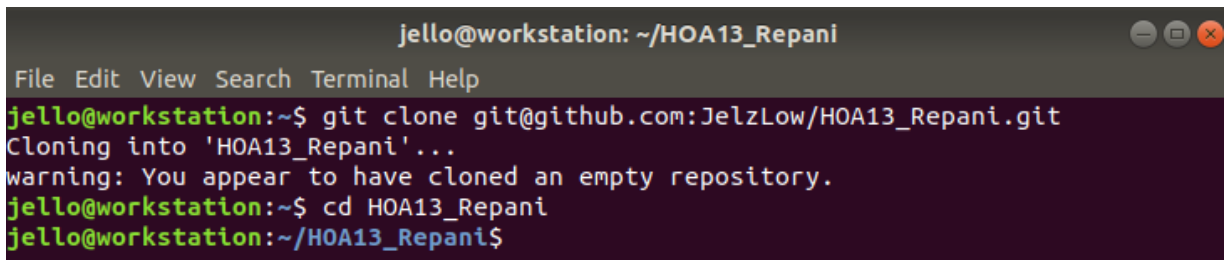
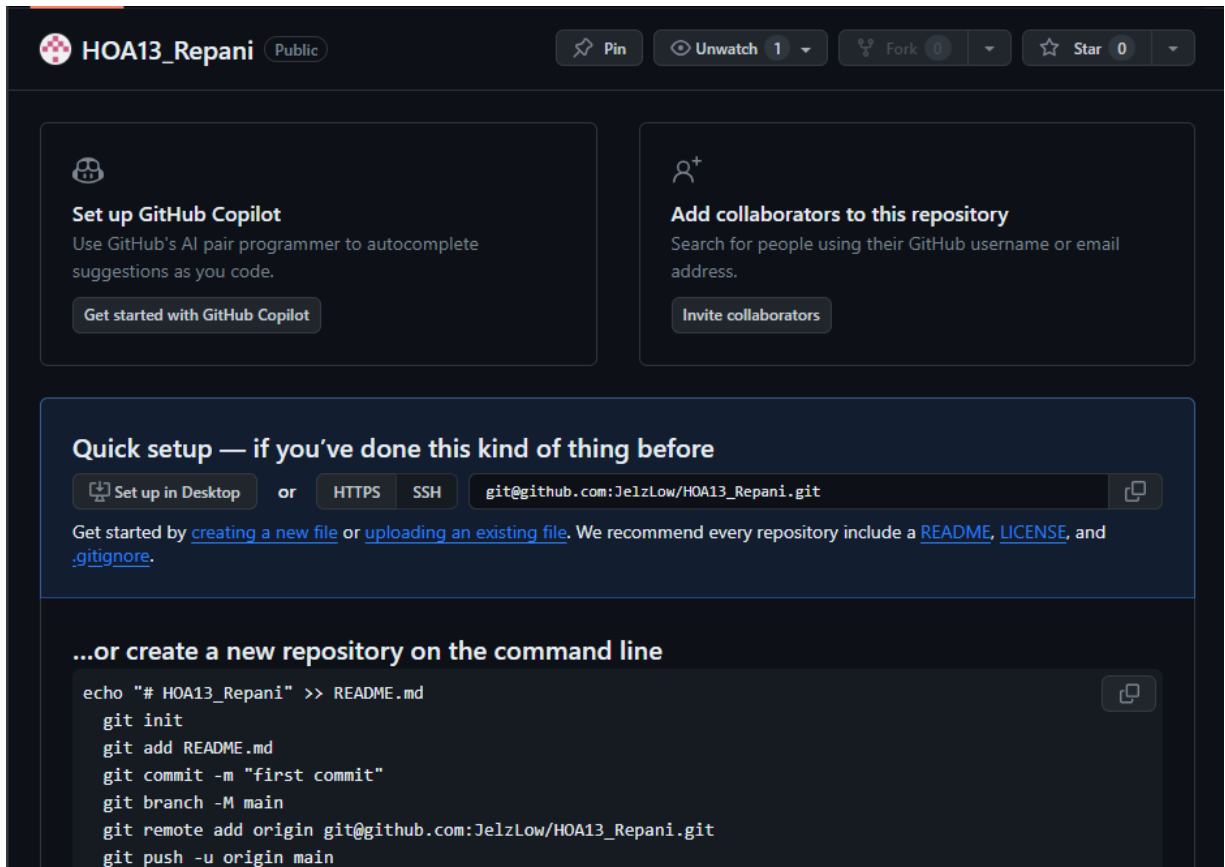
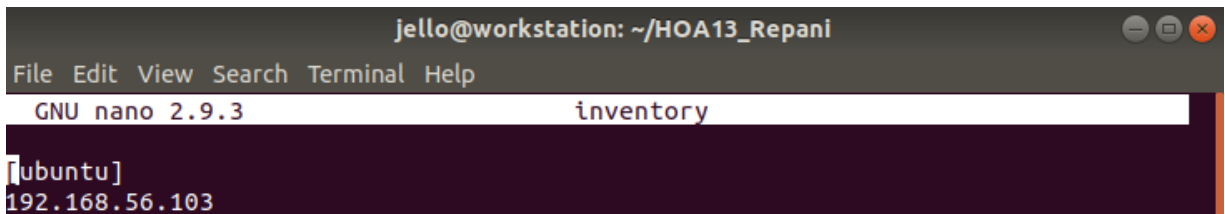


