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<b>Course/Section: CPE31S21</b>	<b>Date Submitted:12/04/24</b>
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<b>Activity 13: OpenStack Prerequisite Installation</b>	
<b>1. Objectives</b>	
Create a workflow to install OpenStack using Ansible as your Infrastructure as Code (IaC).	
<b>2. Intended Learning Outcomes</b>	
<ol style="list-style-type: none"> <li>1. Analyze the advantages and disadvantages of cloud services</li> <li>2. Evaluate different Cloud deployment and service models</li> <li>3. Create a workflow to install and configure OpenStack base services using Ansible as documentation and execution.</li> </ol>	
<b>3. Resources</b>	
<p>Oracle VirtualBox (Hypervisor)</p> <p>1x Ubuntu VM or Centos VM</p>	
<b>4. Tasks</b>	
<ol style="list-style-type: none"> <li>1. Create a new repository for this activity.</li> <li>2. Create a playbook that converts the steps in the following items in <a href="https://docs.openstack.org/install-guide/">https://docs.openstack.org/install-guide/</a> <ol style="list-style-type: none"> <li>a. NTP</li> <li>b. OpenStack packages</li> <li>c. SQL Database</li> <li>d. Message Queue</li> <li>e. Memcached</li> <li>f. Etcd</li> <li>g. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in Inventory file.</li> <li>h. Add, commit and push it to your GitHub repo.</li> </ol> </li> </ol>	

## 5. Output (screenshots and explanations)

Created a new repository in github for HOA 13.


**Create a new repository**


A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

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*Required fields are marked with an asterisk (\*).*

**Owner \*** **Repository name \***


 emrys66 /


 Act13 is available.

Great repository names are short and memorable. Need inspiration? How about **turbo-octo-system** ?

**Description** (optional)

---

☒  **Public**  
Anyone on the internet can see this repository. You choose who can commit.

☐  **Private**  
You choose who can see and commit to this repository.

---

**Initialize this repository with:**

☒ **Add a README file**  
This is where you can write a long description for your project. [Learn more about READMEs.](#)

**Add .gitignore**


.gitignore template:

Choose which files not to track from a list of templates. [Learn more about ignoring files.](#)


**Choose a license**

License:

A license tells others what they can and can't do with your code. [Learn more about licenses.](#)

This will set  main as the default branch. Change the default name in your [settings](#).

---

 You are creating a public repository in your personal account.

---

[Create repository](#)

Created the ansible.cfg and inventory file for ansible connection to my manage node.

```
workstation@workstation: ~/Act13
GNU nano 7.2 ansible.cfg
[defaults]

inventory = inventory
host_key_checking = False

deprecation_warnings= False

remote_user = workstation
private_key_file = ~/.ssh/
```

```
workstation@workstation: ~/Act13
GNU nano 7.2 inventory
[servers]

server1 ansible_host=192.168.56.135
```

Check the connection of my control node to my manage node.

```
workstation@workstation:~/Act13$ ansible all -m ping
server1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
```

Created the roles directory inside the repository.

```
workstation@workstation:~/Act13$ mkdir -p roles/compute-controller/tasks
```

Created the playbook that will install OpenStack, NTP, SQL, Message Queue, Memcached and Etcd packages through ansible.

```
workstation@workstation: ~/Act13/roles/compute-controller/tasks
GNU nano 7.2 main.yml
---
- name: Install NTP Ubuntu
  apt:
    name: chrony
    state: latest
    when: ansible_distribution == "Ubuntu"

- name: Start NTP
  service:
    name: chronyd
    state: restarted
    enabled: true

- name: Install OpenStack packages
  apt:
    name: python3-openstackclient
    state: latest
    when: ansible_distribution == "Ubuntu"

- name: Install SQL Database
  apt:
    name: mariadb-server
    state: latest
    when: ansible_distribution == "Ubuntu"

- name: Start SQL Database
  service:
    name: mariadb
    state: restarted
    enabled: true

- name: Install Message Queue
  apt:
    name: rabbitmq-server
    state: latest
    when: ansible_distribution == "Ubuntu"

- name: Start Message Queue
  service:
    name: rabbitmq-server
    state: restarted
    enabled: true

- name: Install Memcached
  apt:
    name: memcached
    state: latest
    when: ansible_distribution == "Ubuntu"

- name: Start Memcached
  service:
    name: memcached
    state: restarted
    enabled: true

- name: Install Etcd
  apt:
    name: etcd-server
    state: latest
    when: ansible_distribution == "Ubuntu"

- name: Start Etcd
  service:
    name: etcd
    state: restarted
    enabled: true
```

