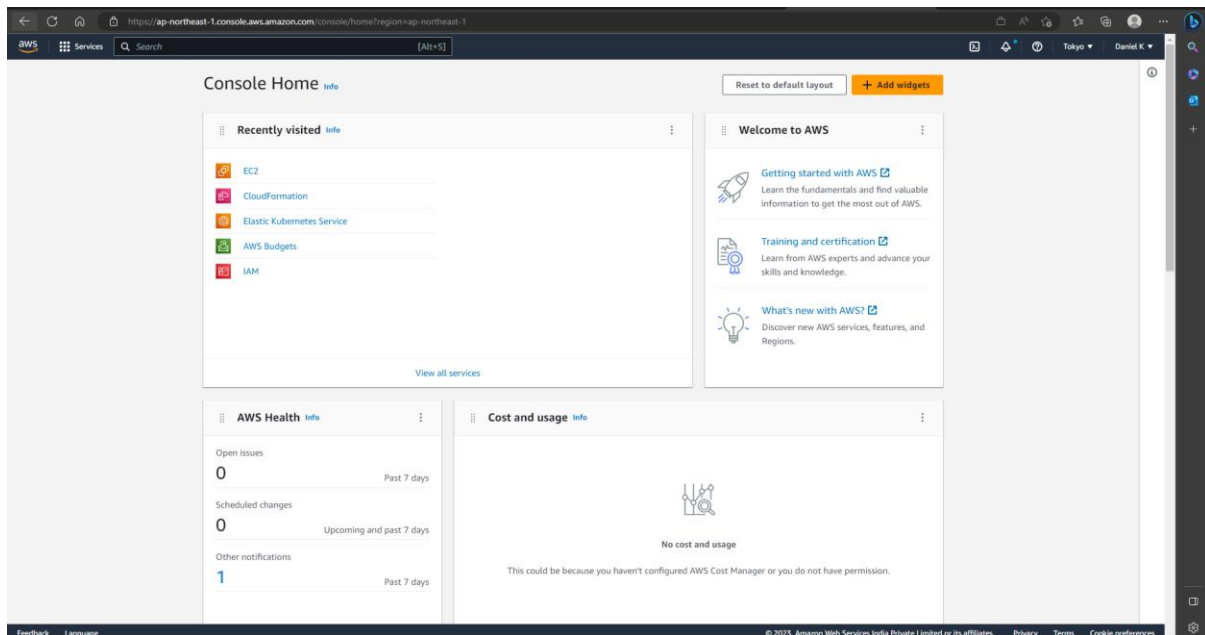


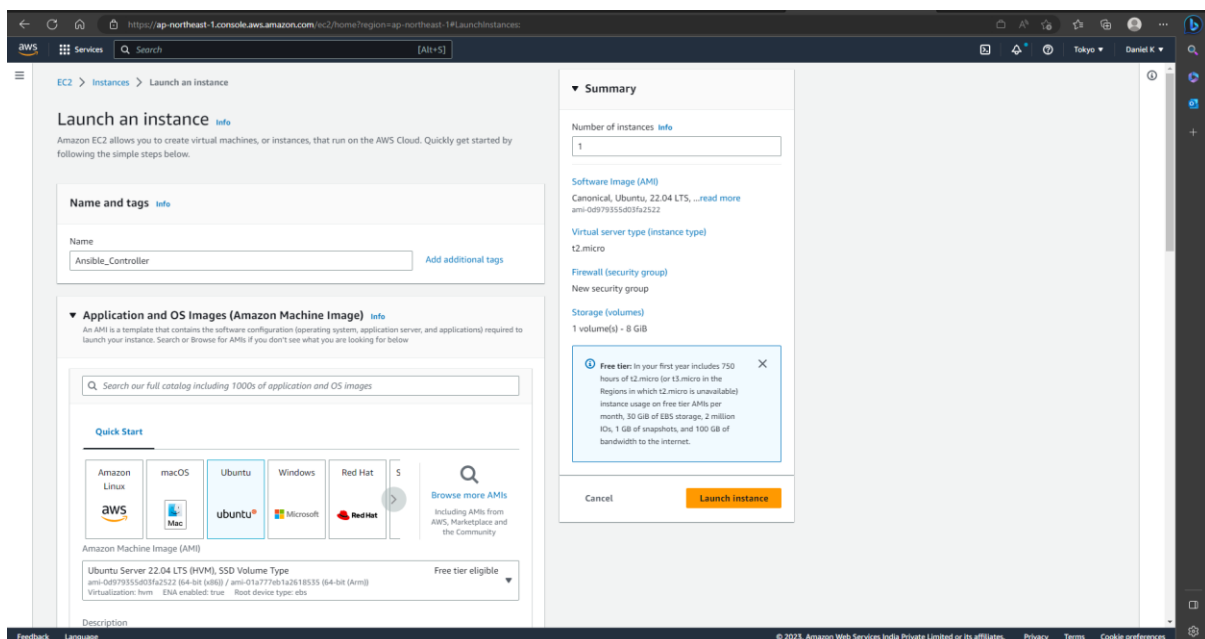
Devops Assignments - Module 8 - Continuous Deployment using Ansible

