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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)

- It's a default that when installing packages using scripts, we have to create a new repository for it and clone it to our virtual machines.

```
reponte@workstation:~$ git clone git@github.com:meyreponte/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.
reponte@workstation:~$ cd HOA15
reponte@workstation:~/HOA15$
```

- Scripts for the Neutron, Horizon, Cinder package.

Ubuntu

```
---
#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
```

```
  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:
```

```
    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
```

```
  GNU nano 2.9.3                        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
```

```
  GNU nano 2.9.3                  local_settings.py.j2                  Modifie

# 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]
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
```

```
  GNU nano 2.9.3                        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
```

```
 GNU nano 2.9.3              openstack-dashboard.conf.j2              Modified

<VirtualHost *:80>
  ServerName your_horizon_server_domain_or_ip

  WSGIDaemonProcess horizon user=www-data group=www-data processes=3 threads=1$
  WSGIProcessGroup horizon
  WSGIScriptAlias / /usr/share/openstack-dashboard/openstack_dashboard/wsgi/dj$
  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>
```

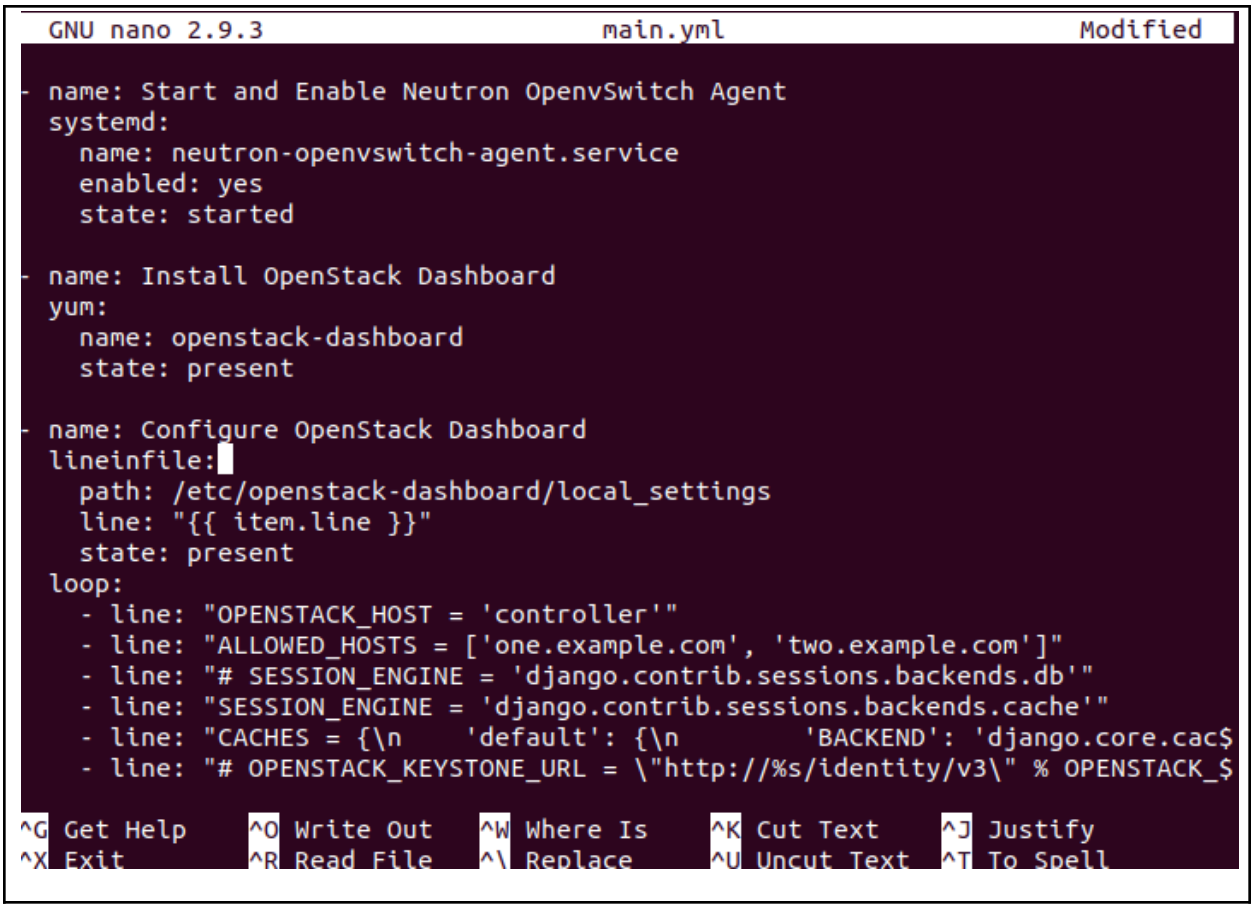
```
 GNU nano 2.9.3                        openstack2.yml

---

  hosts: all
  become: true
  pre_tasks:

    - name: install updates (CentOS)
      tags: always
      yum:
        name: "*"
        update_only: yes
        update_cache: yes
      when: ansible_distribution == "CentOS"

    - name: install updates (Ubuntu)
      tags: always
      apt:
        upgrade: dist
        update_cache: yes
      when: ansible_distribution == "Ubuntu"

  hosts: ubuntu
  become: true
```

```
- hosts: ubuntu
  become: true
  roles:
    - name: ubuntu

- hosts: centos
  become: true
  roles:
    - name: centos
```

