

Assignment–8

Module-11: Configuration Automation using Ansible

Submitted by : Shaik Junaid Adil

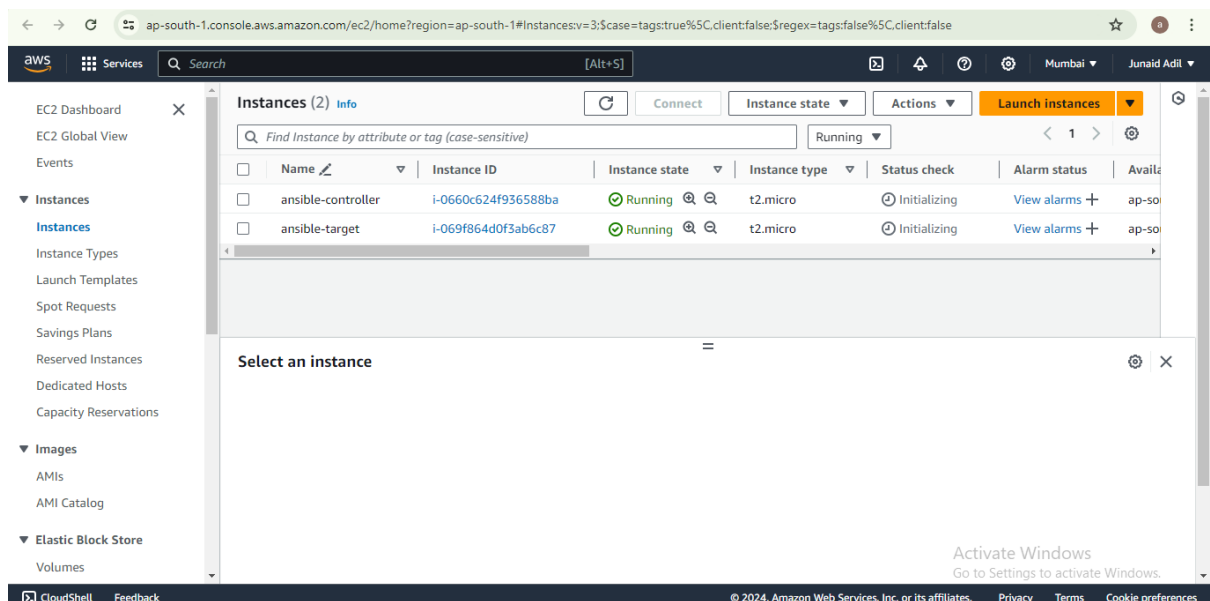
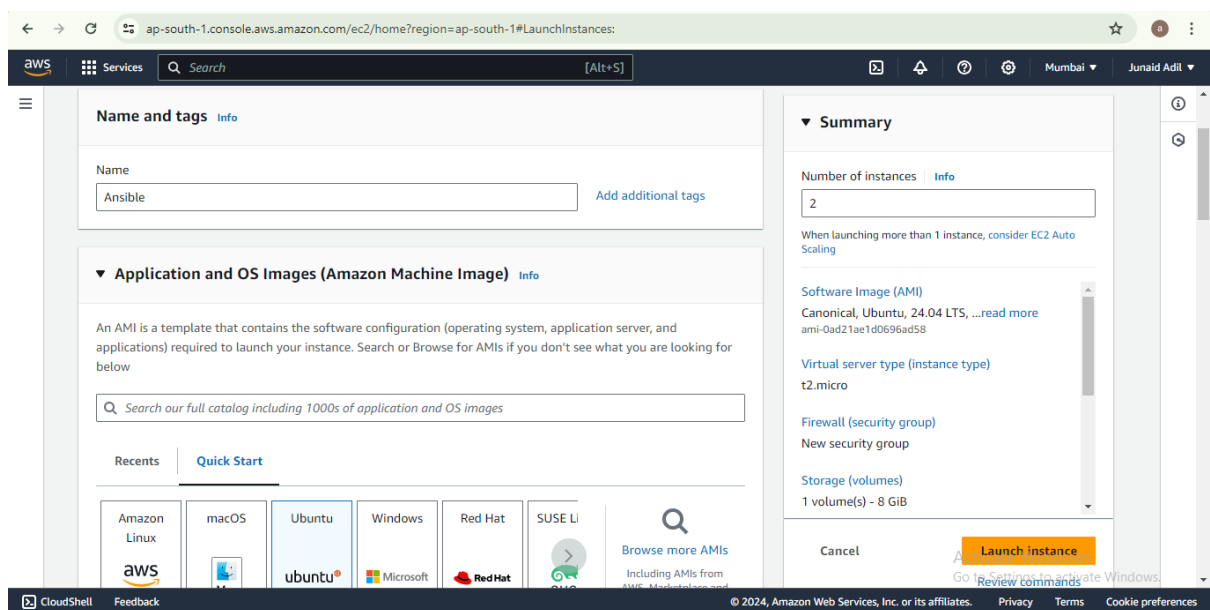
Date of Submission: 12-07-2024

Submitted to: Vikul

L1 - Create and Execute Ansible Playbook to Setup Java Maven Application Build Server

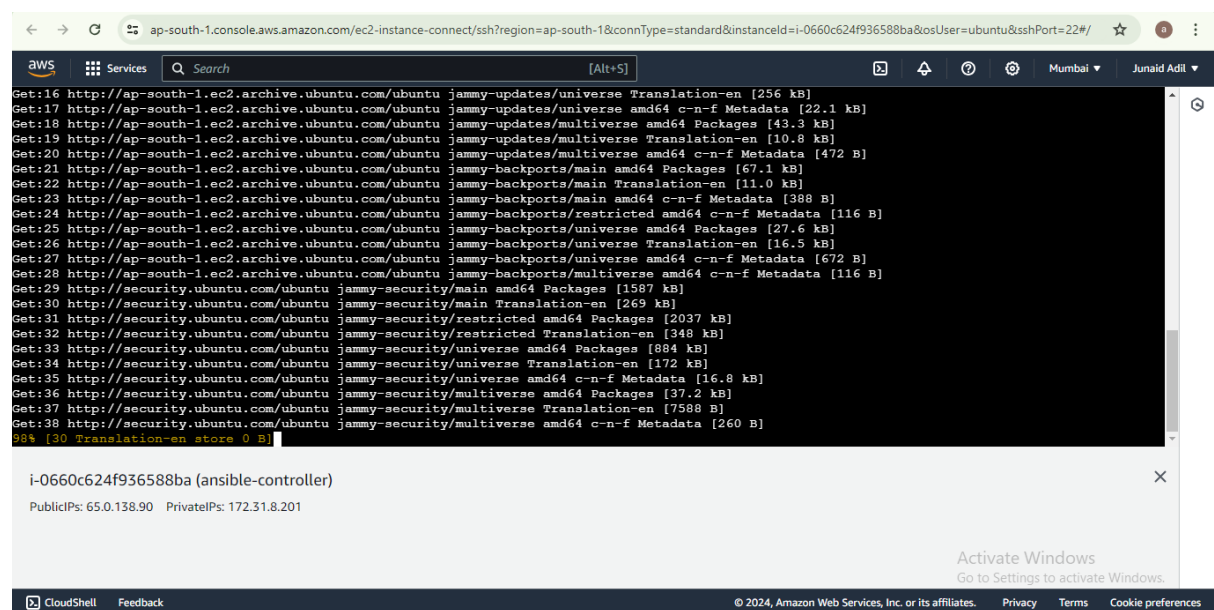
Step 1: To create and execute Ansible Playbook we need to create 2 Instances. In 1 Instance install the Ansible, which will be the Controller machine. Other instance will be the Target server, where we will setup the Java Maven application Build Server using Controller machine.

Create 2 Instances



ansible controller and ansible target node.

Step 2: Update all the packages and as a root user run below commands



The screenshot shows the AWS CloudShell interface with a terminal window. The terminal displays a list of package updates being fetched from the Ubuntu archive. The updates include jammy-updates/universe Translation-en, jammy-updates/universe amd64 c-n-f Metadata, jammy-updates/multiverse amd64 Packages, jammy-updates/multiverse Translation-en, jammy-updates/multiverse amd64 c-n-f Metadata, jammy-backports/main amd64 Packages, jammy-backports/main Translation-en, jammy-backports/main amd64 c-n-f Metadata, jammy-backports/restricted amd64 c-n-f Metadata, jammy-backports/universe amd64 Packages, jammy-backports/universe Translation-en, jammy-backports/universe amd64 c-n-f Metadata, jammy-backports/multiverse amd64 c-n-f Metadata, jammy-security/main amd64 Packages, jammy-security/main Translation-en, jammy-security/restricted amd64 Packages, jammy-security/restricted Translation-en, jammy-security/universe amd64 Packages, jammy-security/universe Translation-en, jammy-security/universe amd64 c-n-f Metadata, jammy-security/multiverse amd64 Packages, jammy-security/multiverse Translation-en, and jammy-security/multiverse amd64 c-n-f Metadata. The progress bar shows 98% completion for the Translation-en store.

```
Get:16 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [256 kB]
Get:17 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [22.1 kB]
Get:18 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [43.3 kB]
Get:19 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [10.8 kB]
Get:20 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [472 B]
Get:21 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [67.1 kB]
Get:22 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [11.0 kB]
Get:23 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [388 B]
Get:24 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:25 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [27.6 kB]
Get:26 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [16.5 kB]
Get:27 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [672 B]
Get:28 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:29 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1597 kB]
Get:30 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [269 kB]
Get:31 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [2037 kB]
Get:32 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [348 kB]
Get:33 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [884 kB]
Get:34 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [172 kB]
Get:35 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [16.8 kB]
Get:36 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [37.2 kB]
Get:37 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [7588 B]
Get:38 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 c-n-f Metadata [260 B]
98% [30 Translation-en store 0 B]
```

i-0660c624f936588ba (ansible-controller)

PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

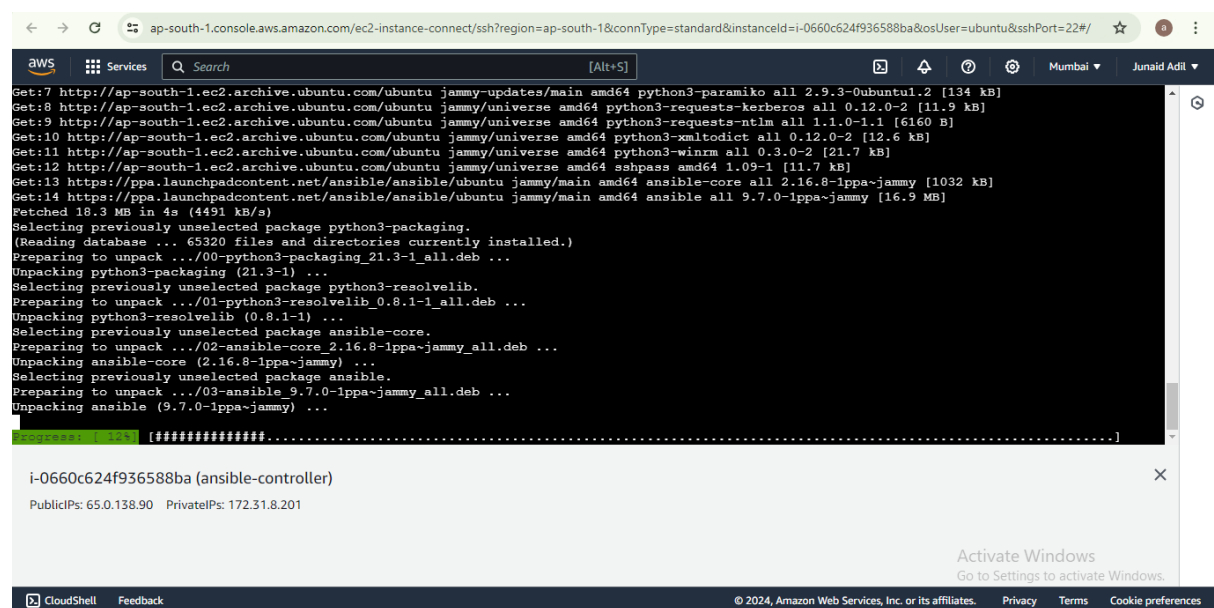
CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Commands: “ sudo apt install software-properties-common -y “

“ sudo add-apt-repository --yes --update ppa:ansible/ansible “

“ sudo apt update -y “

“ sudo apt install ansible -y “



The screenshot shows the AWS CloudShell interface with a terminal window. The terminal displays the output of the command 'sudo apt install ansible -y'. It shows the fetching of packages, selecting previously unselected packages, and unpacking them. The packages include python3-paramiko, python3-requests-kerberos, python3-requests-ntlm, python3-xmltodict, python3-winrm, python3-sshpass, ansible-core, and ansible. The progress bar shows 100% completion for the ansible package.

```
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3-paramiko all 2.9.3-0ubuntu1.2 [134 kB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-requests-kerberos all 0.12.0-2 [11.9 kB]
Get:9 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-requests-ntlm all 1.1.0-1.1 [6160 B]
Get:10 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-xmltodict all 0.12.0-2 [12.6 kB]
Get:11 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-winrm all 0.3.0-2 [21.7 kB]
Get:12 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-sshpass amd64 1.09-1 [11.7 kB]
Get:13 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu jammy/main amd64 ansible-core all 2.16.8-1ppa-jammy [1032 kB]
Get:14 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu jammy/main amd64 ansible all 9.7.0-1ppa-jammy [16.9 MB]
Fetched 18.3 MB in 4s (4491 kB/s)
Selecting previously unselected package python3-packaging.
(Reading database ... 65320 files and directories currently installed.)
Preparing to unpack .../00-python3-packaging_21.3-1_all.deb ...
Unpacking python3-packaging (21.3-1) ...
Selecting previously unselected package python3-resolvelib.
Preparing to unpack .../01-python3-resolvelib_0.8.1-1_all.deb ...
Unpacking python3-resolvelib (0.8.1-1) ...
Selecting previously unselected package ansible-core.
Preparing to unpack .../02-ansible-core_2.16.8-1ppa-jammy_all.deb ...
Unpacking ansible-core (2.16.8-1ppa-jammy) ...
Selecting previously unselected package ansible.
Preparing to unpack .../03-ansible_9.7.0-1ppa-jammy_all.deb ...
Unpacking ansible (9.7.0-1ppa-jammy) ...
```

i-0660c624f936588ba (ansible-controller)

PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

```
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0660c624f936588ba&osUser=ubuntu&sshPort=22#/  
[Alt+S]  
Setting up python3-xmldict (0.12.0-2) ...  
Setting up python3-packaging (21.3-1) ...  
Setting up python3-jmespath (0.10.0-1) ...  
Setting up python3-requests-kerberos (0.12.0-2) ...  
Setting up python3-nacl (1.5.0-2) ...  
Setting up python3-requests-ntlm (1.1.0-1.1) ...  
Setting up ansible-core (2.16.8-1ppa-jammy) ...  
Setting up python3-winscp (0.3.0-2) ...  
Setting up ansible (9.7.0-1ppa-jammy) ...  
Setting up python3-paramiko (2.9.3-0ubuntu1.2) ...  
Processing triggers for man-db (2.10.2-1) ...  
Scanning processes...  
Scanning linux images...  
  
Running kernel seems to be up-to-date.  
  
No services need to be restarted.  
  
No containers need to be restarted.  
  
No user sessions are running outdated binaries.  
  
No VM guests are running outdated hypervisor (qemu) binaries on this host.  
root@ip-172-31-8-201:/home/ubuntu#  
  
i-0660c624f936588ba (ansible-controller)  
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201  
  
Activate Windows  
Go to Settings to activate Windows.  
CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences
```

Step 3: Check Ansible version using command “ansible --version”

```
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0660c624f936588ba&osUser=ubuntu&sshPort=22#/  
[Alt+S]  
Processing triggers for man-db (2.10.2-1) ...  
Scanning processes...  
Scanning linux images...  
  
Running kernel seems to be up-to-date.  
  
No services need to be restarted.  
  
No containers need to be restarted.  
  
No user sessions are running outdated binaries.  
  
No VM guests are running outdated hypervisor (qemu) binaries on this host.  
root@ip-172-31-8-201:/home/ubuntu# ansible --version  
ansible [core 2.16.8]  
  config file = /etc/ansible/ansible.cfg  
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']  
  ansible python module location = /usr/lib/python3/dist-packages/ansible  
  ansible collection location = /root/.ansible/collections:/usr/share/ansible/collections  
  executable location = /usr/bin/ansible  
  python version = 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0] (/usr/bin/python3)  
  jinja version = 3.0.3  
  libyaml = True  
root@ip-172-31-8-201:/home/ubuntu#  
  
i-0660c624f936588ba (ansible-controller)  
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201  
  
Activate Windows  
Go to Settings to activate Windows.  
CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences
```

Step 4: Create SSH Keypair using command “ssh-keygen -t ecdsa -b 521 “

```
root@ip-172-31-8-201:/home/ubuntu# ssh-keygen -t ecdsa -b 521
Generating public/private ecdsa key pair.
Enter file in which to save the key (/root/.ssh/id_ecdsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_ecdsa
Your public key has been saved in /root/.ssh/id_ecdsa.pub
The key fingerprint is:
SHA256:2Wt1P14p3549a6BRa/EEFl+cYf2F4i67UG0x8iXN+Rc root@ip-172-31-8-201
The key's randomart image is:
+---[ECDSA 521]---+
|      .           |
|      o.++        |
|      .++*+       |
|      o  BBXO|    |
|      S . +.#+@|   |
|      =.-.*=      |
|      + oo.. |    |
|      . o. .. |    |
|      .... |      |
+---[SHA256]-----+
root@ip-172-31-8-201:/home/ubuntu#
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

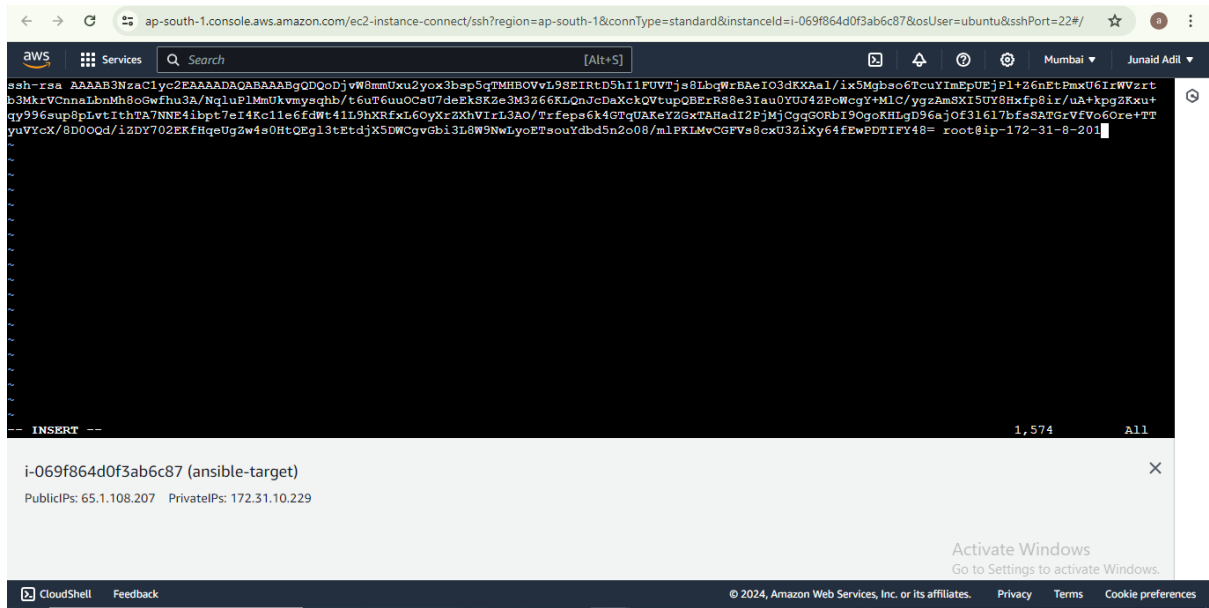
We can use this keys and create a file in Target node as “authorized_keys and paste this public key

