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Course/Section: CPE31S6	Date Submitted: December 4, 2023
Instructor: Dr. Jonathan V. Taylar	Semester and SY: 1st Sem SY 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	
<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)	

Create new repository for HOA15 and clone to workstation

The screenshot shows the GitHub interface for a newly created repository named 'HOA15_Repani'. The repository is public and has 1 watcher, 0 forks, and 0 stars. The page offers options to 'Set up GitHub Copilot' and 'Add collaborators to this repository'. A 'Quick setup' section provides instructions for setting up on a desktop or cloning via HTTPS or SSH. The SSH URL is 'git@github.com:JelzLow/HOA15_Repani.git'. A '...or create a new repository on the command line' section provides a series of git commands to initialize the repository, create a README, commit, and push to the main branch.

HOA15_Repani Public

Pin Unwatch 1 Fork 0 Star 0

Set up GitHub Copilot
Use GitHub's AI pair programmer to autocomplete suggestions as you code.
Get started with GitHub Copilot

Add collaborators to this repository
Search for people using their GitHub username or email address.
Invite collaborators

Quick setup — if you've done this kind of thing before

Set up in Desktop or HTTPS SSH git@github.com:JelzLow/HOA15_Repani.git

Get started by [creating a new file](#) or [uploading an existing file](#). We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#).

...or create a new repository on the command line

```
echo "# HOA15_Repani" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M main
git remote add origin git@github.com:JelzLow/HOA15_Repani.git
git push -u origin main
```

```
jello@workstation:~$ git clone git@github.com:JelzLow/HOA15_Repani.git
Cloning into 'HOA15_Repani'...
warning: You appear to have cloned an empty repository.
```

Add the directories and files needed

```
jello@workstation:~/H0A15_Repani$ tree
```

```
.
├── ansible.cfg
├── cinder.conf.j2
├── install.yml
├── inventory
├── local_settings.py.j2
├── ml2_conf.ini.j2
├── neutron.conf.j2
├── openstack-dashboard.conf.j2
└── roles
    ├── cinder
    │   └── tasks
    │       └── main.yml
    ├── horizon
    │   └── tasks
    │       └── main.yml
    └── neutron
        └── tasks
            └── main.yml
```

7 directories, 11 files

Inventory file content

GNU nano 2.9.3	inventory	Modified
[horizon]		
192.168.56.103		
[neutron]		
192.168.56.103		
[cinder]		
192.168.56.103		

Contents of roles/cinder/tasks/

```
Code Blame 20 lines (15 loc) · 386 Bytes Raw Copy Download

1  ---
2
3
4  - name: Install Cinder packages
5    apt:
6      name:
7        - cinder-api
8        - cinder-scheduler
9        - cinder-volume
10     state: present
11
12  - name: Configure Cinder
13    template:
14      src: cinder.conf.j2
15      dest: /etc/cinder/cinder.conf
16
17  - name: Create Cinder database
18    command: cinder-manage db sync
19    become_user: cinder
20
```

Contents of roles/horizon/tasks/main.yml

```
Code Blame 21 lines (18 loc) · 525 Bytes Raw Copy Download

1  ---
2  - name: Install Horizon packages
3    apt:
4      name:
5        - openstack-dashboard
6      state: present
7
8  - name: Configure Apache for Horizon
9    template:
10     src: openstack-dashboard.conf.j2
11     dest: /etc/apache2/sites-available/openstack-dashboard.conf
12
13  - name: Configure Horizon settings
14    template:
15     src: local_settings.py.j2
16     dest: /etc/openstack-dashboard/local_settings.py
17
18  - name: Restart Apache
19    service:
20     name: apache2
21     state: restarted
```

Contents of roles/neutron/tasks/main.yml

```
Code Blame 27 lines (23 loc) · 630 Bytes Raw Copy Download Toggle

1  ---
2
3  - name: Install Neutron packages
4    apt:
5      name:
6        - neutron-server
7        - neutron-plugin-m12
8        - neutron-linuxbridge-agent
9        - neutron-l3-agent
10       - neutron-dhcp-agent
11       - neutron-metadata-agent
12      state: present
13
14  - name: Configure Neutron
15    template:
16      src: neutron.conf.j2
17      dest: /etc/neutron/neutron.conf
18
19  - name: Configure ML2 plugin
20    template:
21      src: ml2_conf.ini.j2
22      dest: /etc/neutron/plugins/ml2/ml2_conf.ini
23
24  - name: Restart Neutron
25    service:
26      name: neutron-server
27      state: restarted
```

