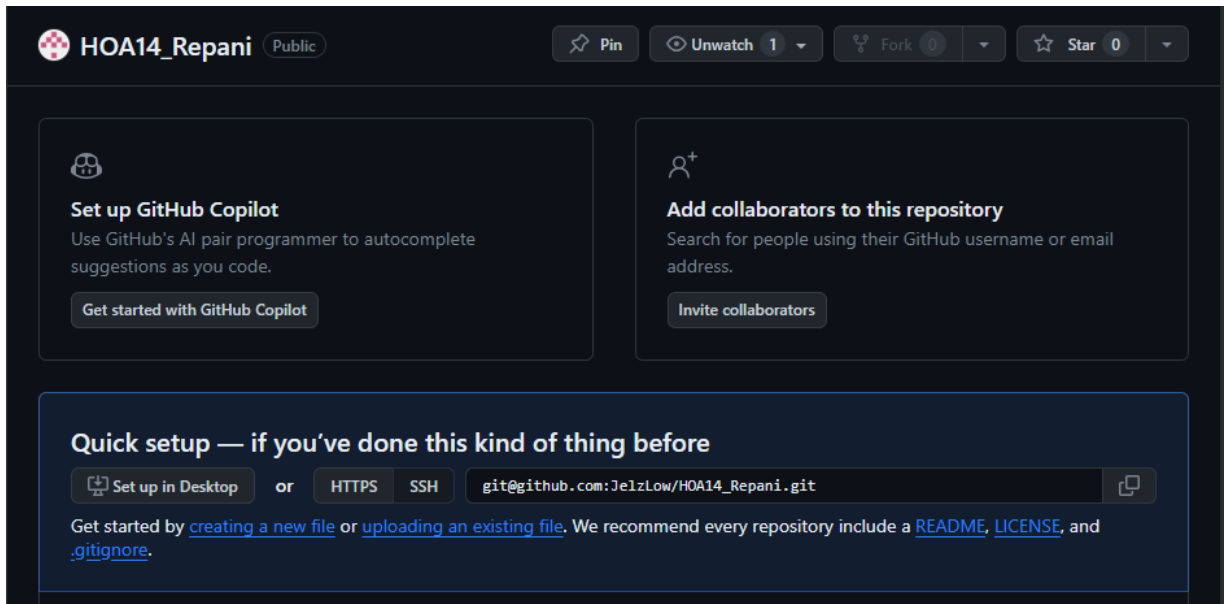


Name: Repani, Justin Jello J.	Date Performed: November 30, 2023
Course/Section: CPE31S6	Date Submitted: November 30, 2023
Instructor: Dr. Jonathan V. Taylar	Semester and SY: 1st Sem SY 2023-2024
Activity 14: OpenStack Installation (Keystone, Glance, Nova)	
1. Objectives	
Create a workflow to install OpenStack using Ansible as your Infrastructure as Code (IaC).	
2. Intended Learning Outcomes	
<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. 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)	

Create a new repository and clone to workstation



The screenshot shows the GitHub interface for a repository named "HOA14_Repani". At the top, there are buttons for "Pin", "Unwatch 1", "Fork 0", and "Star 0". Below this, there are two main sections: "Set up GitHub Copilot" and "Add collaborators to this repository". The "Set up GitHub Copilot" section includes a description and a button "Get started with GitHub Copilot". The "Add collaborators to this repository" section includes a description and a button "Invite collaborators". Below these sections, there is a "Quick setup" section with a "Set up in Desktop" button, an "or" separator, and "HTTPS" and "SSH" options. The "SSH" option is selected, showing the URL "git@github.com:JelzLow/HOA14_Repani.git". Below the "Quick setup" section, there is a note about getting started by creating a new file or uploading an existing file, and a recommendation to include a README, LICENSE, and .gitignore.

```
jello@workstation:~$ git clone git@github.com:JelzLow/HOA14_Repani.git
Cloning into 'HOA14_Repani'...
warning: You appear to have cloned an empty repository.
jello@workstation:~$
```

