

Name: Sonny Jay B. Bencito	Date Performed: 12/06/2022
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Instructor: Dr. Jonathan Taylar	Semester and SY: 1st sem 2022-2023
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	
<ol style="list-style-type: none"> 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	
<p>Oracle VirtualBox (Hypervisor)</p> <p>1x Ubuntu VM or Centos VM</p>	
4. Tasks	
<ol style="list-style-type: none"> 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/ <ol style="list-style-type: none"> 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)	

Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Owner *

Bencitoo

Repository name *

Bencito_OpenKGN

Great repository names are short and memorable. Need inspiration? How about [refactored-octo-lamp](#)?

Description (optional)

☒ Public

Anyone on the internet can see this repository. You choose who can commit.

☐ Private

You choose who can see and commit to this repository.

Initialize this repository with:

Skip this step if you're importing an existing repository.

☒ Add a README file

This is where you can write a long description for your project. [Learn more.](#)

Add .gitignore

Choose which files not to track from a list of templates. [Learn more.](#)

.gitignore template: None

Choose a license

A license tells others what they can and can't do with your code. [Learn more.](#)

License: None

This will set `main` as the default branch. Change the default name in your [settings](#).

You are creating a public repository in your personal account.

Create repository

Bencitoo / Bencito_OpenKGN Public

Pin Unwatch 1 Fork 0 Star 0

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

main 1 branch 0 tags

Go to file

Add file

Code

About

Bencitoo Initial commit

README.md Initial commit

README.md

Bencito_OpenKGN

Hands-on Activity 14.1- OpenStack Installation (Keystone, Glance, Nova)

Local Codespaces

Clone

HTTPS SSH GitHub CLI

git@github.com:Bencitoo/Bencito_OpenKGN.git

Use a password-protected SSH key.

Open with GitHub Desktop

Download ZIP

Hands-on Activity 14.1- OpenStack Installation (Keystone, Glance, Nova)

Readme

0 stars

1 watching

0 forks

Releases

No releases published

Create a new release

```
bencito@workstation:~$ git clone git@github.com:Bencitoo/Bencito_OpenKGN.git
Cloning into 'Bencito_OpenKGN'...
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
Receiving objects: 100% (3/3), done.
bencito@workstation:~$ cd Bencito_OpenKGN
bencito@workstation:~/Bencito_OpenKGN$
```

```
GNU nano 6.2 inventory
[controller]
192.168.56.101

[compute]
192.168.56.101
```

```
GNU nano 6.2 ansible.cfg
[defaults]

inventory = inventory
Host_key_checking = False

deprecation_warnings = False
command_warnings = False

remote_user = bencito
private_key_file = /.ssh/
```

```
bencito@workstation:~$ git clone git@github.com:Bencitoo/Bencito_OpenKGN.git
Cloning into 'Bencito_OpenKGN'...
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
Receiving objects: 100% (3/3), done.
bencito@workstation:~$ cd Bencito_OpenKGN
bencito@workstation:~/Bencito_OpenKGN$ nano inventory
bencito@workstation:~/Bencito_OpenKGN$ nano ansible.cfg
bencito@workstation:~/Bencito_OpenKGN$ ansible -m ping all
192.168.56.101 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
bencito@workstation:~/Bencito_OpenKGN$
```

```
bencito@workstation:~/Bencito_OpenKGN$ nano site.yml
bencito@workstation:~/Bencito_OpenKGN$
```

As you can see it was created successfully and I add the inventory with the ansible.cfg and ping it.

```
GNU nano 6.2 site.yml
---
- hosts: all
  become: true
  pre_tasks:
    - name: Update Repository (Ubuntu)
      apt:
        upgrade: dist
        update_cache: yes
        changed_when: false
        when: ansible_distribution == "Ubuntu"
    - name: Install Updates on Ubuntu
      tags: always
      apt:
        upgrade: dist
        update_cache: yes
        changed_when: false
        when: ansible_distribution == "Ubuntu"
- hosts: controller
  become: true
  roles:
    - Keystone

- hosts: controller
  become: true
  roles:
    - Keystone
    - Glance

- hosts: compute
  become: true
  roles:
    - Nova
```

