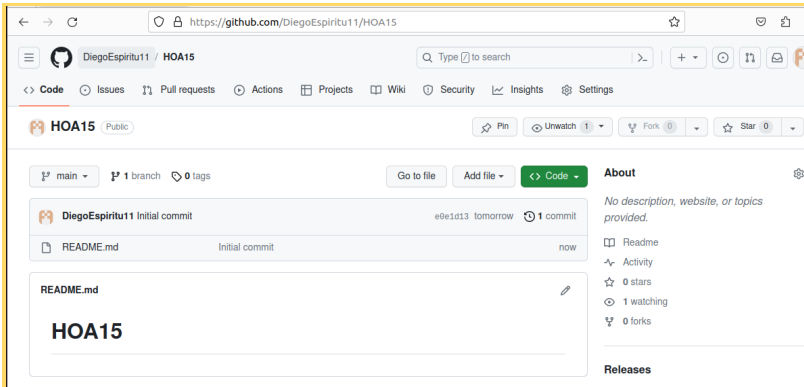


| | |
|---|--------------------------------------|
| Name: Espiritu, Diego Angelo G. | Date Performed: 12/06/2023 |
| Course/Section: CPE31S6 / CPE232 | Date Submitted: 12/07/2023 |
| Instructor: Dr. Jonathan Vidal Taylar | Semester and SY: 1st sem 2023 |
| Activity 15: OpenStack Installation (Neutron, Horizon, Cinder) | |
| 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. Neutron b. Horizon c. Cinder 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: Create a repository in github.



Step 2: Clone the created repository.

```
diego@workstation:~$ git clone https://github.com/DiegoEspiritu11/HOA15.git
Cloning into 'HOA15'...
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.
diego@workstation:~$ cd HOA15
diego@workstation:~/HOA15$
```

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

```
diego@workstation:~/HOA15$ touch ansible.cfg inventory
diego@workstation:~/HOA15$ ls
ansible.cfg  inventory  README.md
diego@workstation:~/HOA15$
```

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

```
diego@workstation: ~/HOA15
GNU nano 6.2 inventory
[neutron]
192.168.56.105

[horizon]
192.168.56.105

[cinder]
192.168.56.105
```

Step 5: Necessary file for ansible.cfg

```
diego@workstation: ~/HOA15
GNU nano 6.2 ansible.cfg *
[defaults]

inventory = inventory
host_key_checking = False

deprecation_warnings = False

remote_user = diego
private_key_file = ~/.ssh

```

Step 6: Creating a playbook that converts the steps in the following items <https://docs.openstack.org/install-guide/>.

```
diego@workstation: ~/HOA15/roles
diego@workstation:~/HOA15$ mkdir roles
diego@workstation:~/HOA15$ cd roles
diego@workstation:~/HOA15/roles$ mkdir cinder
diego@workstation:~/HOA15/roles$ cd cinder
diego@workstation:~/HOA15/roles/cinder$ mkdir tasks
diego@workstation:~/HOA15/roles/cinder$ cd tasks
diego@workstation:~/HOA15/roles/cinder/tasks$ sudo nano main.yml
diego@workstation:~/HOA15/roles/cinder/tasks$ cd ..
diego@workstation:~/HOA15/roles/cinder$ cd ..
diego@workstation:~/HOA15/roles$ mkdir horizon
diego@workstation:~/HOA15/roles$ cd horizon
diego@workstation:~/HOA15/roles/horizon$ mkdir tasks
diego@workstation:~/HOA15/roles/horizon$ cd tasks
diego@workstation:~/HOA15/roles/horizon/tasks$ sudo nano main.yml
diego@workstation:~/HOA15/roles/horizon/tasks$ cd ..
diego@workstation:~/HOA15/roles/horizon$ cd ..
diego@workstation:~/HOA15/roles$ mkdir neutron
diego@workstation:~/HOA15/roles$ cd neutron
diego@workstation:~/HOA15/roles/neutron$ mkdir tasks
diego@workstation:~/HOA15/roles/neutron$ cd tasks
diego@workstation:~/HOA15/roles/neutron/tasks$ sudo nano main.yml
diego@workstation:~/HOA15/roles/neutron/tasks$ cd ..
diego@workstation:~/HOA15/roles/neutron$ cd ..
diego@workstation:~/HOA15/roles$ tree
.
├── cinder
│   └── tasks
│       └── main.yml
├── horizon
│   └── tasks
│       └── main.yml
└── neutron
    └── tasks
        └── main.yml

6 directories, 3 files
diego@workstation:~/HOA15/roles$
```

Step 7: Create a file inside of the main directory (HOA15) and name it installNHC.yml, create a playbook for running the installation of the given.

```
diego@workstation: ~/HOA15
GNU nano 6.2 installNHC.yml *
---
- import_playbook: roles/neutron/tasks/main.yml
- import_playbook: roles/horizon/tasks/main.yml
- import_playbook: roles/cinder/tasks/main.yml
```

Step 8: In the created directories create files for its necessary installations.