CentOS

```
  GNU nano 2.9.3                          main.yml

---
- name: Install OpenStack Neutron OpenvSwitch
  yum:
    name: openstack-neutron-openvswitch
    state: present

- name: Configure Networking Common Component
  become: true
  blockinfile:
    path: /etc/neutron/neutron.conf
    marker: "# START ANSIBLE MANAGED BLOCK"
    block: |
      [database]
      # ...

      [DEFAULT]
      # ...
      transport_url = rabbit://openstack:RABBIT_PASS@controller

      [DEFAULT]
      # ...
      auth_strategy = keystone
```

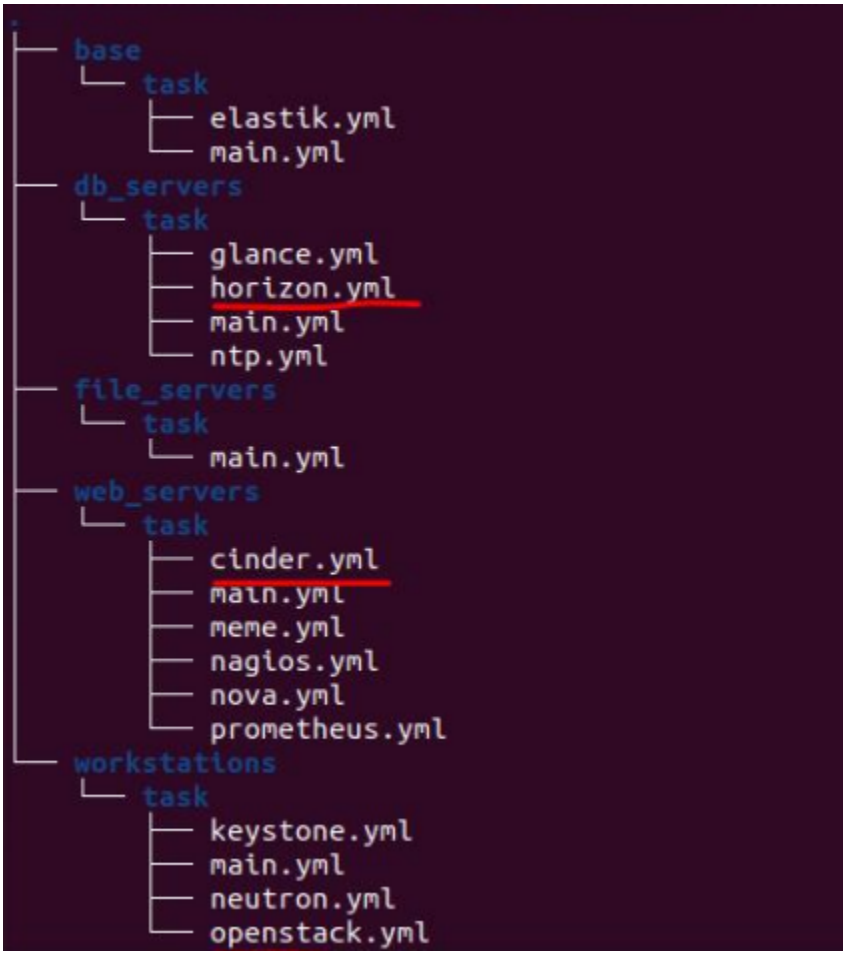
```
 GNU nano 2.9.3                          main.yml

      # ...
      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 = neutron
      password = NEUTRON_PASS

- name: Configure Lock Path in oslo_concurrency
  lineinfile:
    path: /etc/neutron/neutron.conf
    line: "lock_path = /var/lib/neutron/tmp"
    state: present
    insertafter: "# [oslo_concurrency]"

- name: Configure Compute Service to Use Networking Service
  blockinfile:
    path: /etc/nova/nova.conf
    marker: "# START ANSIBLE MANAGED BLOCK"
    block: |
```


GNU nano 2.9.3 main.yml Modified
- name: Start and Enable Neutron OpenvSwitch Agent
systemd:
name: neutron-openvswitch-agent.service
enabled: yes
state: started
- name: Install OpenStack Dashboard
yum:
name: openstack-dashboard
state: present
- name: Configure OpenStack Dashboard
lineinfile:
path: /etc/openstack-dashboard/local_settings
line: "{{ item.line }}"
state: present
loop:
- line: "OPENSTACK_HOST = 'controller'"
- line: "ALLOWED_HOSTS = ['one.example.com', 'two.example.com']"
- line: "# SESSION_ENGINE = 'django.contrib.sessions.backends.db'"
- line: "SESSION_ENGINE = 'django.contrib.sessions.backends.cache'"
- line: "CACHES = {\n 'default': {\n 'BACKEND': 'django.core.cac$
- line: "# OPENSTACK_KEYSTONE_URL = \"http://%s/identity/v3\" % OPENSTACK_$
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell

```
    line: "WSGIApplicationGroup %{GLOBAL}"
    state: present

- name: Restart Web Server and Session Storage Service
  systemd:
    name: "{{ item }}"
    state: restarted
  loop:
    - httpd.service
    - memcached.service
  failed_when: false
  no_log: true

- name: Install OpenStack Cinder
  yum:
    name: openstack-cinder
    state: present

- name: Configure Cinder
  blockinfile:
    path: /etc/cinder/cinder.conf
    marker: "# START ANSIBLE MANAGED BLOCK"
    block: |
```

```
    path: /etc/nova/nova.conf
    line: "[cinder]\nos_region_name = RegionOne"
    state: present

- name: Restart Nova API service
  systemd:
    name: openstack-nova-api.service
    state: restarted

- name: Start and Enable Cinder Services
  systemd:
    name: "{{ item }}"
    enabled: yes
    state: started
  loop:
    - openstack-cinder-api.service
    - openstack-cinder-scheduler.service
```

