Name: Kevin Roi A. Sumaya	Date Performed: November 30 2023
Course/Section: CPE 31S6	Date Submitted: November 30 2023
Instructor:	Semester and SY:

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)

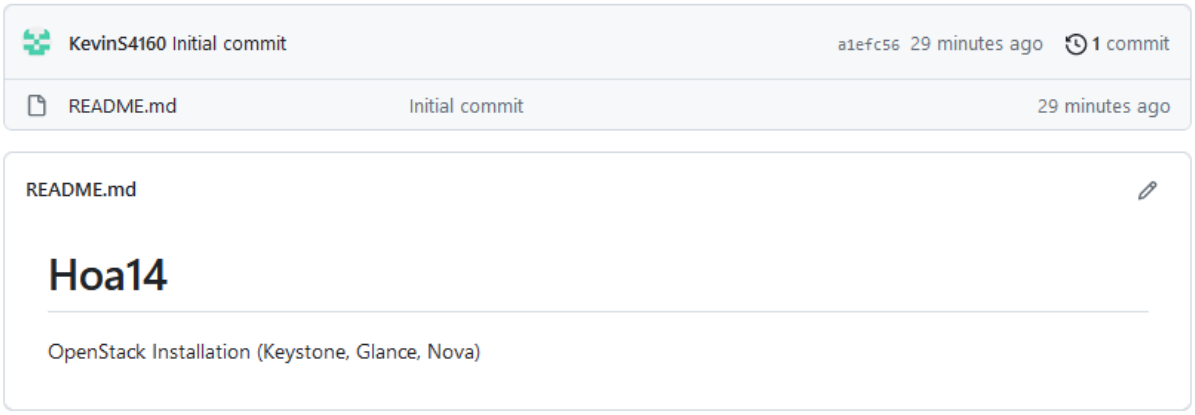
1x Ubuntu VM or Centos VM

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)

Step 1: First we create a repository



Step 2: Clone the created repository

```
kevin@Workstation:~$ git clone https://github.com/KevinS4160/Hoa14.git
Cloning into 'Hoa14'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
```

Step 3: Creating a file inside the directory (ansible.cfg, inventory).

Step 4: Put the ip address into the inventory file.

KevinS4160 Updated Repo

Code | Blame | 8 lines (6 loc) · 74 Bytes | Code 55% faster with GitHub Copilot

```
[keystone]
192.168.56.102

[glance]
192.168.56.102

[nova]
192.168.56.102
```

Step 5: Necessary file for ansible.cfg

KevinS4160 Updated Repo

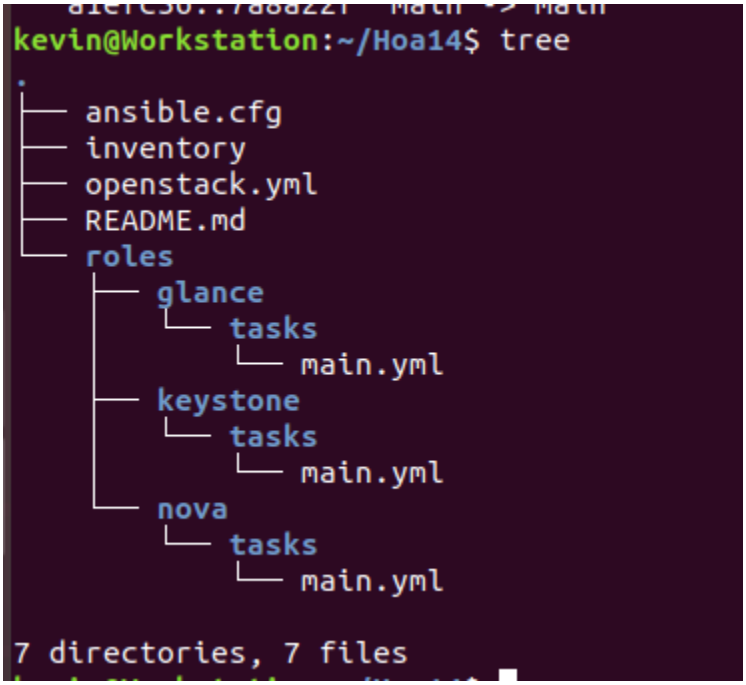
Code | Blame | 9 lines (6 loc) · 138 Bytes | Code 55% faster with GitHub Copilot

```
[defaults]

inventory = inventory
host_key_checking = False

deprecation_warnings = False

remote_user = kevin
private_key_file = ~/.ssh/
```

