| | |
|---|---|
| **Name: Denzel Dinglasan** | **Date Performed: 04/12/2023** |
| **Course/Section: CPE31S6** | **Date Submitted: 04/12/2023** |
| **Instructor: Dr. Jonathan Vidal Taylar** | **Semester and SY: 1st Sem 2023 - 2024** |

## 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

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)

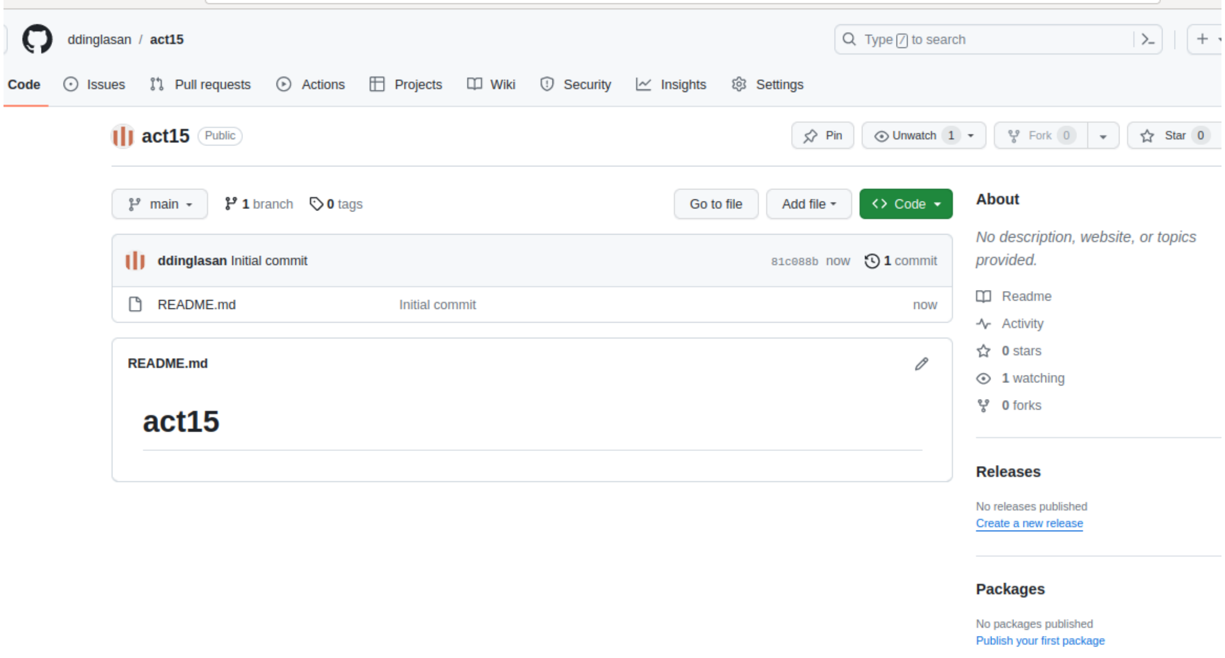
1x Ubuntu VM or Centos VM

## 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. 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)

1. Create a new repository for this activity.



act15 Public

ddinglasan Initial commit 81c088b now 1 commit

README.md Initial commit now

README.md

act15

About

*No description, website, or topics provided.*

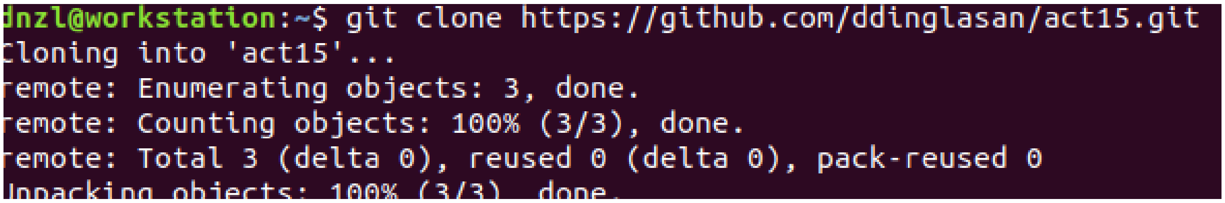
Readme
Activity
0 stars
1 watching
0 forks