Assignment 1- Installing Ansible on Centos 7.docx

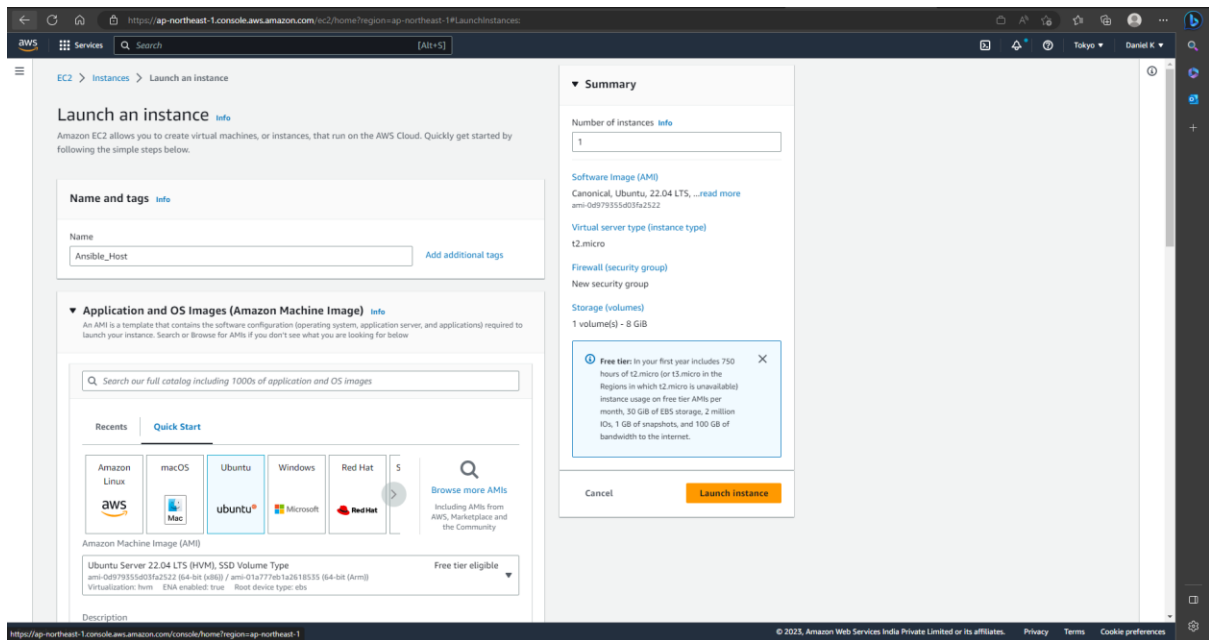
1. Create 2 Centos 7 EC2 instances with all traffic allowed (Centos 7 is available in AWS Market Place). Name the instances as Ansible Controller Machine and Ansible Host:
 - Login to AWS Console and creating 2 EC2 Instance