^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify

I create a main site.yml playbook that I will use to run the general playbook.

```
bencito@workstation:~/Bencito_OpenKGN$ mkdir roles
bencito@workstation:~/Bencito_OpenKGN$ cd roles
bencito@workstation:~/Bencito_OpenKGN/roles$ mkdir -p {Keystone,Glance,Nova}/tasks
bencito@workstation:~/Bencito_OpenKGN/roles$ tree
.
├── Glance
│   └── tasks
├── Keystone
│   └── tasks
└── Nova
    └── tasks

6 directories, 0 files
bencito@workstation:~/Bencito_OpenKGN/roles$
```

I create a directory role that inside of it was the following need to install.

```

bencito@workstation:~/Bencito_OpenKGN/roles$ cd Glance
bencito@workstation:~/Bencito_OpenKGN/roles/Glance$ cd tasks
bencito@workstation:~/Bencito_OpenKGN/roles/Glance/tasks$ nano main.yml
bencito@workstation:~/Bencito_OpenKGN/roles/Glance/tasks$ cd ..
bencito@workstation:~/Bencito_OpenKGN/roles/Glance$ cd ..
bencito@workstation:~/Bencito_OpenKGN/roles$ cd Keystone
bencito@workstation:~/Bencito_OpenKGN/roles/Keystone$ cd tasks
bencito@workstation:~/Bencito_OpenKGN/roles/Keystone/tasks$ nano main.yml
bencito@workstation:~/Bencito_OpenKGN/roles/Keystone/tasks$ cd ..
bencito@workstation:~/Bencito_OpenKGN/roles/Keystone$ cd ..
bencito@workstation:~/Bencito_OpenKGN/roles$ cd Nova
bencito@workstation:~/Bencito_OpenKGN/roles/Nova$ cd tasks
bencito@workstation:~/Bencito_OpenKGN/roles/Nova/tasks$ nano main.yml
bencito@workstation:~/Bencito_OpenKGN/roles/Nova/tasks$ cd ..
bencito@workstation:~/Bencito_OpenKGN/roles/Nova$ cd ..
bencito@workstation:~/Bencito_OpenKGN/roles$ cd ..
bencito@workstation:~/Bencito_OpenKGN$

```

Ubuntu Nova

```

GNU nano 6.2 main.yml *
- name: Install Nova on Ubuntu
  apt:
    name:
      - nova-compute
      - python3-openstackclient
    state: latest
    update_cache: yes
    when: ansible_distribution == "Ubuntu"

```

Ubuntu Keystone

```

GNU nano 6.2 main.yml *
- name: Install Keystone Ubuntu
  apt:
    name:
      - keystone
      - apache2
      - libapache2-mod-php
      - php
    state: latest
    update_cache: yes
    when: ansible_distribution == "Ubuntu"

```

Ubuntu Glance

```

GNU nano 6.2 main.yml *
- name: Install Glance on Ubuntu
  apt:
    name: glance
    state: latest
    update_cache: yes
    when: ansible_distribution == "Ubuntu"

```

I added the playbook code from the given installation guide link.

OUTPUT

```
bencito@workstation:~/Bencito_OpenKGN$ ansible-playbook --ask-become-pass site.
yml
BECOME password:

PLAY [all] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.101]

TASK [Update Repository (Ubuntu)] *****
*
ok: [192.168.56.101]

TASK [Install Updates on Ubuntu] *****
*
ok: [192.168.56.101]

PLAY [controller] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.101]

TASK [Keystone : Install Keystone Ubuntu] *****
*
changed: [192.168.56.101]

TASK [Glance : Install Glance on Ubuntu] *****
*
changed: [192.168.56.101]

PLAY [compute] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.101]

TASK [Nova : Install Nova on Ubuntu] *****
*
ok: [192.168.56.101]

PLAY RECAP *****
*
192.168.56.101      : ok=8    changed=2    unreachable=0    failed=0
skipped=0    rescued=0    ignored=0

bencito@workstation:~/Bencito_OpenKGN$
```

It was successfully run and I don't encounter errors.