Releases

No releases published
Create a new release

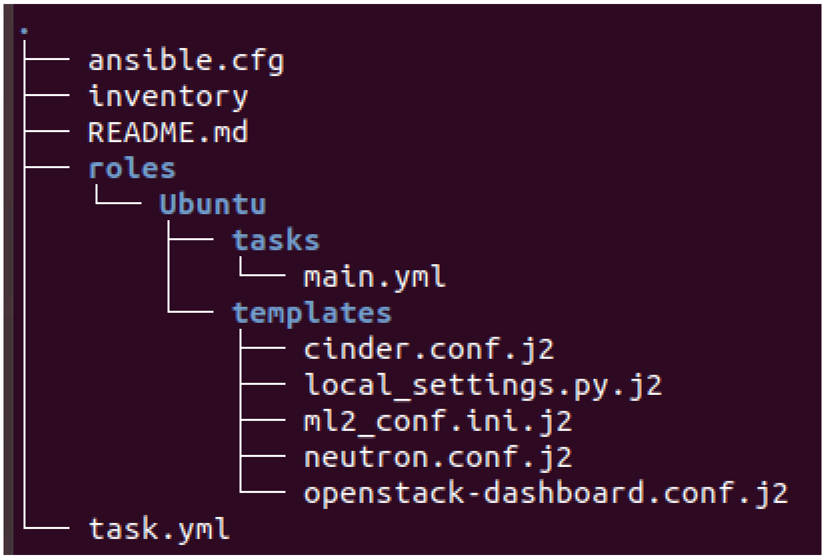
Packages

No packages published
Publish your first package



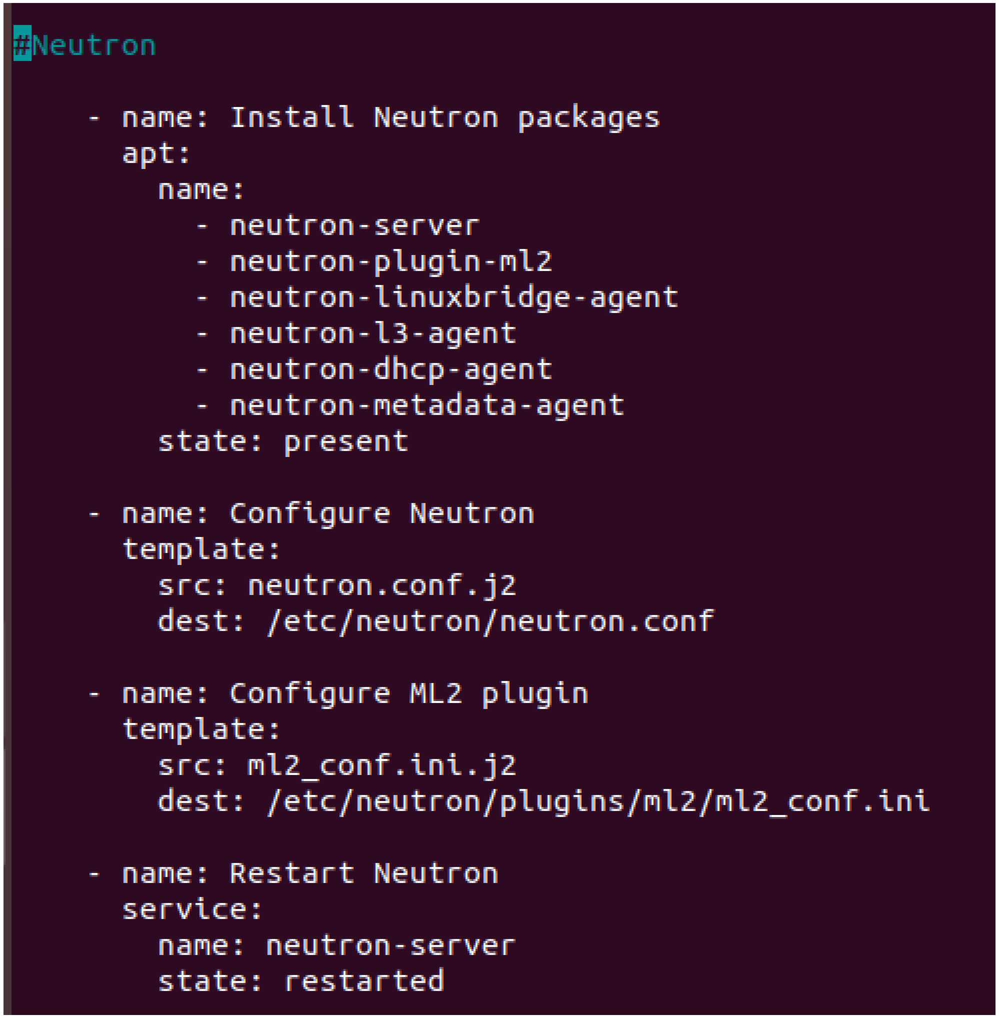
```
dnzl@workstation:~$ git clone https://github.com/ddinglasan/act15.git
Cloning into 'act15'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
```

Step 2: Create the basic files needed(ansible.cfg & inventory) and create the roles needed for the Ubuntu computer with the main.yml file for the tasks. Also created a task.yml file to run the tasks of the roles.

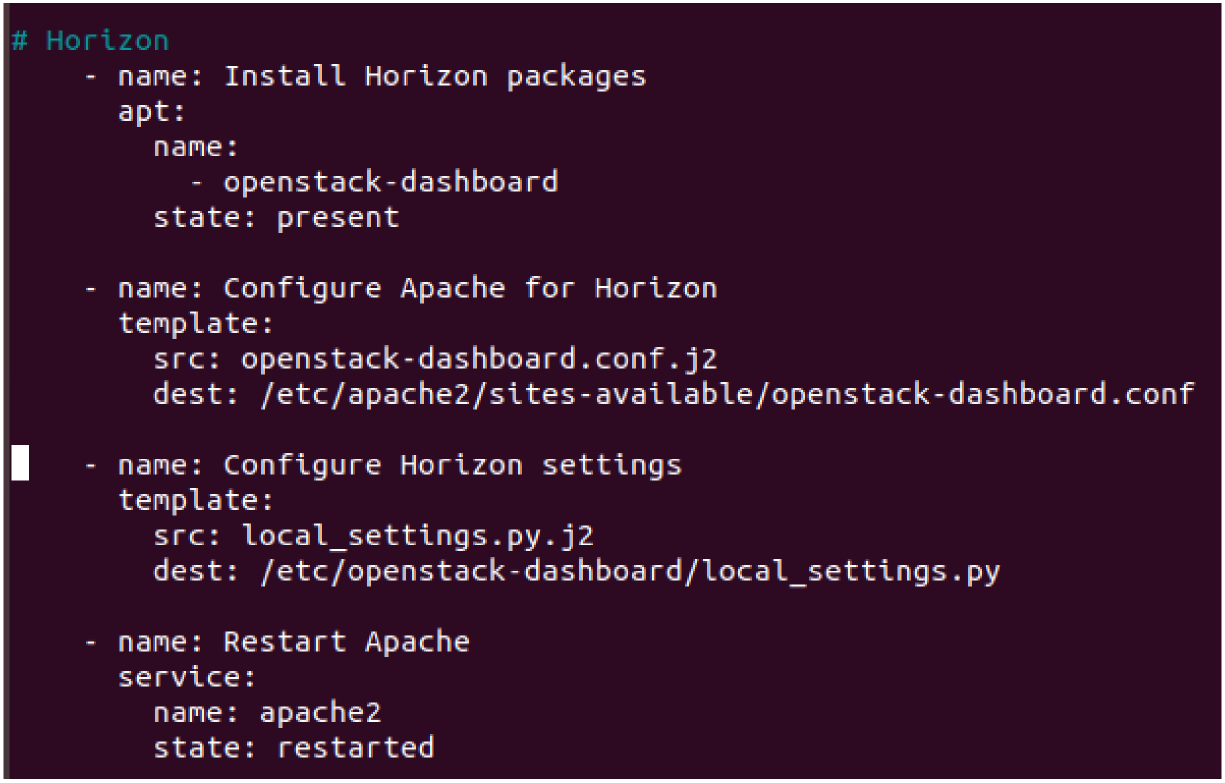


```
.
├── ansible.cfg
├── inventory
├── README.md
├── roles
│   └── Ubuntu
│       ├── tasks
│       │   └── main.yml
│       └── templates
│           ├── cinder.conf.j2
│           ├── local_settings.py.j2
│           ├── ml2_conf.ini.j2
│           ├── neutron.conf.j2
│           └── openstack-dashboard.conf.j2
└── task.yml
```

