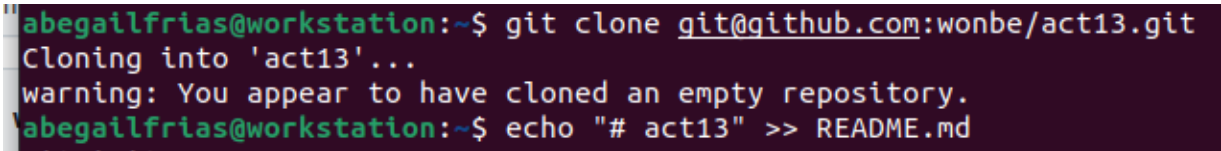


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Course/Section: CPE212 - CPE31S21	Date Submitted: Dec. 6, 2024
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Activity 13: OpenStack Prerequisite Installation	
1. Objectives	
Create a workflow to install OpenStack using Ansible as your Infrastructure 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. NTP b. OpenStack packages c. SQL Database d. Message Queue e. Memcached f. Etcd g. Create different plays in installing per server type (controller, compute etc.) and identify it as a group in Inventory file. h. Add, commit and push it to your GitHub repo. 	
5. Output (screenshots and explanations)	
 <pre> abegailfrias@workstation:~\$ git clone git@github.com:wonbe/act13.git Cloning into 'act13'... warning: You appear to have cloned an empty repository. abegailfrias@workstation:~\$ echo "# act13" >> README.md </pre>	

I connect my repository to my ubuntu.

```
abegailfrias@workstation:~/act13$ cat inventory
[server]
192.168.56.107
```

This is my Inventory.

```
abegailfrias@workstation:~/act13$ cat ansible.cfg
[defaults]

inventory = inventory
host_key_checking = False

deprecation_warnings= False

remote_user = workstation
private_key_file = ~/.ssh/
abegailfrias@workstation:~/act13$
```

This is the inside of ny ansible.

```
abegailfrias@workstation:~/act13$ cat main.yml
---
- hosts: all
  become: true
  pre_tasks:

- hosts: all
  become: true
  role:
    - computer
```

This is my main playbook.

```
abegallfrias@workstation:~/act13/role/computer/tasks$ cat 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

```

This is what inside my main.yml

```

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

```

Running the playbook.

```
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+1.1.0build1               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:~$
```

checking the installation.

Reflections:

Answer the following:

1. What are the benefits of implementing OpenStack?
 - **OpenStack is an open-source cloud platform that lowers hardware requirements and helps companies save money by avoiding costly software licenses. It is adaptable, enabling customization to meet particular requirements, and it grows with your company with ease. OpenStack facilitates automation, increases productivity, and works well with Kubernetes and other tools. It permits a combination of private and public clouds and improves security through role-based access and data isolation. OpenStack is affordable, future-ready, and perfect for managing contemporary IT systems because of its robust community support and frequent updates.**

Conclusions:

- This exercise demonstrated the advantages of Infrastructure as Code (IaC) by automating the installation of OpenStack services using Ansible. We learned how to configure key components like NTP, SQL databases, and message queues by following the OpenStack installation guide. Compared to manual setups, using Ansible sped up the process and reduced the likelihood of errors. The process was made more reusable and organized by breaking up the work into plays for various server types, such as compute and controller. The

exercise highlighted how crucial inventory files are to the administration of server clusters. We demonstrated the adaptability of cloud deployment models by simulating a cloud environment using VirtualBox. The benefits of cloud services, including scalability, cost savings, and automation, were also illustrated by this project.