Cinder main.yml

```
diego@workstation: ~/HOA15/roles/cinder
GNU nano 6.2 main.yml
OS_USERNAME: "admin"
OS_PASSWORD: "admin"
OS_PROJECT_NAME: "admin"
OS_USER_DOMAIN_NAME: "Default"
OS_PROJECT_DOMAIN_NAME: "Default"

- name: Add Cinder User to Admin Role
  command: "openstack role add --project service --user cinder admin"
  become: false
  environment:
    HOME: "([ lookup('env','HOME') ])"
    OS_AUTH_URL: "http://192.168.56.102:5000"
    OS_USERNAME: "admin"
    OS_PASSWORD: "admin"
    OS_PROJECT_NAME: "admin"
    OS_USER_DOMAIN_NAME: "Default"
    OS_PROJECT_DOMAIN_NAME: "Default"

- name: Create Cinder Service
  command: "openstack service create --name cinderv3 --description 'OpenStack Block Storage' volumev3"
  become: false
  environment:
    HOME: "([ lookup('env','HOME') ])"
    OS_AUTH_URL: "http://192.168.56.102:5000"
    OS_USERNAME: "admin"
    OS_PASSWORD: "admin"
    OS_PROJECT_NAME: "admin"
```

Horizon main.yml

```
diego@workstation: ~/HOA15/roles/horizon
GNU nano 6.2 main.yml *
---
- name: Install Horizon Service
  hosts: horizon
  become: true
  tasks:
    - name: Install openstack-dashboard package
      apt:
        name: openstack-dashboard
        state: present

    - name: Configure local_settings.py
      template:
        src: local_settings.py.j2
        dest: /etc/openstack-dashboard/local_settings.py
        notify: Reload Apache

  handlers:
    - name: Reload Apache
      systemd:
        name: apache2
        state: reloaded
```

Neutron main.yml

```
diego@workstation: ~/HOA15/roles/neutron
GNU nano 6.2 main.yml *
---
- name: Install Neutron Service
  hosts: neutron
  become: true
  vars:
    neutron_db_password: "neutron"
    neutron_user_password: "neutron"
    rabbit_password: "rabbitpass"
    nova_password: "nova"
    provider_interface_name: "enp0s8"
    start_ip_address: "192.168.56.150"
    end_ip_address: "92.168.56.200"
    dns_resolver: "8.8.8.8"
```

TREE:

```
diego@workstation:~/HOA15/roles$ tree
.
├── cinder
│   └── tasks
│       ├── main.yml
│       └── templates
│           ├── cinder.conf.j2
│           └── nova.conf.j2
├── horizon
│   └── tasks
│       ├── handlers
│       │   └── main.yml
│       ├── main.yml
│       └── templates
│           └── local_settings.py.j2
└── neutron
    └── tasks
        ├── main.yml
        └── templates
            ├── dhcp_agent.ini.j2
            ├── metadata_agent.ini.j2
            ├── ml2_conf.ini.j2
            ├── neutron.conf.j2
            └── openvswitch_agent.ini.j2

10 directories, 12 files
diego@workstation:~/HOA15/roles$
```