```
root@ip-172-31-8-201:/home/ubuntu/.ssh# ssh ubuntu@172.31.10.229
ubuntu@172.31.10.229: Permission denied (publickey).
root@ip-172-31-8-201:/home/ubuntu/.ssh# cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGDgQDjVW8mmUxu2yox3bsp5qTMHBOVvL9SEIRtD5h1lFUVtjs8LlqWvRAeIO3dKXAal/ix5Mgbso6TcuYImEpUEjPl+Z6nEtPmxU6IrwVZ
rtb3MkrVCnnaIbnMh8oGwfh3A/NqluPlMmUkvmysghb/t6vT6uuOCsU7dePksKZe3M3Z66KLQnJcDaXckOVtupQBErRS8e3Iau0YUJ42PoWcgY+M1C/ygzAmSXl5UY8Hxfp8ir/ua+kpgZ
Kxutqy996sup8PlvtlthTA7NNB4ibpt7eI4Kc1le6fdwt41L9hXRfxL6OyXrZKhVIRL3AO/Trfeps6k4GTqUAKeY2GxTAHadI2PjMjCggGORbI9OgoKHLqD96ajOf31617bfsSATGrVfVo6
Ore+TtyuvVcX/8D0OQD/iZDY702EKfHqeUg2w4s0HtQeql3tEtdjX5DWCgvGbi3L8W9NwLuyETsOuYdbd5n2o08/mlPKLMvCGFVs8cxU3ZiXy64fEwPD/TIFy48= root@ip-172-31-8-20
1
root@ip-172-31-8-201:/home/ubuntu/.ssh#
```

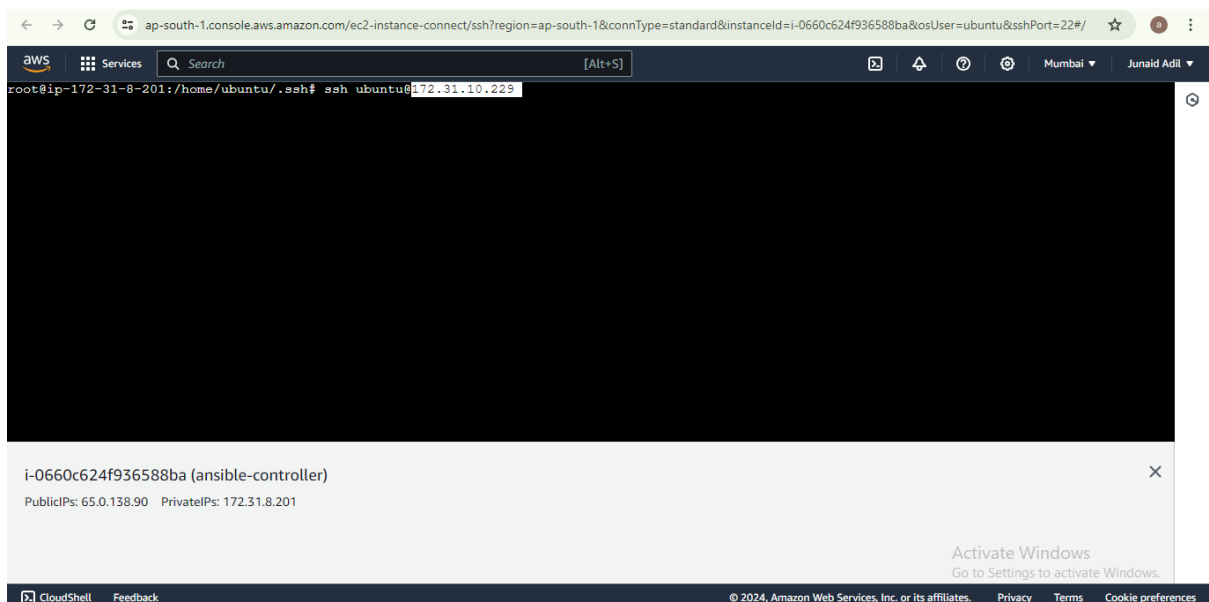
i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences



Step 5: In Controller machine run command “ssh ansibleadmin@private IP “ to connect the Target node



The screenshot shows a terminal window in AWS CloudShell. The terminal output displays system information as of Thursday, July 11, 2024, at 20:08:05 UTC. It lists system load (0.01), memory usage (21%), and processes (99). It also indicates that expanded security maintenance for applications is not enabled and that 0 updates can be applied immediately. A message suggests enabling ESM apps for additional future security updates. The terminal also shows the last login time and the user 'root'.

```
System information as of Thu Jul 11 20:08:05 UTC 2024
System load: 0.01          Processes:          99
Usage of /: 21.1% of 7.57GB Users logged in:   1
Memory usage: 21%         IPv4 address for eth0: 172.31.10.229
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Thu Jul 11 19:55:45 2024 from 13.233.177.5
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-10-229:~$
```

Below the terminal output, there is a box showing the instance ID: i-0660c624f936588ba (ansible-controller) and its public and private IP addresses: PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201.

We are able to connect to the Target node from Controller machine

Step 6: Now create an Inventory file which is used to define and manage the hosts (servers) that the playbooks will target.

Add Target node details in hosts file. Go to `/etc/ansible/`

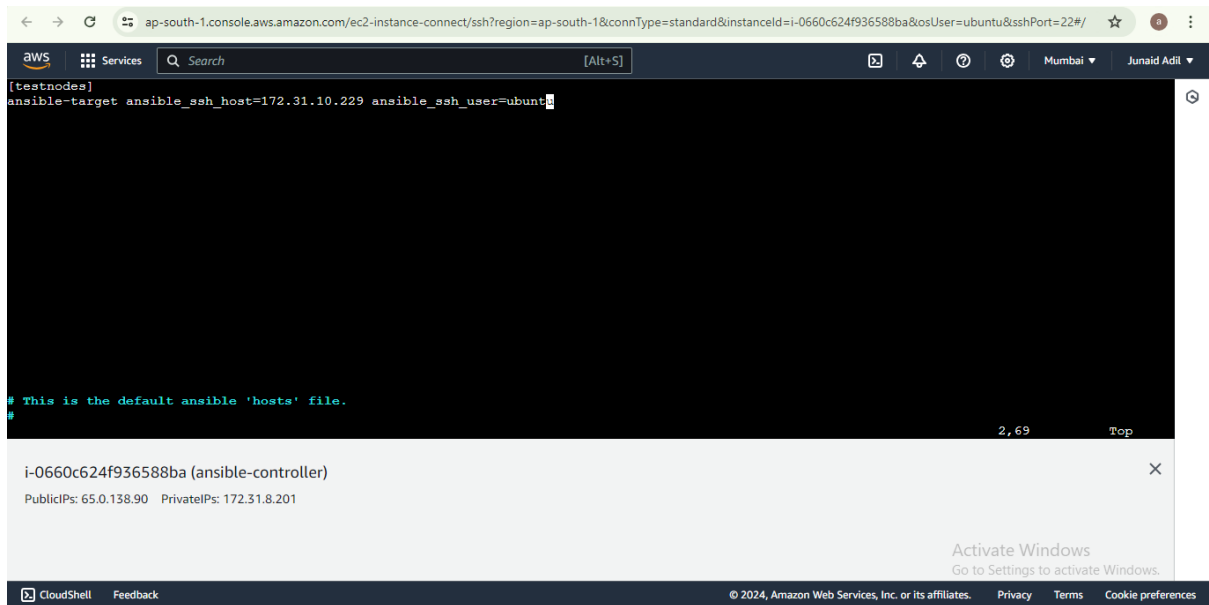
The screenshot shows a terminal window in AWS CloudShell. The user is in the directory `/home/ubuntu/.ssh` and has navigated to `/etc/ansible`. The user has run the `ls` command, which shows the files `ansible.cfg`, `hosts`, and `roles`. The user has then run the `vi hosts` command to open the `hosts` file in the `vi` editor.

```
root@ip-172-31-8-201:/home/ubuntu/.ssh# cd /etc/ansible
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-31-8-201:/etc/ansible# vi hosts
```

Below the terminal output, there is a box showing the instance ID: i-0660c624f936588ba (ansible-controller) and its public and private IP addresses: PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201.

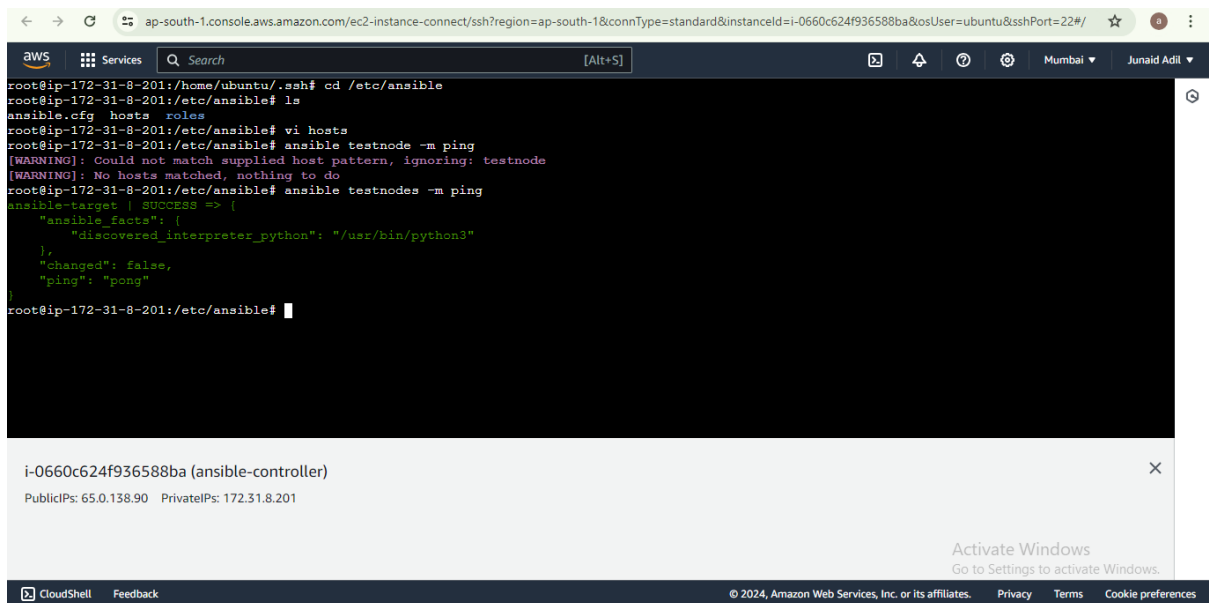
Step 7: Add Target node details:

“ansible-target ansible_ssh_host= 172.31.10.229 ansible_ssh_user=Ubuntu”



The screenshot shows the AWS CloudShell interface. The terminal window displays the command `ansible-target ansible_ssh_host=172.31.10.229 ansible_ssh_user=ubuntu` being entered. Below the terminal, a metadata box for the instance `i-0660c624f936588ba (ansible-controller)` is visible, showing public and private IP addresses. The bottom of the interface includes the AWS logo, a search bar, and navigation links for CloudShell, Feedback, and legal notices.

Step 8: To check the connection use command “ ansible testnodes -m ping ”

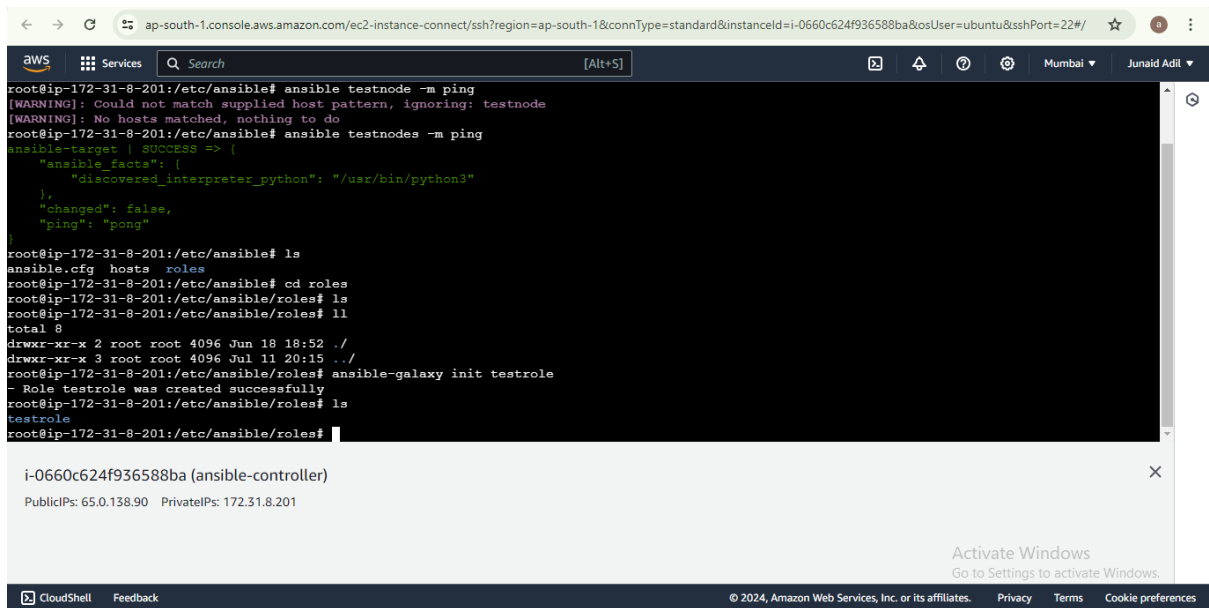


The screenshot shows the AWS CloudShell interface with the terminal window displaying the command `ansible testnodes -m ping`. The output shows a successful ping response from the target node. Below the terminal, the same instance metadata box for `i-0660c624f936588ba (ansible-controller)` is shown. The bottom of the interface includes the AWS logo, a search bar, and navigation links for CloudShell, Feedback, and legal notices.

Connection is success.

Now we can run Ansible playbooks to configure the instance

Step 9: Go to roles folder and create a role using command “ansible-galaxy init testrole”



```
root@ip-172-31-8-201:/etc/ansible# ansible testnode -m ping
[WARNING]: Could not match supplied host pattern, ignoring: testnode
[WARNING]: No hosts matched, nothing to do
root@ip-172-31-8-201:/etc/ansible# ansible testnodes -m ping
ansible-target | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-31-8-201:/etc/ansible# cd roles
root@ip-172-31-8-201:/etc/ansible/roles# ls
root@ip-172-31-8-201:/etc/ansible/roles# ll
total 8
drwxr-xr-x 2 root root 4096 Jun 18 18:52 ./
drwxr-xr-x 3 root root 4096 Jul 11 20:15 ../
root@ip-172-31-8-201:/etc/ansible/roles# ansible-galaxy init testrole
- Role testrole was created successfully
root@ip-172-31-8-201:/etc/ansible/roles# ls
testrole
root@ip-172-31-8-201:/etc/ansible/roles#
```

i-0660c624f936588ba (ansible-controller)

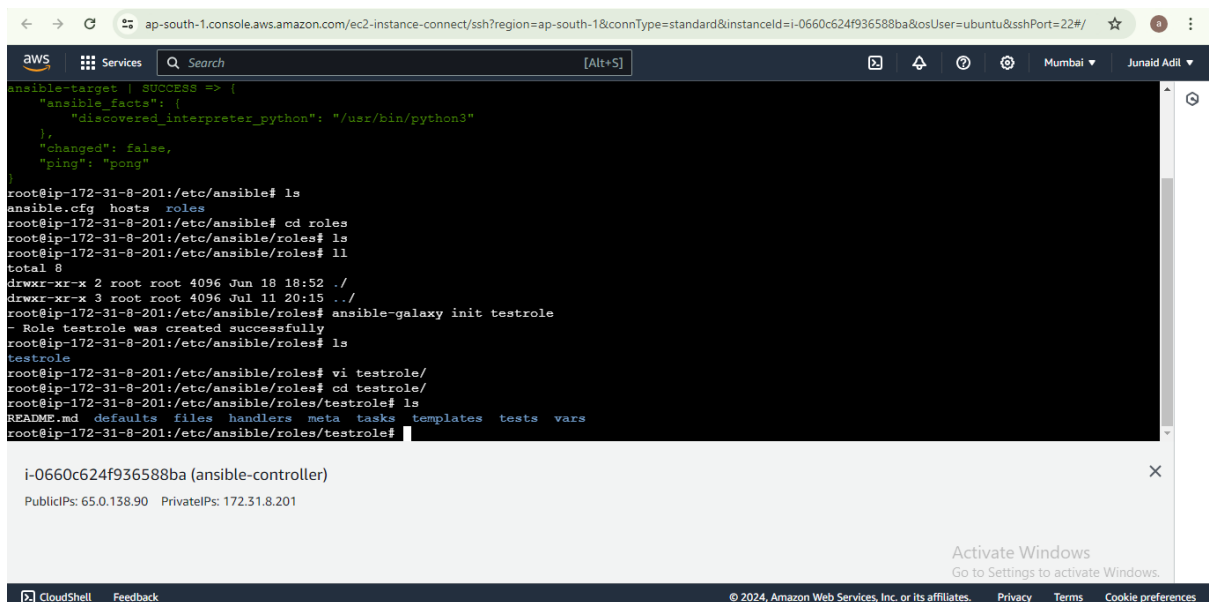
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

We can see testrole file has been added successfully.

Step 10: Open the testrole folder