Step 6: Creating a playbook playbook that converts the steps in the following items

glance/tasks	Updated Repo
keystone/tasks	Updated Repo
nova/tasks	Updated Repo

Step 7: Create a file inside of the main directory (HOA14)



Step 8: Scripts for other playbooks.

GLANCE

```yaml
#This is the main.yml playbook for installing Glance

- 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: "{{ 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 = glance
    - password = admin123

- 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
```

```
42    - name: COnfigure Glance glance_store
43      lineinfile:
44        dest: /etc/glance/glance-api.conf
45        insertafter: '\[glance_store\]'
46        line: "{{ item }}"
47        state: present
48        backup: yes
49
50      with_items:
51        - stores = file,http
52        - default_store = file
53        - filesystem_store_datadir = /var/lib/glance/images/
54
55    - name: Configure Glance oslo_limit
56      lineinfile:
57        dest: /etc/glance/glance-api.conf
58        insertafter: '\[oslo_limit\]'
59        line: "{{ item }}"
60        state: present
61        backup: yes
62
63      with_items:
64        - auth_url = http://controller:5000
65        - auth_type = password
66        - user_domain_id = default
67        - username = MY_SERVICE
68        - system_scope = all
69        - password = MY_PASSWORD
70        - endpoint_id = ENDPOINT_ID
71        - region_name = RegionOne
72
73    - name: Configure Glance DEFAULT
74      lineinfile:
75        dest: /etc/glance/glance-api.conf
76        insertafter: '\[DEFAULT\]'
77        line: 'use_keystone_limits = True'
78        backup: yes
79
80    - name: Populating Image Service Database
81      shell:
82        sudo glance-manage db_sync
```

Keystone

Code | Blame | 51 lines (43 loc) · 1.41 KB | Code 55% faster with GitHub Copilot

```
#This is the main.yml playbook for installing Keystone

- name: Installing Keystone (Ubuntu)
  apt:
    name: keystone
    state: latest

- name: Configuring Config File
  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 Config File
  lineinfile:
    dest: /etc/keystone/keystone.conf
    insertafter: '\[token\]'
    line: 'provider = fernet'
    backup: yes

- name: Populating the Database
  shell:
    sudo keystone-manage db_sync

- name: Initialize Fernet Key
  shell:
    keystone-manage fernet_setup --keystone-user keystone --keystone-group keystone

- name: Initialize Fernet Key
  shell:
     keystone-manage credential_setup --keystone-user keystone --keystone-group keystone

- name: Configuring the Apache (HTTP) Server
  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_DOMANI_NAME=Default
    export OS_PROJECT_DOMAIN_NAME=Default
```

```
47          export OS_PROJECT_NAME=admin
48          export OS_USER_DOMANI_NAME=Default
49          export OS_PROJECT_DOMAIN_NAME=Default
50          export OS_AUTH_URL=http://controller:5000/v3
51          export OS_IDENTITY_API_VERSION=3
```

Nova

Code Blame 124 lines (107 loc) · 2.94 KB Code 55% faster with GitHub Copilot

```
#This is the main.yml playbook for installing Nova

- name: Installing Nova (Ubuntu)
  apt:
    name:
      - nova-api
      - nova-conductor
      - nova-novncproxy
      - nova-scheduler
    state: latest

- name: Configuring Nova API
  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
  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/glance/glance-api.conf
    insertafter: '\[keystone_authtoken\]'
    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/glance/glance-api.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/glance/glance-api.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
```