Step 9: Running the installations.

```
diego@workstation: ~/HOA15
BECOME password:
PLAY [all] *****
TASK [Gathering Facts] *****
ok: [192.168.56.105]
TASK [Install Updates (Ubuntu)] *****
ok: [192.168.56.105]
TASK [Install packages on Ubuntu for OpenStack base Services] *****
changed: [192.168.56.105]
PLAY [ubuntu] *****
TASK [Gathering Facts] *****
ok: [192.168.56.105]
TASK [neutron : installing the components for neutron] *****
changed: [192.168.56.105]
TASK [neutron : configuring RabbitMQ message queue access] *****
changed: [192.168.56.105]
TASK [neutron : configuring Identity service access] *****
changed: [192.168.56.105]
TASK [neutron : configuring the lock path] *****
changed: [192.168.56.105]
TASK [neutron : configuring the access parameters] *****
changed: [192.168.56.105]
TASK [neutron : restarting the compute service] *****
[WARNING]: Consider using the service module rather than running 'service'. If you need to use
command because service is insufficient you can add 'warn: false' to this command task or set
'command_warnings=False' in ansible.cfg to get rid of this message.
changed: [192.168.56.105]
```

```
diego@workstation: ~/HOA15
TASK [neutron : restarting the linux bridge agent] *****
changed: [192.168.56.105]
TASK [neutron : Verifying if already running and active the nova-compute.] *****
changed: [192.168.56.105]
TASK [neutron : Verifying if already running and active the neutron-openvswitch-agent] *****
changed: [192.168.56.105]
TASK [horizon : Installation of openstack-dashboard] *****
changed: [192.168.56.105]
TASK [horizon : configuring the dashboard to use Openstack services] *****
changed: [192.168.56.105]
TASK [horizon : Allowing all hosts to access dashboard] *****
changed: [192.168.56.105]
TASK [horizon : configure the memcached session storage service] *****
changed: [192.168.56.105]
TASK [horizon : enable the identity API version 3] *****
changed: [192.168.56.105]
TASK [horizon : enable support for domains] *****
changed: [192.168.56.105]
TASK [horizon : configure API versions] *****
changed: [192.168.56.105]
TASK [horizon : configure default as the default domain for users that you create via the dashboard]
***
changed: [192.168.56.105]
TASK [horizon : configure user as the default role for users that your create via the dashboard] ***
changed: [192.168.56.105]
```

```
diego@workstation: ~/HOA15

TASK [horizon : add the following line if not added yet] *****
changed: [192.168.56.105]

TASK [horizon : install apache2] *****
ok: [192.168.56.105]

TASK [horizon : finalize installation by starting the apache2 service] *****
[WARNING]: Consider using 'become', 'become_method', and 'become_user' rather than running sudo
changed: [192.168.56.105]

TASK [horizon : finalize installation by reloading the apache2 service] *****
changed: [192.168.56.105]

TASK [horizon : Verifying the apache2.service] *****
changed: [192.168.56.105]

TASK [cinder : Installation of cinder packages and its sub-dependencies] *****
changed: [192.168.56.105]

TASK [cinder : configure database access] *****
changed: [192.168.56.105]

TASK [cinder : configure RabbitMQ message queue access] *****
changed: [192.168.56.105]

TASK [cinder : configure identity services access] *****
changed: [192.168.56.105]

TASK [cinder : configure my_ip option to use the management interface IP add of controller node] ***
changed: [192.168.56.105]

TASK [cinder : configure the lock path] *****
changed: [192.168.56.105]

TASK [cinder : populate the block storage database] *****
[WARNING]: Consider using 'become', 'become_method', and 'become_user' rather than running su
changed: [192.168.56.105]
```

```
Diego5pciditu11/HOA15 X +
diego@workstation: ~/HOA15

TASK [cinder : populate the block storage database] *****
[WARNING]: Consider using 'become', 'become_method', and 'become_user' rather than running su
changed: [192.168.56.105]

TASK [cinder : adding the following line for block storage] *****
changed: [192.168.56.105]

TASK [cinder : install nova-api] *****
changed: [192.168.56.105]

TASK [cinder : restarting the compute API service] *****
changed: [192.168.56.105]

TASK [cinder : restart the block storage services] *****
changed: [192.168.56.105]

TASK [cinder : install the supporting utility packages] *****
ok: [192.168.56.105]

TASK [cinder : create the LVM physical volume /dev/sdb] *****
changed: [192.168.56.105]

TASK [cinder : create the LVM volume group cinder-volume] *****
changed: [192.168.56.105]

TASK [cinder : install the packages for cinder storage node] *****
changed: [192.168.56.105]

TASK [cinder : configure the LVM backend with the LVM driver] *****
changed: [192.168.56.105]

TASK [cinder : enabling the LVM backend] *****
changed: [192.168.56.105]

TASK [cinder : configuring the location of the image service API] *****
changed: [192.168.56.105]

TASK [cinder : configure the location of the image service API] *****
changed: [192.168.56.105]
```

```

TASK [cinder : configuring the location of the image service API] *****
changed: [192.168.56.105]

TASK [cinder : configuring the lock path] *****
changed: [192.168.56.105]

TASK [cinder : Restarting the block storage volume service including its dependencies (1)] *****
changed: [192.168.56.105]

TASK [cinder : Restarting the block storage volume service including its dependencies (2)] *****
changed: [192.168.56.105]

TASK [cinder : install the packages for cinder backup service] *****
changed: [192.168.56.105]

TASK [cinder : configuring the backup options] *****
changed: [192.168.56.105]

TASK [cinder : restart the block storage backup service] *****
changed: [192.168.56.105]

TASK [cinder : Verifying the cinder-backup.] *****
changed: [192.168.56.105]

PLAY RECAP *****
192.168.56.105      : ok=53   changed=48   unreachable=0   failed=0   skipped=0   rescued=
0                  ignored=0

