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Course/Section: CPE232 - CPE31S4	**Date Submitted:** 12-06-23
Instructor: Dr. Jonathan V. Taylar	**Semester and SY:** 1st Sem: '23 - '24

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

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

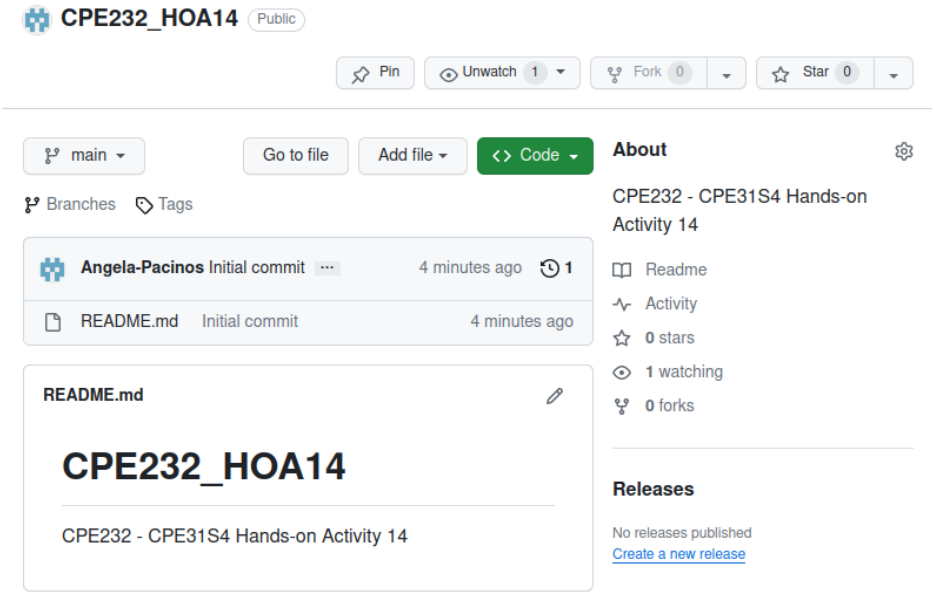
4. Tasks

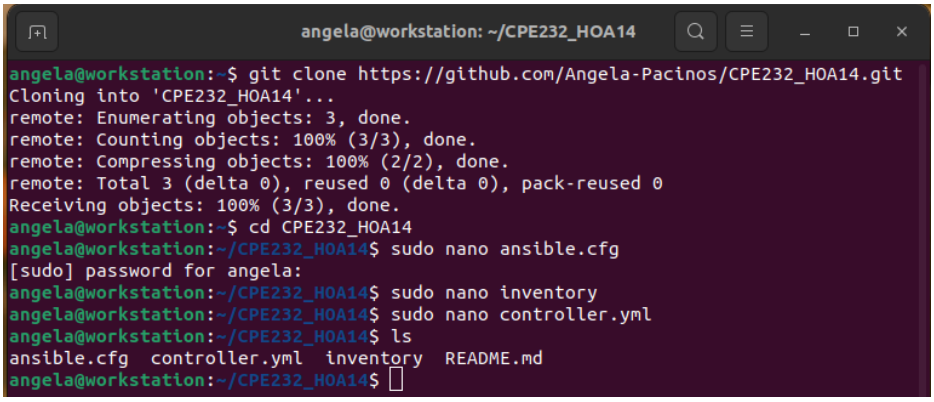
1. Create a new repository for this activity.
2. Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/
    a. Keystone (Identity Service)
    b. Glance (Imaging Service)
    c. Nova (Compute Service)
    d. Create different plays in installing per 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.