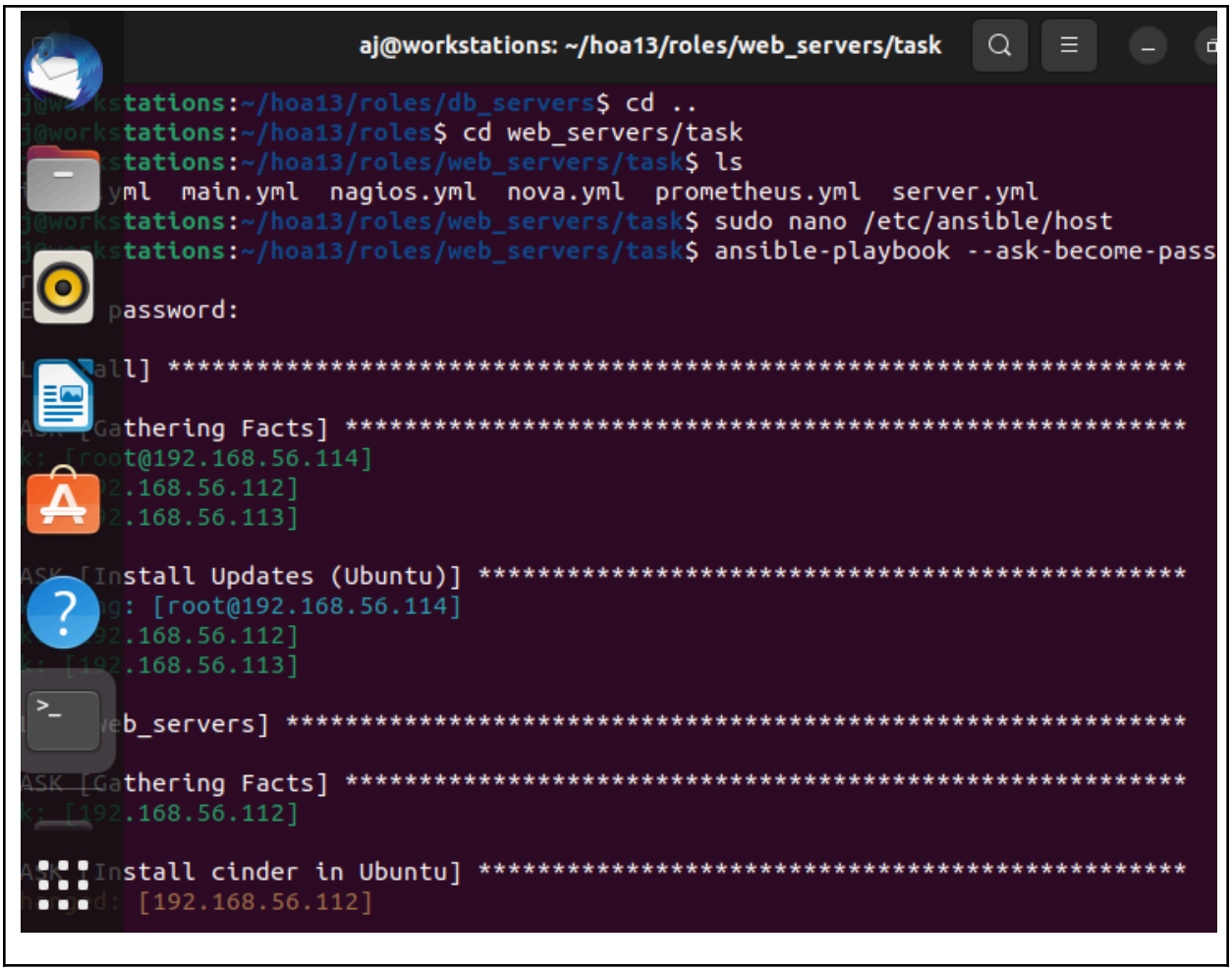
- The directories responsible for the processes.