```

Step 10: Checking the installations.

```

diego@server1:~$ sudo systemctl status neutron-openvswitch-agent
[sudo] password for diego:
● neutron-openvswitch-agent.service - Openstack Neutron Open vSwitch Plugin Agent
   Loaded: loaded (/lib/systemd/system/neutron-openvswitch-agent.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2023-12-07 01:15:54 PST; 15min ago
     Main PID: 16834 (neutron-openvsw)
        Tasks: 2 (limit: 3433)
       Memory: 120.8M
          CPU: 4.271s
      CGroup: /system.slice/neutron-openvswitch-agent.service
              └─16834 "neutron-openvswitch-agent (/usr/bin/python3 /usr/bin/neutron-openvswitch-agent"

Dec 07 01:15:54 server1 systemd[1]: Starting Openstack Neutron Open vSwitch Plugin Agent...
Dec 07 01:15:54 server1 systemd[1]: Started Openstack Neutron Open vSwitch Plugin Agent.
lines 1-12/12 (END)
[1]+  Stopped                  sudo systemctl status neutron-openvswitch-agent
diego@server1:~$ sudo cinder --version
8.3.0
diego@server1:~$ sudo systemctl status cinder-backup
● cinder-backup.service - OpenStack Cinder Backup
   Loaded: loaded (/lib/systemd/system/cinder-backup.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2023-12-07 01:17:46 PST; 13min ago
     Docs: man:cinder-backup(1)
     Main PID: 21294 (cinder-backup)
        Tasks: 3 (limit: 3433)
       Memory: 123.0M
          CPU: 10.248s
      CGroup: /system.slice/cinder-backup.service
              └─21294 /usr/bin/python3 /usr/bin/cinder-backup --config-file=/etc/cinder/cinder.conf
                └─21353 /usr/bin/python3 /usr/bin/cinder-backup --config-file=/etc/cinder/cinder.conf

Dec 07 01:17:46 server1 systemd[1]: Started OpenStack Cinder Backup.
Dec 07 01:17:48 server1 cinder-backup[21294]: /usr/lib/python3/dist-packages/cinder/db/sqlalchemy/m
Dec 07 01:17:48 server1 cinder-backup[21294]: last_heartbeat = column_property(
Dec 07 01:17:48 server1 cinder-backup[21294]: /usr/lib/python3/dist-packages/cinder/db/sqlalchemy/m
Dec 07 01:17:48 server1 cinder-backup[21294]: num_hosts = column_property(
Dec 07 01:17:48 server1 cinder-backup[21294]: /usr/lib/python3/dist-packages/cinder/db/sqlalchemy/m

```


Step 10: Git add, commit and push in the github.

```
diego@workstation:~/HOA15$ git add *
diego@workstation:~/HOA15$ git commit -m "BAKASYON NA"
git: 'commit' is not a git command. See 'git --help'.

The most similar command is
    commit
diego@workstation:~/HOA15$ git commit -m "BAKASYON NA"
[main 1e7a552] BAKASYON NA
15 files changed, 620 insertions(+)
create mode 100644 ansible.cfg
create mode 100644 installNHC.yml
create mode 100644 inventory
create mode 100644 roles/cinder/tasks/main.yml
create mode 100644 roles/cinder/tasks/templates/cinder.conf.j2
create mode 100644 roles/cinder/tasks/templates/nova.conf.j2
create mode 100644 roles/horizon/tasks/handlers/main.yml
create mode 100644 roles/horizon/tasks/main.yml
create mode 100644 roles/horizon/tasks/templates/local_settings.py.j2
create mode 100644 roles/neutron/tasks/main.yml
create mode 100644 roles/neutron/tasks/templates/dhcp_agent.ini.j2
create mode 100644 roles/neutron/tasks/templates/metadata_agent.ini.j2
create mode 100644 roles/neutron/tasks/templates/ml2_conf.ini.j2
create mode 100644 roles/neutron/tasks/templates/neutron.conf.j2
create mode 100644 roles/neutron/tasks/templates/openvswitch_agent.ini.j2
diego@workstation:~/HOA15$ git push origin
Username for 'https://github.com': DiegoEspiritu11
Password for 'https://DiegoEspiritu11@github.com':
remote: Support for password authentication was removed on August 13, 2021.
remote: Please see https://docs.github.com/en/get-started/getting-started-with-git/about-remote-repositories#cloning-with-https-urls
for information on currently recommended modes of authentication.
fatal: Authentication failed for 'https://github.com/DiegoEspiritu11/HOA15.git/'
diego@workstation:~/HOA15$ git push origin
Username for 'https://github.com': DiegoEspiritu11
Password for 'https://DiegoEspiritu11@github.com':
Enumerating objects: 29, done.
Counting objects: 100% (29/29), done.
Delta compression using up to 3 threads
Compressing objects: 100% (23/23), done.
Writing objects: 100% (28/28), 5.58 KiB | 1.86 MiB/s, done.
Total 28 (delta 3), reused 0 (delta 0), pack-reused 0
```

```

diego@workstation:~/HOA15$ git push origin
Username for 'https://github.com': DiegoEspiritu11
Password for 'https://DiegoEspiritu11@github.com':
Enumerating objects: 29, done.
Counting objects: 100% (29/29), done.
Delta compression using up to 3 threads
Compressing objects: 100% (23/23), done.
Writing objects: 100% (28/28), 5.58 KiB | 1.86 MiB/s, done.
Total 28 (delta 3), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (3/3), done.
To https://github.com/DiegoEspiritu11/HOA15.git
    e0e1d13..1e7a552  main -> main
diego@workstation:~/HOA15$

```

DiegoEspiritu11 / HOA15

Code Issues Pull requests Actions Projects Wiki Security Insights Settings

HOA15 Public

main 1 branch 0 tags

Go to file Add file > Code

| File | Commit | Time |
|----------------|----------------|---------------|
| roles | BAKASYON NA | 2 minutes ago |
| README.md | Initial commit | 4 hours ago |
| ansible.cfg | BAKASYON NA | 2 minutes ago |
| installNHC.yml | BAKASYON NA | 2 minutes ago |
| inventory | BAKASYON NA | 2 minutes ago |

README.md

HOA15

About: No description, website, or top provided.

Readme Activity 0 stars 1 watching 0 forks

Releases: No releases published. [Create a new release](#)

Packages: No packages published

<https://github.com/DiegoEspiritu11/HOA15.git>

Reflections:

Answer the following:

1. Describe Neutron, Horizon and Cinder services

Network connection is offered as a service by Neutron, an OpenStack service, to other OpenStack services. In addition to attaching interfaces to these networks, it enables users to establish and maintain networks, subnets, and routers. The OpenStack online dashboard is called Horizon. It offers a graphical user interface (GUI) via which users may interact and control the many OpenStack services (Neutron included). For usage by other OpenStack services, Cinder is an OpenStack block storage solution that offers persistent storage. It enables block storage volume and snapshot creation, attachment, and management for users. Cinder volumes may be utilized as an extra storage device connected to instances or as the primary storage for instances.

Conclusions:

After doing this very last activity for System Administration 2 (Managing Enterprise Servers) I conclude that all of the given activity throughout this course is very knowledgeable and enhance my intellectual thinking, as for this HOA the context of an OpenStack environment, Ansible serves as an Infrastructure as a tool, presenting diverse advantages. Its agentless structure and clear declarative language streamline the management and deployment of intricate infrastructures, alongside its seamless compatibility with various other software solutions. Within OpenStack, distinct elements such as Neutron, Horizon, and Cinder play pivotal roles in automating and refining processes. Neutron, for instance, acts as a service for networking, freeing users to focus on diverse tasks by overseeing networks, subnets, and routers. Horizon, the web-based interface of OpenStack, empowers users to efficiently oversee and engage with a multitude of services offered by the platform through a visually intuitive interface. Cinder, an equally essential component, facilitates block storage services within OpenStack. This feature empowers users to create, attach, and delete block-level persistent storage volumes with ease and flexibility as required