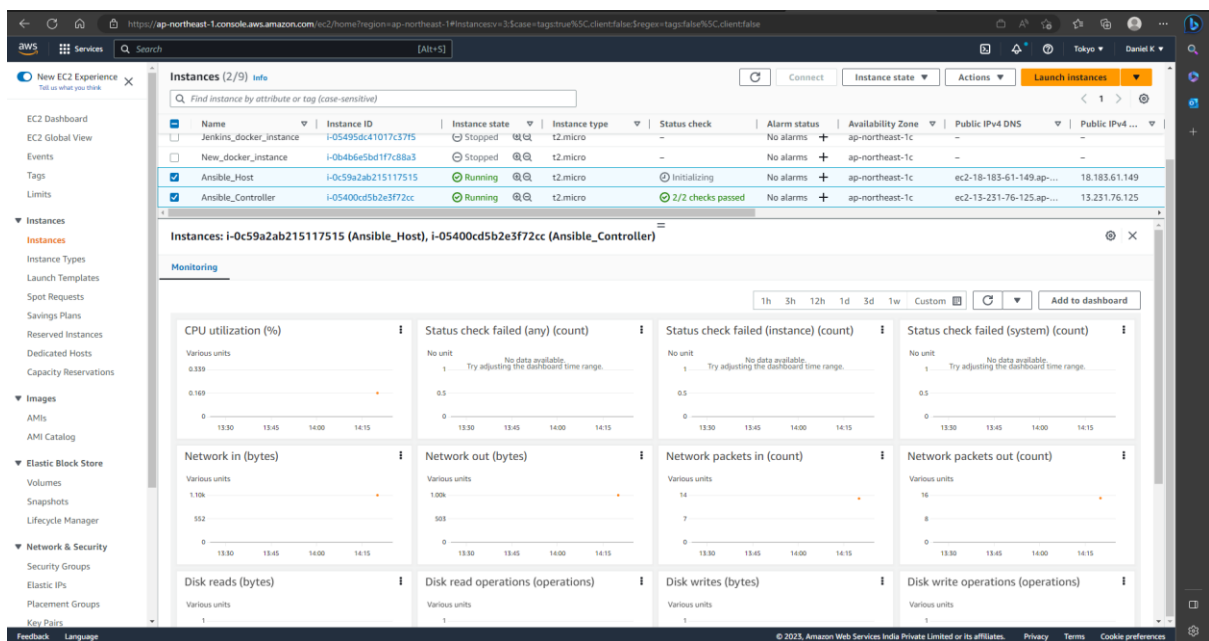
- Creating a EC2 Instance Named Ansible Controller



- Creating a EC2 Instance Named Ansible Host



2. Ansible Controller Machine and Ansible Hosts Instance created successfully:



3. Install epel packages and Ansible along with the dependencies on the master machine:

- ssh to ansible controller through cmd

```
ubuntu@ip-172-31-11-9: ~
```

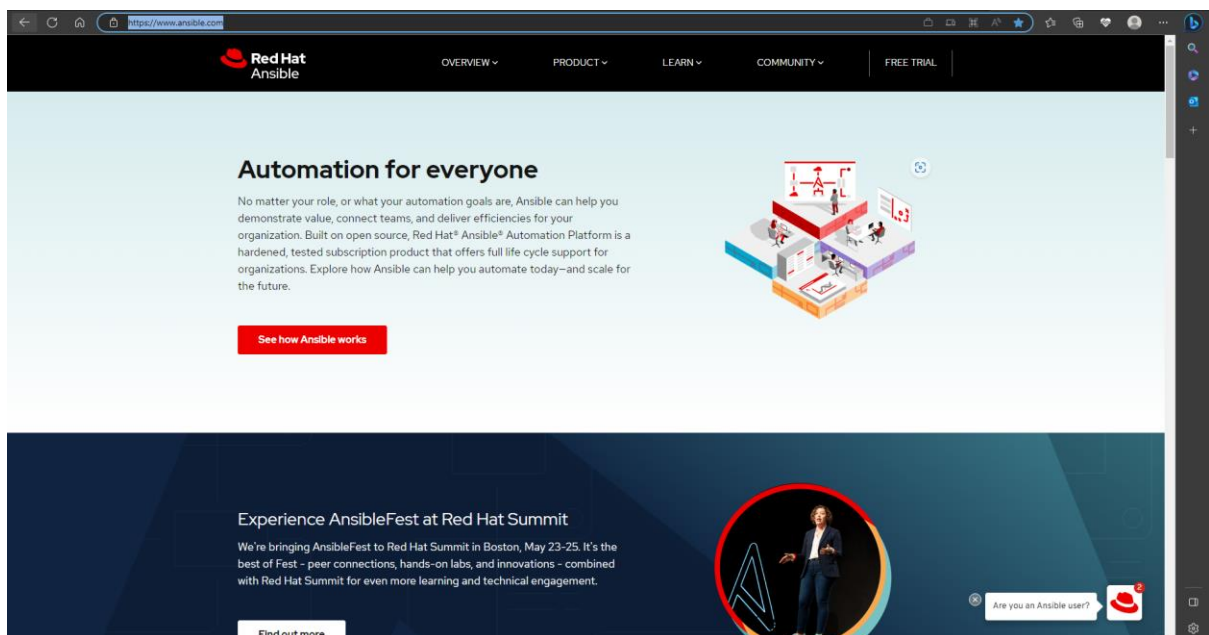
```
the exact distribution terms for each program are described in the individual files in /usr/share/doc/*/copyright.
```

```
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by applicable law.
```

```
To run a command as administrator (user "root"), use "sudo <command>". See "man sudo_root" for details.
```

```
ubuntu@ip-172-31-11-9:~$
```