Contents of cinder.conf.j2

```
Code Blame 20 lines (17 loc) · 469 Bytes Raw Copy Download Toggle

1  [DEFAULT]
2  transport_url = rabbit://guest:guest@localhost
3  auth_strategy = keystone
4
5  [database]
6  connection = sqlite:///var/lib/cinder/cinder.sqlite
7
8  [keystone_authtoken]
9  auth_uri = http://controller:5000
10 auth_url = http://controller:35357
11 memcached_servers = controller:11211
12 auth_type = password
13 project_domain_name = default
14 user_domain_name = default
15 project_name = service
16 username = cinder
17 password = CINDER_PASS
18
19 [oslo_concurrency]
20 lock_path = /var/lib/cinder/tmp
```

Contents of install.yml

```
Code Blame 18 lines (13 loc) · 194 Bytes Raw Copy Download Toggle

1
2 ---
3
4
5 - hosts: neutron
6   become: true
7   roles:
8     - role: neutron
9
10 - hosts: horizon
11   become: true
12   roles:
13     - role: horizon
14
15 - hosts: cinder
16   become: true
17   roles:
18     - role: cinder
```

Contents of local_settings.py.j2

```
Code Blame 8 lines (5 loc) · 319 Bytes Raw Copy Download Toggle

1 # The file is automatically created by the ansible role openstack-horizon
2 # during the installation of the openstack-dashboard package.
3
4 # Please use the "template" module for updates.
5
6 # Modifications to this file will be overwritten by the next update.
7
8 from openstack_dashboard.settings import * # noqa: F403, F401
```

Contents of ml2_conf.ini.j2

```
Code Blame 17 lines (13 loc) · 320 Bytes Raw Copy Download Toggle

1 [ml2]
2 type_drivers = flat,vlan,vxlan
3 tenant_network_types = vxlan
4 mechanism_drivers = linuxbridge,l2population
5 extension_drivers = port_security
6
7 [ml2_type_flat]
8 flat_networks = provider
9
10 [ml2_type_vlan]
11 network_vlan_ranges = physnet1:1000:2999
12
13 [ml2_type_vxlan]
14 vni_ranges = 1:1000
15
16 [securitygroup]
17 enable_ipset = True
```

Contents of neutron.conf.j2

```
Code Blame 19 lines (17 loc) · 468 Bytes Raw Copy Download Toggle
```

```
1 [DEFAULT]
2 core_plugin = ml2
3 service_plugins = router
4 allow_overlapping_ips = True
5 transport_url = rabbit://guest:guest@localhost
6
7 [database]
8 connection = sqlite:///var/lib/neutron/neutron.sqlite
9
10 [keystone_authtoken]
11 auth_uri = http://controller:5000
12 auth_url = http://controller:35357
13 memcached_servers = controller:11211
14 auth_type = password
15 project_domain_name = default
16 user_domain_name = default
17 project_name = service
18 username = neutron
19 password = NEUTRON_PASS
```

Contents of openstack-dashboard.conf.j2

```
Code Blame 15 lines (12 loc) · 523 Bytes Raw Copy Download Toggle
```

```
1 <VirtualHost *:80>
2     ServerName your_horizon_server_domain_or_ip
3
4     WSGIDaemonProcess horizon user=www-data group=www-data processes=3 threads=10 home=/usr/share/openstack-dashboard display-name=%{GROUP}
5     WSGIProcessGroup horizon
6     WSGIScriptAlias / /usr/share/openstack-dashboard/openstack_dashboard/wsgi/django.wsgi
7     WSGIPassAuthorization On
8
9     <IfModule mod_ssl.c>
10         SSLEngine Off
11     </IfModule>
12
13     ErrorLog ${APACHE_LOG_DIR}/horizon_error.log
14     CustomLog ${APACHE_LOG_DIR}/horizon_access.log combined
15 </VirtualHost>
```

Running the playbook

```
jello@workstation:~/H0A15_Repani$ ansible-playbook --ask-become-pass install.yml
BECOME password:

PLAY [neutron] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.103]

TASK [neutron : Install Neutron packages] *****
*
ok: [192.168.56.103]

TASK [neutron : Configure Neutron] *****
*
ok: [192.168.56.103]

TASK [neutron : Configure ML2 plugin] *****
*
ok: [192.168.56.103]

TASK [neutron : Restart Neutron] *****
*
changed: [192.168.56.103]

PLAY [horizon] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.103]

TASK [horizon : Install Horizon packages] *****
*
ok: [192.168.56.103]

TASK [horizon : Configure Apache for Horizon] *****
*
ok: [192.168.56.103]

TASK [horizon : Configure Horizon settings] *****
*
ok: [192.168.56.103]

TASK [horizon : Restart Apache] *****
*
changed: [192.168.56.103]
```



```

PLAY [cinder] *****
*

TASK [Gathering Facts] *****
*
ok: [192.168.56.103]

TASK [cinder : Install Cinder packages] *****
*
ok: [192.168.56.103]

TASK [cinder : Configure Cinder] *****
*
ok: [192.168.56.103]

TASK [cinder : Create Cinder database] *****
*
changed: [192.168.56.103]

PLAY RECAP *****
*
192.168.56.103      : ok=14   changed=3    unreachable=0    failed=0
skipped=0    rescued=0    ignored=0

jello@workstation:~/HOA15_Repani$