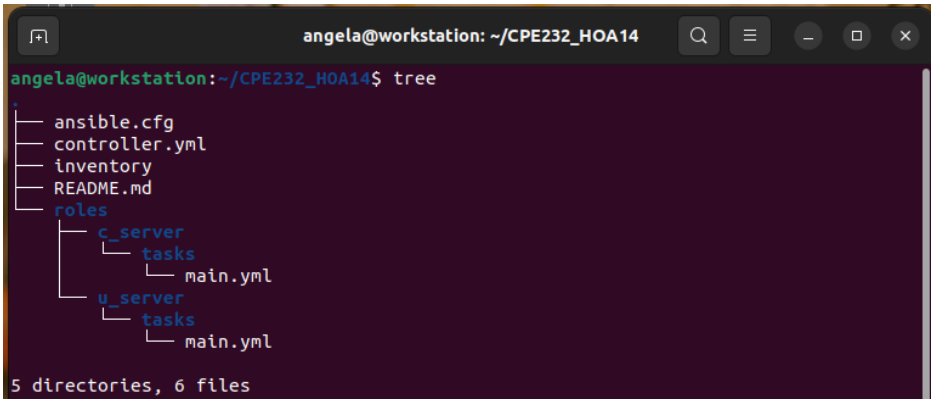
5. Output (screenshots and explanations)