- Here is the official website of Ansible: - <https://www.ansible.com/>



- Installing Ansible
 - **sudo apt-add-repository ppa:ansible/ansible** → command to include the official personal package archive

```
ubuntu@ip-172-31-11-9: ~
```

```
ubuntu@ip-172-31-11-9:~$ sudo apt-add-repository ppa:ansible/ansible
Repository: 'deb https://ppa.launchpadcontent.net/ansible/ansible/ubuntu/ jammy main'
Description:
Ansible is a radically simple IT automation platform that makes your applications and systems easier to
manage, using SSH, with no agents to install on remote systems.

http://ansible.com/

If you face any issues while installing Ansible PPA, file an issue here:
https://github.com/ansible-community/ppa/issues
More info: https://launchpad.net/~ansible/+archive/ubuntu/ansible
Adding repository.
Press [ENTER] to continue or Ctrl-c to cancel.
Adding deb entry to /etc/apt/sources.list.d/ansible-ubuntu-ansible-jammy.list
Adding disabled deb-src entry to /etc/apt/sources.list.d/ansible-ubuntu-ansible-jammy.list
Adding key to /etc/apt/trusted.gpg.d/ansible-ubuntu-ansible.gpg with fingerprint 6125E2A8C77F281
```

- **sudo apt update** → command to Update
- **sudo apt install ansible** → command to install Ansible

```
ubuntu@ip-172-31-11-9: ~
```

```
Reading state information... Done
6 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-11-9:~$ sudo apt install ansible
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ansible-core python3-jmespath python3-kerberos python3-nacl python3-ntlm-auth python3-packaging python3-paramiko python3-requests-ke
Suggested packages:
  python-nacl-doc python3-gssapi python3-invoke
The following NEW packages will be installed:
  ansible ansible-core python3-jmespath python3-kerberos python3-nacl python3-ntlm-auth python3-packaging python3-paramiko python3-req
0 upgraded, 14 newly installed, 0 to remove and 6 not upgraded.
Need to get 16.9 MB of archives.
After this operation, 216 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 python3-packaging all 21.3-1 [30.7 kB]
Get:2 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-resolvelib all 0.8.1-1 [23.6 kB]
Get:3 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 python3-jmespath all 0.10.0-1 [21.7 kB]
Get:4 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-kerberos amd64 1.1.14-3.1build5 [23.0 kB]
Get:5 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 python3-nacl amd64 1.5.0-2 [63.1 kB]
Get:6 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-ntlm-auth all 1.4.0-1 [20.4 kB]
Get:7 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 python3-paramiko all 2.9.3-0ubuntu1 [133 kB]
Get:8 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-requests-kerberos all 0.12.0-2 [11.9 kB]
Get:9 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-requests-ntlm all 1.1.0-1.1 [6160 B]
Get:10 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-xlrdict all 0.12.0-2 [12.6 kB]
Get:11 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-winrm all 0.3.0-2 [21.7 kB]
Get:12 http://ap-northeast-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 sshpass amd64 1.09-1 [11.7 kB]
Get:13 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu jammy/main amd64 ansible-core all 2.14.3-1ppa~jammy [1005 kB]
Get:14 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu jammy/main amd64 ansible all 7.3.0-1ppa~jammy [15.5 MB]
Fetched 16.9 MB in 25s (681 kB/s)
Selecting previously unselected package python3-packaging.
(Reading database ... 63657 files and directories currently installed.)
```