Create the appropriate directories with roles and the yml files

```
jello@workstation:~/HOA14_Repani$ tree
.
├── ansible.cfg
├── install.yml
├── inventory
├── roles
│   ├── glance
│   │   └── tasks
│   │       └── main.yml
│   ├── keystone
│   │   └── tasks
│   │       └── main.yml
│   └── nova
│       └── tasks
│           └── main.yml
└── 7 directories, 6 files
```

Inventory file

```
GNU nano 2.9.3 inventory Modified
[glance]
192.168.56.103

[keystone]
192.168.56.103

[nova]
192.168.56.103
```

Contents of roles/glance/tasks/main.yml

Code

Blame

83 lines (71 loc) · 2.04 KB

Raw



```
1  #This is the main.yml playbook for installing Glance
2
3  - name: Install Glance (Ubuntu)
4    apt:
5      name:
6        - glance
7      state: latest
8
9  - name: Configure Glance database
10   replace:
11     dest: /etc/glance/glance-api.conf
12     regexp: connection = mysql+pymysql://glance:GLANCE_DBPASS@controller/glance
13     replace: connection = mysql+pymysql://glance:admin123@controller/glance
14     backup: yes
15
16  - name: Configure Glance Authentication Key
17    lineinfile:
18      dest: /etc/glance/glance-api.conf
19      insertafter: '[keystone_authtoken\]'
20      line: "{{ item }}"
21      state: present
22      backup: yes
23
24  with_items:
25    - www_authenticate_uri = http://controller:5000
26    - auth_url = http://controller:5000
27    - memcached_servers = controller:11211
28    - auth_type = password
29    - project_domain_name = Default
30    - user_domain_name = Default
31    - project_name = service
32    - username = glance
33    - password = admin123
34
35  - name: Configure Glance paste_deploy
36    lineinfile:
37      dest: /etc/glance/glance-api.conf
38      insertafter: '[paste_deploy\]'
39      line: 'flavor = keystone'
40      backup: yes
```

```
41
42 - name: COnfigure Glance glance_store
43   lineinfile:
44     dest: /etc/glance/glance-api.conf
45     insertafter: '\[glance_store\]'
46     line: "{{ item }}"
47     state: present
48     backup: yes
49
50   with_items:
51     - stores = file,http
52     - default_store = file
53     - filesystem_store_datadir = /var/lib/glance/images/
54
55 - name: Configure Glance oslo_limit
56   lineinfile:
57     dest: /etc/glance/glance-api.conf
58     insertafter: '\[oslo_limit\]'
59     line: "{{ item }}"
60     state: present
61     backup: yes
62
63   with_items:
64     - auth_url = http://controller:5000
65     - auth_type = password
66     - user_domain_id = default
67     - username = MY_SERVICE
68     - system_scope = all
69     - password = MY_PASSWORD
70     - endpoint_id = ENDPOINT_ID
71     - region_name = RegionOne
72
73 - name: Configure Glance DEFAULT
74   lineinfile:
75     dest: /etc/glance/glance-api.conf
76     insertafter: '\[DEFAULT\]'
77     line: 'use_keystone_limits = True'
78     backup: yes
79
80 - name: Populating Image Service Database
81   shell:
82     sudo glance-manage db_sync
```

Contents of roles/keystone/tasks/main.yml

Code

Blame

51 lines (43 loc) · 1.41 KB

Raw



```
1  #This is the main.yml playbook for installing Keystone
2
3  - name: Installing Keystone (Ubuntu)
4    apt:
5      name: keystone
6      state: latest
7
8  - name: Configuring Config File
9    lineinfile:
10     dest: /etc/keystone/keystone.conf
11     insertafter: '\[database\]'
12     regexp: 'connection = mysql+pymysql://keystone:KEYSTONE_DBPASS@controller/keystone'
13     line: 'connection = mysql+pymysql://keystone:admin123@controller/keystone'
14     backup: yes
15     backrefs: yes
16
17  - name: Configuring Config File
18    lineinfile:
19     dest: /etc/keystone/keystone.conf
20     insertafter: '\[token\]'
21     line: 'provider = fernet'
22     backup: yes
23
24  - name: Populating the Database
25    shell:
26     sudo keystone-manage db_sync
27
28  - name: Initialize Fernet Key
29    shell:
30     keystone-manage fernet_setup --keystone-user keystone --keystone-group keystone
31
32  - name: Initialize Fernet Key
33    shell:
34     keystone-manage credential_setup --keystone-user keystone --keystone-group keystone
35
36  - name: Configuring the Apache (HTTP) Server
37    lineinfile:
38     dest: /etc/apache2/apache2.conf
39     line: 'ServerName controller'
40     state: present
41     backup: yes
42
43  - name: Configure Administrative Account Environmental Variables
44    shell:
45     export OS_USERNAME=admin
46     export OS_PASSWORD=ADMIN_PASS
47     export OS_PROJECT_NAME=admin
48     export OS_USER_DOMAIN_NAME=Default
49     export OS_PROJECT_DOMAIN_NAME=Default
50     export OS_AUTH_URL=http://controller:5000/v3
51     export OS_IDENTITY_API_VERSION=3
```