INPUT

Create a new repository for this activity

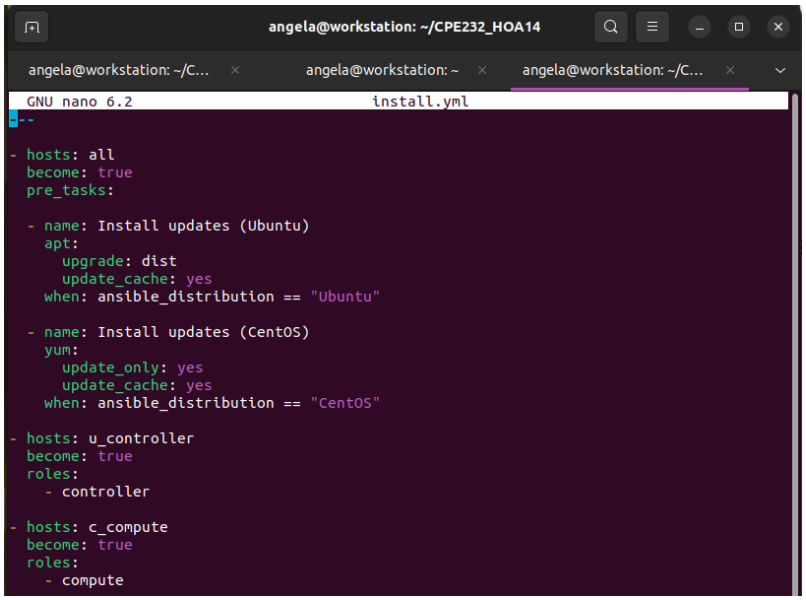




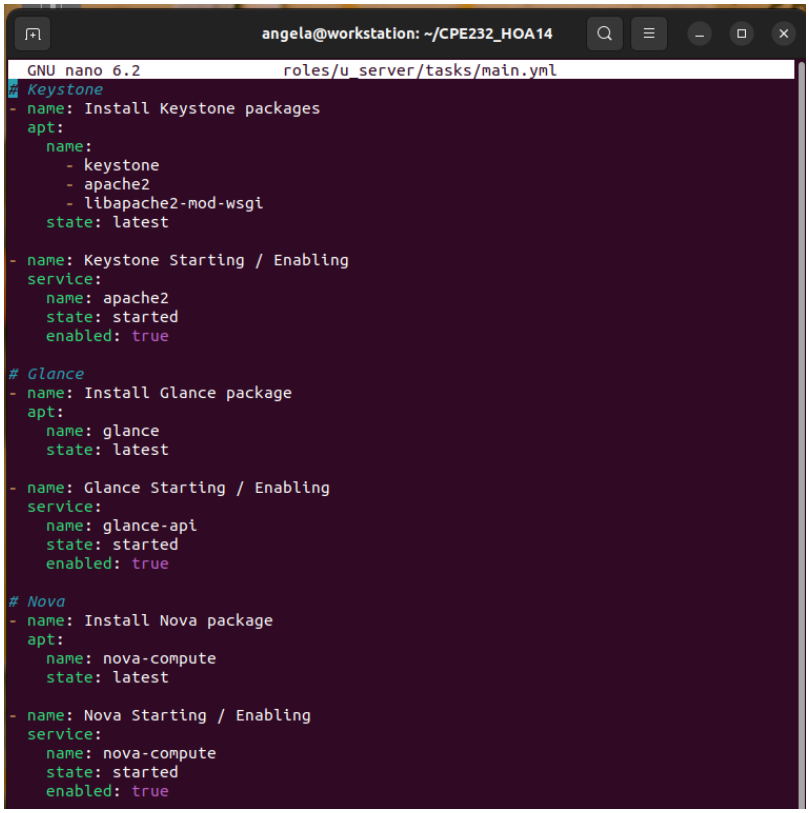


Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/

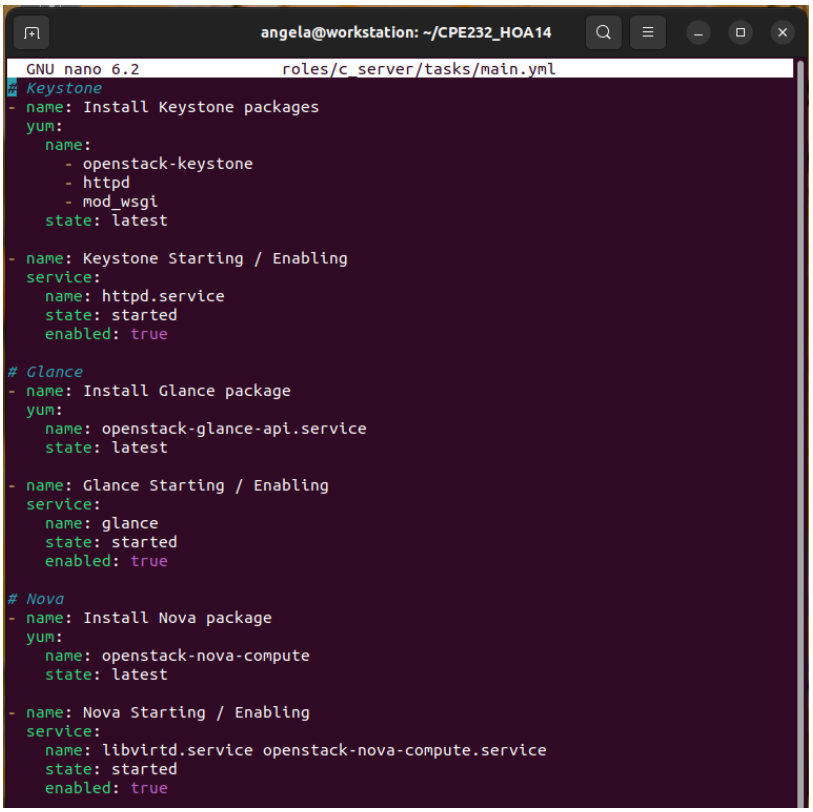
install.yml



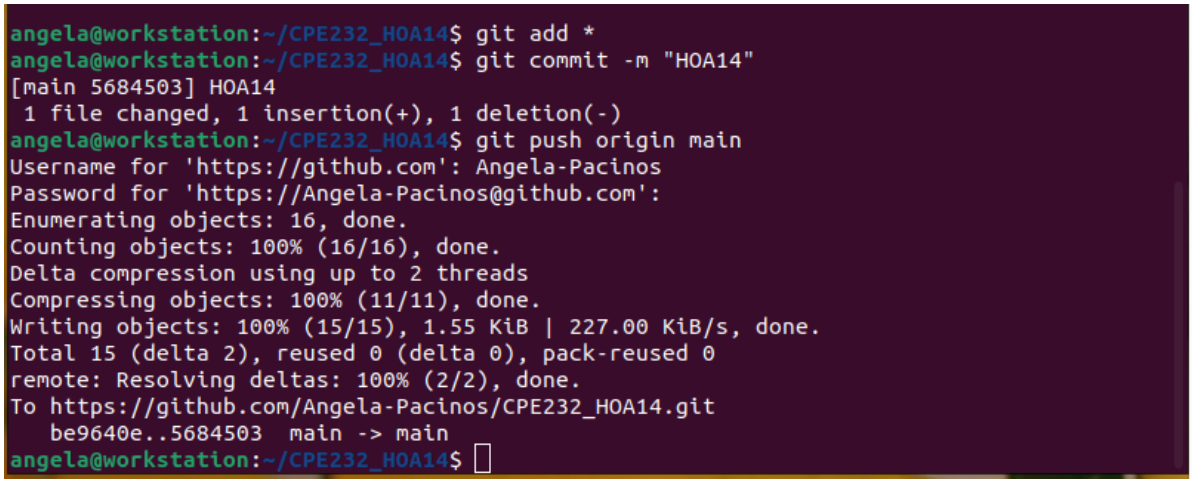
for Ubuntu (controller)



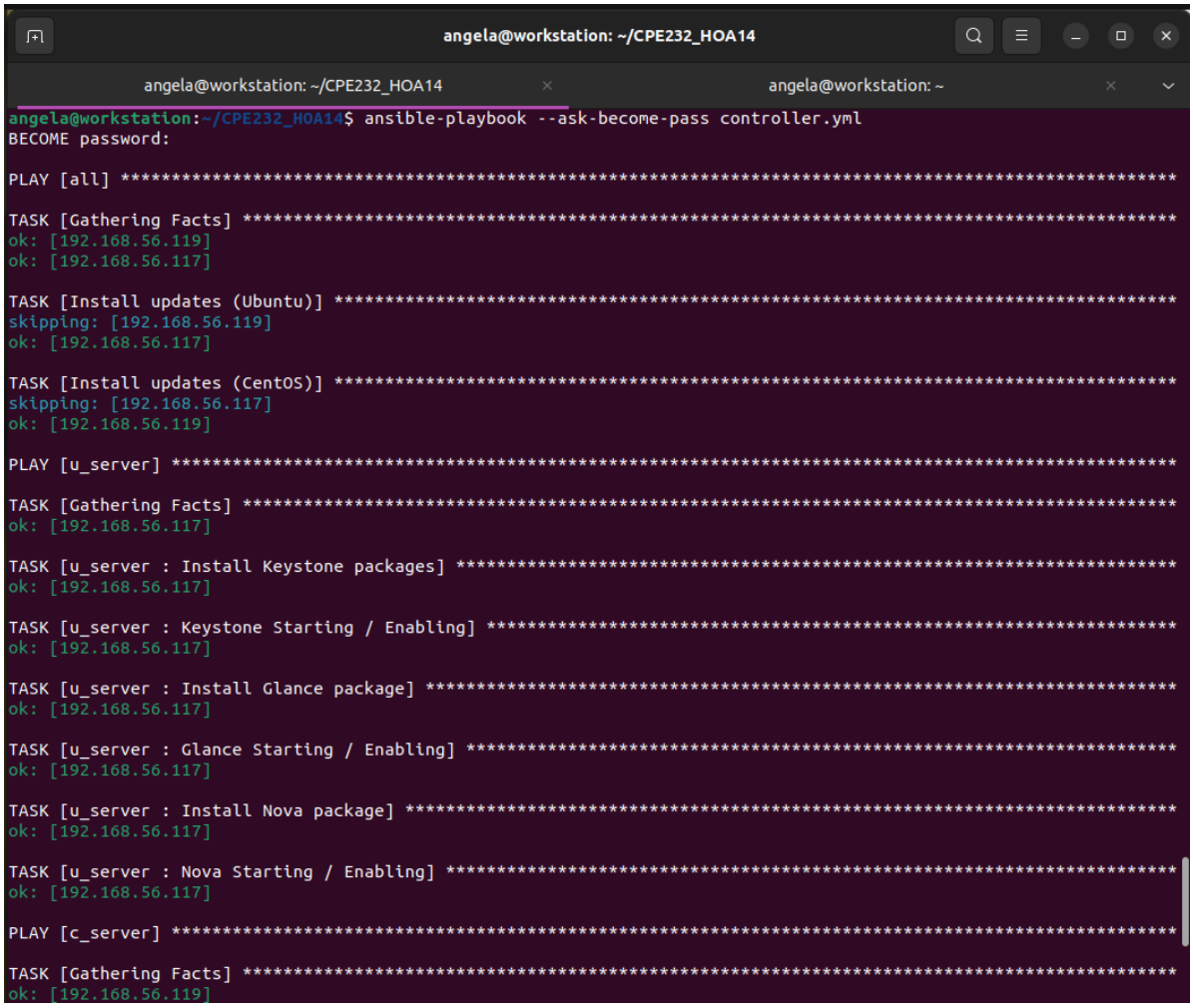
for CentOS (compute)



Add, commit, and push it to your GitHub repo.



PROCESS

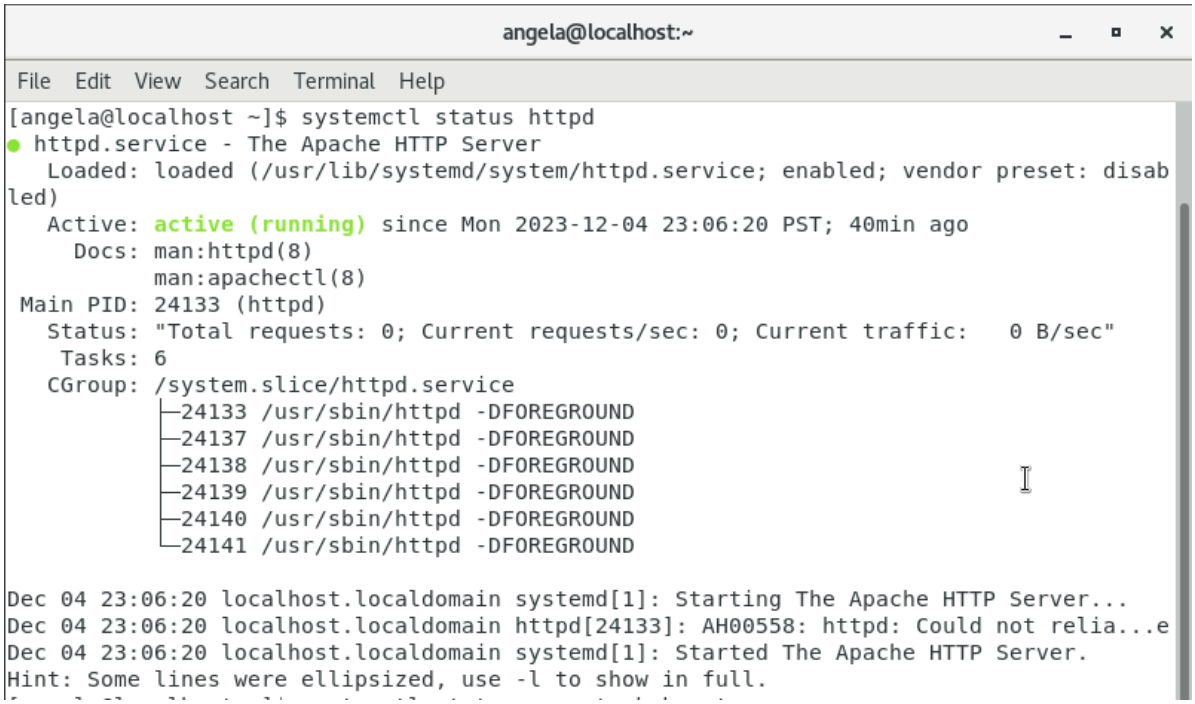

angela@workstation: ~/CPE232_HOA14
angela@workstation: ~/CPE232_HOA14
angela@workstation: ~
angela@workstation:~/CPE232_HOA14$ ansible-playbook --ask-become-pass controller.yml
BECOME password:
PLAY [all] ***********
TASK [Gathering Facts] ***********
ok: [192.168.56.119]
ok: [192.168.56.117]
TASK [Install updates (Ubuntu)] ***********
skipping: [192.168.56.119]
ok: [192.168.56.117]
TASK [Install updates (CentOS)] ***********
skipping: [192.168.56.117]
ok: [192.168.56.119]
PLAY [u_server] ***********
TASK [Gathering Facts] ***********
ok: [192.168.56.117]
TASK [u_server : Install Keystone packages] ***********
ok: [192.168.56.117]
TASK [u_server : Keystone Starting / Enabling] ***********
ok: [192.168.56.117]
TASK [u_server : Install Glance package] ***********
ok: [192.168.56.117]
TASK [u_server : Glance Starting / Enabling] ***********
ok: [192.168.56.117]
TASK [u_server : Install Nova package] ***********
ok: [192.168.56.117]
TASK [u_server : Nova Starting / Enabling] ***********
ok: [192.168.56.117]
PLAY [c_server] ***********
TASK [Gathering Facts] ***********
ok: [192.168.56.119]

```
PLAY [c_server] ***************************************************************************************************

TASK [Gathering Facts] ********************************************************************************************
ok: [192.168.56.119]

TASK [c_server : Install Keystone packages] ***********************************************************************
ok: [192.168.56.119]

TASK [c_server : Keystone Starting / Enabling] ********************************************************************
ok: [192.168.56.119]

TASK [c_server : Install Glance package] **************************************************************************
ok: [192.168.56.119]

TASK [c_server : Glance Starting / Enabling] ***********************************************************************
ok: [192.168.56.119]

TASK [c_server : Install Nova packages] ***************************************************************************
ok: [192.168.56.119]

TASK [c_server : Nova Starting / Enabling] ************************************************************************
changed: [192.168.56.119]

PLAY RECAP ********************************************************************************************************
192.168.56.117             : ok=9    changed=0    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0

192.168.56.119             : ok=9    changed=1    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0


angela@workstation:~/CPE232_HOA14$
```

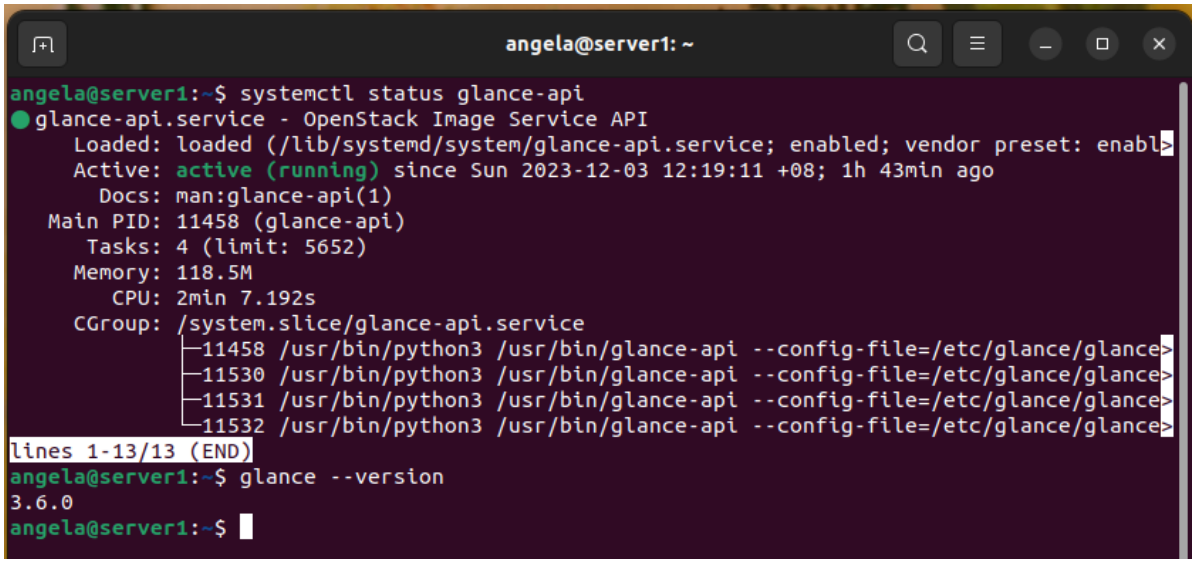
OUTPUT

Keystone

```
angela@server1: ~
angela@server1:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
     Active: active (running) since Sun 2023-12-03 12:18:33 +08; 1h 43min ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 10977 (apache2)
      Tasks: 26 (limit: 5652)
     Memory: 48.3M
        CPU: 6.058s
     CGroup: /system.slice/apache2.service
             ├─10977 /usr/sbin/apache2 -k start
             ├─10979 "(wsgi:keystone-pu" -k start
             ├─10980 "(wsgi:keystone-pu" -k start
             ├─10981 "(wsgi:keystone-pu" -k start
             ├─10982 "(wsgi:keystone-pu" -k start
             ├─10983 "(wsgi:keystone-pu" -k start
             ├─10984 /usr/sbin/apache2 -k start
             ├─10985 /usr/sbin/apache2 -k start
             ├─10986 /usr/sbin/apache2 -k start
             ├─10987 /usr/sbin/apache2 -k start
             └─10988 /usr/sbin/apache2 -k start
angela@server1:~$ keystone-manage --version
21.0.1
angela@server1:~$
```


angela@localhost:~
File Edit View Search Terminal Help
[angela@localhost ~]$ systemctl status httpd
● httpd.service - The Apache HTTP Server
Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)
Active: active (running) since Mon 2023-12-04 23:06:20 PST; 40min ago
Docs: man:httpd(8)
man:apachectl(8)
Main PID: 24133 (httpd)
Status: "Total requests: 0; Current requests/sec: 0; Current traffic: 0 B/sec"
Tasks: 6
CGroup: /system.slice/httpd.service
├─24133 /usr/sbin/httpd -DFOREGROUND
├─24137 /usr/sbin/httpd -DFOREGROUND
├─24138 /usr/sbin/httpd -DFOREGROUND
├─24139 /usr/sbin/httpd -DFOREGROUND
├─24140 /usr/sbin/httpd -DFOREGROUND
└─24141 /usr/sbin/httpd -DFOREGROUND
Dec 04 23:06:20 localhost.localdomain systemd[1]: Starting The Apache HTTP Server...
Dec 04 23:06:20 localhost.localdomain httpd[24133]: AH00558: httpd: Could not relia...e
Dec 04 23:06:20 localhost.localdomain systemd[1]: Started The Apache HTTP Server.
Hint: Some lines were ellipsized, use -l to show in full.

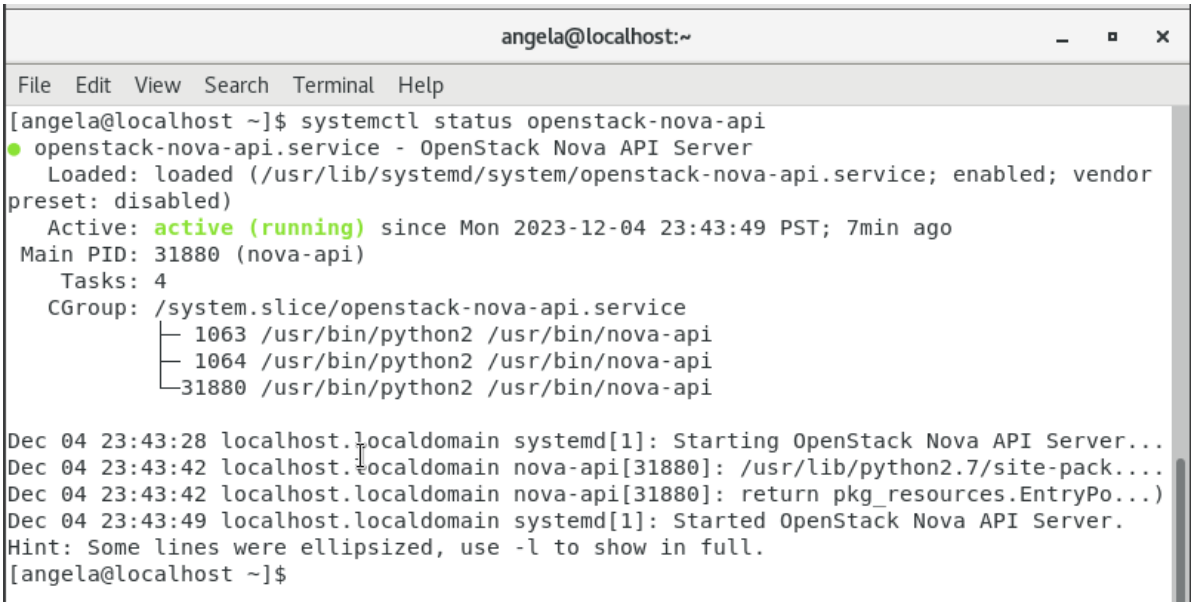
Glance


angela@server1: ~
angela@server1:~$ systemctl status glance-api
● glance-api.service - OpenStack Image Service API
Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor preset: enabl>
Active: active (running) since Sun 2023-12-03 12:19:11 +08; 1h 43min ago
Docs: man:glance-api(1)
Main PID: 11458 (glance-api)
Tasks: 4 (limit: 5652)
Memory: 118.5M
CPU: 2min 7.192s
CGroup: /system.slice/glance-api.service
├─11458 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance>
├─11530 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance>
├─11531 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance>
└─11532 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance/glance>
lines 1-13/13 (END)
angela@server1:~$ glance --version
3.6.0
angela@server1:~$

```
angela@localhost:~
File  Edit  View  Search  Terminal  Help
[angela@localhost ~]$ systemctl status openstack-glance-api
● openstack-glance-api.service - OpenStack Image Service (code-named Glance) API server
   Loaded: loaded (/usr/lib/systemd/system/openstack-glance-api.service; enabled; vendo
r preset: disabled)
   Active: active (running) since Mon 2023-12-04 23:30:26 PST; 19min ago
 Main PID: 27465 (glance-api)
    Tasks: 3
   CGroup: /system.slice/openstack-glance-api.service
           ├─27465 /usr/bin/python2 /usr/bin/glance-api
           ├─27612 /usr/bin/python2 /usr/bin/glance-api
           └─27613 /usr/bin/python2 /usr/bin/glance-api

Dec 04 23:30:26 localhost.localdomain systemd[1]: Started OpenStack Image Service (....
Dec 04 23:30:35 localhost.localdomain glance-api[27465]: /usr/lib/python2.7/site-pac...
Dec 04 23:30:35 localhost.localdomain glance-api[27465]: return pkg_resources.EntryP...
Hint: Some lines were ellipsized, use -l to show in full.
[angela@localhost ~]$
```

Nova

```
angela@server1: ~
angela@server1:~$ systemctl status nova-compute
● nova-compute.service - OpenStack Compute
     Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor preset: ena>
     Active: active (running) since Sun 2023-12-03 12:12:41 +08; 2h 4min ago
   Main PID: 1916 (nova-compute)
      Tasks: 2 (limit: 5652)
     Memory: 169.3M
        CPU: 12.788s
     CGroup: /system.slice/nova-compute.service
             └─1916 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/nova/nova.co>

Warning: some journal files were not opened due to insufficient permissions.

angela@server1:~$ nova-compute --version
Modules with known eventlet monkey patching issues were imported prior to eventlet monkey p
atching: urllib3. This warning can usually be ignored if the caller is only importing and n
ot executing nova code.
25.2.1
```



Reflections:

1. **Describe Keystone, Glance and Nova services**

Keystone is an Openstack Identity service that provides API identity, Authentication and Authorization. It usually is the first service where the users interact with the authenticated. It ensures that only authenticated users can access the openstack resources.

Glance or the image service is for VMs to retrieve, discover, register, etc. images. The said images are the templates used to create new virtual machines. It provides a centralized repository for organizing and managing the different operating system images.

Nova is used to give the users the authorization to use the for launching applications in virtual machines. It is developed to provide quick access to compute resources and allow the managing of the VMs. It also has features for managing storage, security, etc aspects of virtual machines.

Conclusions:

For this activity, it is connected to the previous one as we needed to install openstack packages that are inside the main openstack that we have installed from the previous one. What I did first was to ensure that the openstack package was properly installed for the packages to smoothly install. I had a problem with

openstack in centos about the subscription but I just had to install another type of openstack in this case the openstack-train and eventually was able to figure it out. I created the playbook of the installation based on the given website and structured it as for the playbook. I tried running the playbook and there were errors but it was easy to fix and I just had to remove or add some wordings for it to work.