Recap of installation

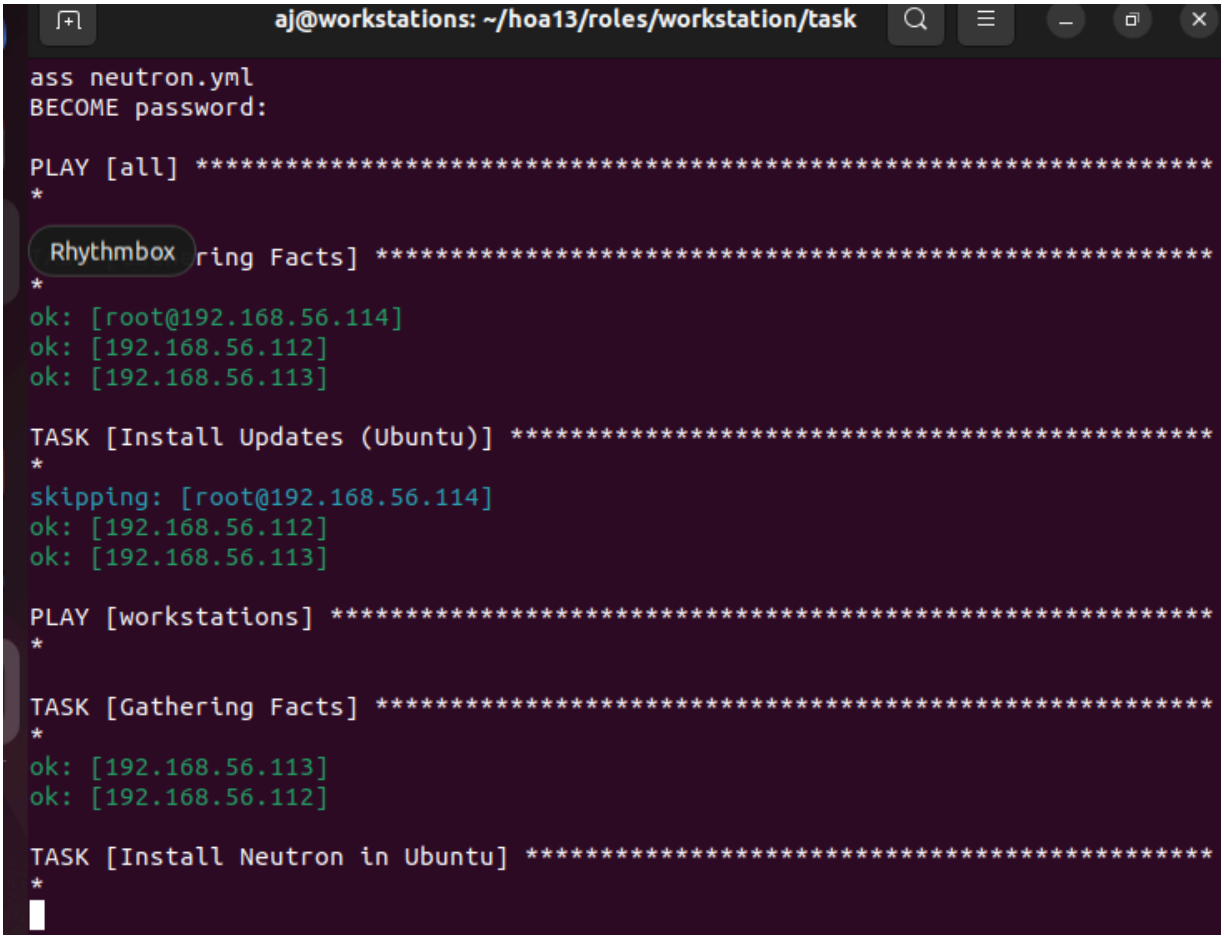
- In this figure i showed that it successfully updated the server and did not encountered error for both **Ubuntu** and **CentOS**.

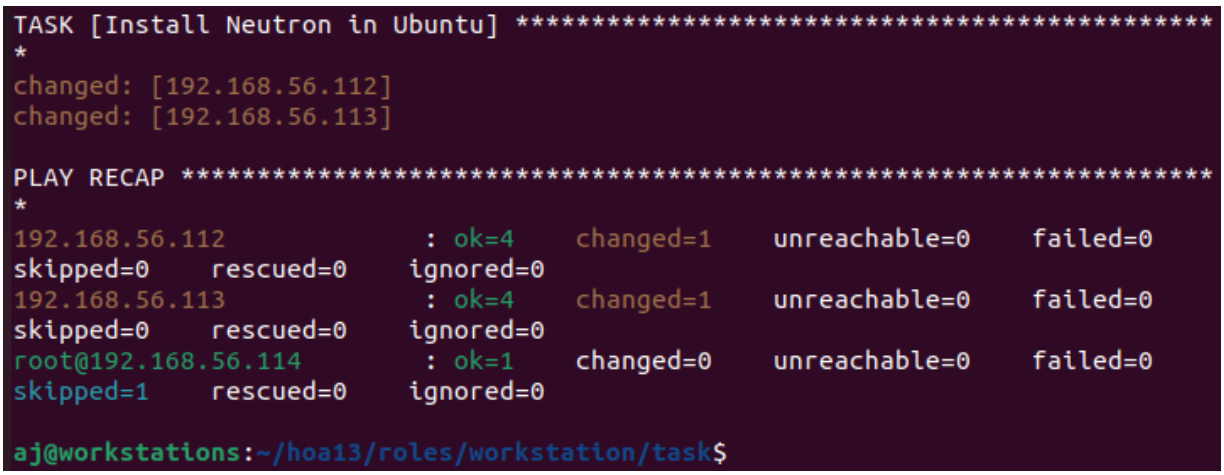
Ubuntu


aj@workstations: ~/hoa13/roles/web_servers/task
tations:~/hoa13/roles/db_servers$ cd ..
tations:~/hoa13/roles$ cd web_servers/task
tations:~/hoa13/roles/web_servers/task$ ls
yml main.yml nagios.yml nova.yml prometheus.yml server.yml
tations:~/hoa13/roles/web_servers/task$ sudo nano /etc/ansible/host
tations:~/hoa13/roles/web_servers/task$ ansible-playbook --ask-become-pass
password:
ll] **
thering Facts] ***
t@192.168.56.114]
.168.56.112]
.168.56.113]
stall Updates (Ubuntu)] **
: [root@192.168.56.114]
.168.56.112]
.168.56.113]
b_servers] ***
thering Facts] ***
.168.56.112]
nstall cinder in Ubuntu] ***
[192.168.56.112]

```
aj@workstations:~/hoa13/roles/db_servers/task$ ansible-playbook --ask-become-pa
ss horizon.yml
BECOME password:

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

TASK [Gathering Facts] *********************************************************
*
ok: [root@192.168.56.114]
ok: [192.168.56.112]
ok: [192.168.56.113]

TASK [Install Updates (Ubuntu)] ************************************************
*
skipping: [root@192.168.56.114]
ok: [192.168.56.112]
ok: [192.168.56.113]

PLAY [db_servers] **************************************************************
*

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.113]

TASK [Install Horizon in Ubuntu] ***********************************************
*
```

```
PLAY [db_servers] **************************************************************
*

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.113]

TASK [Install Horizon in Ubuntu] ***********************************************
*
changed: [192.168.56.113]

PLAY RECAP *********************************************************************
*
192.168.56.112             : ok=2    changed=0    unreachable=0    failed=0
skipped=0    rescued=0    ignored=0
192.168.56.113             : ok=4    changed=1    unreachable=0    failed=0
skipped=0    rescued=0    ignored=0
root@192.168.56.114        : ok=1    changed=0    unreachable=0    failed=0
skipped=1    rescued=0    ignored=0

aj@workstations:~/hoa13/roles/db_servers/task$
```