4. Check the Ansible version:

- **ansible --version** → command to Check Ansible Version

```
ubuntu@ip-172-31-11-9: ~
```

```
No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-11-9:~$ ansible --version
ansible [core 2.14.3]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/ubuntu/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /home/ubuntu/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.10.6 (main, Mar 10 2023, 10:55:28) [GCC 11.3.0] (/usr/bin/python3)
  jinja version = 3.0.3
  libyaml = True
ubuntu@ip-172-31-11-9:~$
```

Assignment 2 - Working with Ansible Playbooks.docx

In this Assignment we will be working with Playbooks to install and start Apache (httpd) on Ansible Host

1. Installing Apache on the controller machine, start the service and check the location of httpd.conf (Configuration File)
 - **sudo apt install apache2** → Command to Install Apache on Ansible_Controller

```
ubuntu@ip-172-31-14-158: ~  
ubuntu@ip-172-31-14-158:~$ sudo systemctl status apache2  
● apache2.service - The Apache HTTP Server  
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)  
   Active: active (running) since Wed 2023-05-17 09:13:07 UTC; 1min 0s ago  
     Docs: https://httpd.apache.org/docs/2.4/  
  Main PID: 3023 (apache2)  
    Tasks: 55 (limit: 1111)  
   Memory: 5.3M  
      CPU: 31ms  
   CGroup: /system.slice/apache2.service  
           └─3023 /usr/sbin/apache2 -k start  
             └─3024 /usr/sbin/apache2 -k start  
               └─3025 /usr/sbin/apache2 -k start  
  
May 17 09:13:07 ip-172-31-14-158 systemd[1]: Starting The Apache HTTP Server...  
May 17 09:13:07 ip-172-31-14-158 systemd[1]: Started The Apache HTTP Server.  
ubuntu@ip-172-31-14-158:~$
```

- After the installation is complete, start the Apache service by running the following command:
 - **sudo systemctl start apache2**
- Check the status of the Apache service to ensure that it is running by running the following command:
 - **sudo systemctl status apache2**

```
ubuntu@ip-172-31-14-158: ~  
ubuntu@ip-172-31-14-158:~$ sudo systemctl start apache2  
ubuntu@ip-172-31-14-158:~$ sudo systemctl status apache2  
● apache2.service - The Apache HTTP Server  
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)  
   Active: active (running) since Wed 2023-05-17 09:13:07 UTC; 3min 55s ago  
     Docs: https://httpd.apache.org/docs/2.4/  
  Main PID: 3023 (apache2)  
    Tasks: 55 (limit: 1111)  
   Memory: 5.3M  
      CPU: 39ms  
   CGroup: /system.slice/apache2.service  
           └─3023 /usr/sbin/apache2 -k start  
             └─3024 /usr/sbin/apache2 -k start  
               └─3025 /usr/sbin/apache2 -k start  
  
May 17 09:13:07 ip-172-31-14-158 systemd[1]: Starting The Apache HTTP Server...  
May 17 09:13:07 ip-172-31-14-158 systemd[1]: Started The Apache HTTP Server.  
ubuntu@ip-172-31-14-158:~$
```

- To find the location of httpd.conf, run the following command:

I am using ubuntu so the command is:

➤ **sudo find / -type f -name 'apache2.conf'**

ubuntu@ip-172-31-14-158: ~

```
-D AP_TYPES_CONFIG_FILE="mime.types"
-D SERVER_CONFIG_FILE="apache2.conf"
ubuntu@ip-172-31-14-158:~$ sudo find / -type f -name 'apache2.conf'
/etc/apache2/apache2.conf
ubuntu@ip-172-31-14-158:~$
```