```

Proof

```

jello@server2:~$ sudo apt list --installed | grep cinder
[sudo] password for jello:

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,automatic]

jello@server2:~$ 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]

```

```
jello@server2:~$ 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,now 2:12.1.1-0ubuntu8.1 all [installed,automatic]
neutron-dhcp-agent/bionic-updates,bionic-updates,bionic-security,bionic-security,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-security,now 2:12.1.1-0ubuntu8.1 all [installed]
neutron-plugin-ml2/bionic-updates,bionic-updates,bionic-security,bionic-security,now 2:12.1.1-0ubuntu8.1 all [installed]
neutron-server/bionic-updates,bionic-updates,bionic-security,bionic-security,now 2:12.1.1-0ubuntu8.1 all [installed]
python-neutron/bionic-updates,bionic-updates,bionic-security,bionic-security,now 2:12.1.1-0ubuntu8.1 all [installed,automatic]
python-neutron-fwaas/bionic-updates,bionic-updates,now 1:12.0.2-0ubuntu1 all [installed,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,automatic]
python3-neutronclient/bionic,bionic,now 1:6.7.0-0ubuntu1 all [installed,automatic]
```

Pushing to git

```
jello@workstation:~/HOA15_Repani$ git add *
jello@workstation:~/HOA15_Repani$ git commit -m "HOA15 complete"
[master (root-commit) dcb9bff] HOA15 complete
11 files changed, 182 insertions(+)
create mode 100644 ansible.cfg
create mode 100644 cinder.conf.j2
create mode 100644 install.yml
create mode 100644 inventory
create mode 100644 local_settings.py.j2
create mode 100644 ml2_conf.ini.j2
create mode 100644 neutron.conf.j2
create mode 100644 openstack-dashboard.conf.j2
create mode 100644 roles/cinder/tasks/main.yml
create mode 100644 roles/horizon/tasks/main.yml
create mode 100644 roles/neutron/tasks/main.yml
jello@workstation:~/HOA15_Repani$ git push origin
Counting objects: 20, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (14/14), done.
Writing objects: 100% (20/20), 2.87 KiB | 1.43 MiB/s, done.
Total 20 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To github.com:JelzLow/HOA15_Repani.git
* [new branch]      master -> master
```

HOA15_Repani Public

Pin Unwatch 1 Fork 0 Star 0

master Go to file Add file <> Code About

Branches Tags

JelzLow HOA15 complete now 1

roles	HOA15 complete	now
ansible.cfg	HOA15 complete	now
cinder.conf.j2	HOA15 complete	now
install.yml	HOA15 complete	now
inventory	HOA15 complete	now
local_settings.pyj2	HOA15 complete	now
ml2_conf.ini.j2	HOA15 complete	now
neutron.conf.j2	HOA15 complete	now
openstack-dashboar...	HOA15 complete	now

Help people interested in this repository understand your project by adding a README. Add a README

About Hands on Activity 15 - CPE232 Sys Ad 2

Activity 0 stars 1 watching 0 forks

Releases No releases published Create a new release

Packages No packages published Publish your first package

Languages

https://github.com/JelzLow/HOA15_Repani

Reflections:

Answer the following:

- Describe Neutron, Horizon and Cinder services
 - Neutron, Horizon, and Cinder services are part of OpenStack. Each of these have its own specific function. The Neutron service is able to provide networking as a service between different devices that use OpenStack. The Horizon service can help in managing and securing the different devices and applications and as well as accessing the cloud service with the use of a GUI. And lastly is the Cinder service is a block storage service. This enables users to create and manage a block service which can store data separately from the virtual machines. This is mostly used for data management.

Conclusions:

In this hands-on activity the topic is about the installation of additional services used in OpenStack. This one specifically uses Neutron, Horizon, and Cinder. Each of these provides a lot of functions and quality of life in terms of creating and managing servers and different devices. In the procedure part of the activity, I made use of the

ansible playbook in order to install these services. I made use of a lot of online resources and references in order to complete the task and come up with the intended output.