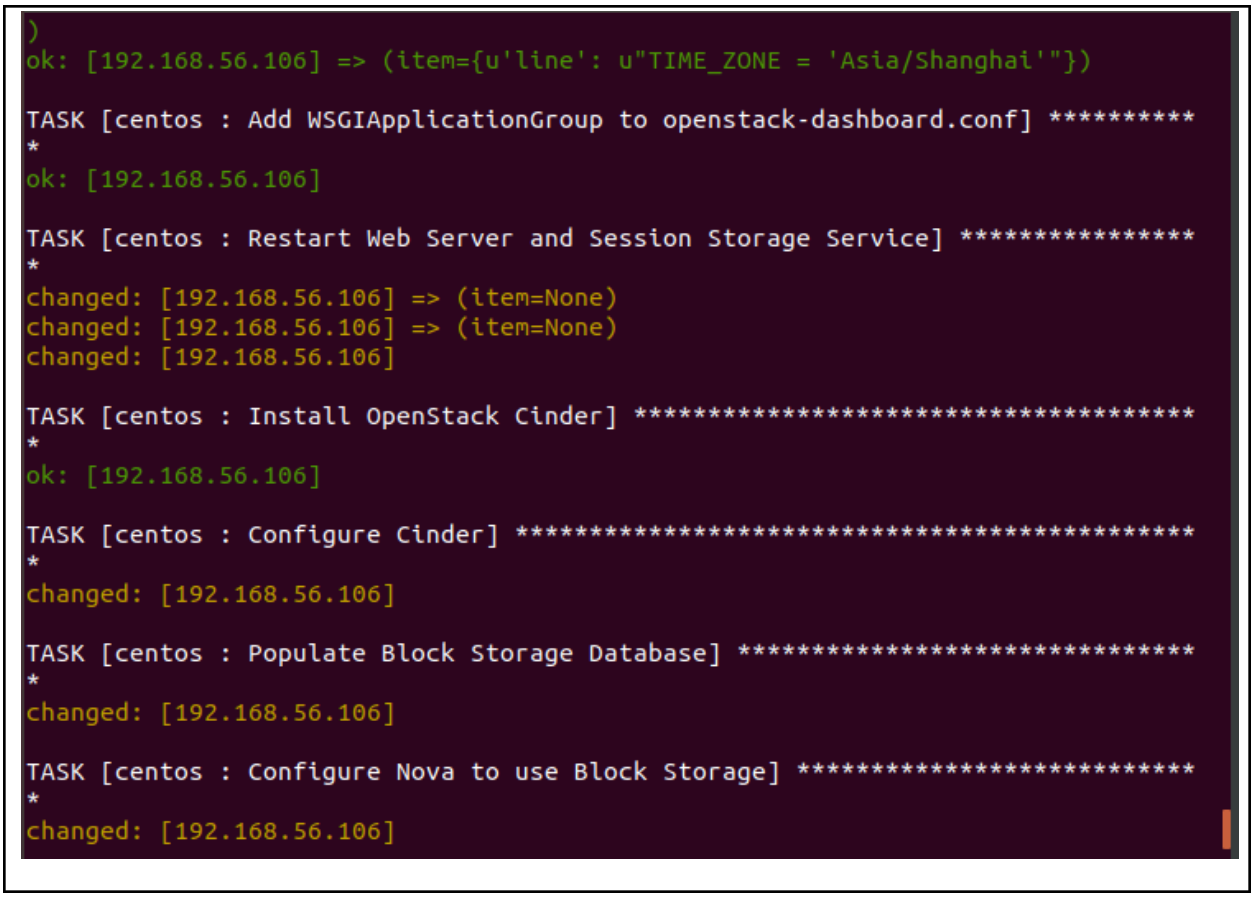

aj@workstations: ~/hoa13/roles/workstation/task
ass neutron.yml
BECOME password:
PLAY [all] ***
*
Rhythmbox
ring Facts] **
*
ok: [root@192.168.56.114]
ok: [192.168.56.112]
ok: [192.168.56.113]
TASK [Install Updates (Ubuntu)] **
*
skipping: [root@192.168.56.114]
ok: [192.168.56.112]
ok: [192.168.56.113]
PLAY [workstations] **
*
TASK [Gathering Facts] ***
*
ok: [192.168.56.113]
ok: [192.168.56.112]
TASK [Install Neutron in Ubuntu] ***
*


TASK [Install Neutron in Ubuntu] ***
*
changed: [192.168.56.112]
changed: [192.168.56.113]
PLAY RECAP ***
*
192.168.56.112 : ok=4 changed=1 unreachable=0 failed=0
skipped=0 rescued=0 ignored=0
192.168.56.113 : ok=4 changed=1 unreachable=0 failed=0
skipped=0 rescued=0 ignored=0
root@192.168.56.114 : ok=1 changed=0 unreachable=0 failed=0
skipped=1 rescued=0 ignored=0
aj@workstations:~/hoa13/roles/workstation/task$