Code | Blame | 124 lines (107 loc) · 2.94 KB | Code 55% faster with GitHub Copilot

```
      - auth_type = password
      - user_domain_name = Default
      - auth_url = http://controller:5000/v3
      - username = placement
      - password = admin123

  - name: Configure Nova Default
    lineinfile:
      dest: /etc/nova/nova.conf
      line: 'my_ip = 10.0.0.11'
      state: present
      backup: yes

  - name: Configure Nova Glance
    lineinfile:
      dest: /etc/nova/nova.conf
      line: 'api_server = http://controller:9292'
      state: present
      backup: yes

  - name: Configure Nova olso_concurrency
    lineinfile:
      dest: /etc/nova/nova.conf
      line: 'lock_path = /var/lib/nova/tmp'
      state: present
      backup: yes

  - name: Additional Configuration of Nova
    shell:
      sudo nova-manage api_db sync

  - name: Additional Configuration
    shell:
      sudo nova-manage cell_v2 map_cell0

  #- name: Additional Configuration
   # shell:
    #  sudo nova-manage cell_v2 create_cell --name=cell1 --verbose

  - name: Additional Configuration
    shell:
      sudo nova-manage db sync

  - name: Additional Configuration
    shell:
      sudo nova-manage cell_v2 list_cells
```