Created the installer.yml that will run the playbook that is inside the tasks directory in the roles directory.

```
workstation@worsktation: ~/Act
GNU nano 7.2 installer.yml
---
- hosts: all
  become: true
  pre_tasks:

- hosts: ubuntu
  become: true
  roles:
    - compute-controller
```

Running the ansible playbook and installing the packages onto the ubuntu server.

```
workstation@worsktation:~/Act13$ ansible-playbook --ask-become-pass installer.yml
BECOME password:

PLAY [all] *****
TASK [Gathering Facts] *****
ok: [server1]

PLAY [all] *****
TASK [Gathering Facts] *****
ok: [server1]

TASK [compute-controller : Install NTP Ubuntu] *****
changed: [server1]

TASK [compute-controller : Start NTP] *****
changed: [server1]

TASK [compute-controller : Install OpenStack packages] *****
changed: [server1]

TASK [compute-controller : Install SQL Database] *****
changed: [server1]

TASK [compute-controller : Start SQL Database] *****
changed: [server1]

TASK [compute-controller : Install Message Queue] *****
changed: [server1]

TASK [compute-controller : Start Message Queue] *****
changed: [server1]

TASK [compute-controller : Install Memcached] *****
changed: [server1]

TASK [compute-controller : Start Memcached] *****
changed: [server1]

TASK [compute-controller : Install Etcd] *****
changed: [server1]

TASK [compute-controller : Start Etcd] *****
changed: [server1]

PLAY RECAP *****
server1 : ok=13  changed=11  unreachable=0  failed=0  skipped=0  rescued=0  ignored=0

workstation@worsktation:~/Act13$
```

Checking if the packages were properly installed in the server by using the command `--version` and `dpkg -l | grep <package_name>`.

```
workstation@server1:~$ openstack --version
openstack 6.6.0
workstation@server1:~$ chronyd --version
chronyd (chrony) version 4.5 (+CMDMON +NTP +REFCLOCK +RTC +PRIVDROP +SCFILTER +SIGND +ASYNCDNS +NTS
+SECHASH +IPV6 -DEBUG)
workstation@server1:~$ dpkg -l | grep mysql
ii  libdbd-mysql-perl:amd64          4.052-1ubuntu3          amd64
    Perl5 database interface to the MariaDB/MySQL database
ii  libmysqlclient21:amd64          8.0.40-0ubuntu0.24.04.1 amd64
    MySQL database client library
ii  mariadb-common                   1:10.11.8-0ubuntu0.24.04.1 all
    MariaDB database common files (e.g. /etc/mysql/mariadb.conf.d/)
ii  mysql-common                     5.8+1.1.10build1        all
    MySQL database common files, e.g. /etc/mysql/my.cnf
workstation@server1:~$ dpkg -l | grep memcached
ii  memcached                        1.6.24-1build3          amd64
    High-performance in-memory object caching system
workstation@server1:~$ dpkg -l | grep etcd
ii  etcd-server                      3.4.30-1ubuntu0.24.04.2 amd64
    highly-available key value store -- daemon
workstation@server1:~$ dpkg -l | grep rabbitmq-server
ii  rabbitmq-server                  3.12.1-1ubuntu1         all
    AMQP server written in Erlang
workstation@server1:~$
```

## Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?

**Implementing OpenStack offers flexibility and control over business cloud infrastructure. It supports scalability, allowing organizations to expand resources as needed without high costs. OpenStack's open-source nature promotes innovation and eliminates vendor lock-in, giving users freedom to customize their environment. Additionally, it integrates well with various tools and technologies, making it suitable for diverse IT needs. Its active community also ensures constant updates and support.**

**Conclusions:**

After completing the activity, I installed all the necessary packages to set up OpenStack on my Ubuntu server using an Ansible playbook. The process included configuring dependencies and making sure everything was properly aligned for OpenStack to work. Using Ansible made the installation easier and more organized, saving time and effort. This experience helped me better understand how to install OpenStack and use automation tools effectively.