2. Install vim editor on the controller machine:

Command to Install vim editor → **sudo apt install vim**

- Verify that the installation was successful by running the following command: **vim --version**

Select ubuntu@ip-172-31-14-158: ~

```
ubuntu@ip-172-31-14-158:~$ vim --version
VIM - Vi IMproved 8.2 (2019 Dec 12, compiled Apr 18 2023 11:40:57)
Included patches: 1-3995, 4563, 4646, 4774, 4895, 4899, 4901, 4919
Modified by team+vim@tracker.debian.org
Compiled by team+vim@tracker.debian.org
Huge version without GUI. Features included (+) or not (-):
+acl                +file_in_path      +mouse_urxvt       -tag_any_white
+arabic             +find_in_path      +mouse_xterm       -tcl
+autocmd            +float             +multi_byte        +termguicolors
+autochdir          +folding           +multi_lang        +terminal
-autoservername     -footer            -mzscheme          +terminfo
-balloon_eval       +fork()            +netbeans_intg     +termresponse
+balloon_eval_term +gettext           +num64             +textobjects
-browse             -hangul_input      +packages          +textprop
++builtin_terms     +iconv             +path_extra        +timers
+byte_offset        +insert_expand     -perl              +title
+channel            +ipv6              +persistent_undo   -toolbar
+cindent            +job               +popupwin          +user_commands
-clientserver       +jumplist          +postscript        +varargs
-clipboard          +keymap            +printer           +vertsplit
```

3. Write a playbook which will install and update httpd on the Ansible Host in the same location as Controller Machine:

- Here connecting Ansible_Host to Ansible_controller:

➤ Creating a Ansible.cfg file → **vi ansible.cfg**

➤ ansible.cfg file contains an Inventory file:

ubuntu@ip-172-31-14-158: ~/

```
[defaults]
inventory = ./dev
```

- Here the Inventory file contains dev file where the dev file has the IP address of nodes

```
C:\> ubuntu@ip-172-31-14-158:~$  
[web]  
16.16.126.209  
~  
~  
~  
~
```

- In Ansible_controller type **ssh-keygen** → it will generate a ssh key

```
C:\> ubuntu@ip-172-31-14-158:~$  
ubuntu@ip-172-31-14-158:~$ ssh-keygen  
Generating public/private rsa key pair.  
Enter file in which to save the key (/home/ubuntu/.ssh/id_rsa):  
Enter passphrase (empty for no passphrase):  
Enter same passphrase again:  
Your identification has been saved in /home/ubuntu/.ssh/id_rsa  
Your public key has been saved in /home/ubuntu/.ssh/id_rsa.pub  
The key fingerprint is:  
SHA256:hrcw9E15E5WTrsmY4TRaPjCvALyCUjpuqGJMKOnk ubuntu@ip-172-31-14-158  
The key's randomart image is:  
+---[RSA 3072]-----+  
| . . . . .  
| o . . . . .+  
|+. . . . .o o . .  
|+. . . . .o o* . .  
|. + + + S*.B o  
|o.. o =..* *  
|* . . . o .  
|OoE  
|*o  
+---[SHA256]-----+  
ubuntu@ip-172-31-14-158:~$ cat /home/ubuntu/.ssh/id_rsa.pub  
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQgQCDC2X9AAxvJ3jFeGyPLlxQUUzTwfZbWs2iVrf59gB5ffY6ZsHik12pvUXJIN89eRHV8tXX8Vard  
BnCv3KDRz4bUbnQLfEgswUhmMeUM1G+MJr0P9qoBxGiOG09pG2Lo5VTdmSqSf5GvB6AkVNE5UDXbtdX3tMj60v5hGGI1cm1Kb03AYVxCqFFQFn6igx  
6Zw13P1sMRoFgiDsZahaPc2svh2mjJ0keJCIQ9+2Vwkb7HEb5H9p24YsXB2xGF6W9rKgq2oz4FEXs= ubuntu@ip-172-31-14-158  
ubuntu@ip-172-31-14-158:~$
```