Step 9: Running output.

```
kevin@Workstation:~/Hoa14$ ansible-playbook --ask-become-pass openstack.yml
BECOME password:

PLAY [keystone] ****************************************************************
*

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.102]

TASK [keystone : Installing Keystone (Ubuntu)] *********************************
*
changed: [192.168.56.102]

TASK [keystone : Configuring Config File] **************************************
*
ok: [192.168.56.102]

TASK [keystone : Configuring Config File] **************************************
*
changed: [192.168.56.102]

TASK [keystone : Populating the Database] **************************************
*
changed: [192.168.56.102]

TASK [keystone : Initialize Fernet Key] ****************************************
*
```

```
*
changed: [192.168.56.102]

TASK [keystone : Initialize Fernet Key] ****************************************
*
changed: [192.168.56.102]

TASK [keystone : Initialize Fernet Key] ****************************************
*
changed: [192.168.56.102]

TASK [keystone : Configuring the Apache (HTTP) Server] *************************
*
changed: [192.168.56.102]

TASK [keystone : Configure Administrative Account Environmental Variables] ****
*
changed: [192.168.56.102]

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.102]

TASK [glance : Install Glance (Ubuntu)] ****************************************
*
changed: [192.168.56.102]
```

```
TASK [glance : Configure Glance Authentication Key] ***************************
*
changed: [192.168.56.102] => (item=www_authenticate_uri = http://controller:500
0)
changed: [192.168.56.102] => (item=auth_url = http://controller:5000)
changed: [192.168.56.102] => (item=memcached_servers = controller:11211)
changed: [192.168.56.102] => (item=auth_type = password)
changed: [192.168.56.102] => (item=project_domain_name = Default)
changed: [192.168.56.102] => (item=user_domain_name = Default)
changed: [192.168.56.102] => (item=project_name = service)
changed: [192.168.56.102] => (item=username = glance)
changed: [192.168.56.102] => (item=password = admin123)

TASK [glance : Configure Glance paste_deploy] *********************************
*
changed: [192.168.56.102]

TASK [glance : COnfigure Glance glance_store] **********************************
*
changed: [192.168.56.102] => (item=stores = file,http)
changed: [192.168.56.102] => (item=default_store = file)
changed: [192.168.56.102] => (item=filesystem_store_datadir = /var/lib/glance/i
mages/)

TASK [glance : Configure Glance oslo_limit] ************************************
*
ok: [192.168.56.102] => (item=auth_url = http://controller:5000)
ok: [192.168.56.102] => (item=auth_type = password)
changed: [192.168.56.102] => (item=user_domain_id = default)
changed: [192.168.56.102] => (item=username = MY_SERVICE)
changed: [192.168.56.102] => (item=system_scope = all)
changed: [192.168.56.102] => (item=password = MY_PASSWORD)
changed: [192.168.56.102] => (item=endpoint_id = ENDPOINT_ID)
changed: [192.168.56.102] => (item=region_name = RegionOne)

TASK [glance : Configure Glance DEFAULT] ***************************************
*
changed: [192.168.56.102]

TASK [glance : Populating Image Service Database] ******************************
*
changed: [192.168.56.102]

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.102]

TASK [nova : Installing Nova (Ubuntu)] *****************************************
*
changed: [192.168.56.102]

TASK [nova : Configuring Nova API] *********************************************
```

```
ok: [192.168.56.102] => (item=memcached_servers = controller:11211)
ok: [192.168.56.102] => (item=auth_type = password)
ok: [192.168.56.102] => (item=project_domain_name = Default)
ok: [192.168.56.102] => (item=user_domain_name = Default)
ok: [192.168.56.102] => (item=project_name = service)
changed: [192.168.56.102] => (item=username = nova)
ok: [192.168.56.102] => (item=password = admin123)

TASK [nova : Configure Nova VNC] ******************************************
*
changed: [192.168.56.102] => (item=enabled = true)
changed: [192.168.56.102] => (item=server_listen = $my_ip)
changed: [192.168.56.102] => (item=server_proxyclient_address = $my_ip)

TASK [nova : Configure Nova placement] ************************************
*
ok: [192.168.56.102] => (item=region_name = RegionOne)
ok: [192.168.56.102] => (item=project_domain_name = Default)
ok: [192.168.56.102] => (item=project_name = service)
ok: [192.168.56.102] => (item=auth_type = password)
ok: [192.168.56.102] => (item=user_domain_name = Default)
changed: [192.168.56.102] => (item=auth_url = http://controller:5000/v3)
changed: [192.168.56.102] => (item=username = placement)
ok: [192.168.56.102] => (item=password = admin123)

TASK [nova : Configure Nova Default] **************************************
*
changed: [192.168.56.102]
```

```
*
changed: [192.168.56.102]

TASK [nova : Configure Nova olso_concurrency] *********************************
*
changed: [192.168.56.102]

TASK [nova : Additional Configuration of Nova] ********************************
*
changed: [192.168.56.102]

TASK [nova : Additional Configuration] ****************************************
*
changed: [192.168.56.102]

TASK [nova : Additional Configuration] ****************************************
*
changed: [192.168.56.102]

TASK [nova : Additional Configuration] ****************************************
*
changed: [192.168.56.102]

PLAY RECAP ********************************************************************
*
192.168.56.102             : ok=33   changed=26   unreachable=0    failed=0
skipped=0    rescued=0    ignored=0
```

Step 10: Checking if it's installed.

```
kevin@server1:~$ keystone-manage --version
13.0.4
kevin@server1:~$ glance --version
2.9.1
```

Step 11: GITHUB Link

- https://github.com/KevinS4160/Hoa14.git

Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services
   - Keystone: This provides identity and authentication for all OpenStack services. It manages users, projects, roles, and services, and offers a catalog of endpoints for all the services available in the cloud. Keystone also supports multiple authentication methods, such as passwords, tokens, and certificates.

   - Glance: This provides the compute image repository. All computer instances launch from glance images, which are virtual copies of hard disks. Glance can store and retrieve images from various backends, such as local file systems, HTTP servers, or object storage systems. Glance also supports multiple image formats, such as raw, qcow2, vhd, and iso.

   - Nova: This is responsible for provisioning and managing computer instances. Nova interacts with other OpenStack services, such as Keystone, Glance, and Neutron, to provide a scalable and flexible cloud computing platform. Nova supports creating virtual machines, baremetal servers, and containers, and offers features such as live migration, resizing, and snapshots.

Conclusions:

- In Doing this activity I learned how to create a playbook with Nova keystone and Glance inside also I learned what they can do to my system once its been installed.