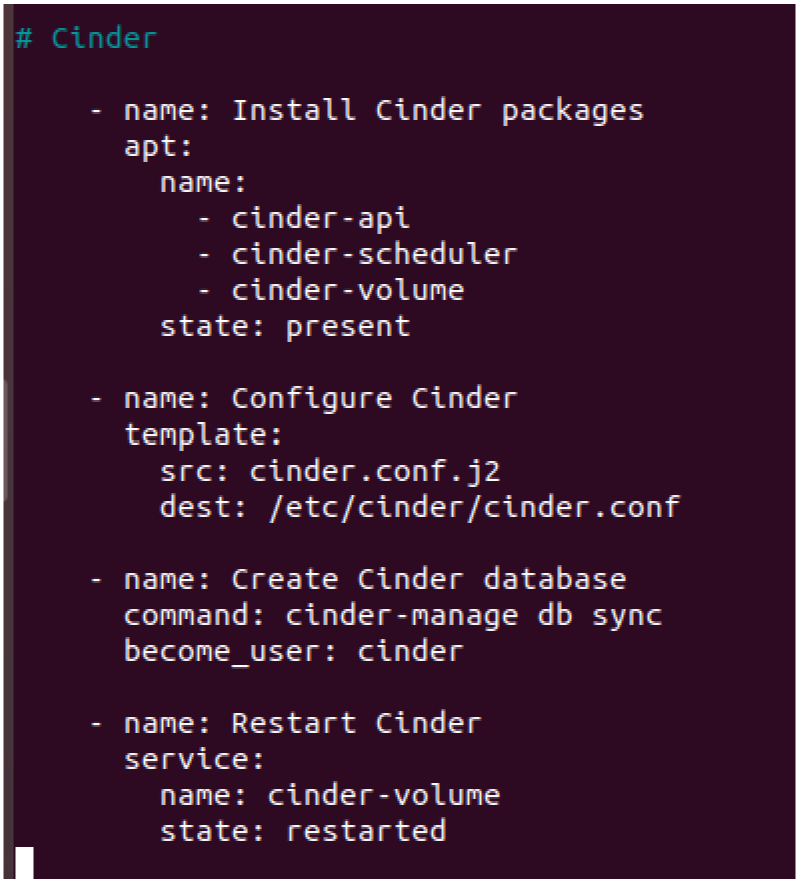
Step 3: Paste this on the main.yml of the Ubuntu role.



```
#Neutron

    - name: Install Neutron packages
      apt:
        name:
          - neutron-server
          - neutron-plugin-ml2
          - neutron-linuxbridge-agent
          - neutron-l3-agent
          - neutron-dhcp-agent
          - neutron-metadata-agent
        state: present

    - name: Configure Neutron
      template:
        src: neutron.conf.j2
        dest: /etc/neutron/neutron.conf

    - name: Configure ML2 plugin
      template:
        src: ml2_conf.ini.j2
        dest: /etc/neutron/plugins/ml2/ml2_conf.ini

    - name: Restart Neutron
      service:
        name: neutron-server
        state: restarted
```



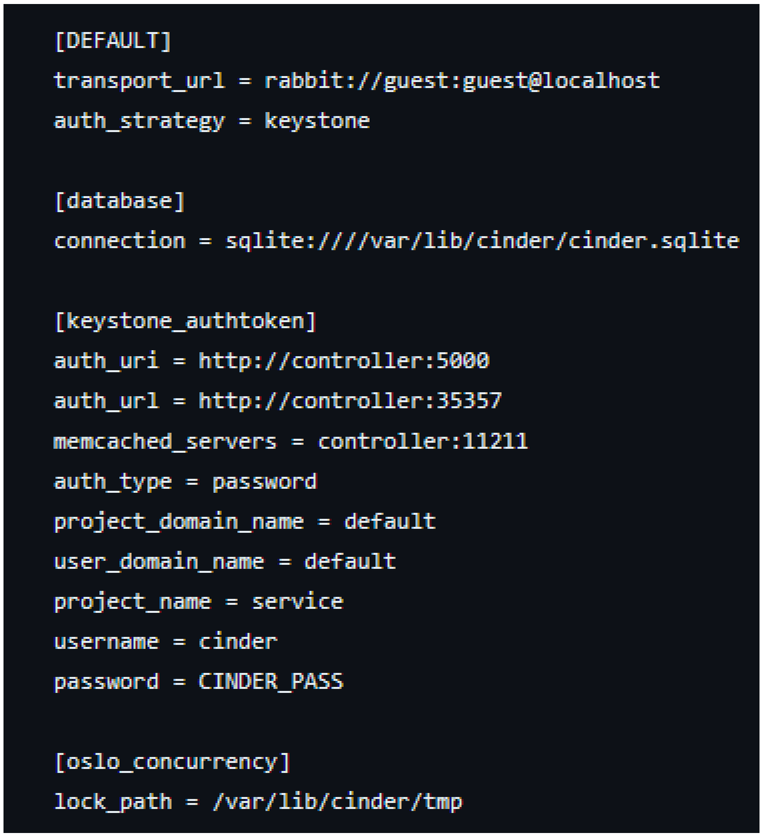
```
# Horizon
    - name: Install Horizon packages
      apt:
        name:
          - openstack-dashboard
        state: present

    - name: Configure Apache for Horizon
      template:
        src: openstack-dashboard.conf.j2
        dest: /etc/apache2/sites-available/openstack-dashboard.conf

    - name: Configure Horizon settings
      template:
        src: local_settings.py.j2
        dest: /etc/openstack-dashboard/local_settings.py

    - name: Restart Apache
      service:
        name: apache2
        state: restarted
```



```
# Cinder

    - name: Install Cinder packages
      apt:
        name:
          - cinder-api
          - cinder-scheduler
          - cinder-volume
        state: present

    - name: Configure Cinder
      template:
        src: cinder.conf.j2
        dest: /etc/cinder/cinder.conf

    - name: Create Cinder database
      command: cinder-manage db sync
      become_user: cinder

    - name: Restart Cinder
      service:
        name: cinder-volume
        state: restarted
```