- Copy the key and paste in Ansible_Host **.ssh/authentication_keys** file:

```
C:\> ubuntu@ip-172-31-8-203:~$  
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQgQCDC2X9AAxvJ3jFeGyPLlxQUUzTwfZbWs2iVrf59gB5ffY6ZsHik12pvUXJIN89eRHV8tXX8Vard  
Dd71grASfMz7f4ILUH6v/Fqrbok2Gg/fG2p9YoSjpc/RbS/iSqeWI6HKqZrJ0c9cXwUdtstvBXo9SyIYLv5pGicyxdXIg3DQopCrtAU0H/sQ8FK/wQ8e2rN36Kedj7Fx/cxkPuOd!  
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQgQCDC2X9AAxvJ3jFeGyPLlxQUUzTwfZbWs2iVrf59gB5ffY6ZsHik12pvUXJIN89eRHV8tXX8Vardq+S3MvN+im1ZGv0V9DapY6A0yi  
BnCv3KDRz4bUbnQLfEgswUhmMeUM1G+MJr0P9qoBxGiOG09pG2Lo5VTdmSqSf5GvB6AkVNE5UDXbtdX3tMj60v5hGGI1cm1Kb03AYVxCqFFQFn6igxOrf344eyqlsIBd2oennScGB+  
6Zw13P1sMRoFgiDsZahaPc2svh2mjJ0keJCIQ9+2Vwkb7HEb5H9p24YsXB2xGF6W9rKgq2oz4FEXs= ubuntu@ip-172-31-14-158  
~  
~  
~  
~
```

Now check whether Ansible_controller is connected to Ansible_Host by Pinging:


```

ubuntu@ip-172-31-14-158: ~/ansible_controller
ubuntu@ip-172-31-14-158:~/ansible_controller$ ansible -m ping all
The authenticity of host '16.16.126.209 (16.16.126.209)' can't be established.
ED25519 key fingerprint is SHA256:5bjatI0QoRD4FB0QWE4tu2AJ6ddJ9bPpVxHSdp1D5bw.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
16.16.126.209 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
ubuntu@ip-172-31-14-158:~/ansible_controller$

```

- Now Creating a Playbook to Install apache2 on Ansible_host:

- Create a new file called **install_apache2.yaml**
- Add the following code in file

```

---
- name: Install Apache2
  hosts: web
  become: true
  tasks:
    - name: Install Apache2 package
      apt:
        name: apache2
        state: present

```

```

ubuntu@ip-172-31-14-158: ~/ansible_controller

```

```

---
- name: install apache2
  hosts: web
  become: true
  tasks:
    - name: Install apache2 package
      apt:
        name: apache2
        state: present
~
~
~

```

- command to run the Playbook→


```
ubuntu@ip-172-31-14-158: ~/ansible_controller
ubuntu@ip-172-31-14-158:~/ansible_controller$ ansible-playbook install_apache2.yaml

PLAY [install apache2] *****
TASK [Gathering Facts] *****
ok: [16.16.126.209]
TASK [Install apache2 package] *****
changed: [16.16.126.209]
PLAY RECAP *****
16.16.126.209      : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

ubuntu@ip-172-31-14-158:~/ansible_controller$
```

4. Logon to the Ansible Host and check if Apache has been installed and configured. Also check if the service is running:

- Command to check whether apache2 has been installed and service is running in Ansible_Host:

→ **Sudo systemctl status apache2**

```
ubuntu@ip-172-31-8-203: ~
ubuntu@ip-172-31-8-203:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-05-17 11:06:56 UTC; 12min ago
     Docs: https://httpd.apache.org/docs/2.4/
  Main PID: 3003 (apache2)
    Tasks: 55 (limit: 1111)
   Memory: 5.4M
      CPU: 66ms
   CGroup: /system.slice/apache2.service
           └─3003 /usr/sbin/apache2 -k start
             3005 /usr/sbin/apache2 -k start
             3006 /usr/sbin/apache2 -k start

May 17 11:06:56 ip-172-31-8-203 systemd[1]: Starting The Apache HTTP Server...
May 17 11:06:56 ip-172-31-8-203 systemd[1]: Started The Apache HTTP Server.
ubuntu@ip-172-31-8-203:~$
```

- Logging in to Ansible_Host through ansible IP address:

