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Course/Section:CPE232-CPE31S1	Date Submitted:5/7/2024
Instructor: Dr. Jonathan Taylar	Semester and SY: 2nd Semester
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)	



HOA14.1

Public



Pin



Unwatch

1



main



1 Branch



0 Tags

Go to file



Add file

<> Code



JemEspiritu Initial commit

a512ad6 · yesterday



1 Commits



README.md

Initial commit

yesterday



README



HOA14.1

Open



*main.yml

~/HOA14p1

```
1 ---
2
3 - hosts: all
4   become: true
5   pre_tasks:
6
7     - name: Dpkg fixing in Ubuntu Servers
8       shell: |
9         dpkg --configure -a
10      when: ansible_distribution == "Ubuntu"
11
12    - name: Update and Upgrade remote in Ubuntu servers
13      apt:
14        update_cache: yes
15        upgrade: yes
16        when: ansible_distribution == "Ubuntu"
17
18 - hosts: controller_node
19   become: true
20   roles:
21     - keystone
22     - glance
23     - nova
```

```
35 - name: install and configure components of glance
36 apt:
37     name: glance
38     when: ansible_distribution == "Ubuntu"
39
40 #editing the [database] /etc/glance/glance-api.conf
41
42 - name: configuring database access
43 copy:
44     dest: /etc/glance/glance-api.conf
45     content: |
46         [database]
47         connection = mysql+pymysql://glance:1234@controller/glance
48         [keystone_authtoken]
49         www_authenticate_uri = http://controller:5000
50         auth_url = http://controller:5000
51         memcached_servers = controller:11211
52         auth_type = password
53         project_domain_name = Default
54         user_domain_name = Default
55         project_name = service
56         username = glance
57         password = 1234
58         [paste_deploy]
59         flavor = keystone
60
61 - name: configuring the local file system store and location of image files
62 copy:
63     dest: /etc/glance/glance-api.conf
64     content: |
65         [glance_store]
66         stores = file, http
67         default_store = file
68         filesystem_store_datadir = /var/lib/glance/images/
69
```

```

##Installing the mod_wsgi
- name: Install the prerequisites for mod_wsgi
  apt:
    name:
      - apache2
      - apache2-utils
      - libexpat1
      - ssl-cert
      - python3
      - libapache2-mod-wsgi-py3
    when: ansible_distribution == "Ubuntu"

- name:
  copy:
    dest: /var/www/html/test_script.py
    content: |
      def application(environ,start_response):
        status = '200 OK'
        html = '\n' \
              '\n' \
              ' mod_wsgi is working \n' \
              '\n' \
              '\n'
        response_header = [('Content-type','text/html')]
        start_response(status,response_header)
        return [html]

- name: Create a seperate apache config to serve our python script over HTTP
  copy:
    dest: /etc/apache2/conf-available/wsgi.conf
    content: |
      WSGIScriptAlias /test_wsgi /var/www/html/test_script.py

```

```
1 #Nova
2
3 - name: install the packages
4 apt:
5     name: nova-compute
6 when: ansible_distribution == "Ubuntu"
7
8 - name: configuring RabbitMQ message queue access
9 copy:
10     dest: /etc/nova/nova.conf
11     content: |
12         [DEFAULT]
13         transport_url = rabbit://openstack:1234@controller
14         my_ip = 192.168.56.119
15
16 - name: configuring identity service access (1)
17 copy:
18     dest: /etc/nova/nova.conf
19     content: |
20         [api]
21         auth_strategy = keystone
22
23 - name: configuring identity service access (2)
24 copy:
25     dest: /etc/nova/nova.conf
26     content: |
27         [keystone_authtoken]
28         www_authenticate_uri = http://controller:5000/
29         auth_url = http://controller:5000/
30         memcached_servers = controller:11211
31         auth_type = password
32         project_domain_name = Default
33         user_domain_name = Default
34         project_name = service
35         username = nova
36         password = 1234
37
```

```
jem@ManagedNode:~/H0A14p1$ ansible-playbook --ask-become-pass main.yml
BECOME password:

PLAY [all] *****

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

TASK [Dpkg fixing in Ubuntu Servers] *****
changed: [192.168.56.102]

TASK [Update and Upgrade remote in Ubuntu servers] *****
[WARNING]: The value "True" (type bool) was converted to "'True'" (type string). If this doe
the entire value to ensure it does not change.
changed: [192.168.56.102]

PLAY [controller_node] *****

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

TASK [keystone : Install the prerequisites for mod_wsgi] *****
changed: [192.168.56.102]

TASK [keystone : copy] *****
changed: [192.168.56.102]

TASK [keystone : Create a seperate apache config to serve our python script over HTTP] *****
changed: [192.168.56.102]

TASK [keystone : install the keystone package] *****
changed: [192.168.56.102]

TASK [keystone : initializing the fernet repositories (1)] *****
changed: [192.168.56.102]

TASK [keystone : initializing the fernet repositories (2)] *****
changed: [192.168.56.102]
```

```

TASK [keystone : configure apache http server] *****
changed: [192.168.56.102]

TASK [keystone : configuring administrative account by setting the proper environmental variables (1)] *****
changed: [192.168.56.102]

TASK [keystone : configuring administrative account by setting the proper environmental variables (2)] *****
changed: [192.168.56.102]

TASK [keystone : configuring administrative account by setting the proper environmental variables (3)] *****
changed: [192.168.56.102]

TASK [keystone : configuring administrative account by setting the proper environmental variables(4)] *****
changed: [192.168.56.102]

TASK [keystone : configuring administrative account by setting the proper environmental variables(5)] *****
changed: [192.168.56.102]

TASK [keystone : configuring administrative account by setting the proper environmental variables(6)] *****
changed: [192.168.56.102]

TASK [keystone : configuring administrative account by setting the proper environmental variables (7)] *****
changed: [192.168.56.102]

TASK [keystone : Verifying if already active and running the keystone.] *****
changed: [192.168.56.102]

TASK [keystone : debug] *****
ok: [192.168.56.102] => {
  "msg": {
    "changed": true,
    "cmd": "keystone-manage --help",
    "delta": "0:00:01.573251",
    "end": "2024-05-06 19:10:47.678504",
    "failed": false,
    "rc": 0,
    "start": "2024-05-06 19:10:46.105253",
    "stderr": "",
    "stderr_lines": [],
    "stdout": "usage: keystone-manage [bootstrap|credential_migrate|credential_rotate|credential_setup|db

```

GLANCE:

```
TASK [glance : install and configure components of glance] *****
changed: [192.168.56.102]

TASK [glance : configuring database access] *****
changed: [192.168.56.102]

TASK [glance : configuring the local file system store and location of image files] *****
changed: [192.168.56.102]

TASK [glance : configuring the access to keystone] *****
changed: [192.168.56.102]

TASK [glance : enable per-tenant quotas] *****
changed: [192.168.56.102]

TASK [glance : restart the image services] *****
[WARNING]: Consider using the service module rather than running 'service'. If you need to use
insufficient you can add 'warn: false' to this command task or set 'command_warnings=False' in
message.
changed: [192.168.56.102]

TASK [glance : Verifying if already installed Glance.] *****
changed: [192.168.56.102]

TASK [glance : debug] *****
ok: [192.168.56.102] => {
  "msg": {
    "changed": true,
    "cmd": "glance --version",
    "delta": "0:00:00.482737",
    "end": "2024-05-06 19:12:24.810505",
    "failed": false,
    "rc": 0,
    "start": "2024-05-06 19:12:24.327768",
    "stderr": "",
    "stderr_lines": [],
    "stdout": "3.6.0",
    "stdout_lines": [
      "3.6.0"
    ]
  }
}
```



```
TASK [glance : Verifying if already active and running the Glance.] *****
changed: [192.168.56.102]
```

TASK [glance : debug] *****

```
ok: [192.168.56.102] => {
```

```
"msg": {
  "changed": true,
  "cmd": "systemctl status glance-api",
  "delta": "0:00:00.145925",
  "end": "2024-05-06 19:12:25.249300",
  "failed": false,
  "rc": 0,
  "start": "2024-05-06 19:12:25.103375",
  "stderr": "",
  "stderr_lines": [],
  "stdout": "●glance-api.service - OpenStack Image Service API\n      Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor preset: enabled)\n      Active: active (running) since Mon 2024-05-06 19:12:24 PST; 1s\n      Main PID: 34329 (glance-api)\n      Tasks: 1 (limit: 2260)\n      Memory slice: glance-api.service\n      CGroup: /systemd/system/34329 /usr/bin/python3 /usr/bin/glance-api\n      --log-file=/var/log/glance-api.log\nMay 06 19:12:24\nvice API.",
  "stdout_lines": [
    "●glance-api.service - OpenStack Image Service API",
    "    Loaded: loaded (/lib/systemd/system/glance-api.service; enabled",
    "    Active: active (running) since Mon 2024-05-06 19:12:24 PST; 1s",
    "    Docs: man:glance-api(1)",
    "    Main PID: 34329 (glance-api)",
    "    Tasks: 1 (limit: 2260)",
    "    Memory: 85.2M"
```

NOVA:

```
TASK [nova : install the packages] *****
changed: [192.168.56.102]

TASK [nova : configuring RabbitMQ message queue access] *****
changed: [192.168.56.102]

TASK [nova : configuring identity service access (1)] *****
changed: [192.168.56.102]

TASK [nova : configuring identity service access (2)] *****
changed: [192.168.56.102]

TASK [nova : enable and configure remote console access] *****
changed: [192.168.56.102]

TASK [nova : configure the location of the image service API] *****
changed: [192.168.56.102]

TASK [nova : configure the lock path] *****
changed: [192.168.56.102]

TASK [nova : configure the placement API] *****
changed: [192.168.56.102]

TASK [nova : configuring to make the computer node to support hardware acceleration] *****
changed: [192.168.56.102]

TASK [nova : restarting the computer service] *****
changed: [192.168.56.102]

TASK [nova : Verifying if already running and active the nova-compute.] *****
changed: [192.168.56.102]

TASK [nova : debug] *****
ok: [192.168.56.102] => {
  "msg": {
    "changed": true,
    "cmd": "systemctl status nova-compute",
    "delta": "0:00:00.007829",
    "end": "2024-05-06 19:14:47.492923",
```

```

TASK [nova : debug] *****
ok: [192.168.56.102] => {
  "msg": {
    "changed": true,
    "cmd": "systemctl status nova-compute",
    "delta": "0:00:00.007829",
    "end": "2024-05-06 19:14:47.492923",
    "failed": false,
    "rc": 0,
    "start": "2024-05-06 19:14:47.485094",
    "stderr": "",
    "stderr_lines": [],
    "stdout": "● nova-compute.service - OpenStack Compute\n    Loaded: loaded (/lib/systemd/system/nova-compute.service; vendor preset: enabled)\n    Active: active (running) since Mon 2024-05-06 19:14:47 PST; 257ms ago\n    Main PID: 44861\n    Tasks: 1 (limit: 2260)\n    Memory: 23.2M\n    CPU: 132ms\n    CGroup: /system.slice/nova-compute.service\n            └─44861 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/nova/nova.conf --config-file=/etc/nova/nova.conf --log-file=/var/log/nova/nova-compute.log\n\nMay 06 19:14:47 ManagedNode systemd[1]: Started OpenStack Compute.",
    "stdout_lines": [
      "● nova-compute.service - OpenStack Compute",
      "    Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor preset: enabled)",
      "    Active: active (running) since Mon 2024-05-06 19:14:47 PST; 257ms ago",
      "    Main PID: 44861 (nova-compute)",
      "    Tasks: 1 (limit: 2260)",
      "    Memory: 23.2M",
      "    CPU: 132ms",
      "    CGroup: /system.slice/nova-compute.service",
      "            └─44861 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/nova/nova.conf --config-file=/etc/nova/nova.conf --log-file=/var/log/nova/nova-compute.log",
      "    May 06 19:14:47 ManagedNode systemd[1]: Started OpenStack Compute."
    ]
  }
}

PLAY RECAP *****
192.168.56.102 : ok=42  changed=36  unreachable=0  failed=0  skipped=0  rescued=0  ignored=0

jem@ManagedNode:~/HOA14p1$

```

OUTPUT:

```

jem@ManagedNode:~$ keystone-manage --version
21.0.1
jem@ManagedNode:~$ sudo systemctl status glance-api
[sudo] password for jem:
● glance-api.service - OpenStack Image Service API
   Loaded: loaded (/lib/systemd/system/glance-api.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2024-05-07 17:41:27 PST; 7min ago
     Docs: man:glance-api(1)
  Main PID: 1752 (glance-api)
    Tasks: 4 (limit: 2255)
   Memory: 4.0M
      CPU: 5.853s
   CGroup: /system.slice/glance-api.service
            └─1752 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance-api.conf
            └─3256 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance-api.conf
            └─3257 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance-api.conf
            └─3258 /usr/bin/python3 /usr/bin/glance-api --config-file=/etc/glance-api.conf

May 07 17:41:27 ManagedNode systemd[1]: Started OpenStack Image Service API.
lines 1-15/15 (END)

```

```

jem@ManagedNode:~$ sudo systemctl status nova-compute
● nova-compute.service - OpenStack Compute
   Loaded: loaded (/lib/systemd/system/nova-compute.service; enabled; vendor
   Active: active (running) since Tue 2024-05-07 17:41:27 PST; 8min ago
 Main PID: 1753 (nova-compute)
    Tasks: 1 (limit: 2255)
   Memory: 8.6M
      CPU: 2.622s
   CGroup: /system.slice/nova-compute.service
           └─1753 /usr/bin/python3 /usr/bin/nova-compute --config-file=/etc/n
May 07 17:41:27 ManagedNode systemd[1]: Started OpenStack Compute.
May 07 17:41:29 ManagedNode nova-compute[1753]: Modules with known eventlet mon
lines 1-12/12 (END)

```

GITPUSH:

```

jem@ManagedNode:~/HOA14p1$ git add *
jem@ManagedNode:~/HOA14p1$ git commit -m "HOA14"
[main 89e2912] HOA14
 6 files changed, 337 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 inventory
 create mode 100644 main.yml
 create mode 100644 roles/glance/tasks/main.yml
 create mode 100644 roles/keystone/tasks/main.yml
 create mode 100644 roles/nova/tasks/main.yml
jem@ManagedNode:~/HOA14p1$ git push
Enumerating objects: 16, done.
Counting objects: 100% (16/16), done.
Delta compression using up to 3 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (15/15), 3.93 KiB | 3.93 MiB/s, done.
Total 15 (delta 0), reused 0 (delta 0), pack-reused 0
To github.com:JemEspiritu/HOA14.1.git
 a512ad6..89e2912  main -> main
jem@ManagedNode:~/HOA14p1$

```

[git@github.com:JemEspiritu/HOA14.1.git](https://github.com/JemEspiritu/HOA14.1.git)

<https://github.com/JemEspiritu/HOA14.1.git>

Reflections:

Answer the following:

1. Describe Keystone, Glance and Nova services

- Important roles are played by Keystone, Glance, and Nova in the OpenStack cloud.

platform for computing. Serving as the identity service, Keystone is in charge of permissions and authentication for any OpenStack service. A quick look helps as the image service, expediting virtual machine storage and recovery

pictures. It functions as a central repository, enabling users to easily Make, distribute, and use images. On the other hand, Nova acts as the calculate service, in charge of managing and arranging virtual machines. It oversees activities such as scheduling of resources, connection, and instance lifecycle Giving users the ability to launch and grow instances in the OpenStack infrastructure. Keystone, Glance, and Nova together make up the foundation for building and managing cloud resources in the OpenStack network.

Conclusions:

To sum up, the utilization of Ansible as the Infrastructure as Code (IaC) solution to construct an OpenStack installation procedure offers a tactical approach to cloud deployment. This method makes use of Ansible's automation expertise in addition to OpenStack's powerful cloud computing features. The deployment process is made easier to repeat, more consistent, and efficient with IaC. In addition to increasing productivity through work automation, Ansible's involvement in the orchestration of OpenStack installation guarantees a consistent and reliable infrastructure. This approach makes it easier to monitor, adjust, and scale for future requirements. To put it simply, using Ansible for OpenStack deployment is a commitment to the flexibility, effectiveness, and long-term manageability of cloud infrastructure.