CentOS

```
reponte@workstation:~/HOA15$ ansible-playbook --ask-become-pass openstack2.yml
SUDO password:

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

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.106]

PLAY [centos] ******************************************************************
*

TASK [Gathering Facts] *********************************************************
*
ok: [192.168.56.106]

TASK [centos : Install OpenStack Neutron OpenvSwitch] **************************
*
ok: [192.168.56.106]

TASK [centos : Configure Networking Common Component] **************************
*
changed: [192.168.56.106]

TASK [centos : Configure Lock Path in oslo_concurrency] ************************
```

```
TASK [centos : Install OpenStack Dashboard] ************************************
*
ok: [192.168.56.106]

TASK [centos : Configure OpenStack Dashboard] **********************************
*
ok: [192.168.56.106] => (item={u'line': u"OPENSTACK_HOST = 'controller'"})
ok: [192.168.56.106] => (item={u'line': u"ALLOWED_HOSTS = ['one.example.com', '
two.example.com']"})
ok: [192.168.56.106] => (item={u'line': u"# SESSION_ENGINE = 'django.contrib.se
ssions.backends.db'"})
ok: [192.168.56.106] => (item={u'line': u"SESSION_ENGINE = 'django.contrib.sess
ions.backends.cache'"})
changed: [192.168.56.106] => (item={u'line': u"CACHES = {\n    'default': {\n
      'BACKEND': 'django.core.cache.backends.memcached.MemcachedCache',\n
  'LOCATION': 'controller:11211',\n    }\n}"})
ok: [192.168.56.106] => (item={u'line': u'# OPENSTACK_KEYSTONE_URL = "http://%s
/identity/v3" % OPENSTACK_HOST'})
ok: [192.168.56.106] => (item={u'line': u'OPENSTACK_KEYSTONE_URL = "http://%s:5
000/identity/v3" % OPENSTACK_HOST'})
ok: [192.168.56.106] => (item={u'line': u'OPENSTACK_KEYSTONE_MULTIDOMAIN_SUPPOR
T = True'})
changed: [192.168.56.106] => (item={u'line': u"OPENSTACK_API_VERSIONS = {\n
'identity': 3,\n    'image': 2,\n    'volume': 3,\n}"})
ok: [192.168.56.106] => (item={u'line': u"OPENSTACK_KEYSTONE_DEFAULT_DOMAIN = '
Default'"})
ok: [192.168.56.106] => (item={u'line': u"OPENSTACK_KEYSTONE_DEFAULT_ROLE = 'us
er'"})
changed: [192.168.56.106] => (item={u'line': u"OPENSTACK_NEUTRON_NETWORK = {\n
```


)
ok: [192.168.56.106] => (item={u'line': u"TIME_ZONE = 'Asia/Shanghai'"})
TASK [centos : Add WSGIApplicationGroup to openstack-dashboard.conf] **********
*
ok: [192.168.56.106]
TASK [centos : Restart Web Server and Session Storage Service] ***************
*
changed: [192.168.56.106] => (item=None)
changed: [192.168.56.106] => (item=None)
changed: [192.168.56.106]
TASK [centos : Install OpenStack Cinder] *************************************
*
ok: [192.168.56.106]
TASK [centos : Configure Cinder] ***
*
changed: [192.168.56.106]
TASK [centos : Populate Block Storage Database] ******************************
*
changed: [192.168.56.106]
TASK [centos : Configure Nova to use Block Storage] **************************
*
changed: [192.168.56.106]

```
ok: [192.168.56.106]

TASK [centos : Configure Cinder] ***********************************************
*
changed: [192.168.56.106]

TASK [centos : Populate Block Storage Database] ********************************
*
changed: [192.168.56.106]

TASK [centos : Configure Nova to use Block Storage] ****************************
*
changed: [192.168.56.106]

TASK [centos : Restart Nova API service] ***************************************
*
changed: [192.168.56.106]

TASK [centos : Start and Enable Cinder Services] *******************************
*
changed: [192.168.56.106] => (item=openstack-cinder-api.service)
changed: [192.168.56.106] => (item=openstack-cinder-scheduler.service)

PLAY RECAP *********************************************************************
*
192.168.56.106             : ok=17   changed=9    unreachable=0    failed=0

reponte@workstation:~/HOA15$
```

Verifications

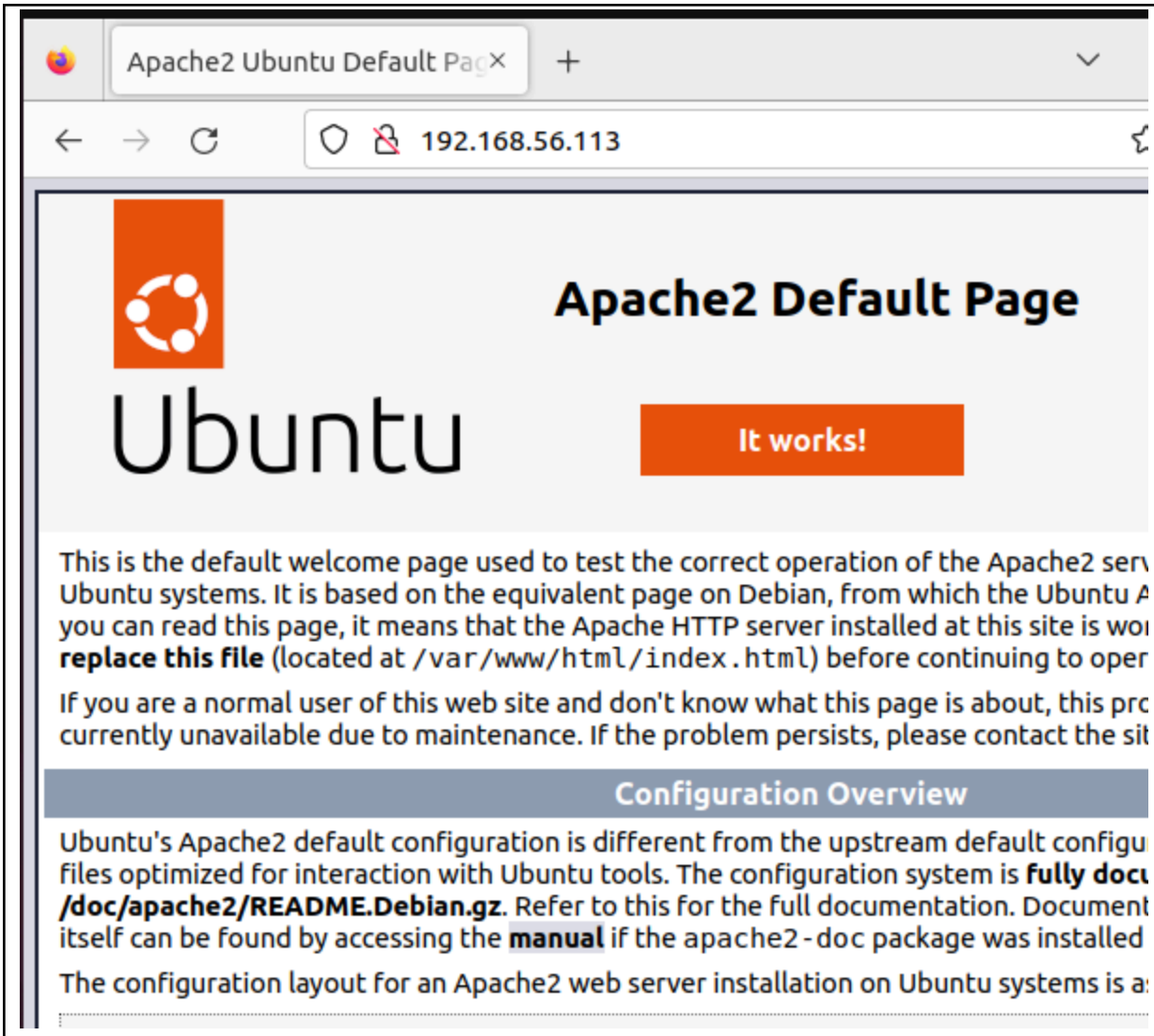
- In this process, we have to verify and check if the packages are installed and running to the machines for both **Ubuntu** and **CentOS**.

Ubuntu

Neutron

```
aj@ss1:~$ service neutron-server status
● neutron-server.service - OpenStack Neutron Server
     Loaded: loaded (/lib/systemd/system/neutron-server.service; enabled; vend
     Active: active (running) since Sat 2022-12-10 14:40:40 PST; 5s ago
       Docs: man:neutron-server(1)
   Main PID: 209291 (neutron-server)
      Tasks: 1 (limit: 1349)
     Memory: 112.6M
        CPU: 4.556s
     CGroup: /system.slice/neutron-server.service
             └─209291 /usr/bin/python3 /usr/bin/neutron-server --config-file=/
```

Horizon



Cinder

```
$ cinder-api --version
b/python3/dist-packages/cinder/db/sqlalchemy/models.py:152: SAWarning: implicitl
ing SELECT object to scalar subquery; please use the .scalar_subquery() method t
ce a scalar subquery.
heartbeat = column_property(
b/python3/dist-packages/cinder/db/sqlalchemy/models.py:160: SAWarning: implicitl
ing SELECT object to scalar subquery; please use the .scalar_subquery() method t
ce a scalar subquery.
osts = column_property(
b/python3/dist-packages/cinder/db/sqlalchemy/models.py:169: SAWarning: implicitl
ing SELECT object to scalar subquery; please use the .scalar_subquery() method t
ce a scalar subquery.
own_hosts = column_property(
```

CentOS

Neutron

```
[reponte@server3 ~]$ rpm -qa | grep neutron
python2-neutronclient-6.14.1-1.el7.noarch
openstack-neutron-common-15.3.4-1.el7.noarch
python2-neutron-lib-1.29.1-1.el7.noarch
openstack-neutron-openvswitch-15.3.4-1.el7.noarch
python2-neutron-15.3.4-1.el7.noarch
[reponte@server3 ~]$
```

Horizon

```
[reponte@server3 ~]$ systemctl status httpd
● httpd.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disal
led)
  Drop-In: /usr/lib/systemd/system/httpd.service.d
           └─openstack-dashboard.conf
   Active: active (running) since Tue 2024-05-07 03:45:33 PST; 1min 8s ago
     Docs: man:httpd(8)
           man:apachectl(8)
  Process: 32533 ExecStop=/bin/kill -WINCH ${MAINPID} (code=exited, status=0/SUCCESS)
  Process: 371 ExecStartPre=/usr/bin/python2 /usr/share/openstack-dashboard/manage.py
ompress --force -v0 (code=exited, status=0/SUCCESS)
  Process: 32549 ExecStartPre=/usr/bin/python2 /usr/share/openstack-dashboard/manage.py
 collectstatic --noinput --clear -v0 (code=exited, status=0/SUCCESS)
 Main PID: 848 (httpd)
   Status: "Total requests: 0; Current requests/sec: 0; Current traffic:   0 B/sec"
    Tasks: 44
   CGroup: /system.slice/httpd.service
```