```
ansible-target | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-31-8-201:/etc/ansible# cd roles
root@ip-172-31-8-201:/etc/ansible/roles# ls
root@ip-172-31-8-201:/etc/ansible/roles# ll
total 8
drwxr-xr-x 2 root root 4096 Jun 18 18:52 ./
drwxr-xr-x 3 root root 4096 Jul 11 20:15 ../
root@ip-172-31-8-201:/etc/ansible/roles# ansible-galaxy init testrole
- Role testrole was created successfully
root@ip-172-31-8-201:/etc/ansible/roles# ls
testrole
root@ip-172-31-8-201:/etc/ansible/roles# vi testrole/
root@ip-172-31-8-201:/etc/ansible/roles# cd testrole/
root@ip-172-31-8-201:/etc/ansible/roles/testrole# ls
README.md  defaults  files  handlers  meta  tasks  templates  tests  vars
root@ip-172-31-8-201:/etc/ansible/roles/testrole#
```

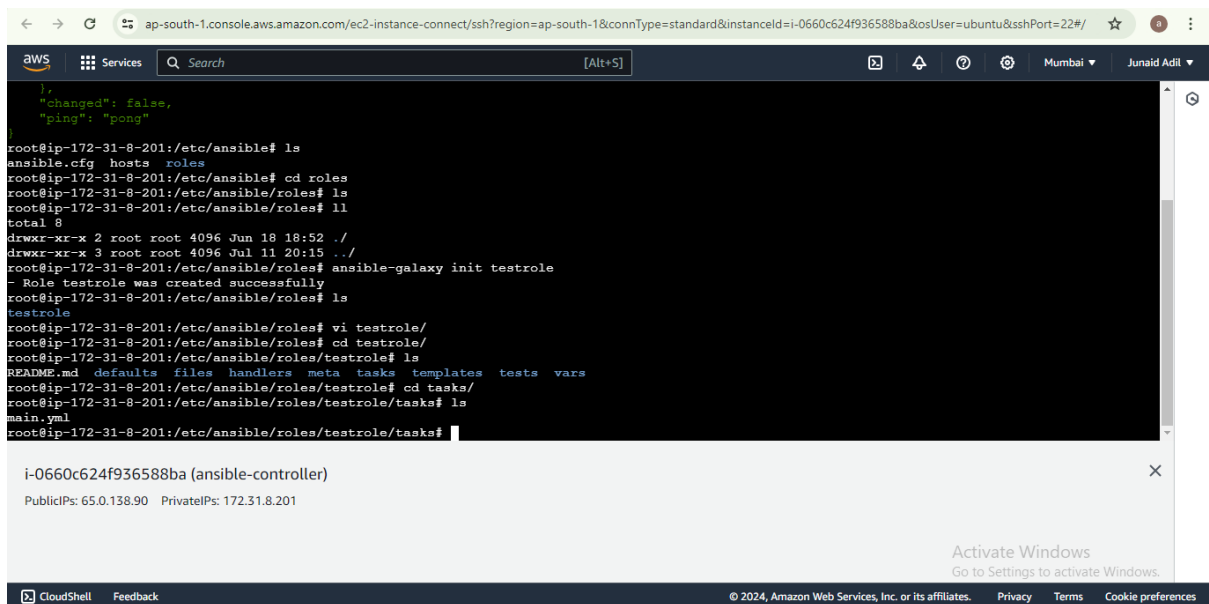
i-0660c624f936588ba (ansible-controller)

PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 11: Go to tasks folder and open main.yml file to add commands to run java, maven



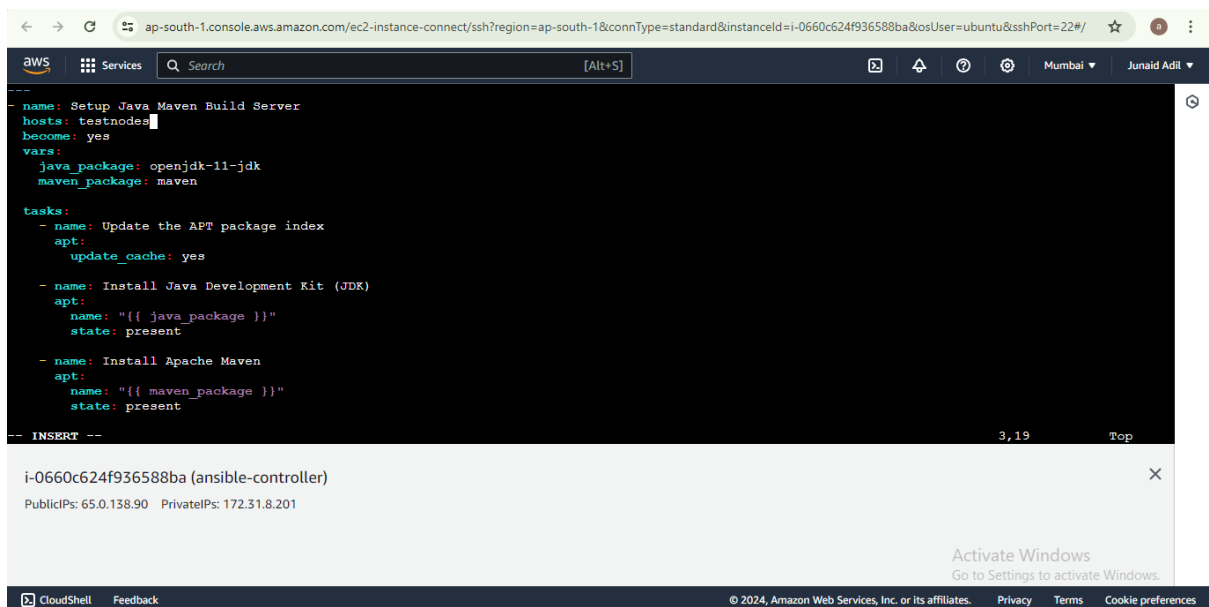
The screenshot shows the AWS CloudShell interface with a terminal window. The terminal output shows the user navigating through the Ansible directory structure, creating a new role named 'testrole', and entering the 'tasks' directory. The file 'main.yml' is visible in the directory listing.

```
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-31-8-201:/etc/ansible# cd roles
root@ip-172-31-8-201:/etc/ansible/roles# ls
root@ip-172-31-8-201:/etc/ansible/roles# ll
total 8
drwxr-xr-x 2 root root 4096 Jun 18 18:52 ./
drwxr-xr-x 3 root root 4096 Jul 11 20:15 ../
root@ip-172-31-8-201:/etc/ansible/roles# ansible-galaxy init testrole
- Role testrole was created successfully
root@ip-172-31-8-201:/etc/ansible/roles# ls
testrole
root@ip-172-31-8-201:/etc/ansible/roles# cd testrole/
root@ip-172-31-8-201:/etc/ansible/roles/testrole# cd testrole/
root@ip-172-31-8-201:/etc/ansible/roles/testrole# ls
README.md  defaults  files  handlers  meta  tasks  templates  tests  vars
root@ip-172-31-8-201:/etc/ansible/roles/testrole# cd tasks/
root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks# ls
main.yml
root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks#
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences



The screenshot shows the AWS CloudShell interface with a terminal window displaying the content of the 'main.yml' file in the 'tasks' directory of the 'testrole' role. The file contains tasks for updating the APT package index, installing the Java Development Kit (JDK), and installing Apache Maven.

```
-- name: Setup Java Maven Build Server
hosts: testnodes
become: yes
vars:
  java_package: openjdk-11-jdk
  maven_package: maven

tasks:
  - name: Update the APT package index
    apt:
      update_cache: yes

  - name: Install Java Development Kit (JDK)
    apt:
      name: "{{ java_package }}"
      state: present

  - name: Install Apache Maven
    apt:
      name: "{{ maven_package }}"
      state: present

-- INSERT --
```

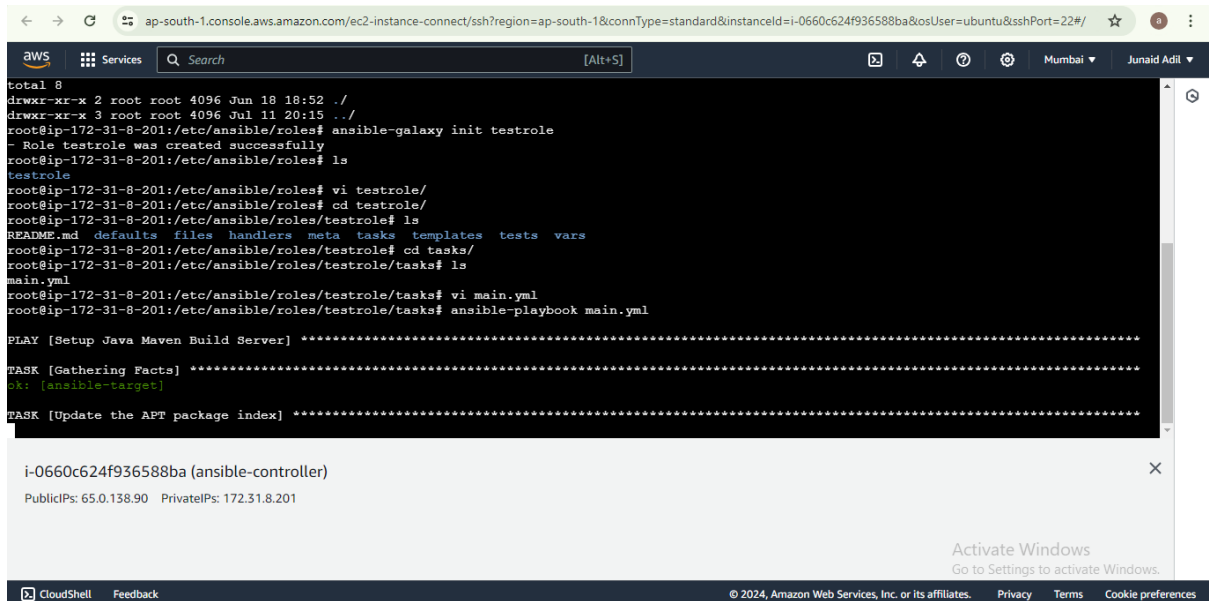
3, 19 Top

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 12: Execute the file using command “ansible-playbook main.yml”



The screenshot shows the AWS CloudShell interface. The terminal window displays the following commands and output:

```
total 8
drwxr-xr-x 2 root root 4096 Jun 18 18:52 ./
drwxr-xr-x 3 root root 4096 Jul 11 20:15 ../
root@ip-172-31-8-201:/etc/ansible/roles# ansible-galaxy init testrole
- Role testrole was created successfully
root@ip-172-31-8-201:/etc/ansible/roles# ls
testrole
root@ip-172-31-8-201:/etc/ansible/roles# cd testrole/
root@ip-172-31-8-201:/etc/ansible/roles/testrole# ls
README.md defaults files handlers meta tasks templates tests vars
root@ip-172-31-8-201:/etc/ansible/roles/testrole# cd tasks/
root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks# ls
main.yml
root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks# vi main.yml
root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks# ansible-playbook main.yml

PLAY [Setup Java Maven Build Server] *****

TASK [Gathering Facts] *****
ok: [ansible-target]

TASK [Update the APT package index] *****
```

Below the terminal window, the instance details for `i-0660c624f936588ba` (ansible-controller) are shown, including Public IPs (65.0.138.90) and Private IPs (172.31.8.201).



The screenshot shows the continuation of the AWS CloudShell terminal session. The terminal window displays the following commands and output:

```
TASK [Verify Java installation] *****
changed: [ansible-target]

TASK [Display Java version] *****
ok: [ansible-target] => {
  "msg": "Java version: openjdk version \"11.0.23\" 2024-04-16\nOpenJDK Runtime Environment (build 11.0.23+9-post-Ubuntu-1ubuntu122.04.1)\nOpenJDK 64-Bit Server VM (build 11.0.23+9-post-Ubuntu-1ubuntu122.04.1, mixed mode, sharing)"
}

TASK [Verify Maven installation] *****
changed: [ansible-target]

TASK [Display Maven version] *****
ok: [ansible-target] => {
  "msg": "Maven version: \u001b[38mApache Maven 3.6.3\u001b[39m\nMaven home: /usr/share/maven\nJava version: 11.0.23, vendor: Ubuntu, runtime: /usr/lib/jvm/java-11-openjdk-amd64\nDefault locale: en, platform encoding: UTF-8\nOS name: \"linux\", version: \"6.5.0-1022-aws\", arch: \"amd64\", family: \"unix\""
}

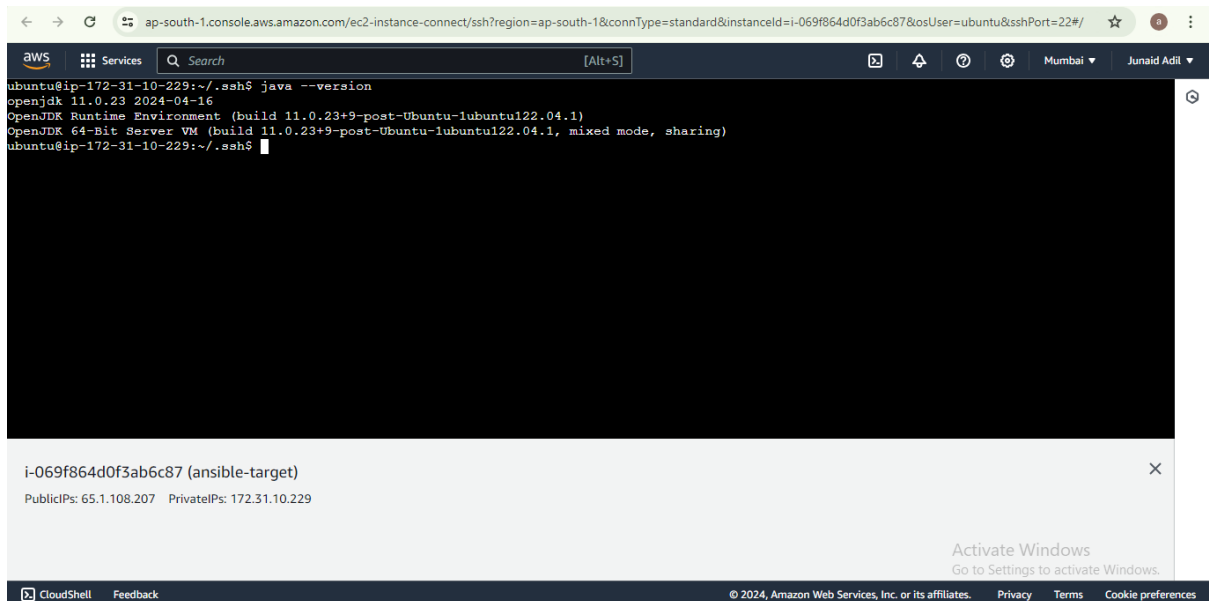
PLAY RECAP *****
ansible-target : ok=8 changed=5 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks#
```

Below the terminal window, the instance details for `i-0660c624f936588ba` (ansible-controller) are shown, including Public IPs (65.0.138.90) and Private IPs (172.31.8.201).

Step 13: Now check if Java and maven installed in the target server.

We can see java 11 and maven have been installed in target node



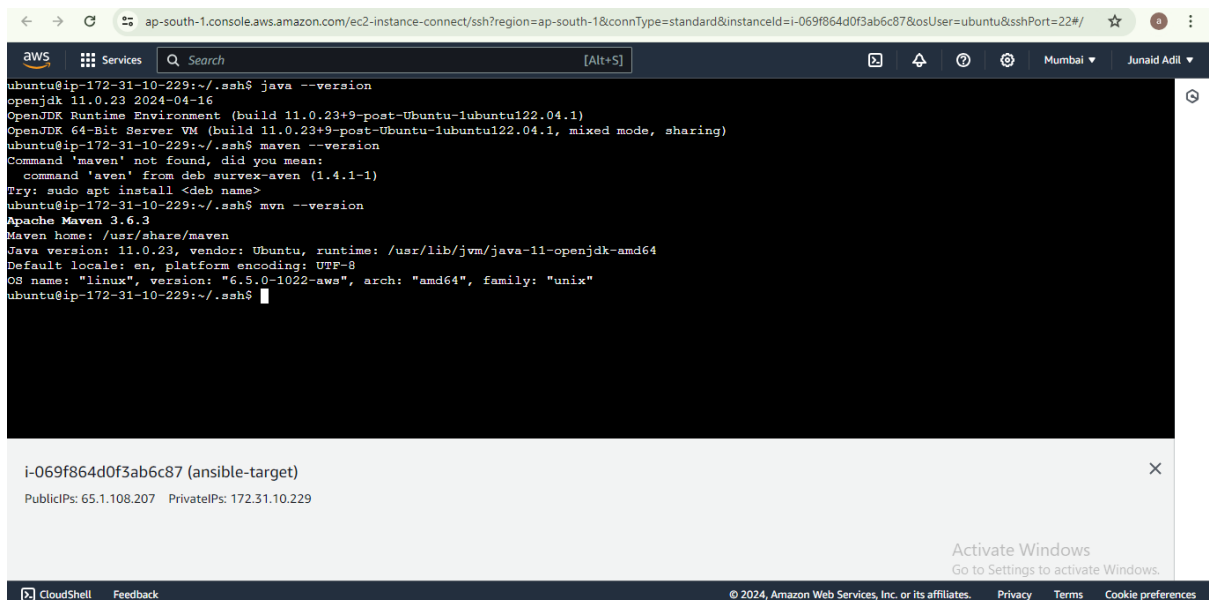
The screenshot shows the AWS CloudShell interface. The terminal window displays the output of the command `java --version`. The output indicates that OpenJDK 11.0.23 is installed, with details about the runtime environment and server VM. Below the terminal, a metadata box for the instance `i-069f864d0f3ab6c87` is visible, showing public and private IP addresses. The bottom of the interface includes the AWS logo, a search bar, and navigation links for CloudShell and Feedback.

```
ubuntu@ip-172-31-10-229:~/.ssh$ java --version
openjdk 11.0.23 2024-04-16
OpenJDK Runtime Environment (build 11.0.23+9-post-Ubuntu-1ubuntu122.04.1)
OpenJDK 64-Bit Server VM (build 11.0.23+9-post-Ubuntu-1ubuntu122.04.1, mixed mode, sharing)
ubuntu@ip-172-31-10-229:~/.ssh$
```

i-069f864d0f3ab6c87 (ansible-target)
PublicIPs: 65.1.108.207 PrivateIPs: 172.31.10.229

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences



The screenshot shows the AWS CloudShell interface. The terminal window displays the output of the command `maven --version`. The output indicates that Apache Maven 3.6.3 is installed, along with details about the Java version (11.0.23), vendor (Ubuntu), runtime, and platform encoding. Below the terminal, a metadata box for the instance `i-069f864d0f3ab6c87` is visible, showing public and private IP addresses. The bottom of the interface includes the AWS logo, a search bar, and navigation links for CloudShell and Feedback.

```
ubuntu@ip-172-31-10-229:~/.ssh$ java --version
openjdk 11.0.23 2024-04-16
OpenJDK Runtime Environment (build 11.0.23+9-post-Ubuntu-1ubuntu122.04.1)
OpenJDK 64-Bit Server VM (build 11.0.23+9-post-Ubuntu-1ubuntu122.04.1, mixed mode, sharing)
ubuntu@ip-172-31-10-229:~/.ssh$ maven --version
Command 'maven' not found, did you mean:
  Command 'aven' from deb suryex-aven (1.4.1-1)
Try: sudo apt install <deb name>
ubuntu@ip-172-31-10-229:~/.ssh$ mvn --version
Apache Maven 3.6.3
Maven home: /usr/share/maven
Java version: 11.0.23, vendor: Ubuntu, runtime: /usr/lib/jvm/java-11-openjdk-amd64
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "6.5.0-1022-aws", arch: "amd64", family: "unix"
ubuntu@ip-172-31-10-229:~/.ssh$
```

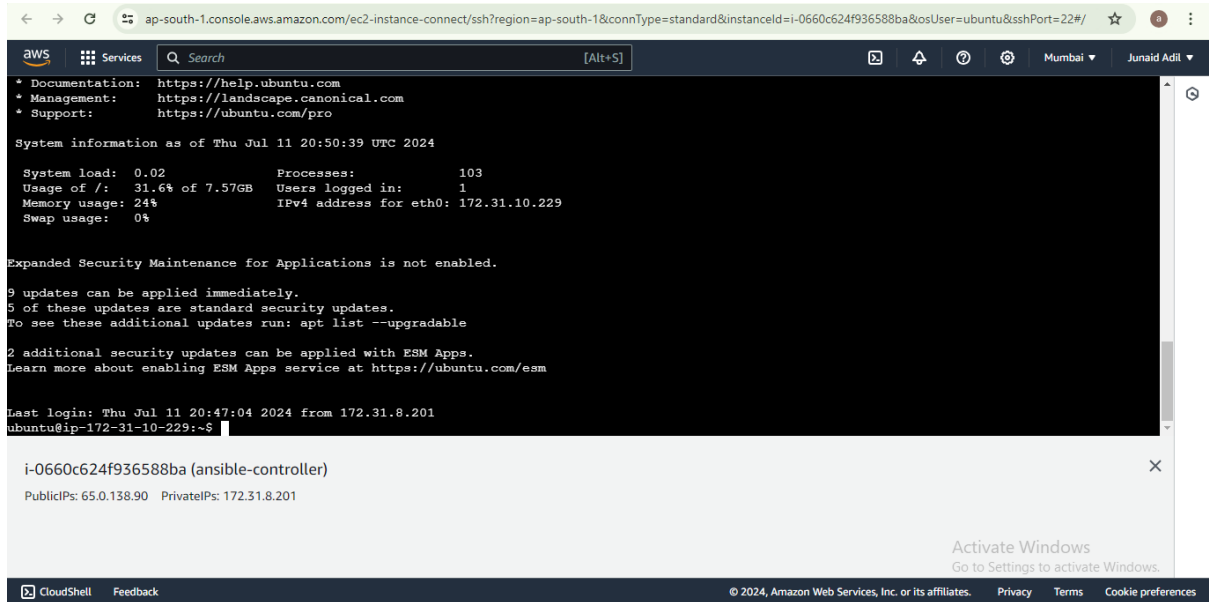
i-069f864d0f3ab6c87 (ansible-target)
PublicIPs: 65.1.108.207 PrivateIPs: 172.31.10.229

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 14: We can directly check from controller machine by logging into target node through “ssh username@IPaddress”

Logged into target node from controller machine.



The screenshot shows the AWS CloudShell interface. The terminal window displays the following output:

```
* Documentation: https://help.ubuntu.com
* Management:   https://landscape.canonical.com
* Support:       https://ubuntu.com/pro

System information as of Thu Jul 11 20:50:39 UTC 2024

System load: 0.02          Processes:            103
Usage of /:  31.6% of 7.57GB Users logged in:      1
Memory usage: 24%          IPv4 address for eth0: 172.31.10.229
Swap usage:  0%

Expanded Security Maintenance for Applications is not enabled.

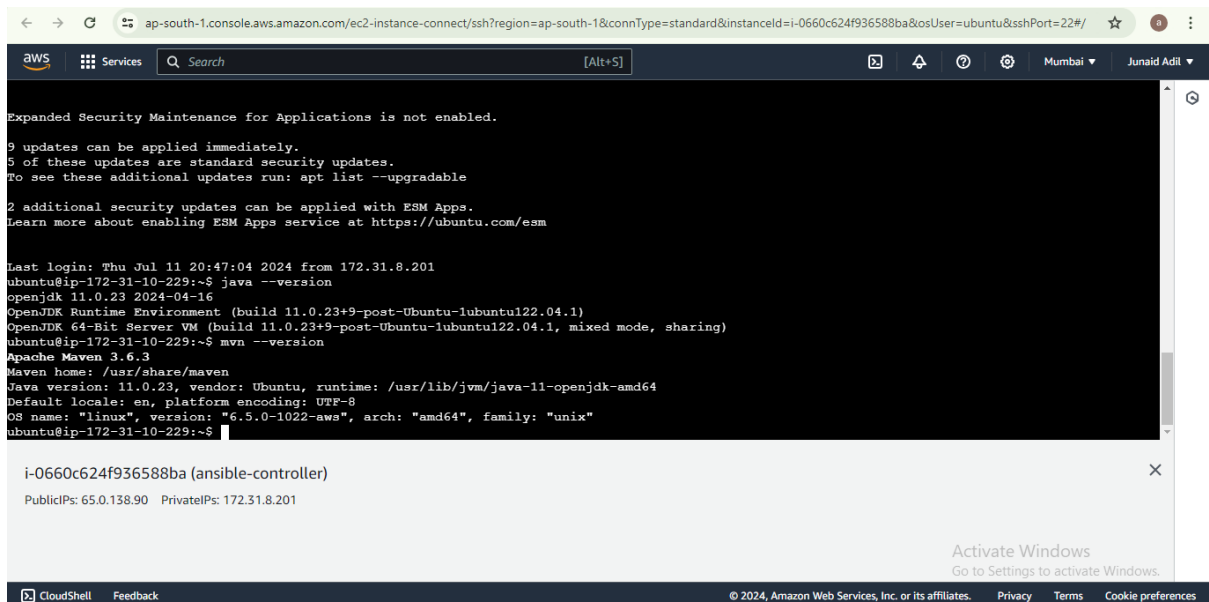
9 updates can be applied immediately.
5 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

2 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

Last login: Thu Jul 11 20:47:04 2024 from 172.31.8.201
ubuntu@ip-172-31-10-229:~$
```

Below the terminal window, a metadata box shows the instance ID: i-0660c624f936588ba (ansible-controller) and its public/private IP addresses. The bottom of the interface includes the AWS logo, a search bar, and footer text: © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences.

We can see java and maven are installed successfully



The screenshot shows the AWS CloudShell interface with the terminal window displaying the following output:

```
Expanded Security Maintenance for Applications is not enabled.

9 updates can be applied immediately.
5 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

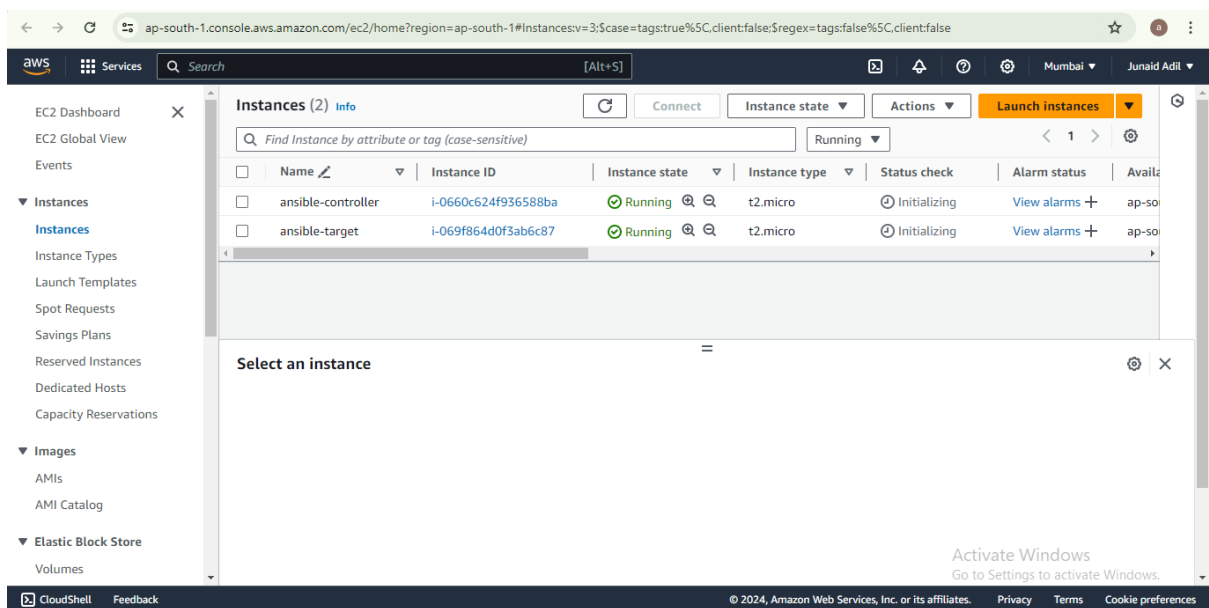
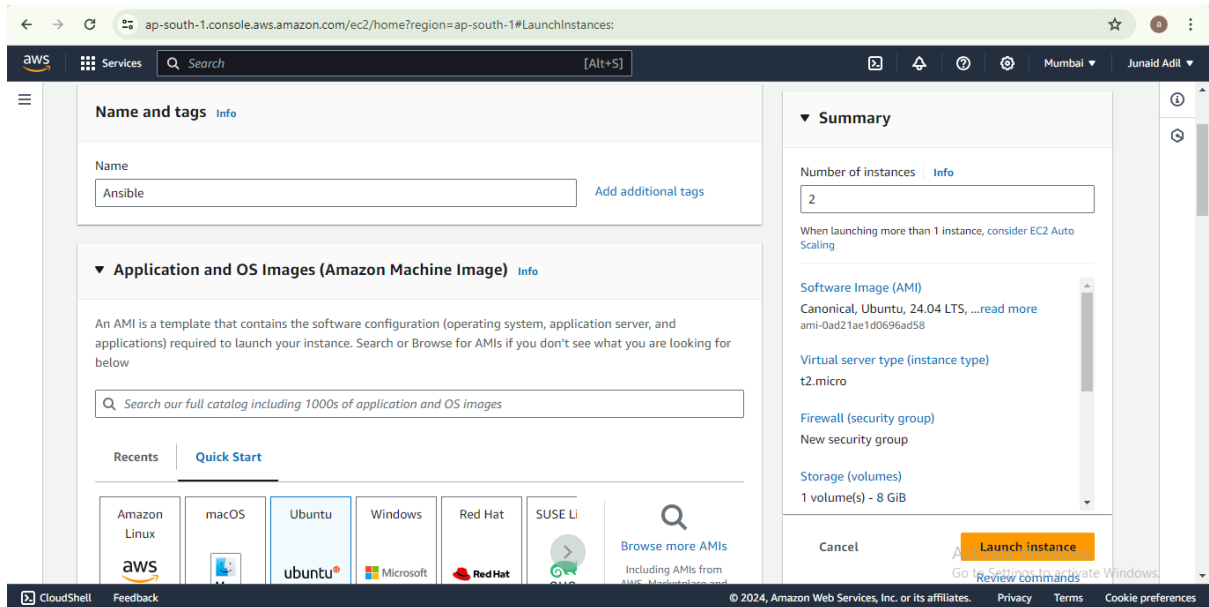
2 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

Last login: Thu Jul 11 20:47:04 2024 from 172.31.8.201
ubuntu@ip-172-31-10-229:~$ java --version
openjdk 11.0.23 2024-04-16
OpenJDK Runtime Environment (build 11.0.23+9-post-Ubuntu-1ubuntu122.04.1)
OpenJDK 64-Bit Server VM (build 11.0.23+9-post-Ubuntu-1ubuntu122.04.1, mixed mode, sharing)
ubuntu@ip-172-31-10-229:~$ mvn --version
Apache Maven 3.6.3
Maven home: /usr/share/maven
Java version: 11.0.23, vendor: Ubuntu, runtime: /usr/lib/jvm/java-11-openjdk-amd64
Default locale: en, platform encoding: UTF-8
OS name: "linux", version: "6.5.0-1022-aws", arch: "amd64", family: "unix"
ubuntu@ip-172-31-10-229:~$
```

Below the terminal window, a metadata box shows the instance ID: i-0660c624f936588ba (ansible-controller) and its public/private IP addresses. The bottom of the interface includes the AWS logo, a search bar, and footer text: © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences.

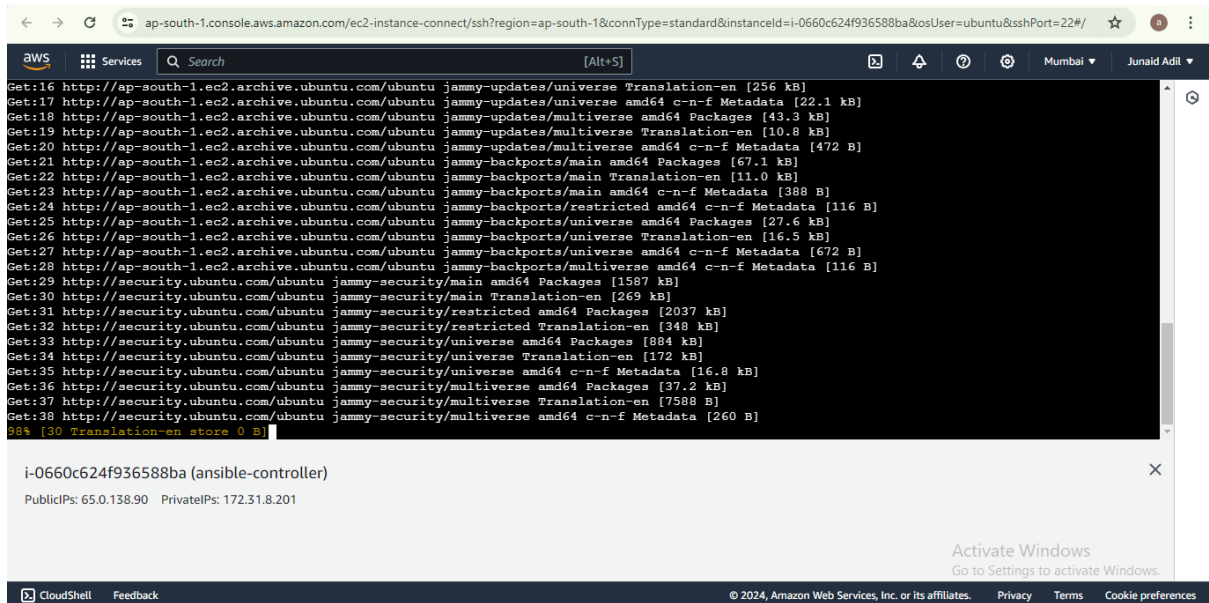
L2 - Create and Execute Ansible Playbook to Install Docker and Run the Docker Application Image created in Docker Module

Step 1: Create 2 instances for Controller machine and target node



Ansible controller and ansible target node.

Step 2: Update all the packages and as a root user run below commands



The screenshot shows the AWS CloudShell interface with a terminal window. The terminal displays a list of package updates from the Ubuntu archive. The updates include jammy-updates/universe Translation-en, jammy-updates/multiverse amd64 Packages, jammy-backports/main amd64 Packages, jammy-backports/main amd64 c-n-f Metadata, jammy-backports/restricted amd64 c-n-f Metadata, jammy-backports/universe amd64 Packages, jammy-backports/universe Translation-en, jammy-backports/universe amd64 c-n-f Metadata, jammy-backports/multiverse amd64 c-n-f Metadata, jammy-security/main amd64 Packages, jammy-security/main Translation-en, jammy-security/restricted amd64 Packages, jammy-security/restricted Translation-en, jammy-security/universe amd64 Packages, jammy-security/universe Translation-en, jammy-security/universe amd64 c-n-f Metadata, jammy-security/multiverse amd64 Packages, jammy-security/multiverse Translation-en, and jammy-security/multiverse amd64 c-n-f Metadata. The progress bar shows 98% completion for the Translation-en store. Below the terminal, the instance ID i-0660c624f936588ba is shown, along with public and private IP addresses. The bottom of the interface includes the AWS logo, Services menu, search bar, and footer information.

```
Get:16 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [256 kB]
Get:17 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [22.1 kB]
Get:18 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [43.3 kB]
Get:19 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [10.8 kB]
Get:20 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 c-n-f Metadata [472 B]
Get:21 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 Packages [67.1 kB]
Get:22 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main Translation-en [11.0 kB]
Get:23 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/main amd64 c-n-f Metadata [388 B]
Get:24 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/restricted amd64 c-n-f Metadata [116 B]
Get:25 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 Packages [27.6 kB]
Get:26 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe Translation-en [16.5 kB]
Get:27 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 c-n-f Metadata [672 B]
Get:28 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:29 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1587 kB]
Get:30 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [269 kB]
Get:31 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [2037 kB]
Get:32 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [348 kB]
Get:33 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [884 kB]
Get:34 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [172 kB]
Get:35 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [16.8 kB]
Get:36 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [37.2 kB]
Get:37 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [7588 B]
Get:38 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 c-n-f Metadata [260 B]
98% [30 Translation-en store 0 B]
```

i-0660c624f936588ba (ansible-controller)

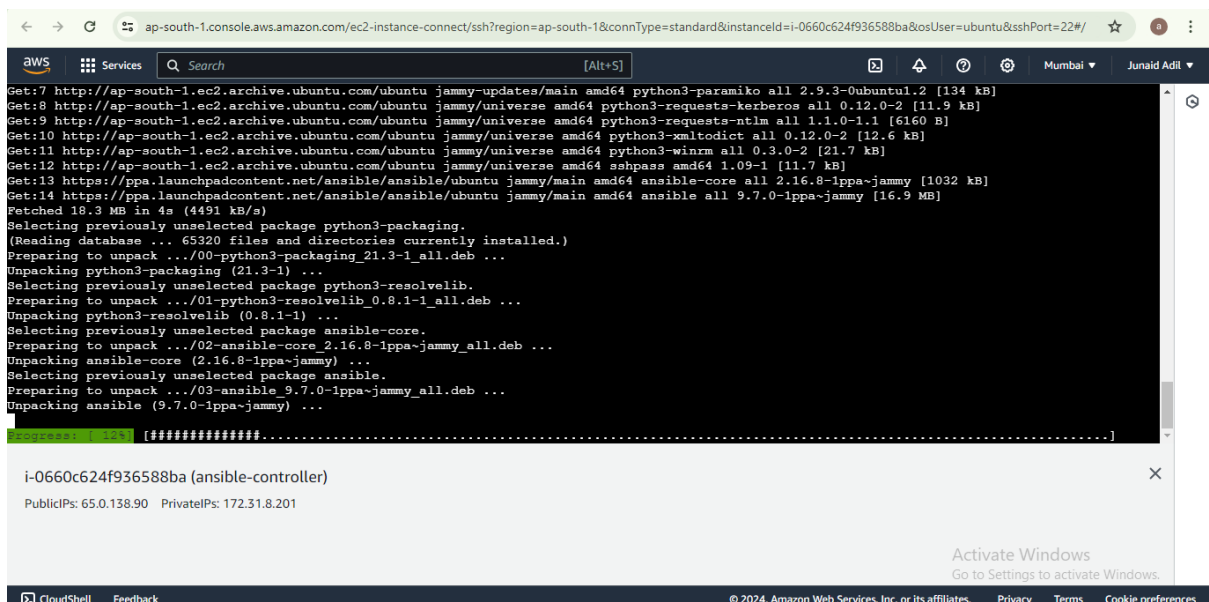
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Commands: “ sudo apt install software-properties-common -y “

“ sudo add-apt-repository --yes --update ppa:ansible/ansible “

“ sudo apt update -y “

“ sudo apt install ansible -y “

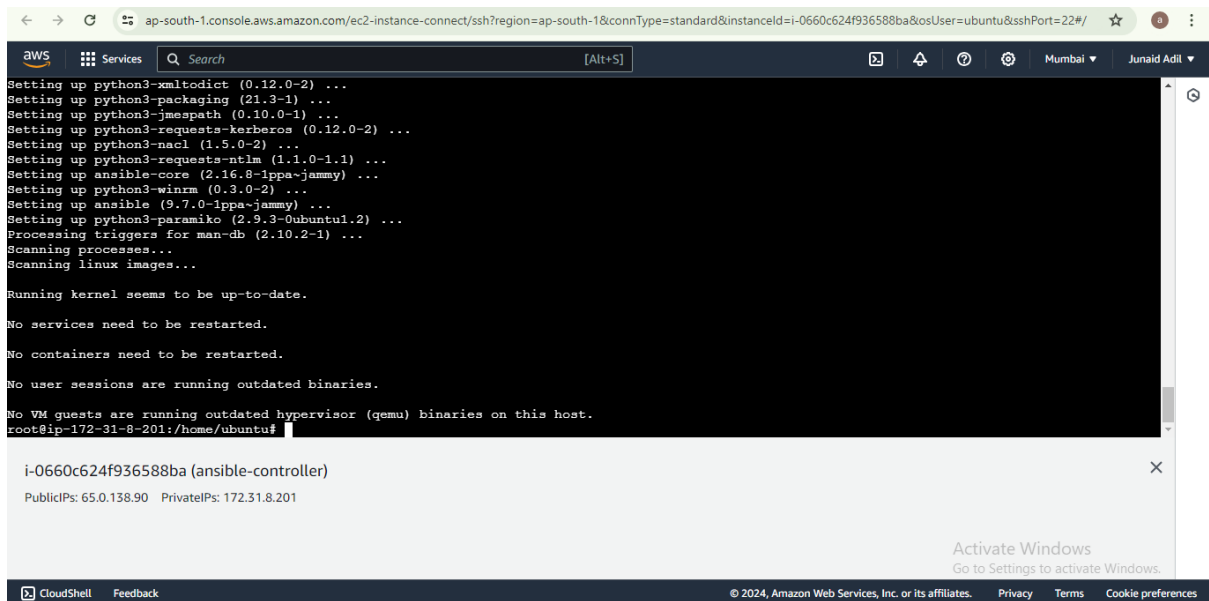


The screenshot shows the AWS CloudShell interface with a terminal window. The terminal displays the output of the command 'sudo apt install ansible -y'. It shows the installation of python3-packaging, python3-resolvelib, and ansible. The progress bar shows 100% completion. Below the terminal, the instance ID i-0660c624f936588ba is shown, along with public and private IP addresses. The bottom of the interface includes the AWS logo, Services menu, search bar, and footer information.

```
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3-paramiko all 2.9.3-0ubuntu1.2 [134 kB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-requests-kerberos all 0.12.0-2 [11.9 kB]
Get:9 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-requests-ntlm all 1.1.0-1.1 [6160 B]
Get:10 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-xlrd all 0.12.0-2 [12.6 kB]
Get:11 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-winrm all 0.3.0-2 [21.7 kB]
Get:12 http://ap-south-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 2.16.8-1ppa~jammy [1032 kB]
Get:14 https://ppa.launchpadcontent.net/ansible/ansible/ubuntu jammy/main amd64 ansible all 9.7.0-1ppa~jammy [16.9 MB]
Fetched 18.3 MB in 4s (4491 kB/s)
Selecting previously unselected package python3-packaging.
(Reading database ... 63320 files and directories currently installed.)
Preparing to unpack .../00-python3-packaging_21.3-1_all.deb ...
Unpacking python3-packaging (21.3-1) ...
Selecting previously unselected package python3-resolvelib.
Preparing to unpack .../01-python3-resolvelib_0.8.1-1_all.deb ...
Unpacking python3-resolvelib (0.8.1-1) ...
Selecting previously unselected package ansible-core.
Preparing to unpack .../02-ansible-core_2.16.8-1ppa~jammy_all.deb ...
Unpacking ansible-core (2.16.8-1ppa~jammy) ...
Selecting previously unselected package ansible.
Preparing to unpack .../03-ansible_9.7.0-1ppa~jammy_all.deb ...
Unpacking ansible (9.7.0-1ppa~jammy) ...
```

i-0660c624f936588ba (ansible-controller)

PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201



The screenshot shows the AWS CloudShell interface with a terminal window. The terminal output displays the progress of installing various Ansible dependencies, including python3-xmltodict, python3-packaging, python3-jmespath, python3-requests-kerberos, python3-nacl, python3-requests-ntlm, ansible-core, python3-winrm, and ansible. It also shows the processing of triggers for man-db and scanning of processes and Linux images. The output concludes with messages indicating that the kernel is up-to-date, no services, containers, or user sessions need to be restarted, and no VM guests are running outdated hypervisor binaries. The prompt is root@ip-172-31-8-201:/home/ubuntu#. Below the terminal, a metadata box shows the instance ID i-0660c624f936588ba (ansible-controller) and its public and private IP addresses. The bottom of the interface includes the AWS CloudShell logo, a feedback link, and a footer with copyright information for Amazon Web Services, Inc. (2024) and links to privacy, terms, and cookie preferences.

```
Setting up python3-xmltodict (0.12.0-2) ...
Setting up python3-packaging (21.3-1) ...
Setting up python3-jmespath (0.10.0-1) ...
Setting up python3-requests-kerberos (0.12.0-2) ...
Setting up python3-nacl (1.5.0-2) ...
Setting up python3-requests-ntlm (1.1.0-1.1) ...
Setting up ansible-core (2.16.8-1ppa-jammy) ...
Setting up python3-winrm (0.3.0-2) ...
Setting up ansible (9.7.0-1ppa-jammy) ...
Setting up python3-paramiko (2.9.3-0ubuntu1.2) ...
Processing triggers for man-db (2.10.2-1) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

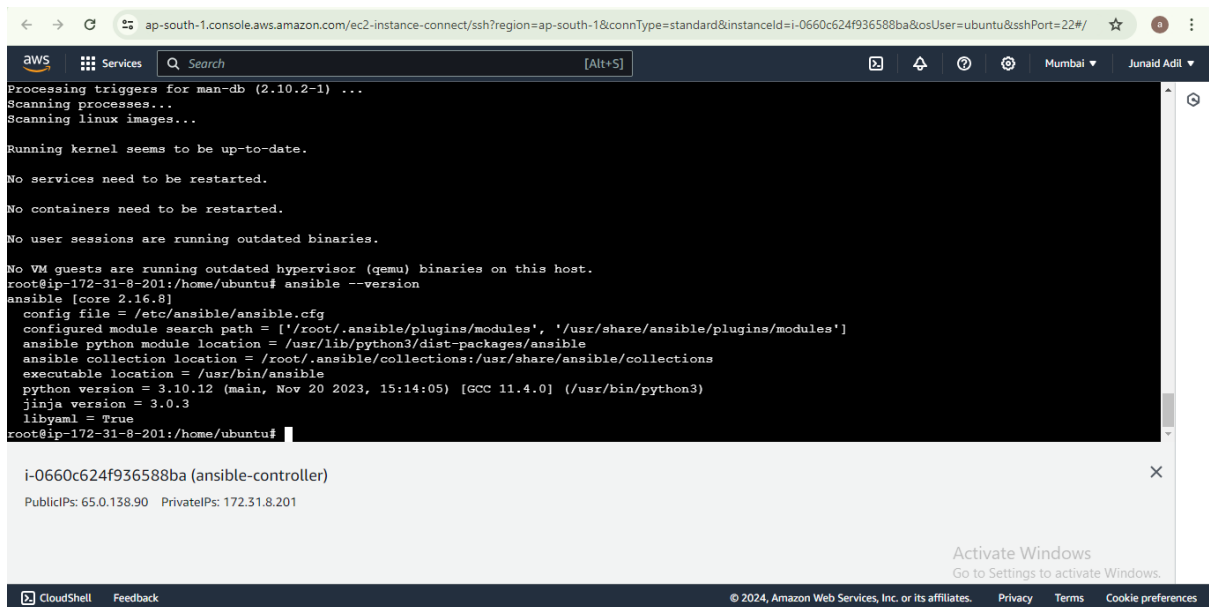
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-8-201:/home/ubuntu#
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 3: Check Ansible version using command “ansible --version”



The screenshot shows the AWS CloudShell interface with a terminal window. The terminal output shows the execution of the 'ansible --version' command. The output displays the configured module search path, the Ansible Python module location, the Ansible collection location, the executable location, the Python version (3.10.12), the Jinja version (3.0.3), and the libyaml status (True). The prompt is root@ip-172-31-8-201:/home/ubuntu#. Below the terminal, a metadata box shows the instance ID i-0660c624f936588ba (ansible-controller) and its public and private IP addresses. The bottom of the interface includes the AWS CloudShell logo, a feedback link, and a footer with copyright information for Amazon Web Services, Inc. (2024) and links to privacy, terms, and cookie preferences.

```
Processing triggers for man-db (2.10.2-1) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

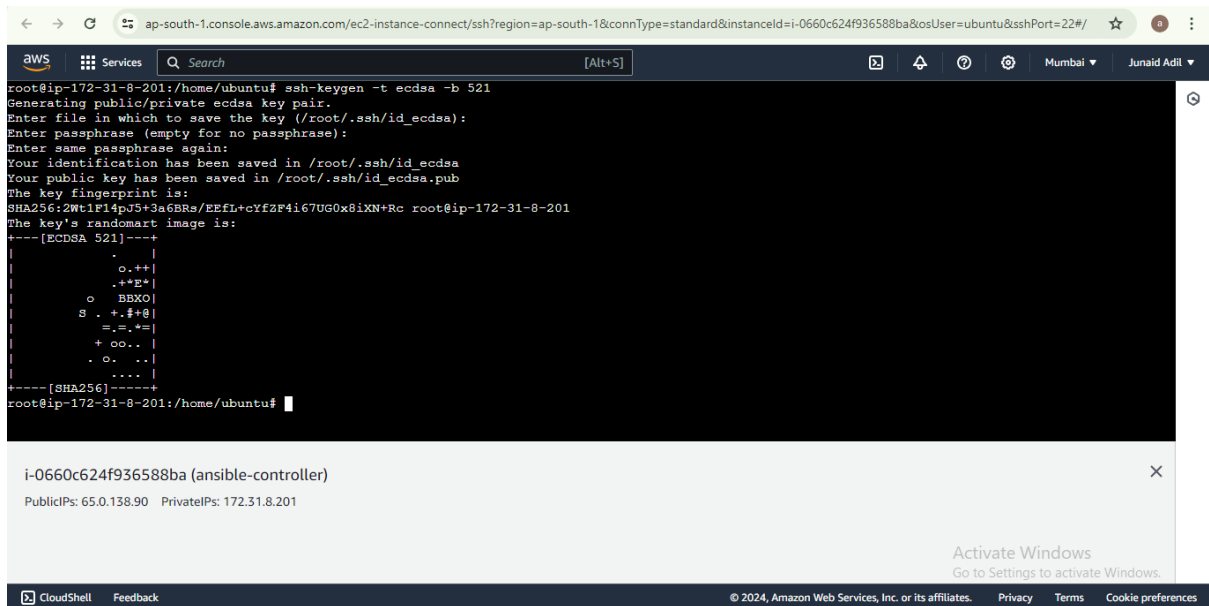
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-31-8-201:/home/ubuntu# ansible --version
ansible [core 2.16.8]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /root/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.10.12 (main, Nov 20 2023, 15:14:05) [GCC 11.4.0] (/usr/bin/python3)
  jinja version = 3.0.3
  libyaml = True
root@ip-172-31-8-201:/home/ubuntu#
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 4: Create SSH Keypair using command “ssh-keygen -t ecdsa -b 521”



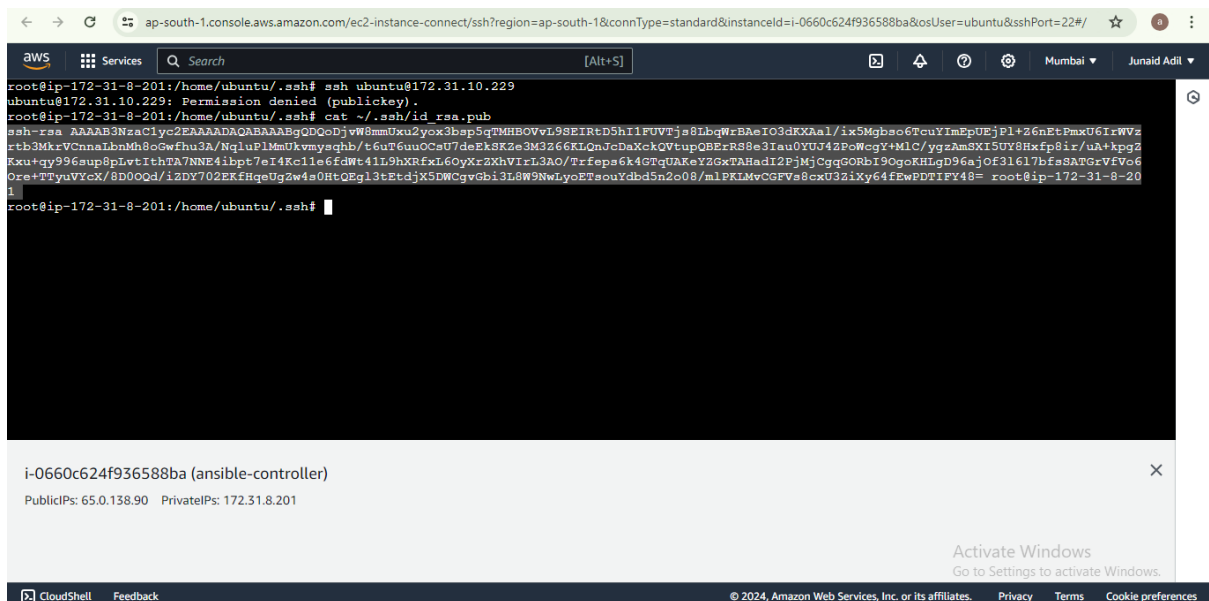
```
root@ip-172-31-8-201:/home/ubuntu# ssh-keygen -t ecdsa -b 521
Generating public/private ecdsa key pair.
Enter file in which to save the key (/root/.ssh/id_ecdsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_ecdsa
Your public key has been saved in /root/.ssh/id_ecdsa.pub
The key fingerprint is:
SHA256:2Wt1F14pJ5+3a6BRs/EEFl+cYf2F4i67UG0x8iXN+Rc root@ip-172-31-8-201
The key's randomart image is:
+---[ECDSA 521]---+
|
|  .o.++|
|  .+*+|
|  o  BKO|
|  S . .+#+8|
|  =.+.+=|
|  +.oo..|
|  .o. ...|
|  ....|
+---[SHA256]-----+
root@ip-172-31-8-201:/home/ubuntu#
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 5: We can use this keys and create a file in Target node as “authorized_keys and paste this keys

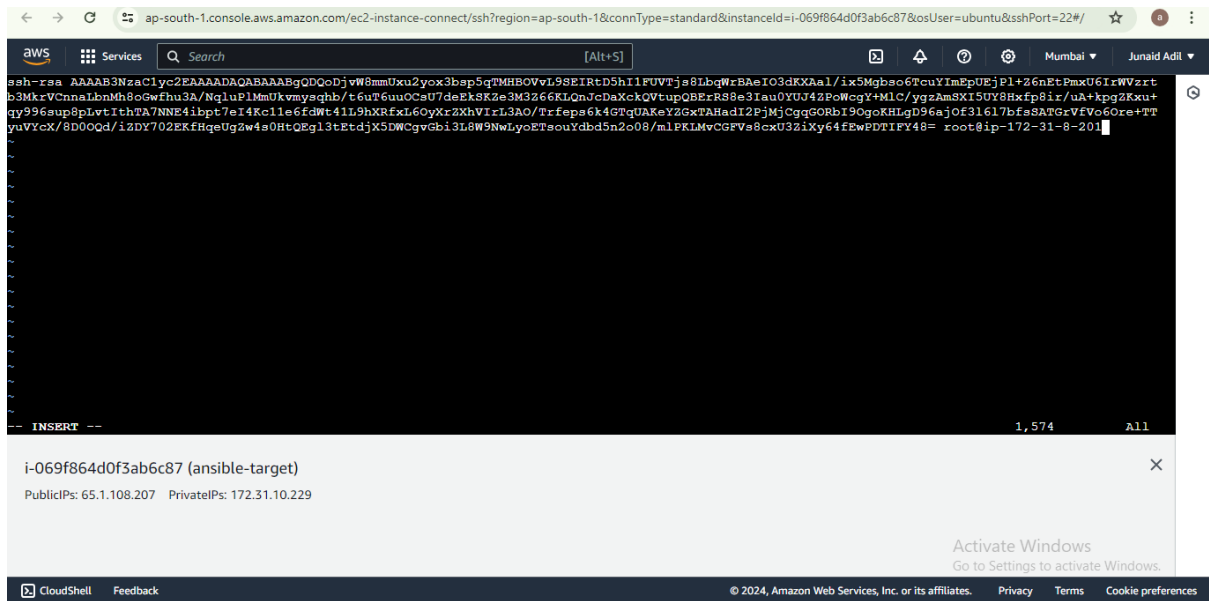


```
root@ip-172-31-8-201:/home/ubuntu/.ssh# ssh ubuntu@172.31.10.229
ubuntu@172.31.10.229: Permission denied (publickey).
root@ip-172-31-8-201:/home/ubuntu/.ssh# cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGDQoDjvW8mmUxu2yox3bsp5qTMHBOVtL9SEIRtDShiIFUVTjjs8LbqWzBAeIO3dKXAal/ix5Mgbsoc6TcuYImPpUEjPl+Z6nEtPmxU6IrWVZ
rtb3MkrVCnaibnMh8oowEhu3A/NqluPlMmUkvmysqhb/t6uT6uuOcsU7dePkSKZe3M3266KLQnJcDaXckQVtupQBErR8e3Iau0YUu4zPoWcgY+MLC/ygzAm3XI50Y8Hxfp8ir/ua+kpgz
Kxu+qy996aup8PlwtIthTA/NNP4ibpt7eI4Kclle6fdWt41L9hXRFxL6OyXrZXhVITL3AO/Trfeps6k4GtqUAKeYZ6xTAHadI2PjMjOggG0Rb19OgckHLgD96ajOf31617bfsSATG+VfVo6
Oze+TiyuVYcx/8D00Qd/i2DY702EKHgeUgaw4s0HtQpL3tEtcdjX5IWCgvGbi3L8W9NwlyoETs0uYdbd5n2o08/mlPKLMvCGFVs8cxU3aiXy64fEwPDTIFy48= root@ip-172-31-8-20
1#
root@ip-172-31-8-201:/home/ubuntu/.ssh#
```

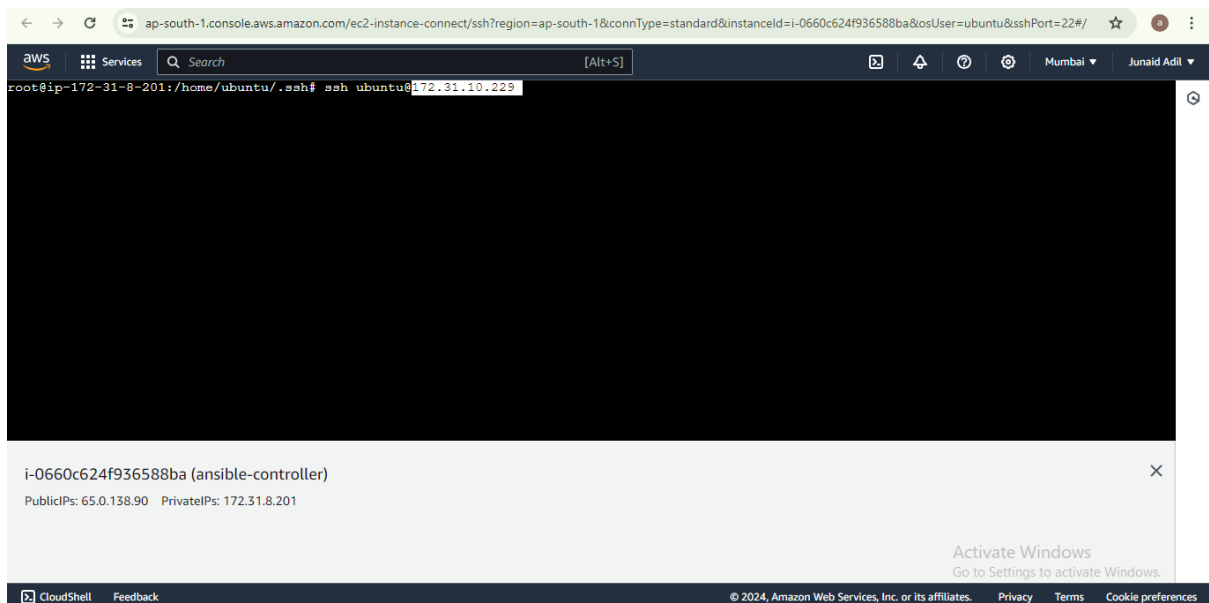
i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences



Step 6: In Controller machine run command “ssh ansibleadmin@private IP “ to connect the Target node



```
System information as of Thu Jul 11 20:08:05 UTC 2024
System load: 0.01          Processes:          99
Usage of /: 21.1% of 7.57GB Users logged in:   1
Memory usage: 21%         IPv4 address for eth0: 172.31.10.229
Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.
0 updates can be applied immediately.
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Thu Jul 11 19:55:45 2024 from 13.233.177.5
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-172-31-10-229:~$
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

We are able to connect to the Target node from Controller machine

Step 7: Now create an Inventory file which is used to define and manage the hosts (servers) that the playbooks will target.

Add Target node details in hosts file. Go to `/etc/ansible/`

```
root@ip-172-31-8-201:/home/ubuntu/.ssh# cd /etc/ansible
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-31-8-201:/etc/ansible# vi hosts
```

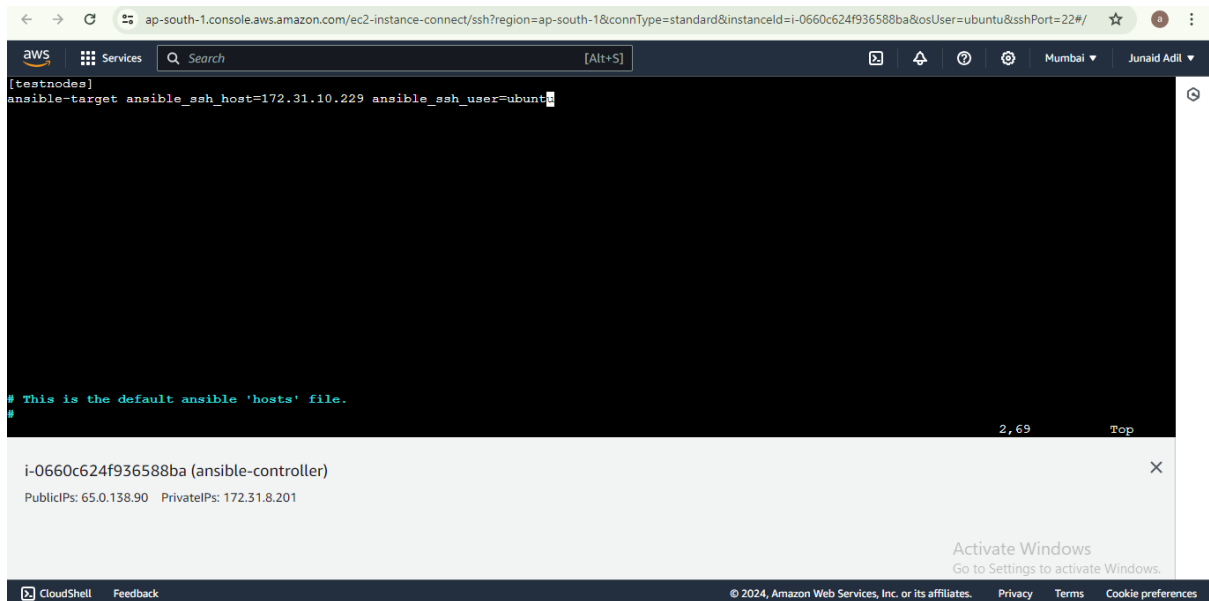
i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 8: Add Target node details:

“ansible-target ansible_ssh_host= 172.31.10.229 ansible_ssh_user=Ubuntu”



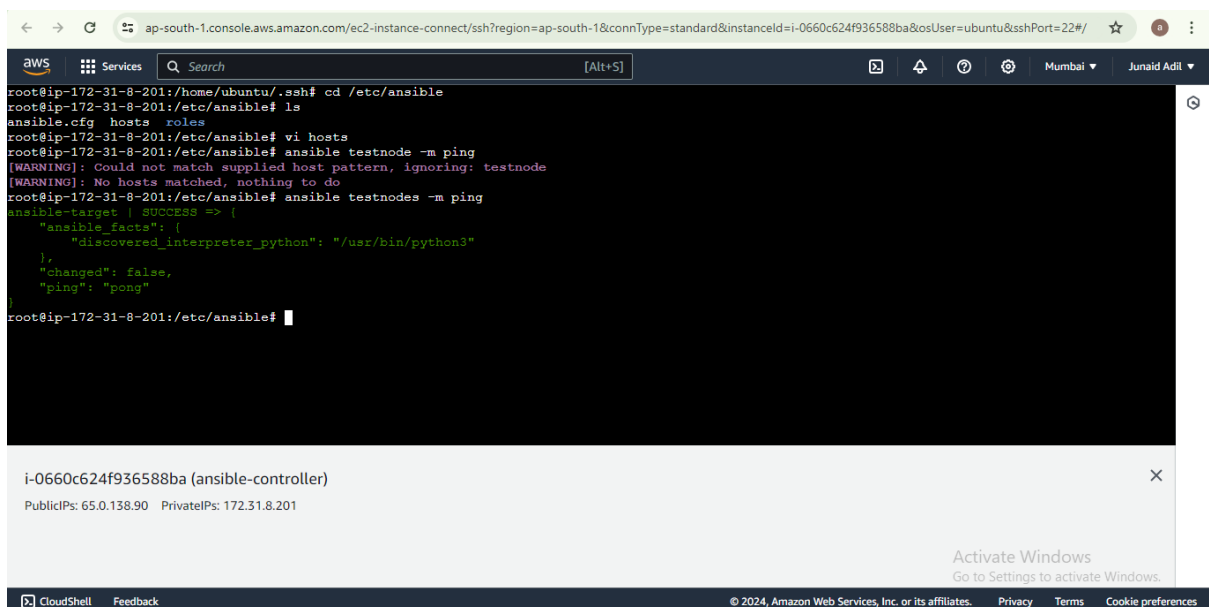
The screenshot shows the AWS CloudShell interface. The terminal window displays the following commands and output:

```
[testnodes]
ansible-target ansible_ssh_host=172.31.10.229 ansible_ssh_user=ubuntu

# This is the default ansible 'hosts' file.
#
```

Below the terminal window, the instance details for `i-0660c624f936588ba (ansible-controller)` are shown, including Public IPs (65.0.138.90) and Private IPs (172.31.8.201). The bottom of the interface includes the AWS logo, a search bar, and navigation links for CloudShell, Feedback, and other services.

Step 9: To check the connection use command “ ansible testnodes -m ping ”



The screenshot shows the AWS CloudShell interface. The terminal window displays the following commands and output:

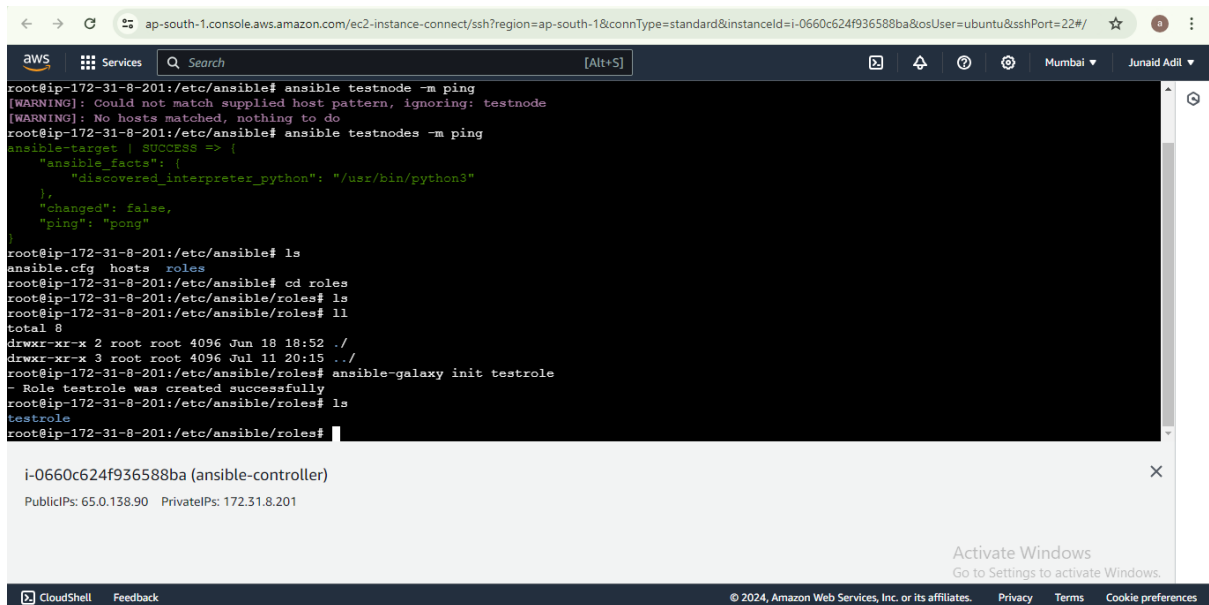
```
root@ip-172-31-8-201:/home/ubuntu/.ssh# cd /etc/ansible
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-31-8-201:/etc/ansible# vi hosts
root@ip-172-31-8-201:/etc/ansible# ansible testnode -m ping
[WARNING]: Could not match supplied host pattern, ignoring: testnode
[WARNING]: No hosts matched, nothing to do
root@ip-172-31-8-201:/etc/ansible# ansible testnodes -m ping
ansible-target | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
root@ip-172-31-8-201:/etc/ansible#
```

Below the terminal window, the instance details for `i-0660c624f936588ba (ansible-controller)` are shown, including Public IPs (65.0.138.90) and Private IPs (172.31.8.201). The bottom of the interface includes the AWS logo, a search bar, and navigation links for CloudShell, Feedback, and other services.

Connection is success.

Step 10: Now we can run Ansible playbooks to configure the instance

Go to roles folder and create a role using command “ansible-galaxy init testrole”



```
root@ip-172-31-8-201:/etc/ansible# ansible testnode -m ping
[WARNING]: Could not match supplied host pattern, ignoring: testnode
[WARNING]: No hosts matched, nothing to do
root@ip-172-31-8-201:/etc/ansible# ansible testnodes -m ping
ansible-target | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-31-8-201:/etc/ansible# cd roles
root@ip-172-31-8-201:/etc/ansible/roles# ls
root@ip-172-31-8-201:/etc/ansible/roles# ll
total 8
drwxr-xr-x 2 root root 4096 Jun 18 18:52 ./
drwxr-xr-x 3 root root 4096 Jul 11 20:15 ../
root@ip-172-31-8-201:/etc/ansible/roles# ansible-galaxy init testrole
- Role testrole was created successfully
root@ip-172-31-8-201:/etc/ansible/roles# ls
testrole
root@ip-172-31-8-201:/etc/ansible/roles#
```

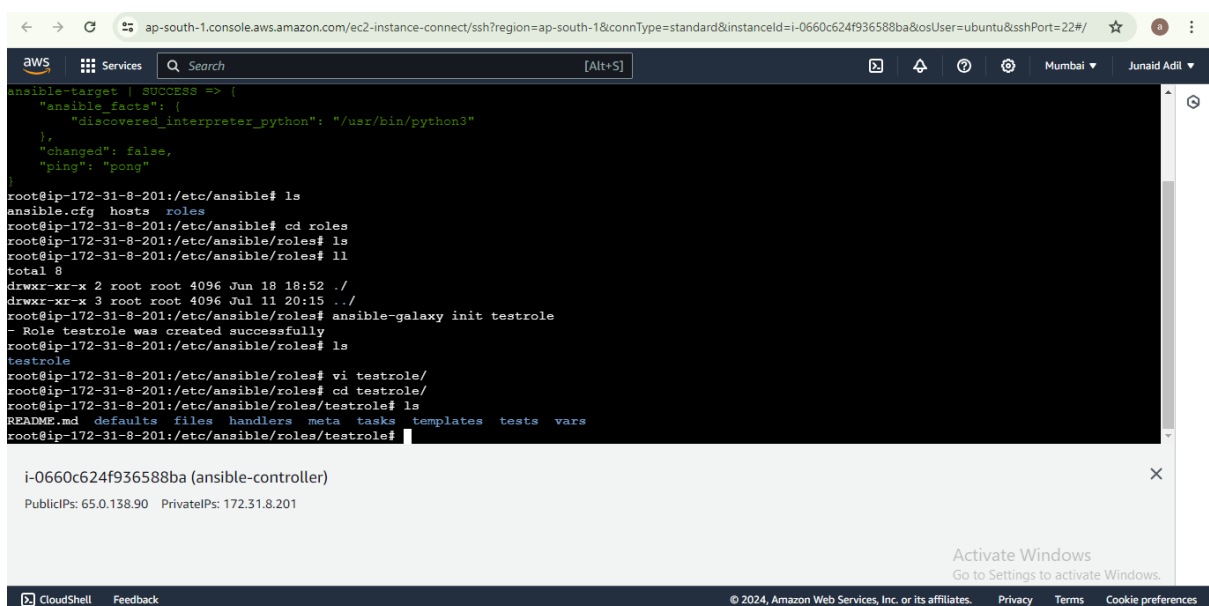
i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

We can see testrole file has been added successfully.

Step 11: Open the testrole folder



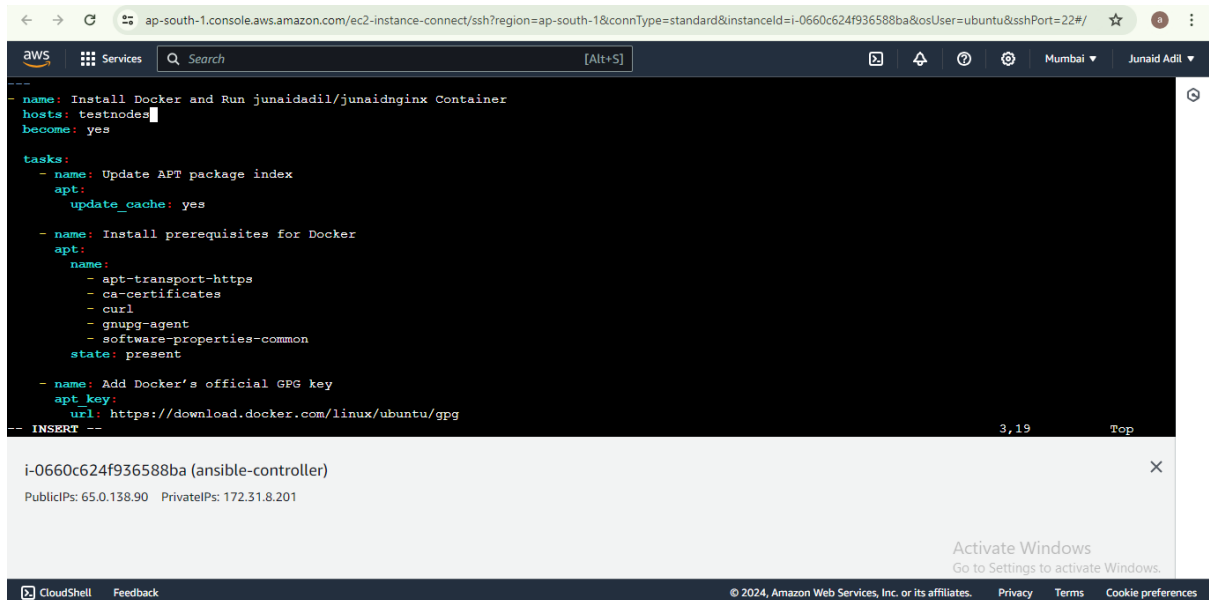
```
ansible-target | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-31-8-201:/etc/ansible# cd roles
root@ip-172-31-8-201:/etc/ansible/roles# ls
root@ip-172-31-8-201:/etc/ansible/roles# ll
total 8
drwxr-xr-x 2 root root 4096 Jun 18 18:52 ./
drwxr-xr-x 3 root root 4096 Jul 11 20:15 ../
root@ip-172-31-8-201:/etc/ansible/roles# ansible-galaxy init testrole
- Role testrole was created successfully
root@ip-172-31-8-201:/etc/ansible/roles# ls
testrole
root@ip-172-31-8-201:/etc/ansible/roles# vi testrole/
root@ip-172-31-8-201:/etc/ansible/roles# cd testrole/
root@ip-172-31-8-201:/etc/ansible/roles/testrole# ls
README.md  defaults  files  handlers  meta  tasks  templates  tests  vars
root@ip-172-31-8-201:/etc/ansible/roles/testrole#
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 12: Go to tasks folder and create a docker.yml file to write the script of docker installation, pull the docker image and run the image



The screenshot shows the AWS CloudShell interface. The terminal displays the first part of the `docker.yml` file. The file starts with `name: Install Docker and Run junaidadil/junaidnginx Container`, `hosts: testnodes`, and `become: yes`. The `tasks` section includes three tasks: 1. `name: Update APT package index` with `apt: update_cache: yes`. 2. `name: Install prerequisites for Docker` with `apt: name:` followed by a list of packages: `apt-transport-https`, `ca-certificates`, `curl`, `gnupg-agent`, and `software-properties-common`, and `state: present`. 3. `name: Add Docker's official GPG key` with `apt_key: url: https://download.docker.com/linux/ubuntu/gpg`. The terminal shows line numbers 3 and 19, and a 'Top' button. Below the terminal, the instance ID `i-0660c624f936588ba` (ansible-controller) is shown with public and private IP addresses. An 'Activate Windows' watermark is visible at the bottom right.

```
-- name: Install Docker and Run junaidadil/junaidnginx Container
hosts: testnodes
become: yes

tasks:
  - name: Update APT package index
    apt:
      update_cache: yes

  - name: Install prerequisites for Docker
    apt:
      name:
        - apt-transport-https
        - ca-certificates
        - curl
        - gnupg-agent
        - software-properties-common
      state: present

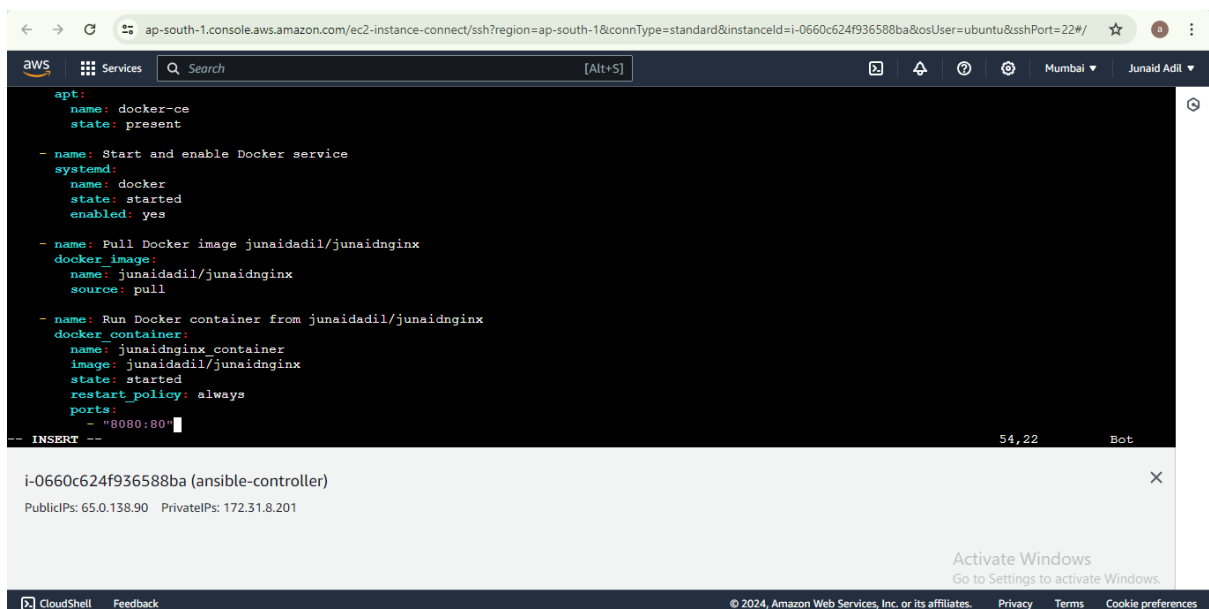
  - name: Add Docker's official GPG key
    apt_key:
      url: https://download.docker.com/linux/ubuntu/gpg

-- INSERT --
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences



The screenshot shows the AWS CloudShell interface. The terminal displays the second part of the `docker.yml` file. The first task is `name: docker-ee` with `state: present`. The second task is `name: Start and enable Docker service` with `systemd: name: docker`, `state: started`, and `enabled: yes`. The third task is `name: Pull Docker image junaidadil/junaidnginx` with `docker_image: name: junaidadil/junaidnginx` and `source: pull`. The fourth task is `name: Run Docker container from junaidadil/junaidnginx` with `docker_container: name: junaidnginx container`, `image: junaidadil/junaidnginx`, `state: started`, `restart_policy: always`, and `ports: - "8080:80"`. The terminal shows line numbers 54 and 22, and a 'Bot' button. Below the terminal, the instance ID `i-0660c624f936588ba` (ansible-controller) is shown with public and private IP addresses. An 'Activate Windows' watermark is visible at the bottom right.

```
apt:
  name: docker-ee
  state: present

- name: Start and enable Docker service
  systemd:
    name: docker
    state: started
    enabled: yes

- name: Pull Docker image junaidadil/junaidnginx
  docker_image:
    name: junaidadil/junaidnginx
    source: pull

- name: Run Docker container from junaidadil/junaidnginx
  docker_container:
    name: junaidnginx container
    image: junaidadil/junaidnginx
    state: started
    restart_policy: always
    ports:
      - "8080:80"

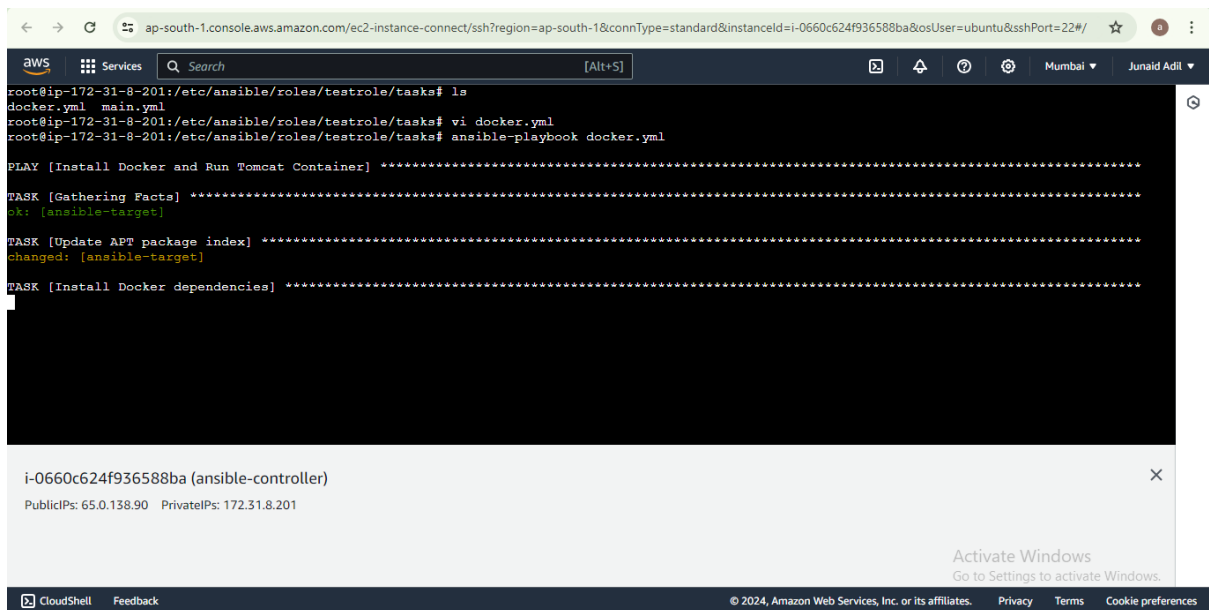
-- INSERT --
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 13: Execute the docker.yml file using command “ansible-playbook docker.yml”



The screenshot shows the AWS CloudShell interface with a terminal window. The terminal output shows the user is in the directory `/etc/ansible/roles/testrole/tasks` and has executed `ls`, listing `docker.yml` and `main.yml`. Then, the user runs `vi docker.yml` and `ansible-playbook docker.yml`. The output shows the start of the playbook: `PLAY [Install Docker and Run Tomcat Container]`. The first task, `TASK [Gathering Facts]`, is completed successfully with `ok: [ansible-target]`. The second task, `TASK [Update APT package index]`, is also completed successfully with `changed: [ansible-target]`. The third task, `TASK [Install Docker dependencies]`, is partially visible.

```
root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks# ls
docker.yml  main.yml
root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks# vi docker.yml
root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks# ansible-playbook docker.yml

PLAY [Install Docker and Run Tomcat Container] *****

TASK [Gathering Facts] *****
ok: [ansible-target]

TASK [Update APT package index] *****
changed: [ansible-target]

TASK [Install Docker dependencies] *****
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences



The screenshot shows the continuation of the ansible-playbook execution. The tasks `TASK [Add Docker's official GPG key]`, `TASK [Add Docker APT repository]`, `TASK [Install Docker Engine]`, and `TASK [Start and enable Docker service]` are all completed successfully with `ok: [ansible-target]`. The next task, `TASK [Pull Docker image junaidadil/junaidnginx]`, is completed with `changed: [ansible-target]`. The final task, `TASK [Run Docker container from junaidadil/junaidnginx]`, is also completed with `changed: [ansible-target]`. The `PLAY RECAP` shows `ok=9`, `changed=4`, and all other counts are zero. The terminal then returns to the prompt `root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks#`.

```
changed: [ansible-target]

TASK [Add Docker's official GPG key] *****
ok: [ansible-target]

TASK [Add Docker APT repository] *****
ok: [ansible-target]

TASK [Install Docker Engine] *****
ok: [ansible-target]

TASK [Start and enable Docker service] *****
ok: [ansible-target]

TASK [Pull Docker image junaidadil/junaidnginx] *****
changed: [ansible-target]

TASK [Run Docker container from junaidadil/junaidnginx] *****
changed: [ansible-target]

PLAY RECAP *****
ansible-target      : ok=9    changed=4    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@ip-172-31-8-201:/etc/ansible/roles/testrole/tasks#
```

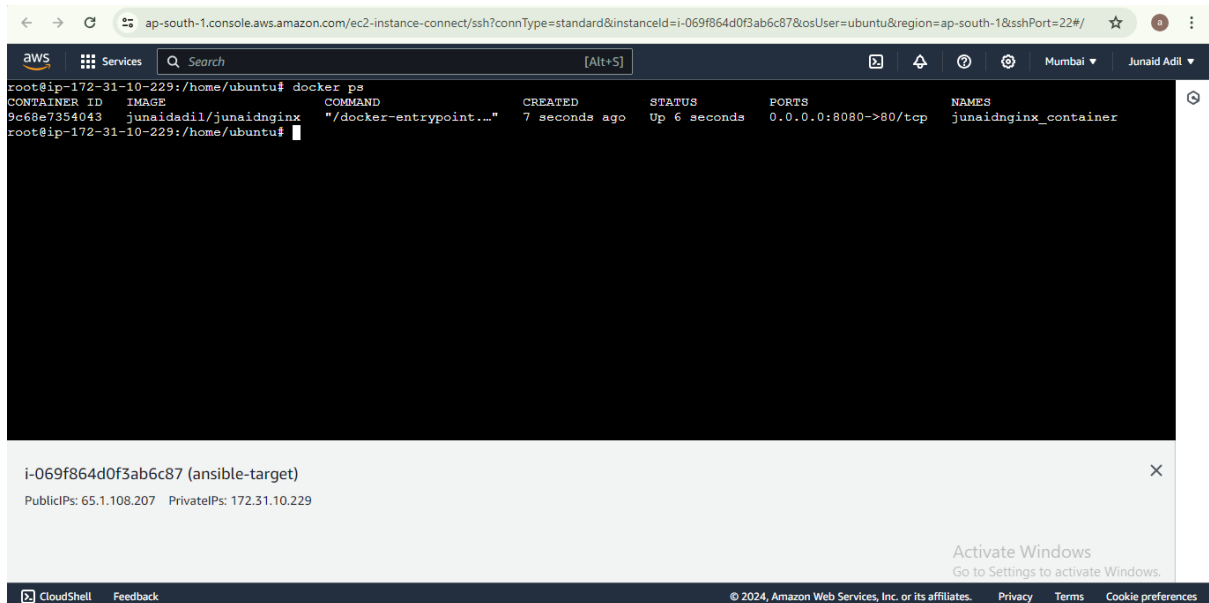
i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

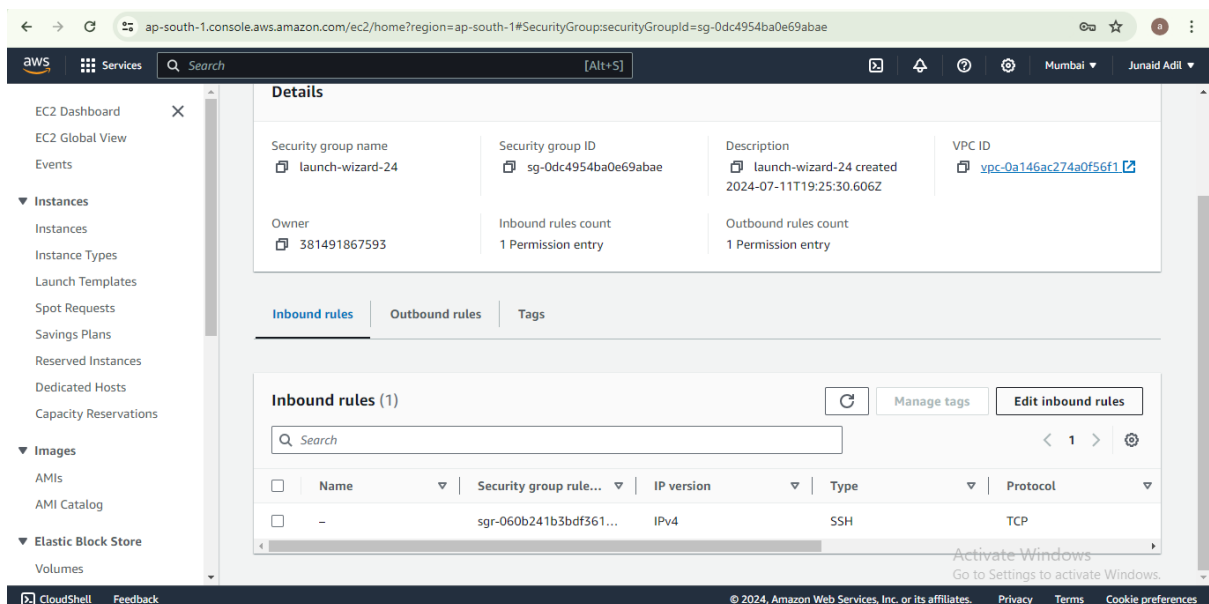
CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

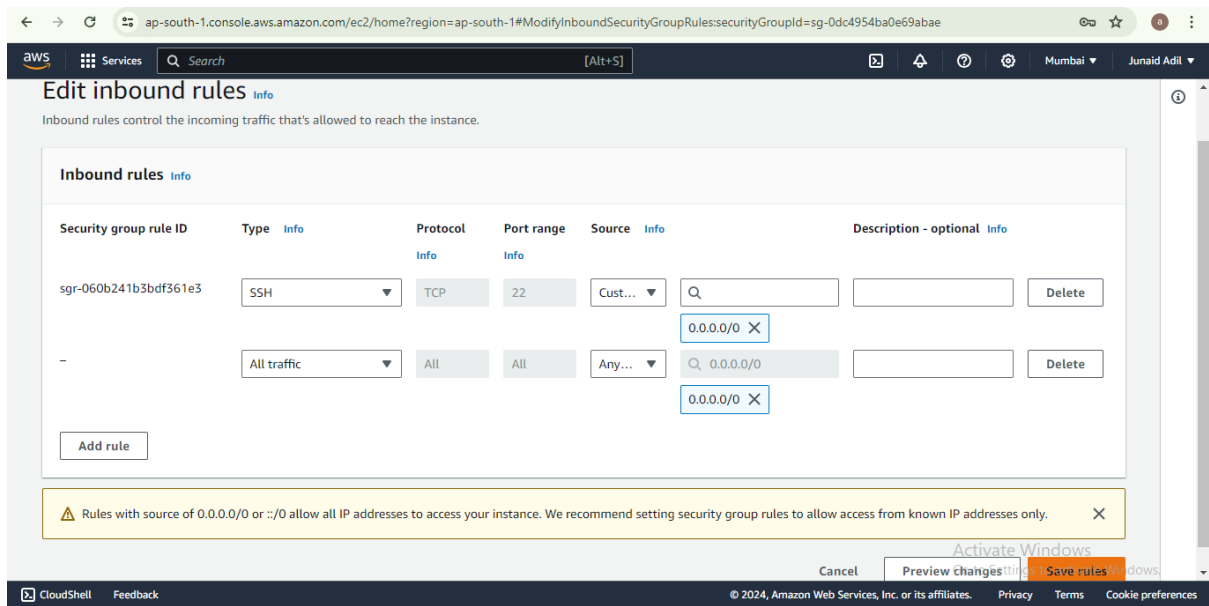
Docker is successfully installed and docker Image has been pulled and up on running.