| | |
|---|---|
| Name: Repani, Justin Jello J. | Date Performed: November 30, 2023 |
| Course/Section: CPE31S6 | Date Submitted: December 4, 2023 |
| Instructor: Dr. Jonathan V. Taylar | Semester and SY: 1st Sem SY 2023-2024 |
| Activity 13: OpenStack Prerequisite Installation | |
| 1. Objectives | |
| 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) | |

The first step is to create a new repository for HOA 13 and then clone this to the workstation



The inventory file will contain ubuntu server



Create a roles directory for each of the needed installation separately for both ubuntu and centos

```
jello@workstation:~/H0A13_Repani$ tree
```

```
.
├── ansible.cfg
├── etcd
│   └── tasks
│       └── main.yml
├── install_openstack.yml
├── inventory
├── memcache
│   └── tasks
│       └── main.yml
├── mesq
│   └── tasks
│       └── main.yml
├── ntp
│   └── tasks
│       └── main.yml
├── openstack
│   └── tasks
│       └── main.yml
└── sql
    └── tasks
        └── main.yml
```

```
12 directories, 9 files
```

Contents of install_openstack.yml

```
Code Blame 15 lines (11 loc) · 208 Bytes
1  #This is the main playbook for openstack installation
2
3  ---
4
5
6  - hosts: all
7    become: true
8    roles:
9      - role: ntp
10     - role: openstack
11     - role: sql
12     - role: mesq
13     - role: memcache
14     - role: etcd
```

Contents of etcd/tasks/main.yml

```
Code Blame 22 lines (19 loc) · 856 Bytes Raw Copy Download Edit View

1 #This is the main.yml file for installing etcd
2
3 - name: Installing Packages (etcd for Ubuntu)
4   apt:
5     name:
6       - etcd
7     state: latest
8
9 - name: Editing Config File
10  lineinfile:
11    dest: /etc/default/etcd
12    regexp: '{{ item.regexp }}'
13    line: '{{ item.line }}'
14    state: present
15    backup: yes
16
17  with_items:
18    - { regexp: 'ETCD_INITIAL_CLUSTER=', line: 'ETCD_INITIAL_CLUSTER="controller=http://10.0.0.11:2380"' }
19    - { regexp: 'ETCD_INITIAL_ADVERTISE_PEER_URLS=', line: 'ETCD_INITIAL_ADVERTISE_PEER_URLS="http://10.0.0.11:2380"' }
20    - { regexp: 'ETCD_ADVERTISE_CLIENT_URLS=', line: 'ETCD_ADVERTISE_CLIENT_URLS="http://10.0.0.11:2379"' }
21    - { regexp: 'ETCD_LISTEN_PEER_URLS=', line: 'ETCD_LISTEN_PEER_URLS="http://0.0.0.0:2380 " ' }
22    - { regexp: 'ETCD_LISTEN_CLIENT_URLS=', line: 'ETCD_LISTEN_CLIENT_URLS="http:// 10.0.0.11:2379" ' }
```