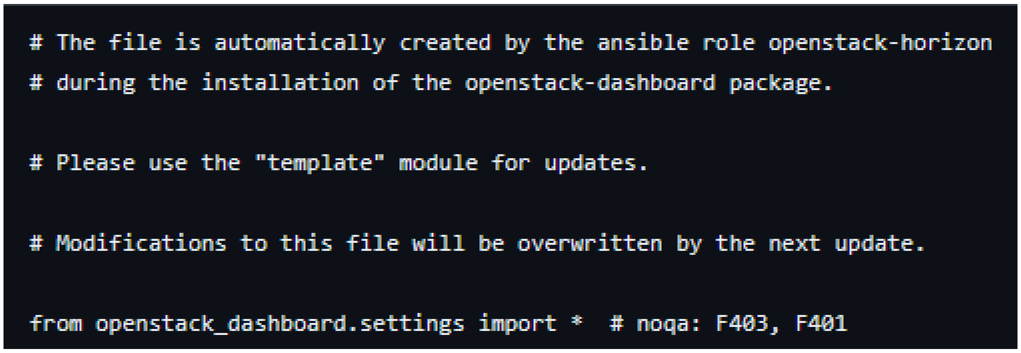
Step 4: Create the following templates.

cinder.conf.j2



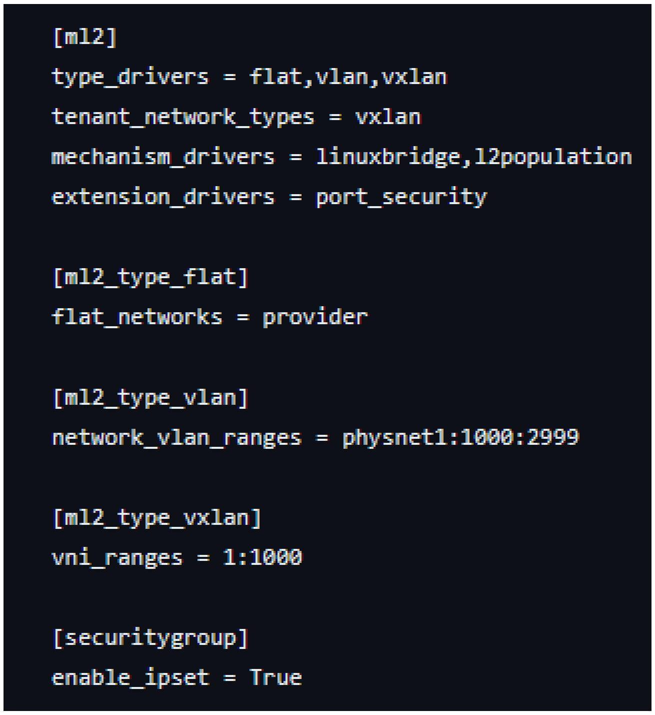
```
[DEFAULT]
transport_url = rabbit://guest:guest@localhost
auth_strategy = keystone

[database]
connection = sqlite:////var/lib/cinder/cinder.sqlite

[keystone_authtoken]
auth_uri = http://controller:5000
auth_url = http://controller:35357
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = cinder
password = CINDER_PASS

[oslo_concurrency]
lock_path = /var/lib/cinder/tmp
```

local_settings.py.j2



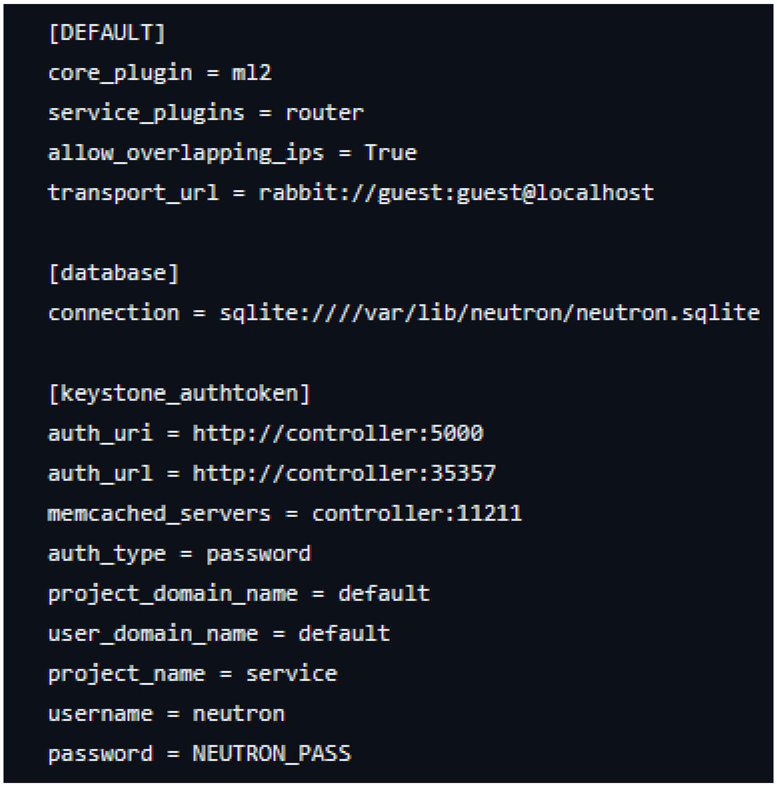
```
# The file is automatically created by the ansible role openstack-horizon
# during the installation of the openstack-dashboard package.

# Please use the "template" module for updates.

# Modifications to this file will be overwritten by the next update.

from openstack_dashboard.settings import *  # noqa: F403, F401
```