Contents of roles/nova/tasks/main.yml

Code

Blame

124 lines (107 loc) · 2.94 KB

Raw



```
1  #This is the main.yml playbook for installing Nova
2
3  - name: Installing Nova (Ubuntu)
4    apt:
5      name:
6        - nova-api
7        - nova-conductor
8        - nova-novncproxy
9        - nova-scheduler
10     state: latest
11
12  - name: Configuring Nova API
13    lineinfile:
14      dest: /etc/nova/nova.conf
15      regexp: connection = mysql+pymysql://nova:NOVA_DBPASS@controller/nova_api
16      line: connection = mysql+pymysql://nova:admin123@controller/nova_api
17      backup: yes
18      backrefs: yes
19
20  - name: Configure Nova API
21    lineinfile:
22      dest: /etc/nova/nova.conf
23      insertafter: '\[api\]'
24      line: 'auth_strategy = keystone'
25      state: present
26      backup: yes
27
28  - name: Configuring Nova Database
29    lineinfile:
30      dest: /etc/nova/nova.conf
31      regexp: mysql+pymysql://nova:NOVA_DBPASS@controller/nova
32      line: mysql+pymysql://nova:admin123@controller/nova
33      backup: yes
34      backrefs: yes
35
36  - name: Configure Nova Authentication Token (for Keystone)
37    lineinfile:
38      dest: /etc/glance/glance-api.conf
39      insertafter: '\[keystone_authtoken\]'
40      line: "{{ item }}"
41      state: present
42      backup: yes
43    with_items:
44      - www_authenticate_uri = http://controller:5000/
```

```
45     - auth_url = http://controller:5000/
46     - memcached_servers = controller:11211
47     - auth_type = password
48     - project_domain_name = Default
49     - user_domain_name = Default
50     - project_name = service
51     - username = nova
52     - password = admin123
53
54     - name: Configure Nova VNC
55     lineinfile:
56         dest: /etc/glance/glance-api.conf
57         insertafter: '\[vnc\]'
58         line: "{{ item }}"
59         state: present
60         backup: yes
61
62     with_items:
63         - enabled = true
64         - server_listen = $my_ip
65         - server_proxyclient_address = $my_ip
66
67     - name: Configure Nova placement
68     lineinfile:
69         dest: /etc/glance/glance-api.conf
70         insertafter: '\[placement\]'
71         line: "{{ item }}"
72         state: present
73         backup: yes
74
75     with_items:
76         - region_name = RegionOne
77         - project_domain_name = Default
78         - project_name = service
79         - auth_type = password
80         - user_domain_name = Default
81         - auth_url = http://controller:5000/v3
82         - username = placement
83         - password = admin123
84
85     - name: Configure Nova Default
86     lineinfile:
```



```
87     dest: /etc/nova/nova.conf
88     line: 'my_ip = 10.0.0.11'
89     state: present
90     backup: yes
91
92 - name: Configure Nova Glance
93   lineinfile:
94     dest: /etc/nova/nova.conf
95     line: 'api_server = http://controller:9292'
96     state: present
97     backup: yes
98
99 - name: Configure Nova oslo_concurrency
100   lineinfile:
101     dest: /etc/nova/nova.conf
102     line: 'lock_path = /var/lib/nova/tmp'
103     state: present
104     backup: yes
105
106 - name: Additional Configuration of Nova
107   shell:
108     sudo nova-manage api_db sync
109
110 - name: Additional Configuration
111   shell:
112     sudo nova-manage cell_v2 map_cell0
113
114 #- name: Additional Configuration
115 # shell:
116 #   sudo nova-manage cell_v2 create_cell --name=cell1 --verbose
117
118 - name: Additional Configuration
119   shell:
120     sudo nova-manage db sync
121
122 - name: Additional Configuration
123   shell:
124     sudo nova-manage cell_v2 list_cells
```