Contents of memcache/tasks/main.yml

```
Code Blame 22 lines (19 loc) · 428 Bytes Raw Copy Download Edit View

1 #This is the main.yml file for installing Memory Cached
2
3 - name: Installing MemCached (Ubuntu)
4   apt:
5     name:
6       - memcached
7       - python3-memcache
8     state: latest
9
10  - name: Editing Config File
11    lineinfile:
12      dest: /etc/memcached.conf
13      regexp: "-l 127.0.0.1"
14      line: "-l 10.0.0.11"
15      state: present
16      backup: yes
17
18  - name: Restart Service
19    service:
20      name: memcached
21      state: restarted
22      enabled: true
```

Contents of mesq/tasks/main.yml

```
Code Blame 11 lines (10 loc) · 212 Bytes Raw Copy Download Edit View

1  - name: Install Message Queue
2    apt:
3      name: rabbitmq-server
4      state: present
5      update_cache: yes
6
7  - name: Starting service
8    service:
9      name: rabbitmq-server.service
10     state: started
11     enabled: true
```

Contents of ntp/tasks/main.yml

```
Code Blame 24 lines (20 loc) · 528 Bytes Raw Copy Download Edit View

1  #this is the main.yml playbook for installing NTP
2
3  - name: Installing Chrony (Ubuntu)
4    apt:
5      name: chrony
6      state: latest
7
8  - replace:
9      dest: /etc/chrony/chrony.conf
10     regexp: server NTP_SERVER iburst
11     replace: server 192.168.56.102 iburst
12     backup: yes
13
14  - name: add key to chrony.conf
15    ansible.builtin.lineinfile:
16      dest: /etc/chrony/chrony.conf
17      line: allow 10.0.0.0/24
18      backup: yes
19
20  - name: Verifying Installation (Chrony for Ubuntu)
21    service:
22      name: chrony
23      state: restarted
24      enabled: true
```

Contents of openstack/tasks/main.yml

```
Code Blame 8 lines (7 loc) · 178 Bytes Raw Copy Download Edit View

1  #this is the main.yml file for installing Openstack
2
3  - name: Installing OpenStack (Ubuntu)
4    apt:
5      name:
6        - nova-compute
7        - python3-openstackclient
8      state: latest
```

Contents of sql/tasks/main.yml

Code Blame 52 lines (47 loc) · 1.24 KB

Raw Copy Download Edit View

```
1  #this is the main.yml file for installing SQL Database
2
3  - name: Installing Packages (SQL for Ubuntu)
4    apt:
5      name:
6        - mariadb-server
7        - python3-pymysql
8      state: latest
9
10 - name: Create Config File
11   file:
12     path: /etc/mysql/mariadb.conf.d/99-openstack.cnf
13     state: touch
14     owner: root
15     group: root
16     mode: 0777
17
18 - name: Editing Config File
19   lineinfile:
20     dest: /etc/mysql/mariadb.conf.d/99-openstack.cnf
21     line: "{{ item }}"
22     state: present
23     backup: yes
24   with_items:
25     - '[mysqld]'
26     - 'bind-address = 10.0.0.11'
27     - ' '
28     - 'default-store-engine = innodb'
29     - 'innodb_file_per_table = on'
30     - 'max_connections = 4096'
31     - 'collation-server = utf8_general_ci'
32     - 'character-ser-server = utf8'
33
34 - name: Restarting Service
35   service:
36     name: mysql
37     state: restarted
38     enabled: true
39
40 - name: Finalizing Installation
```

```
41   expect:
42     command: mysql_secure_installation
43     responses:
44       'Enter current password for root:': ' '
45       'Set root password': 'n'
46       'Remove anonymous users': 'y'
47       'Disallow root login remotely': 'y'
48       'Remove test database': 'y'
49       'Reload privilege tables now': 'y'
50     timeout: 1
51   register: secure_mariadb
52   failed_when: "'. . . Failed!' in secure_mariadb.stdout_lines"
```

Running the command

```
jello@workstation:~/HOA13_Repani$ ansible-playbook --ask-become-pass install_op
enstack.yml
BECOME password:

PLAY [all] *****
*

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

TASK [ntp : Installing Chrony (Ubuntu)] *****
*
changed: [192.168.56.103]

TASK [ntp : replace] *****
*
ok: [192.168.56.103]

TASK [ntp : add key to chrony.conf] *****
*
changed: [192.168.56.103]

TASK [ntp : Verifying Installation (Chrony for Ubuntu)] *****
*
changed: [192.168.56.103]
```

```
jello@server2:~$ systemctl status mysql
● mariadb.service - MariaDB 10.1.48 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset:
   Active: active (running) since Thu 2023-11-30 17:46:34 PST; 41min ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
   Main PID: 20738 (mysqld)
    Status: "Taking your SQL requests now..."
     Tasks: 27 (limit: 4656)
    CGroup: /system.slice/mariadb.service
            └─20738 /usr/sbin/mysqld

Nov 30 17:46:34 server2 systemd[1]: Starting MariaDB 10.1.48 database server...
Nov 30 17:46:34 server2 sh[20664]: Warning: World-writable config file '/etc/my
Nov 30 17:46:34 server2 mysqld[20738]: Warning: World-writable config file '/et
Nov 30 17:46:34 server2 mysqld[20738]: 2023-11-30 17:46:34 140177396550784 [Not
Nov 30 17:46:34 server2 /etc/mysql/debian-start[20767]: Upgrading MySQL tables
Nov 30 17:46:34 server2 systemd[1]: Started MariaDB 10.1.48 database server.

[2]+  Stopped                  systemctl status mysql
```

```
TASK [openstack : Installing OpenStack (Ubuntu)] *****
*
changed: [192.168.56.103]

TASK [sql : Installing Packages (SQL for Ubuntu)] *****
*
changed: [192.168.56.103]

TASK [sql : Create Config File] *****
*
changed: [192.168.56.103]

TASK [sql : Editing Config File] *****
*
changed: [192.168.56.103] => (item=[mysqld])
changed: [192.168.56.103] => (item=bind-address = 10.0.0.11)
changed: [192.168.56.103] => (item= )
changed: [192.168.56.103] => (item=default-store-engine = innodb)
changed: [192.168.56.103] => (item=innodb_file_per_table = on)
changed: [192.168.56.103] => (item=max_connections = 4096)
changed: [192.168.56.103] => (item=collation-server = utf8_general_ci)
changed: [192.168.56.103] => (item=character-ser-server = utf8)

TASK [sql : Restarting Service] *****
*
changed: [192.168.56.103]

TASK [sql : Finalizing Installation] *****
*
changed: [192.168.56.103]

TASK [mesq : Install Message Queue] *****
*
changed: [192.168.56.103]

TASK [mesq : Starting service] *****
*
ok: [192.168.56.103]

TASK [memcache : Installing MemCached (Ubuntu)] *****
*
changed: [192.168.56.103]

TASK [memcache : Editing Config File] *****
*
changed: [192.168.56.103]

TASK [memcache : Restart Service] *****
*
changed: [192.168.56.103]
```



```

TASK [etcd : Installing Packages (etcd for Ubuntu)] *****
*
changed: [192.168.56.103]

TASK [etcd : Editing Config File] *****
*
changed: [192.168.56.103] => (item={'regex': 'ETCD_INITIAL_CLUSTER=', 'line':
'ETCD_INITIAL_CLUSTER="controller=http://10.0.0.11:2380"'})
changed: [192.168.56.103] => (item={'regex': 'ETCD_INITIAL_ADVERTISE_PEER_URLS
=', 'line': 'ETCD_INITIAL_ADVERTISE_PEER_URLS="http://10.0.0.11:2380"'})
changed: [192.168.56.103] => (item={'regex': 'ETCD_ADVERTISE_CLIENT_URLS=', 'l
ine': 'ETCD_ADVERTISE_CLIENT_URLS="http://10.0.0.11:2379"'})
changed: [192.168.56.103] => (item={'regex': 'ETCD_LISTEN_PEER_URLS=', 'line':
'ETCD_LISTEN_PEER_URLS="http://0.0.0.0:2380 " '})
changed: [192.168.56.103] => (item={'regex': 'ETCD_LISTEN_CLIENT_URLS=', 'line
': 'ETCD_LISTEN_CLIENT_URLS="http:// 10.0.0.11:2379" '})

PLAY RECAP *****
*
192.168.56.103      : ok=18   changed=15   unreachable=0   failed=0
skipped=0   rescued=0   ignored=0

jello@workstation:~/HOA13_Repani$

```

Proof

```

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

jello@server2:~$ systemctl status mariadb
● mariadb.service - MariaDB 10.1.48 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset:
   Active: active (running) since Thu 2023-11-30 17:46:34 PST; 41min ago
     Docs: man:mysql(8)
           https://mariadb.com/kb/en/library/systemd/
   Main PID: 20738 (mysqld)
    Status: "Taking your SQL requests now..."
     Tasks: 27 (limit: 4656)
    CGroup: /system.slice/mariadb.service
            └─20738 /usr/sbin/mysqld

Nov 30 17:46:34 server2 systemd[1]: Starting MariaDB 10.1.48 database server...
Nov 30 17:46:34 server2 sh[20664]: Warning: World-writable config file '/etc/my
Nov 30 17:46:34 server2 mysqld[20738]: Warning: World-writable config file '/et
Nov 30 17:46:34 server2 mysqld[20738]: 2023-11-30 17:46:34 140177396550784 [Not
Nov 30 17:46:34 server2 /etc/mysql/debian-start[20767]: Upgrading MySQL tables
Nov 30 17:46:34 server2 systemd[1]: Started MariaDB 10.1.48 database server.

[1]+  Stopped                  systemctl status mariadb

```

```
jello@server2:~$ systemctl status mysql
● mariadb.service - MariaDB 10.1.48 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset:
   Active: active (running) since Thu 2023-11-30 17:46:34 PST; 50min ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
   Main PID: 20738 (mysqld)
    Status: "Taking your SQL requests now..."
     Tasks: 27 (limit: 4656)
    CGroup: /system.slice/mariadb.service
            └─20738 /usr/sbin/mysqld

Nov 30 17:46:34 server2 systemd[1]: Starting MariaDB 10.1.48 database server...
Nov 30 17:46:34 server2 sh[20664]: Warning: World-writable config file '/etc/my
Nov 30 17:46:34 server2 mysqld[20738]: Warning: World-writable config file '/et
Nov 30 17:46:34 server2 mysqld[20738]: 2023-11-30 17:46:34 140177396550784 [Not
Nov 30 17:46:34 server2 /etc/mysql/debian-start[20767]: Upgrading MySQL tables
Nov 30 17:46:34 server2 systemd[1]: Started MariaDB 10.1.48 database server.

[5]+  Stopped                  systemctl status mysql
```

```
jello@server2:~$ systemctl status me rabbitmq-server
Unit me.service could not be found.
● rabbitmq-server.service - RabbitMQ Messaging Server
   Loaded: loaded (/lib/systemd/system/rabbitmq-server.service; enabled; vendor
   Active: active (running) since Thu 2023-11-30 17:47:11 PST; 50min ago
   Main PID: 21811 (beam.smp)
    Status: "Initialized"
     Tasks: 87 (limit: 4656)
    CGroup: /system.slice/rabbitmq-server.service
            └─21807 /bin/sh /usr/sbin/rabbitmq-server
              └─21811 /usr/lib/erlang/erts-9.2/bin/beam.smp -W w -A 64 -P 1048576
                └─21887 /usr/lib/erlang/erts-9.2/bin/epmd -daemon
                  └─22027 erl_child_setup 65536
                    └─22049 inet_gethost 4
                      └─22050 inet_gethost 4

Nov 30 18:09:44 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:45 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:46 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:47 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:49 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:49 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:49 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:51 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:51 server2 systemd[1]: rabbitmq-server.service: Supervising proces
Nov 30 18:09:52 server2 systemd[1]: rabbitmq-server.service: Supervising proces
```

```
jello@server2:~$ systemctl status etcd
● etcd.service - etcd - highly-available key value store
   Loaded: loaded (/lib/systemd/system/etcd.service; disabled; vendor preset: e
   Active: active (running) since Thu 2023-11-30 17:47:40 PST; 51min ago
     Docs: https://github.com/coreos/etcd
    man:etcd
   Main PID: 23842 (etcd)
      Tasks: 11 (limit: 4656)
   CGroup: /system.slice/etcd.service
           └─23842 /usr/bin/etcd

Nov 30 17:47:40 server2 etcd[23842]: 8e9e05c52164694d received MsgVoteResp from
Nov 30 17:47:40 server2 etcd[23842]: 8e9e05c52164694d became leader at term 2
Nov 30 17:47:40 server2 etcd[23842]: raft.node: 8e9e05c52164694d elected leader
Nov 30 17:47:40 server2 etcd[23842]: setting up the initial cluster version to
Nov 30 17:47:40 server2 etcd[23842]: set the initial cluster version to 3.2
Nov 30 17:47:40 server2 etcd[23842]: enabled capabilities for version 3.2
Nov 30 17:47:40 server2 etcd[23842]: published {Name:server2 ClientURLs:[http:/
Nov 30 17:47:40 server2 systemd[1]: Started etcd - highly-available key value s
Nov 30 17:47:40 server2 etcd[23842]: ready to serve client requests
Nov 30 17:47:40 server2 etcd[23842]: serving insecure client requests on 127.0.

[9]+  Stopped                  systemctl status etcd
```

Committing to Git

```
jello@workstation:~/HOA13_Repani$ git add *
jello@workstation:~/HOA13_Repani$ git commit -m "HOA13 complete"
[master (root-commit) bfeaa6e] HOA13 complete
 9 files changed, 166 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 etcd/tasks/main.yml
 create mode 100644 install_openstack.yml
 create mode 100644 inventory
 create mode 100644 memcache/tasks/main.yml
 create mode 100644 mesq/tasks/main.yml
 create mode 100644 ntp/tasks/main.yml
 create mode 100644 openstack/tasks/main.yml
 create mode 100644 sql/tasks/main.yml
jello@workstation:~/HOA13_Repani$ git push origin
Counting objects: 23, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (10/10), done.
Writing objects: 100% (23/23), 2.98 KiB | 2.98 MiB/s, done.
Total 23 (delta 0), reused 0 (delta 0)
To github.com:JelzLow/HOA13_Repani.git
 * [new branch]      master -> master
jello@workstation:~/HOA13_Repani$
```

HOA13_Repani Public

Pin Unwatch 1 Fork 0 Star 0

master Go to file Add file <> Code About

Branches Tags

JelzLow HOA13 complete 1 minute ago 1

| | | |
|-----------------------|----------------|--------------|
| etcd/tasks | HOA13 complete | 1 minute ago |
| memcache/tasks | HOA13 complete | 1 minute ago |
| mesq/tasks | HOA13 complete | 1 minute ago |
| ntp/tasks | HOA13 complete | 1 minute ago |
| openstack/tasks | HOA13 complete | 1 minute ago |
| sql/tasks | HOA13 complete | 1 minute ago |
| ansible.cfg | HOA13 complete | 1 minute ago |
| install_openstack.yml | HOA13 complete | 1 minute ago |
| inventory | HOA13 complete | 1 minute ago |

Activity 0 stars 1 watching 0 forks

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https://github.com/JelzLow/HOA13_Repani

Reflections:

Answer the following:

- What are the benefits of implementing OpenStack?
 - The benefits of implementing open stack is being able to control different servers and devices in a more efficient manner. It helps a lot in the management of these machines which allows for easier control and over the network and systems and also allows for easier maintenance which results in better scalability and efficiency.

Conclusions:

In this hands-on activity the task is to install the OpenStack prerequisites specifically the NTP, SQL, message queue, memcached, and etcd. This activity was performed by downloading these services with the use of an ansible playbook and the role functions. Using different sources online such as forums, tutorials, and guides I

have successfully installed all the required services and have come up with the desired output for this activity.