ml2_conf.ini.j2



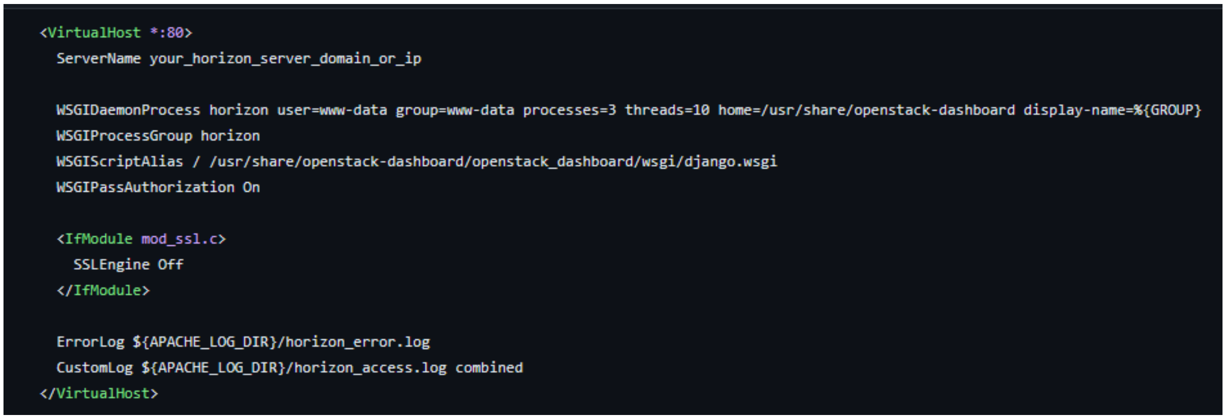
```
[ml2]
type_drivers = flat,vlan,vxlan
tenant_network_types = vxlan
mechanism_drivers = linuxbridge,l2population
extension_drivers = port_security

[ml2_type_flat]
flat_networks = provider

[ml2_type_vlan]
network_vlan_ranges = physnet1:1000:2999

[ml2_type_vxlan]
vni_ranges = 1:1000

[securitygroup]
enable_ipset = True
```

neutron.conf.j2



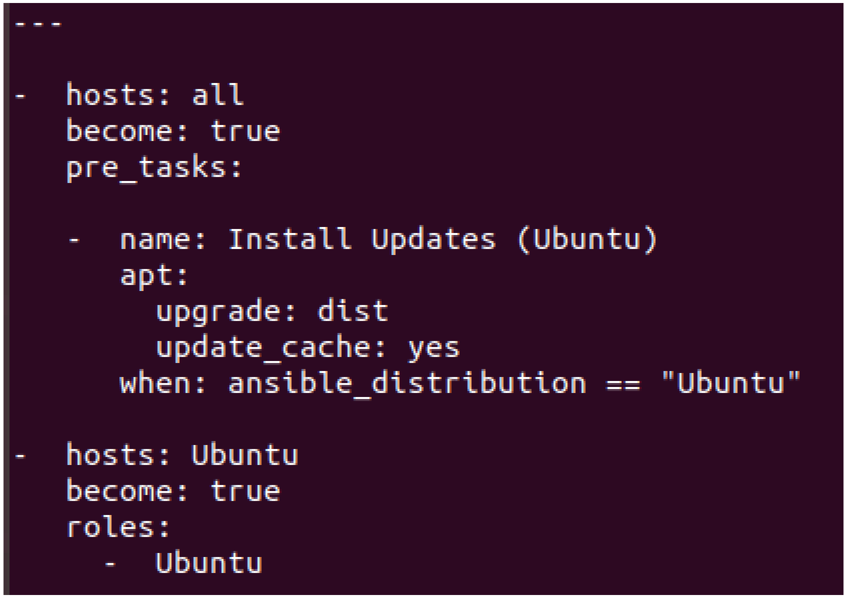
```
[DEFAULT]
core_plugin = ml2
service_plugins = router
allow_overlapping_ips = True
transport_url = rabbit://guest:guest@localhost

[database]
connection = sqlite:////var/lib/neutron/neutron.sqlite

[keystone_authtoken]
auth_uri = http://controller:5000
auth_url = http://controller:35357
memcached_servers = controller:11211
auth_type = password
project_domain_name = default
user_domain_name = default
project_name = service
username = neutron
password = NEUTRON_PASS
```

openstack-dashboard.conf.j2



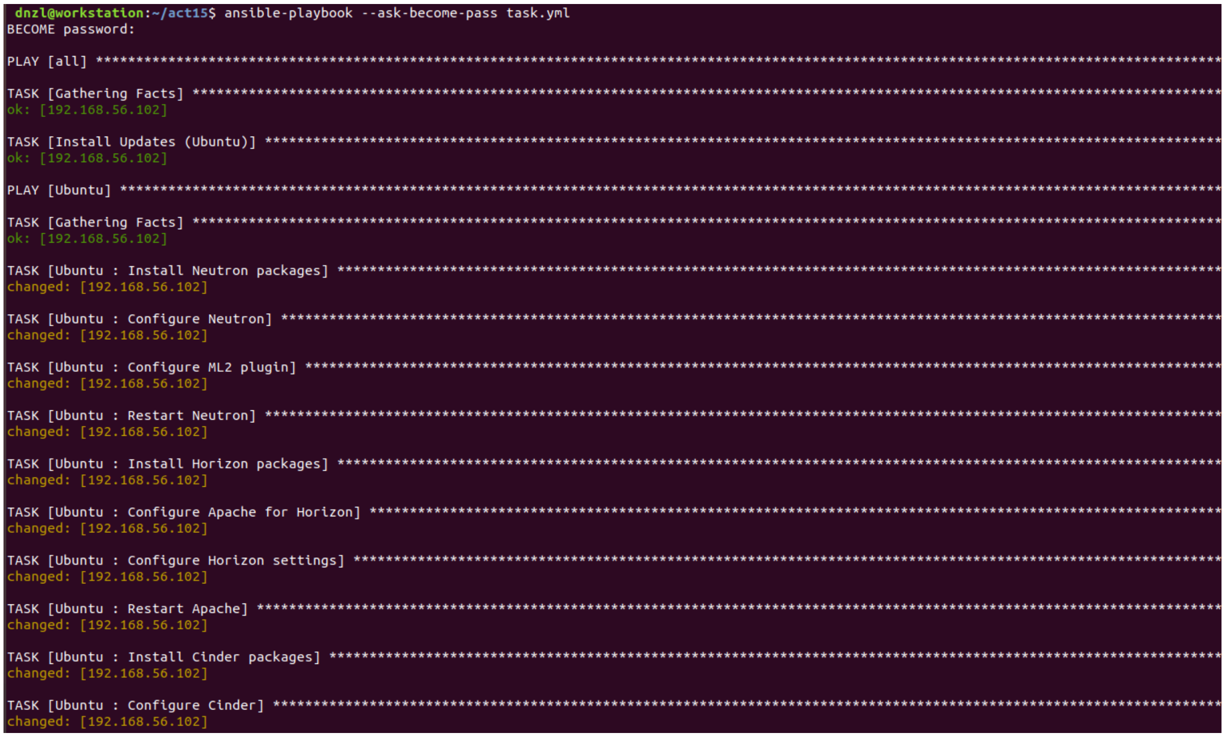
```
<VirtualHost *:80>
  ServerName your_horizon_server_domain_or_ip

  WSGIDaemonProcess horizon user=www-data group=www-data processes=3 threads=10 home=/usr/share/openstack-dashboard display-name=%{GROUP}
  WSGIProcessGroup horizon
  WSGIScriptAlias / /usr/share/openstack-dashboard/openstack_dashboard/wsgi/django.wsgi
  WSGIPassAuthorization On

  <IfModule mod_ssl.c>
    SSLEngine Off
  </IfModule>

  ErrorLog ${APACHE_LOG_DIR}/horizon_error.log
  CustomLog ${APACHE_LOG_DIR}/horizon_access.log combined
</VirtualHost>
```

Step 5: Paste this on the task.yml in the main directory.

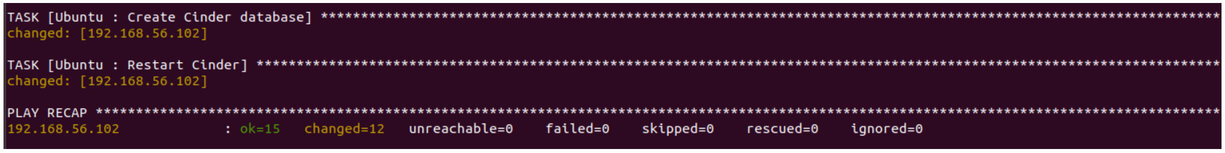


```
---

-   hosts: all
    become: true
    pre_tasks:

    -   name: Install Updates (Ubuntu)
        apt:
          upgrade: dist
          update_cache: yes
        when: ansible_distribution == "Ubuntu"

-   hosts: Ubuntu
    become: true
    roles:
      -   Ubuntu
```

Step 6: Run the playbook with the command *ansible-playbook –ask-become-pass task.yml*

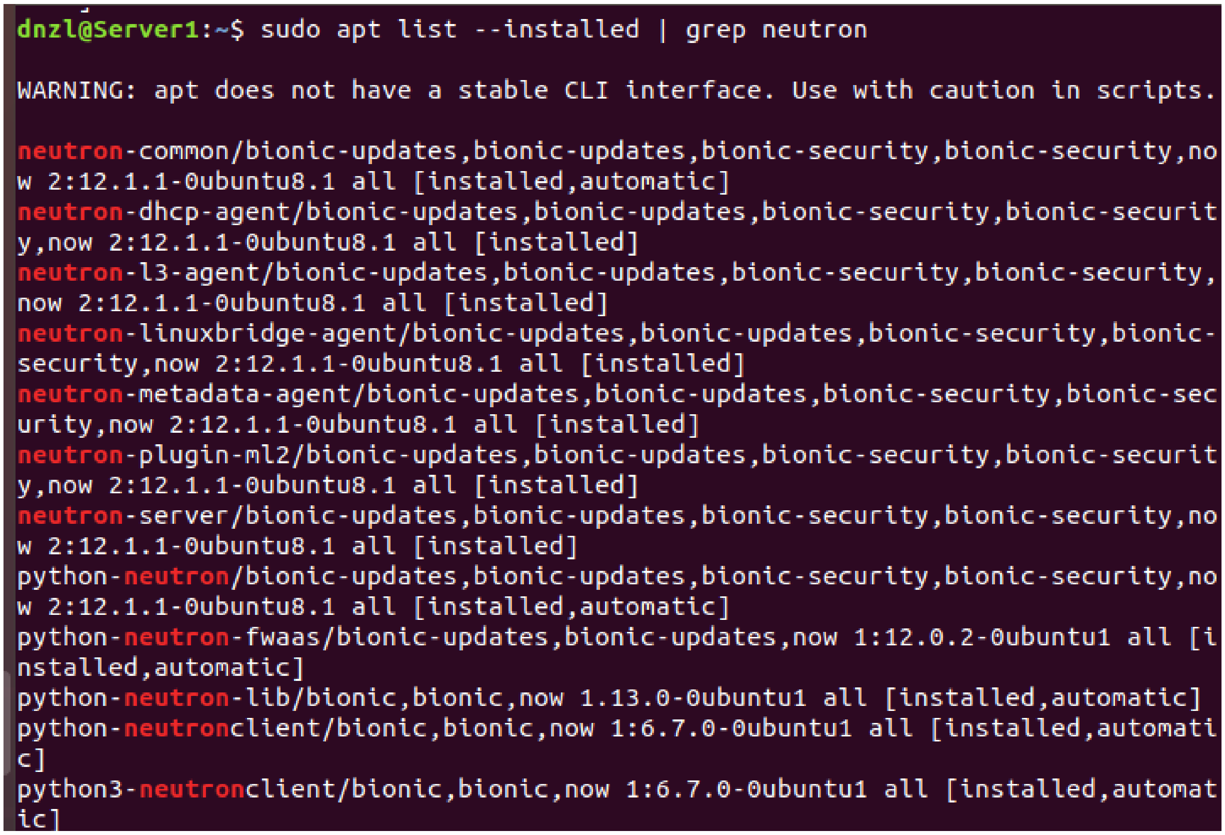


```
dnzl@workstation:~/act15$ ansible-playbook --ask-become-pass task.yml
BECOME password:

PLAY [all] **********************************************************************************************************

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

TASK [Install Updates (Ubuntu)] *************************************************************************************
ok: [192.168.56.102]

PLAY [Ubuntu] *******************************************************************************************************

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

TASK [Ubuntu : Install Neutron packages] ****************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Configure Neutron] ***********************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Configure ML2 plugin] ********************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Restart Neutron] *************************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Install Horizon packages] ****************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Configure Apache for Horizon] ************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Configure Horizon settings] **************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Restart Apache] **************************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Install Cinder packages] *****************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Configure Cinder] ************************************************************************************
changed: [192.168.56.102]
```

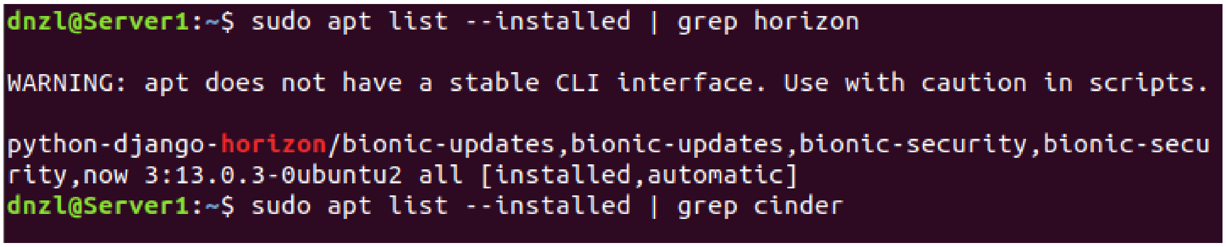


```
TASK [Ubuntu : Create Cinder database] **************************************************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Restart Cinder] **********************************************************************************************************
changed: [192.168.56.102]

PLAY RECAP ******************************************************************************************************************************
192.168.56.102             : ok=15   changed=12   unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

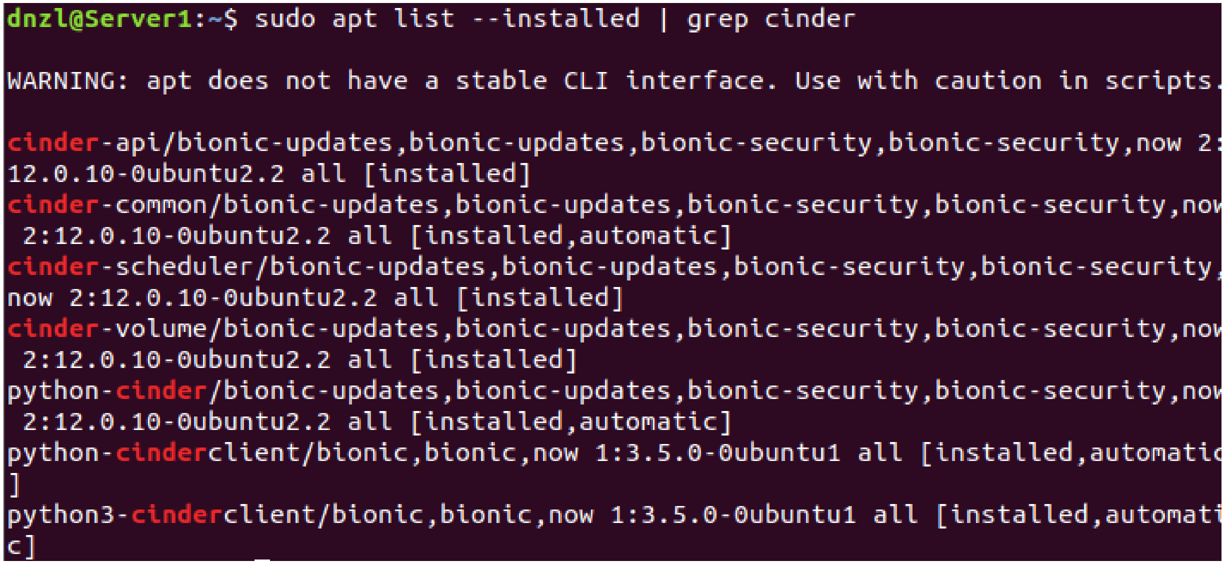
Step 7: Proof



```
dnzl@Server1:~$ sudo apt list --installed | grep neutron

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

neutron-common/bionic-updates,bionic-updates,bionic-security,bionic-security,no
w 2:12.1.1-0ubuntu8.1 all [installed,automatic]
neutron-dhcp-agent/bionic-updates,bionic-updates,bionic-security,bionic-securit
y,now 2:12.1.1-0ubuntu8.1 all [installed]
neutron-l3-agent/bionic-updates,bionic-updates,bionic-security,bionic-security,
now 2:12.1.1-0ubuntu8.1 all [installed]
neutron-linuxbridge-agent/bionic-updates,bionic-updates,bionic-security,bionic-
security,now 2:12.1.1-0ubuntu8.1 all [installed]
neutron-metadata-agent/bionic-updates,bionic-updates,bionic-security,bionic-sec
urity,now 2:12.1.1-0ubuntu8.1 all [installed]
neutron-plugin-ml2/bionic-updates,bionic-updates,bionic-security,bionic-securit
y,now 2:12.1.1-0ubuntu8.1 all [installed]
neutron-server/bionic-updates,bionic-updates,bionic-security,bionic-security,no
w 2:12.1.1-0ubuntu8.1 all [installed]
python-neutron/bionic-updates,bionic-updates,bionic-security,bionic-security,no
w 2:12.1.1-0ubuntu8.1 all [installed,automatic]
python-neutron-fwaas/bionic-updates,bionic-updates,now 1:12.0.2-0ubuntu1 all [i
nstalled,automatic]
python-neutron-lib/bionic,bionic,now 1.13.0-0ubuntu1 all [installed,automatic]
python-neutronclient/bionic,bionic,now 1:6.7.0-0ubuntu1 all [installed,automati
c]
python3-neutronclient/bionic,bionic,now 1:6.7.0-0ubuntu1 all [installed,automat
ic]
```

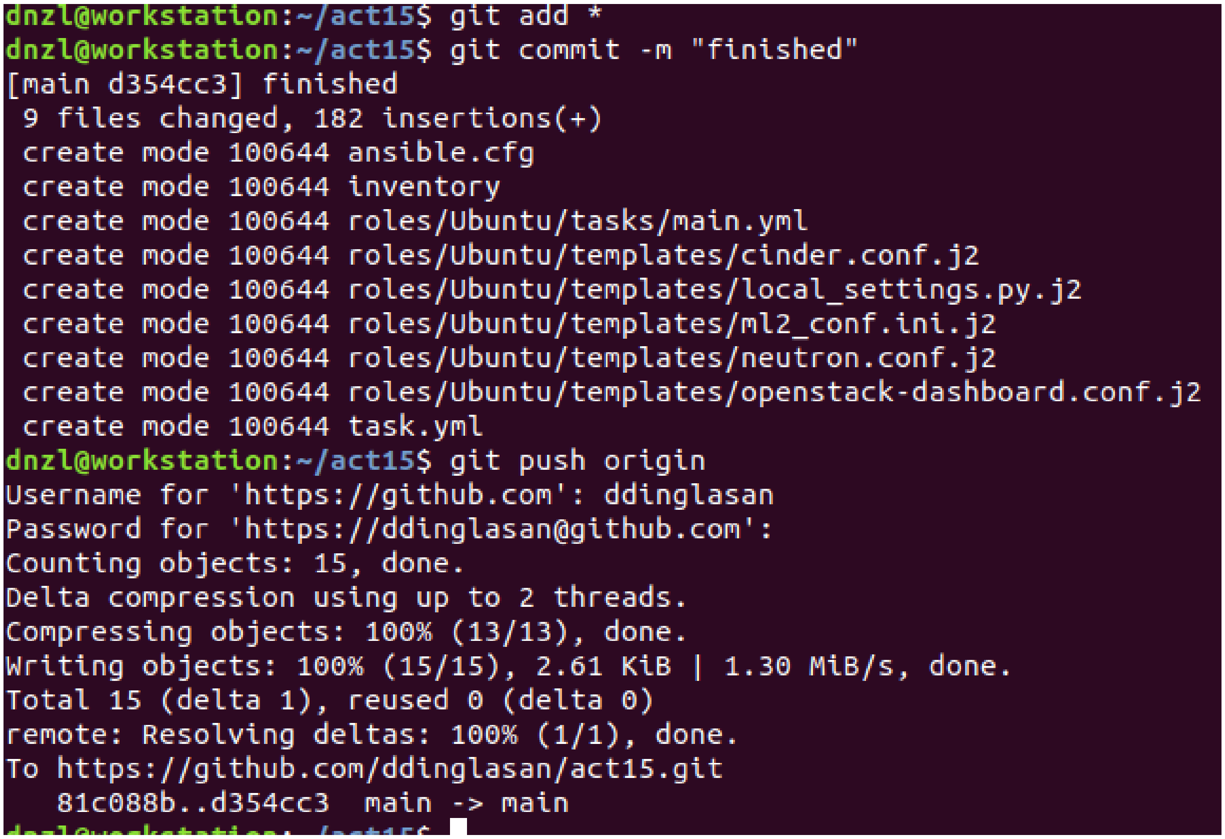


```
dnzl@Server1:~$ sudo apt list --installed | grep horizon

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

python-django-horizon/bionic-updates,bionic-updates,bionic-security,bionic-secu
rity,now 3:13.0.3-0ubuntu2 all [installed,automatic]
dnzl@Server1:~$ sudo apt list --installed | grep cinder
```



```
dnzl@Server1:~$ sudo apt list --installed | grep cinder

WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

cinder-api/bionic-updates,bionic-updates,bionic-security,bionic-security,now 2:
12.0.10-0ubuntu2.2 all [installed]
cinder-common/bionic-updates,bionic-updates,bionic-security,bionic-security,now
 2:12.0.10-0ubuntu2.2 all [installed,automatic]
cinder-scheduler/bionic-updates,bionic-updates,bionic-security,bionic-security,
now 2:12.0.10-0ubuntu2.2 all [installed]
cinder-volume/bionic-updates,bionic-updates,bionic-security,bionic-security,now
 2:12.0.10-0ubuntu2.2 all [installed]
python-cinder/bionic-updates,bionic-updates,bionic-security,bionic-security,now
 2:12.0.10-0ubuntu2.2 all [installed,automatic]
python-cinderclient/bionic,bionic,now 1:3.5.0-0ubuntu1 all [installed,automatic
]
python3-cinderclient/bionic,bionic,now 1:3.5.0-0ubuntu1 all [installed,automati
c]
```

Step 8: save in the repository



```
dnzl@workstation:~/act15$ git add *
dnzl@workstation:~/act15$ git commit -m "finished"
[main d354cc3] finished
 9 files changed, 182 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 roles/Ubuntu/tasks/main.yml
 create mode 100644 roles/Ubuntu/templates/cinder.conf.j2
 create mode 100644 roles/Ubuntu/templates/local_settings.py.j2
 create mode 100644 roles/Ubuntu/templates/ml2_conf.ini.j2
 create mode 100644 roles/Ubuntu/templates/neutron.conf.j2
 create mode 100644 roles/Ubuntu/templates/openstack-dashboard.conf.j2
 create mode 100644 task.yml
dnzl@workstation:~/act15$ git push origin
Username for 'https://github.com': ddinglasan
Password for 'https://ddinglasan@github.com':
Counting objects: 15, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (13/13), done.
Writing objects: 100% (15/15), 2.61 KiB | 1.30 MiB/s, done.
Total 15 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To https://github.com/ddinglasan/act15.git
   81c088b..d354cc3  main -> main
dnzl@workstation:~/act15$
```

https://github.com/ddinglasan/act15.git

**Reflections:**

Answer the following:

1. Describe Neutron, Horizon and Cinder services

Neutron is the networking service which provides functionality for managing and the creation of network connectivity within a cloud environment. Horizon is a web-based dashboard which allows users or administrators to interact with and control OpenStack resources in a graphical form. In contrast, Cinder is a block storage service that offers block storage volumes provisioning and management for virtual machines. These services as a whole make up the strength of OpenStack's reliability and flexibility in a cloud environment consisting of network, user interface and volume block.

**Conclusions:**

In this activity, I learned how to install Neutron, Horizon and Cinder. I’ve also learned their importance in Openstack. I’ve learned a lot from this activity.