Running the playbook

```
jello@workstation:~/H0A14_Repani$ ansible-playbook --ask-become-pass install.yml
l
BECOME password:

PLAY [keystone] *****
*

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

TASK [keystone : Installing Keystone (Ubuntu)] *****
*
changed: [192.168.56.103]

TASK [keystone : Configuring Config File] *****
*
ok: [192.168.56.103]

TASK [keystone : Configuring Config File] *****
*
changed: [192.168.56.103]

TASK [keystone : Populating the Database] *****
*
changed: [192.168.56.103]
```

```
TASK [keystone : Initialize Fernet Key] *****
*
changed: [192.168.56.103]

TASK [keystone : Initialize Fernet Key] *****
*
changed: [192.168.56.103]

TASK [keystone : Configuring the Apache (HTTP) Server] *****
*
changed: [192.168.56.103]

TASK [keystone : Configure Administrative Account Environmental Variables] ****
*
changed: [192.168.56.103]

PLAY [glance] *****
*

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

TASK [glance : Install Glance (Ubuntu)] *****
*
changed: [192.168.56.103]
```

```
TASK [glance : Configure Glance database] *****
*
ok: [192.168.56.103]

TASK [glance : Configure Glance Authentication Key] *****
*
changed: [192.168.56.103] => (item=www_authenticate_uri = http://controller:5000)
changed: [192.168.56.103] => (item=auth_url = http://controller:5000)
changed: [192.168.56.103] => (item=memcached_servers = controller:11211)
changed: [192.168.56.103] => (item=auth_type = password)
changed: [192.168.56.103] => (item=project_domain_name = Default)
changed: [192.168.56.103] => (item=user_domain_name = Default)
changed: [192.168.56.103] => (item=project_name = service)
changed: [192.168.56.103] => (item=username = glance)
changed: [192.168.56.103] => (item=password = admin123)

TASK [glance : Configure Glance paste_deploy] *****
*
changed: [192.168.56.103]
```

```
TASK [glance : Configure Glance glance_store] *****
*
changed: [192.168.56.103] => (item=stores = file,http)
changed: [192.168.56.103] => (item=default_store = file)
changed: [192.168.56.103] => (item=filesystem_store_datadir = /var/lib/glance/images/)
```

```
TASK [glance : Configure Glance oslo_limit] *****
*
ok: [192.168.56.103] => (item=auth_url = http://controller:5000)
ok: [192.168.56.103] => (item=auth_type = password)
changed: [192.168.56.103] => (item=user_domain_id = default)
changed: [192.168.56.103] => (item=username = MY_SERVICE)
changed: [192.168.56.103] => (item=system_scope = all)
changed: [192.168.56.103] => (item=password = MY_PASSWORD)
changed: [192.168.56.103] => (item=endpoint_id = ENDPOINT_ID)
changed: [192.168.56.103] => (item=region_name = RegionOne)
```

```
TASK [glance : Configure Glance DEFAULT] *****
*
changed: [192.168.56.103]
```

```
TASK [glance : Populating Image Service Database] *****
*
changed: [192.168.56.103]
```

```
PLAY [nova] *****
*
```

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

```
TASK [nova : Installing Nova (Ubuntu)] *****
*
changed: [192.168.56.103]
```

```
TASK [nova : Configuring Nova API] *****
*
ok: [192.168.56.103]
```

```
TASK [nova : Configure Nova API] *****
*
changed: [192.168.56.103]
```

```
TASK [nova : Configuring Nova Database] *****
*
ok: [192.168.56.103]
```

```
TASK [nova : Configure Nova Authentication Token (for Keystone)] *****
*
changed: [192.168.56.103] => (item=www_authenticate_uri = http://controller:5000/)
changed: [192.168.56.103] => (item=auth_url = http://controller:5000/)
ok: [192.168.56.103] => (item=memcached_servers = controller:11211)
ok: [192.168.56.103] => (item=auth_type = password)
ok: [192.168.56.103] => (item=project_domain_name = Default)
ok: [192.168.56.103] => (item=user_domain_name = Default)
ok: [192.168.56.103] => (item=project_name = service)
changed: [192.168.56.103] => (item=username = nova)
ok: [192.168.56.103] => (item=password = admin123)
```

```
TASK [nova : Configure Nova VNC] *****
*
changed: [192.168.56.103] => (item=enabled = true)
changed: [192.168.56.103] => (item=server_listen = $my_ip)
changed: [192.168.56.103] => (item=server_proxyclient_address = $my_ip)
```

```
TASK [nova : Configure Nova placement] *****
*
ok: [192.168.56.103] => (item=region_name = RegionOne)
ok: [192.168.56.103] => (item=project_domain_name = Default)
ok: [192.168.56.103] => (item=project_name = service)
ok: [192.168.56.103] => (item=auth_type = password)
ok: [192.168.56.103] => (item=user_domain_name = Default)
changed: [192.168.56.103] => (item=auth_url = http://controller:5000/v3)
changed: [192.168.56.103] => (item=username = placement)
ok: [192.168.56.103] => (item=password = admin123)
```

```
TASK [nova : Configure Nova Default] *****
*
changed: [192.168.56.103]
```

```
TASK [nova : Configure Nova Glance] *****
*
changed: [192.168.56.103]
```

```
TASK [nova : Configure Nova oslo_concurrency] *****
*
changed: [192.168.56.103]
```

```
TASK [nova : Additional Configuration of Nova] *****
*
changed: [192.168.56.103]
```

```

TASK [nova : Additional Configuration of Nova] *****
*
changed: [192.168.56.103]

TASK [nova : Additional Configuration] *****
*
changed: [192.168.56.103]

TASK [nova : Additional Configuration] *****
*
changed: [192.168.56.103]

TASK [nova : Additional Configuration] *****
*
changed: [192.168.56.103]

PLAY RECAP *****
*
192.168.56.103      : ok=33   changed=26   unreachable=0   failed=0
skipped=0   rescued=0   ignored=0

jello@workstation:~/H0A14_Repani$

```

Proof

```

jello@server2:~$ openstack --version
openstack 3.14.2

jello@server2:~$ systemctl status glance-api
● glance-api.service - OpenStack Image Service API
   Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor pres
   Active: active (running) since Thu 2023-11-30 18:09:27 PST; 20min ago
   Main PID: 26693 (glance-api)
     Tasks: 3 (limit: 4656)
    CGroup: /system.slice/glance-api.service
            └─26693 /usr/bin/python2 /usr/bin/glance-api --config-file=/etc/glan
              └─26774 /usr/bin/python2 /usr/bin/glance-api --config-file=/etc/glan
                └─26775 /usr/bin/python2 /usr/bin/glance-api --config-file=/etc/glan

Nov 30 18:09:28 server2 glance-api[26693]: /usr/lib/python2.7/dist-packages/pas
Nov 30 18:09:28 server2 glance-api[26693]: return pkg_resources.EntryPoint.pa
Nov 30 18:09:28 server2 glance-api[26693]: /usr/lib/python2.7/dist-packages/pas
Nov 30 18:09:28 server2 glance-api[26693]: return pkg_resources.EntryPoint.pa
Nov 30 18:09:28 server2 glance-api[26693]: /usr/lib/python2.7/dist-packages/pas
Nov 30 18:09:28 server2 glance-api[26693]: return pkg_resources.EntryPoint.pa
Nov 30 18:09:28 server2 glance-api[26693]: /usr/lib/python2.7/dist-packages/pas
Nov 30 18:09:28 server2 glance-api[26693]: return pkg_resources.EntryPoint.pa
Nov 30 18:09:28 server2 glance-api[26693]: /usr/lib/python2.7/dist-packages/pas
Nov 30 18:09:28 server2 glance-api[26693]: val = callable(*args, **kw)

[3]+  Stopped                  systemctl status glance-api

```

```
jello@server2:~$ systemctl status nova-api
● nova-api.service - OpenStack Compute API
   Loaded: loaded (/lib/systemd/system/nova-api.service; enabled; vendor preset
   Active: active (running) since Thu 2023-11-30 18:09:44 PST; 21min ago
   Main PID: 28380 (nova-api)
     Tasks: 5 (limit: 4656)
   CGroup: /system.slice/nova-api.service
           └─28380 /usr/bin/python2 /usr/bin/nova-api --config-file=/etc/nova/n
             └─30467 /usr/bin/python2 /usr/bin/nova-api --config-file=/etc/nova/n
               └─30470 /usr/bin/python2 /usr/bin/nova-api --config-file=/etc/nova/n
                 └─30471 /usr/bin/python2 /usr/bin/nova-api --config-file=/etc/nova/n
                   └─30472 /usr/bin/python2 /usr/bin/nova-api --config-file=/etc/nova/n

Nov 30 18:09:44 server2 systemd[1]: Started OpenStack Compute API.

[4]+  Stopped                  systemctl status nova-api
```

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

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

keystone/bionic-updates,bionic-updates,bionic-security,bionic-security,now 2:13
.0.4-0ubuntu1 all [installed]
python-keystone/bionic-updates,bionic-updates,bionic-security,bionic-security,n
ow 2:13.0.4-0ubuntu1 all [installed,automatic]
python-keystoneauth1/bionic,bionic,now 3.4.0-0ubuntu1 all [installed,automatic]
python-keystoneclient/bionic,bionic,now 1:3.15.0-0ubuntu1 all [installed,automa
tic]
python-keystonemiddleware/bionic,bionic,now 4.21.0-0ubuntu1 all [installed,auto
matic]
python3-keystoneauth1/bionic,bionic,now 3.4.0-0ubuntu1 all [installed,automatic
]
python3-keystoneclient/bionic,bionic,now 1:3.15.0-0ubuntu1 all [installed,autom
atic]
```


Pushing to Git Repository

```
jello@workstation:~/HOA14_Repani$ git add *
jello@workstation:~/HOA14_Repani$ git commit -m "HOA14 completed"
[master (root-commit) 090a6fd] HOA14 completed
6 files changed, 295 insertions(+)
create mode 100644 ansible.cfg
create mode 100644 install.yml
create mode 100644 inventory
create mode 100644 roles/glance/tasks/main.yml
create mode 100644 roles/keystone/tasks/main.yml
create mode 100644 roles/nova/tasks/main.yml
jello@workstation:~/HOA14_Repani$ git push origin
Counting objects: 15, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (9/9), done.
Writing objects: 100% (15/15), 2.81 KiB | 2.81 MiB/s, done.
Total 15 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), done.
To github.com:JelzLow/HOA14_Repani.git
* [new branch]      master -> master
jello@workstation:~/HOA14_Repani$
```

HOA14_Repani Public

Pin Unwatch 1 Fork 0 Star 0

master

Go to file Add file <> Code About

Hands on Activity 14 - CPE232 Sys Ad 2

Activity 0 stars 1 watching 0 forks

Releases No releases published Create a new release

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

File	Commit	Time
roles	HOA14 completed	now
ansible.cfg	HOA14 completed	now
install.yml	HOA14 completed	now
inventory	HOA14 completed	now

https://github.com/JelzLow/HOA14_Repani

Reflections:

Answer the following:

- Describe Keystone, Glance and Nova services
 - The keystone service is used in order to give authentication and authorization for users, the nova service is used for providing virtual machine access to

users, and lastly the glance service is used to manage the different virtual machine images.

Conclusions:

In this hands on activity, the task given is to be able to install OpenStack on either an Ubuntu or a CentOS server. The installations include Glance, Keystone, and Nova. For the procedure, I chose to use the Ubuntu because I am more familiar in the operation of ubuntu especially that the workstation is an ubuntu. I made use of online sources and tutorials along with reference github repositories, I was able to achieve the goals for this activity which is to install the mentioned services with the use of a playbook.