Cinder

```
[reponte@server3 ~]$ rpm -qa | grep cinder
python2-cinderclient-5.0.2-1.el7.noarch
openstack-cinder-15.6.0-1.el7.noarch
python2-cinder-15.6.0-1.el7.noarch
[reponte@server3 ~]$
```

```
[reponte@server3 ~]$ systemctl status openstack-cinder-api.service
● openstack-cinder-api.service - OpenStack Cinder API Server
   Loaded: loaded (/usr/lib/systemd/system/openstack-cinder-api.service; enabled; vendo
r preset: disabled)
   Active: active (running) since Tue 2024-05-07 18:56:23 PST; 1min 25s ago
 Main PID: 13556 (cinder-api)
    Tasks: 1
   CGroup: /system.slice/openstack-cinder-api.service
           └─13556 /usr/bin/python2 /usr/bin/cinder-api --config-file /usr/share/cin...

May 07 18:56:23 server3 systemd[1]: openstack-cinder-api.service holdoff time ove...rt.
May 07 18:56:23 server3 systemd[1]: Stopped OpenStack Cinder API Server.
May 07 18:56:23 server3 systemd[1]: Started OpenStack Cinder API Server.
May 07 18:56:29 server3 cinder-api[13556]: Deprecated: Option "logdir" from group ...".
Hint: Some lines were ellipsized, use -l to show in full.
[reponte@server3 ~]$
```

GIT PUSH

- After installing the packages, we need to save the changes to our GitHub repository using **git push origin/main**.

Reponte:

```
reponte@workstation:~/HOA15$ git add *
reponte@workstation:~/HOA15$ git commit -m "HOA15"
[main 72c7d3f] HOA15
 11 files changed, 370 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 openstack2.retry
 create mode 100644 openstack2.yml
 create mode 100644 roles/centos/tasks/main.yml
 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
reponte@workstation:~/HOA15$ git push origin
Counting objects: 19, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (15/15), done.
Writing objects: 100% (19/19), 4.38 KiB | 4.38 MiB/s, done.
Total 19 (delta 1), reused 0 (delta 0)
To github.com:meyreponte/HOA15.git
   0ed1514..72c7d3f  main -> main
reponte@workstation:~/HOA15$
```

Sales:

```
aj@workstations:~/hoa13$ git add roles
gaj@workstations:~/hoa13$ git commit -m "activity 15"
[main 6d178c4] activity 15
 3 files changed, 72 insertions(+)
 create mode 100644 roles/db_servers/task/horizon.yml
 create mode 100644 roles/web_servers/task/cinder.yml
 create mode 100644 roles/workstation/task/neutron.yml
aj@workstations:~/hoa13$ git push origin main
Enumerating objects: 20, done.
Counting objects: 100% (20/20), done.
Compressing objects: 100% (10/10), done.
Writing objects: 100% (12/12), 1.15 KiB | 588.00 KiB/s, done.
Total 12 (delta 5), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (5/5), completed with 3 local object
To github.com:Angelo001/hoa13.git
   a257ee6..6d178c4  main -> main
aj@workstations:~/hoa13$
```

Yu:

Rife:

Reflections:

Answer the following: [yu]

1. Describe Neutron, Horizon and Cinder services
    - First of all, Neutron handles the network openstack, manages how virtual machines connect to networks. Allows flexible network setups like VLANs and virtual routers. In Horizon lets users and admins easily control cloud resources. The Horizon offers a graphical way to create and manage projects, users, and quotas. Lastly the Cinder, provides persistent storage for virtual machines. Cinder handles creating, attaching, and backing up storage volumes. Overall each of them has unique way of using it and it's strength and weaknesses.

Conclusions:

Reponte:

In this activity, installing Neutron, Horizon, and Cinder on a Ubuntu and CentOS system as part of an OpenStack deployment can be intricate, requiring a good understanding of each component's functionality and interdependencies. Neutron is vital for network services, Horizon provides an accessible web interface, and Cinder offers necessary block storage capabilities. The process involves careful installation and configuration using tools like APT, YUM, and Packstack, followed by meticulous management and monitoring using **systemctl**. Troubleshooting plays a crucial role,

with detailed logs providing insights into issues. This activity underlines the importance of thorough planning, utilizing comprehensive documentation, maintaining regular updates, and engaging with community support. Each stage—from installation to daily management—offers valuable lessons in handling complex cloud infrastructure and emphasizes the necessity of hands-on experience and proactive problem-solving in maintaining a stable and secure cloud environment.

Rife:

Sales:
I consequently draw the conclusion that I have mastered various aspects of
open-source projects like Neutron, Horizon, and Cinder. Neutron provides network services, Cinder provides block storage, and Horizon offers a web-based interface for managers and users. Each component has a specific purpose. I've also transferred the knowledge I've gained from using the Ansible Playbook to Ansible Roles. I developed various playbooks for various groups and roles. Additionally, OpenStack supports a variety of cloud deployment models, including On-Premises Distribution, Public Clouds Built on OpenStack, Private Clouds Hosted on OpenStack, and more. While there are ironic, magnum and sahara, and other models in the service category.

Yu:
The Horizon, Neutron, and Cinder each provide a unique purpose and function. Each has several duties. Some of the softwares have unique qualities, and our objective in the following task is to install the three softwares using OpenStacks. I've profited from using the Ansible Playbook with Ansible Roles. I developed several playbooks for various groups and responsibilities. Furthermore, OpenStack supports a variety of cloud deployment models, such as on-premises distribution, public clouds built on OpenStack, private clouds hosted on OpenStack, and more.