OUTPUT SCREENSHOT

Controller

Glance

```
bencito@Server1:~$ systemctl status glance-api.service
● glance-api.service - OpenStack Image Service API
   Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor p
   Active: active (running) since Tue 2022-12-06 23:37:56 PST; 4min 27s ago
     Docs: man:glance-api(1)
    Main PID: 13656 (glance-api)
      Tasks: 2 (limit: 2225)
     Memory: 142.2M
        CPU: 8.882s
    CGroup: /system.slice/glance-api.service
            └─13656 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/g
              14107 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/g

Dec 06 23:37:56 Server1 systemd[1]: Started OpenStack Image Service API.
lines 1-13/13 (END)
```

Keystone

The output of the keystone is inside of the configuration of the MYSQL.

Compute

Nova

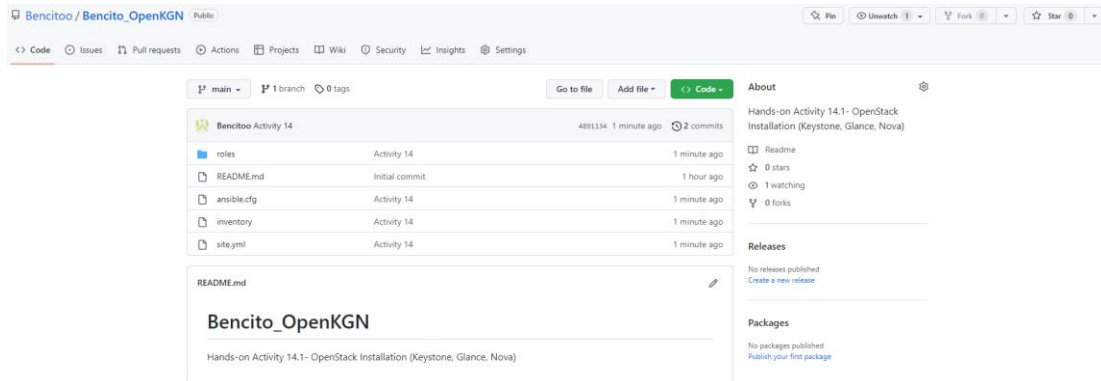
```
bencito@Server1:~$ systemctl status nova-compute.service
● nova-compute.service - OpenStack Compute
   Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor
   Active: active (running) since Tue 2022-12-06 23:12:07 PST; 32min ago
    Main PID: 3917 (nova-compute)
      Tasks: 2 (limit: 2225)
     Memory: 123.4M
        CPU: 6.954s
    CGroup: /system.slice/nova-compute.service
            └─3917 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/

Dec 06 23:12:07 Server1 systemd[1]: Started OpenStack Compute.
Dec 06 23:12:16 Server1 nova-compute[3917]: Modules with known eventlet monkey
lines 1-12/12 (END)
```

This is all the output that verified the installations.

Pushing to GitHub Repo

```
bencito@workstation:~/Bencito_OpenKGN$ git add ansible.cfg
bencito@workstation:~/Bencito_OpenKGN$ git add inventory
bencito@workstation:~/Bencito_OpenKGN$ git add site.yml
bencito@workstation:~/Bencito_OpenKGN$ git add roles/
bencito@workstation:~/Bencito_OpenKGN$ git commit -m "Activity 14"
[main 4891134] Activity 14
 6 files changed, 70 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 roles/Glance/tasks/main.yml
 create mode 100644 roles/Keystone/tasks/main.yml
 create mode 100644 roles/Nova/tasks/main.yml
 create mode 100644 site.yml
bencito@workstation:~/Bencito_OpenKGN$ git push
Enumerating objects: 16, done.
Counting objects: 100% (16/16), done.
Compressing objects: 100% (9/9), done.
Writing objects: 100% (15/15), 1.50 KiB | 118.00 KiB/s, done.
Total 15 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:Bencitoo/Bencito_OpenKGN.git
 3b1ec47..4891134  main -> main
bencito@workstation:~/Bencito_OpenKGN$
```



It was successfully pushing on my GitHub Repository.

Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services

The Keystone is used to provides the client authentication on the openstack service. While the Glance, is an image service that allows the users to discover the container images, and it can use to storage backend. Lastly, The Nova is a compute service that uses to instance the controller system, it uses to host and manage cloud computing system.

Conclusions:

After making this activity, the keystone, glance, and nova is important on the open stack services, it uses to host and manage the cloud computing system. I Haven't encountered errors while making this activity. I just follow the given installation guide.