasks: 8 (limit: 1062)
     Memory: 41.9M
        CPU: 24min 10.947s
     CGroup: /system.slice/nova-api.service
             └─62566 /usr/bin/python3 /usr/bin/nova-api --config-file=/etc/nova>
lines 1-10/10 (END)
```

- Proof that the three are installed in my server1.

- after finishing the activity I git added all the files and directory inside my github repo.

Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services
   - Keystone, Glance, and Nova are a few of the base services in OpenStack. Keystone is the identity service and provides authentication and authorization while managing users, roles, and access to services. Glance is the image service for storing and retrieving disk images for instances. It's used by users to create virtual machine images and manage them. Nova is the compute service for virtual machines it handles their lifecycle, resource allocation, and scheduling. These services altogether form the base of operations for user management, image storage, and computing in OpenStack.

Conclusions:

- In conclusion, Keystone, Glance, and Nova installation and configuration under the OpenStack framework really go to emphasize the basic elements of building a cloud infrastructure. Keystone offers secure authentication and

authorization, Glance provides the necessary tools for managing virtual machine images, and Nova is the basis for creating and overseeing compute instances. This development allows the practical experience of creating a strong cloud infrastructure that can facilitate user interactions, image storage, and compute resource allocation properly. This effort thus focuses on bringing out the interrelation of the fundamental OpenStack services together with their critical functions into the realm of cloud computing.