Step 14: We can check the docker image if its running using command “docker ps” in target node



Step 15: Edit the inbound rules and add “All traffic” for now as it is for demo or we can add port number 8080.

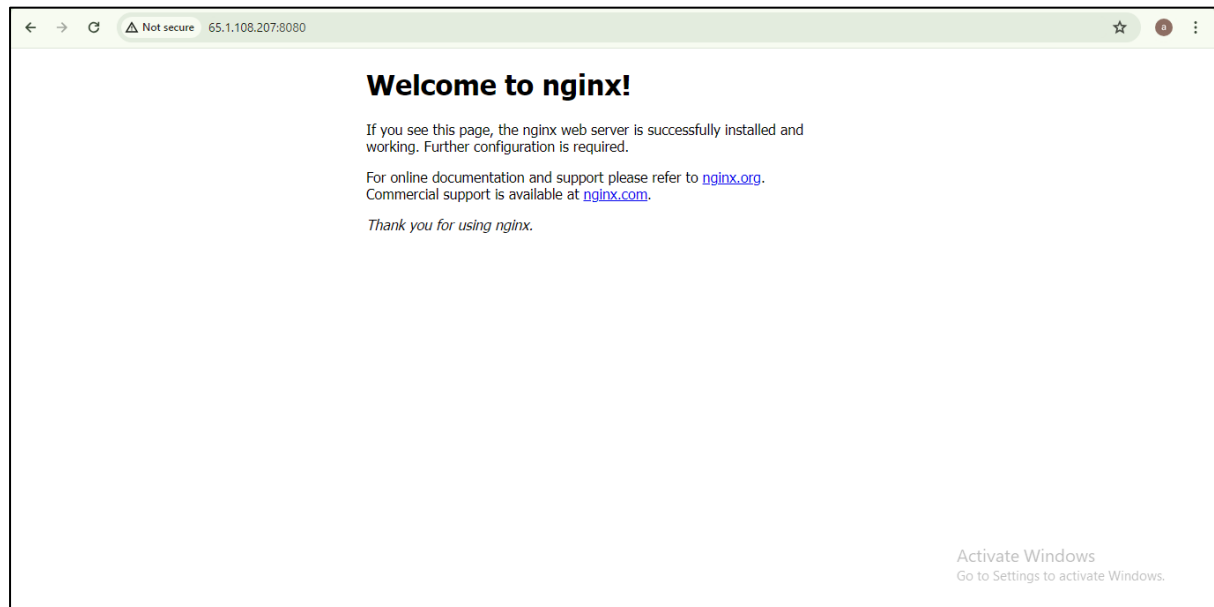




Step 16: Using private IP and port number we can run on browser

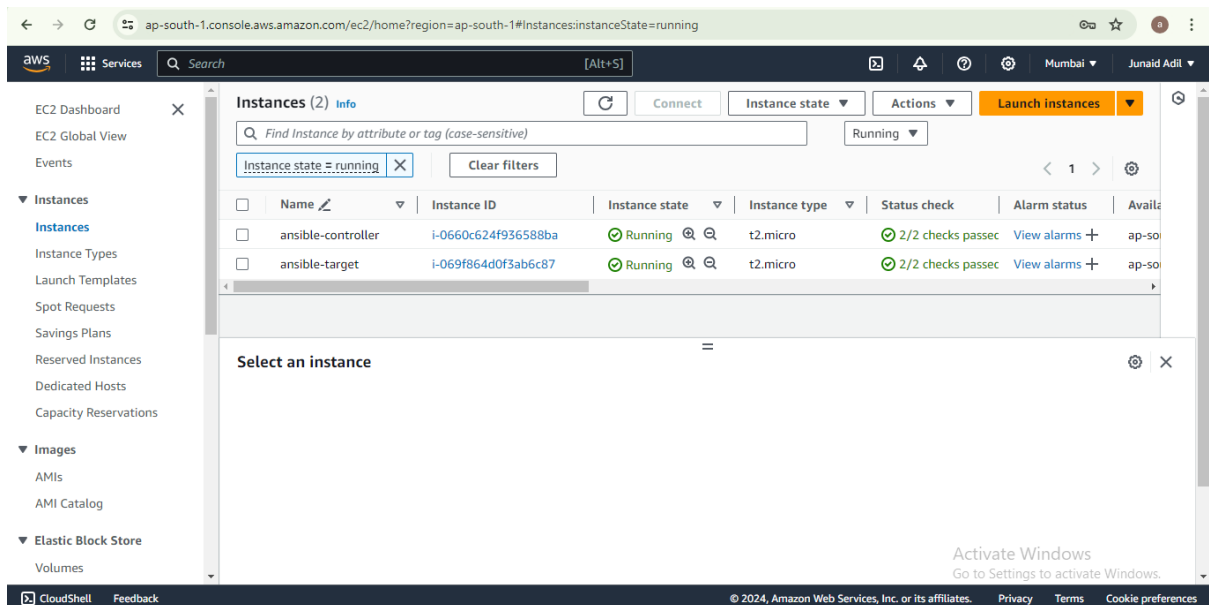
<private IP>:<port number>

65.1.108.207:8080



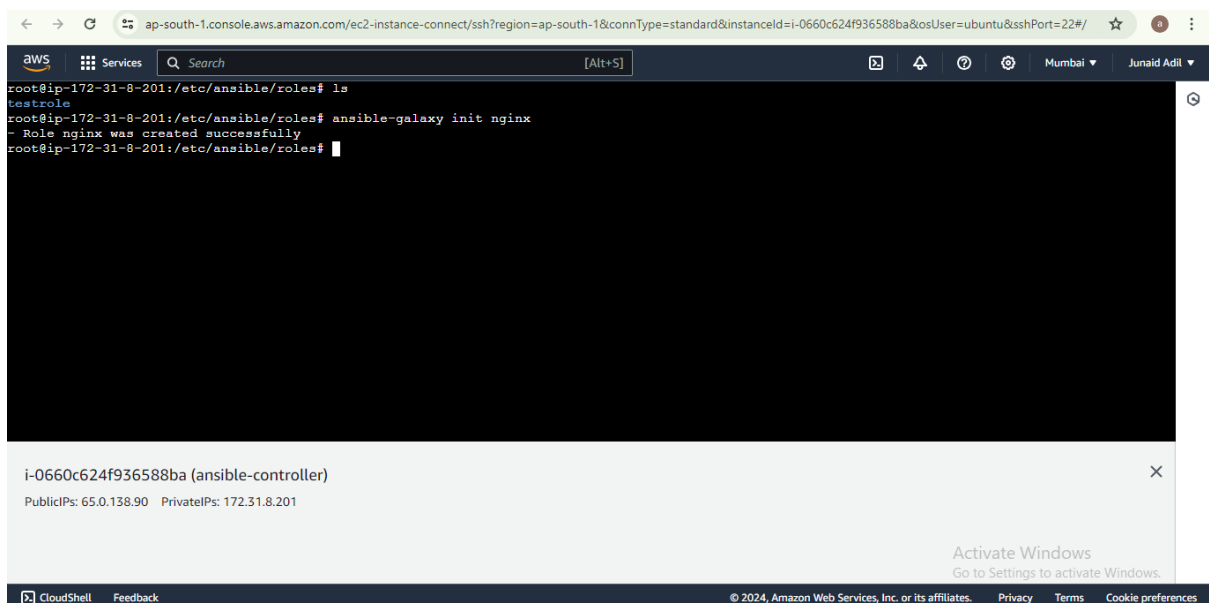
L3 - Create Ansible Role to define the task, handler for Nginx Service Installation and invoke the role in Ansible playbook

Step 1: Create an 2 instances 1 for Ansible controller and one for target node.

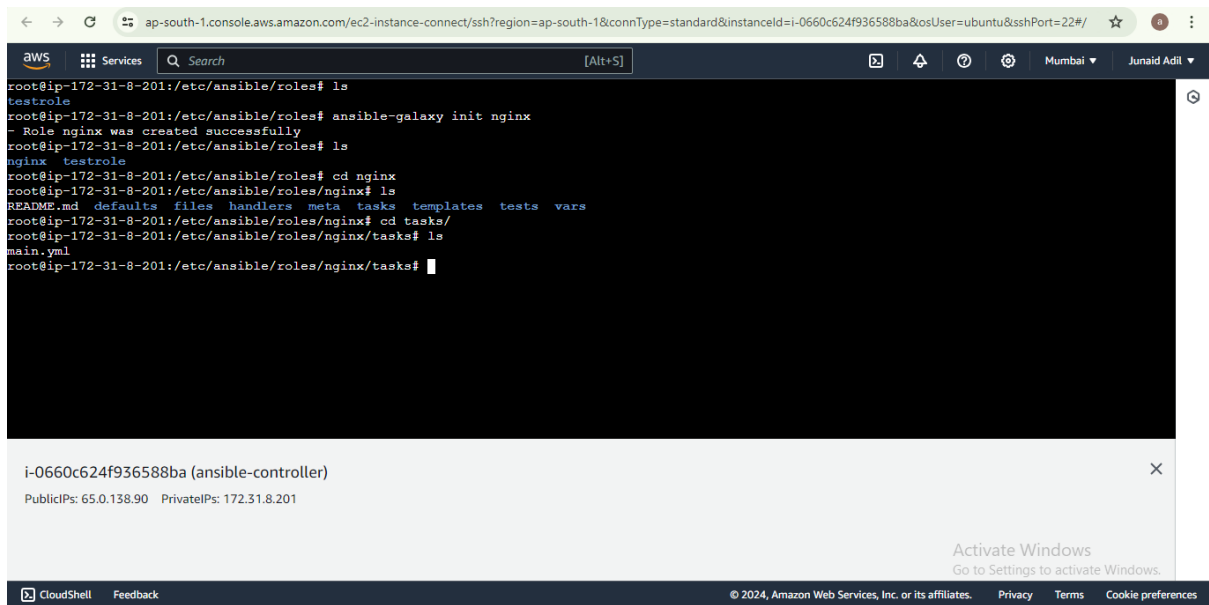


Install all the prerequisites in both the nodes.

Step 2: Create a role directory structure using command “ansible-galaxy init nginx”



Step 3: Go to tasks folder and edit main.yml file



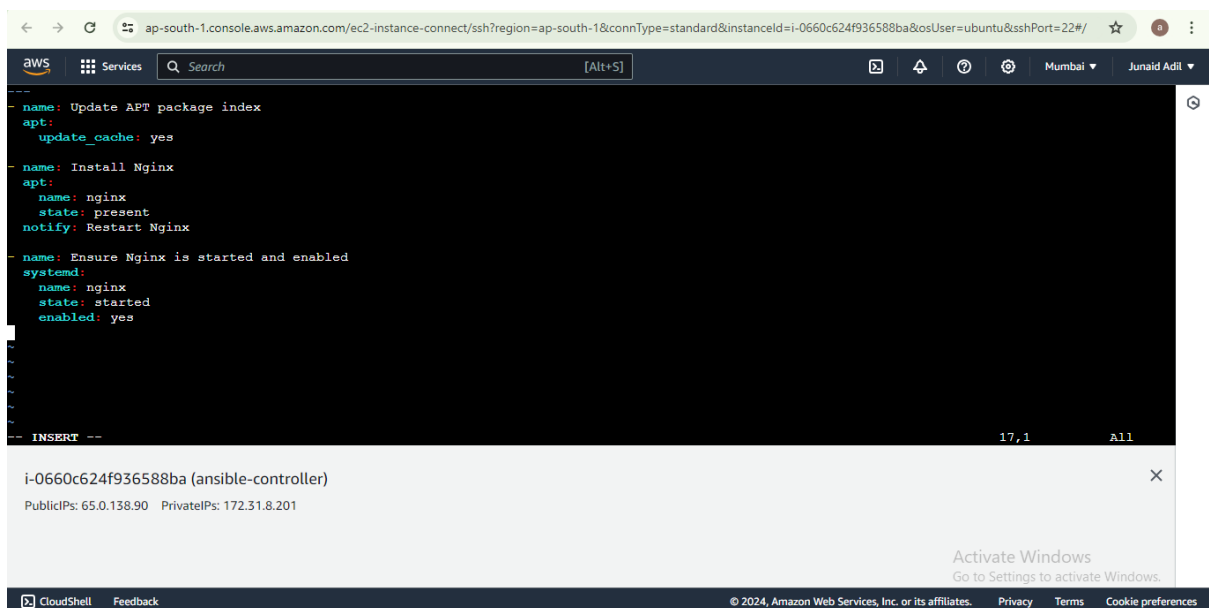
```
root@ip-172-31-8-201:/etc/ansible/roles# ls
testrole
root@ip-172-31-8-201:/etc/ansible/roles# ansible-galaxy init nginx
- Role nginx was created successfully
root@ip-172-31-8-201:/etc/ansible/roles# ls
nginx  testrole
root@ip-172-31-8-201:/etc/ansible/roles# cd nginx
root@ip-172-31-8-201:/etc/ansible/roles/nginx# ls
README.md  defaults  files  handlers  meta  tasks  templates  tests  vars
root@ip-172-31-8-201:/etc/ansible/roles/nginx# cd tasks/
root@ip-172-31-8-201:/etc/ansible/roles/nginx/tasks# ls
main.yml
root@ip-172-31-8-201:/etc/ansible/roles/nginx/tasks#
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 4: Added nginx installation script in the file



```
---
- name: Update APT package index
  apt:
    update_cache: yes
- name: Install Nginx
  apt:
    name: nginx
    state: present
    notify: Restart Nginx
- name: Ensure Nginx is started and enabled
  systemd:
    name: nginx
    state: started
    enabled: yes
-- INSERT --
```

i-0660c624f936588ba (ansible-controller)
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

Step 5: Edit the main.yml file in handlers to define the handler for restarting the nginx.

←

↻

ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&contentType=standard&instanceId=i-0660c624f936588ba&osUser=ubuntu&sshPort=22#/

☆

⌵

⋮

aws

Services

Q Search [Alt+S]

📄 🔔 ⓘ ⚙️ Mumbai ▾ Junaid Adil ▾

```
root@ip-172-31-8-201:/etc/ansible# ls
ansible.cfg  hosts  roleplay.yml  roles
root@ip-172-31-8-201:/etc/ansible# cd roles
root@ip-172-31-8-201:/etc/ansible/roles# ls
nginx  testrole
root@ip-172-31-8-201:/etc/ansible/roles# cd nginx
root@ip-172-31-8-201:/etc/ansible/roles/nginx# ls
README.md  defaults  files  handlers  meta  tasks  templates  tests  vars
root@ip-172-31-8-201:/etc/ansible/roles/nginx# cd handlers/
root@ip-172-31-8-201:/etc/ansible/roles/nginx/handlers# ls
main.yml
root@ip-172-31-8-201:/etc/ansible/roles/nginx/handlers# vi main.yml
```

i-0660c624f936588ba (ansible-controller) ✕

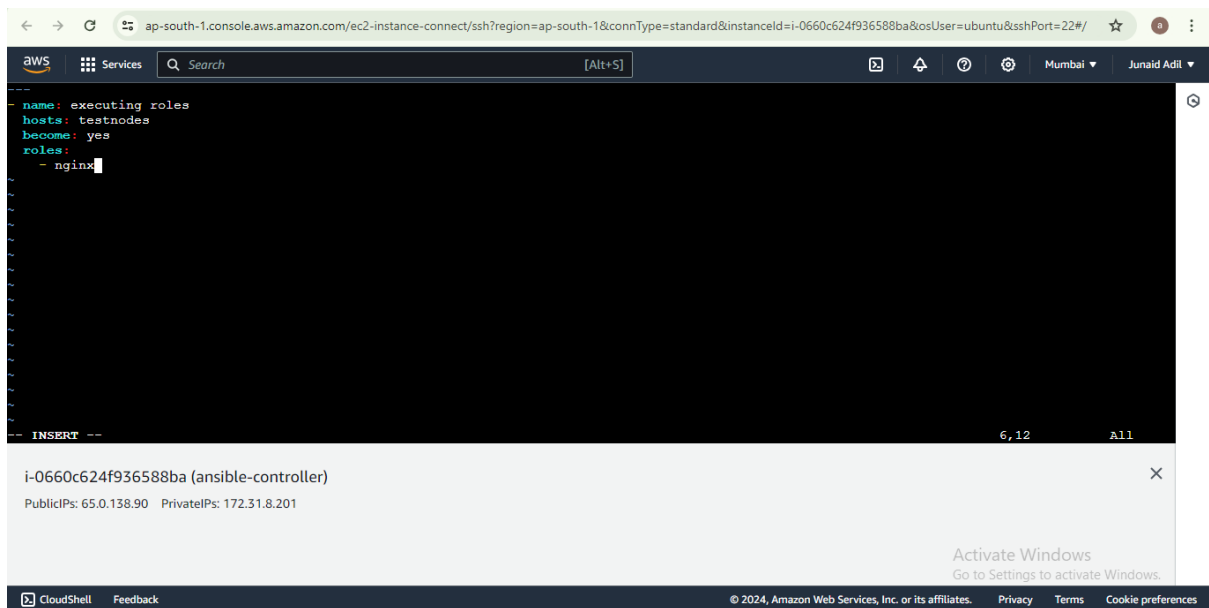
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201

Activate Windows
Go to Settings to activate Windows.

CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences

```
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0660c624f936588ba&osUser=ubuntu&sshPort=22#/  
aws Services Search [Alt+S]  
# handlers file for nginx  
- name: restart nginx  
  service:  
    name: nginx  
    state: restarted  
  
- name: reload nginx  
  service:  
    name: nginx  
    state: reloaded  
  
"main.yml" 13L, 171B 13,0-1 All  
  
i-0660c624f936588ba (ansible-controller)  
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201  
  
Activate Windows  
Go to Settings to activate Windows.  
CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences
```

Step 6: Create a file “roleplay.yml” to execute the role.

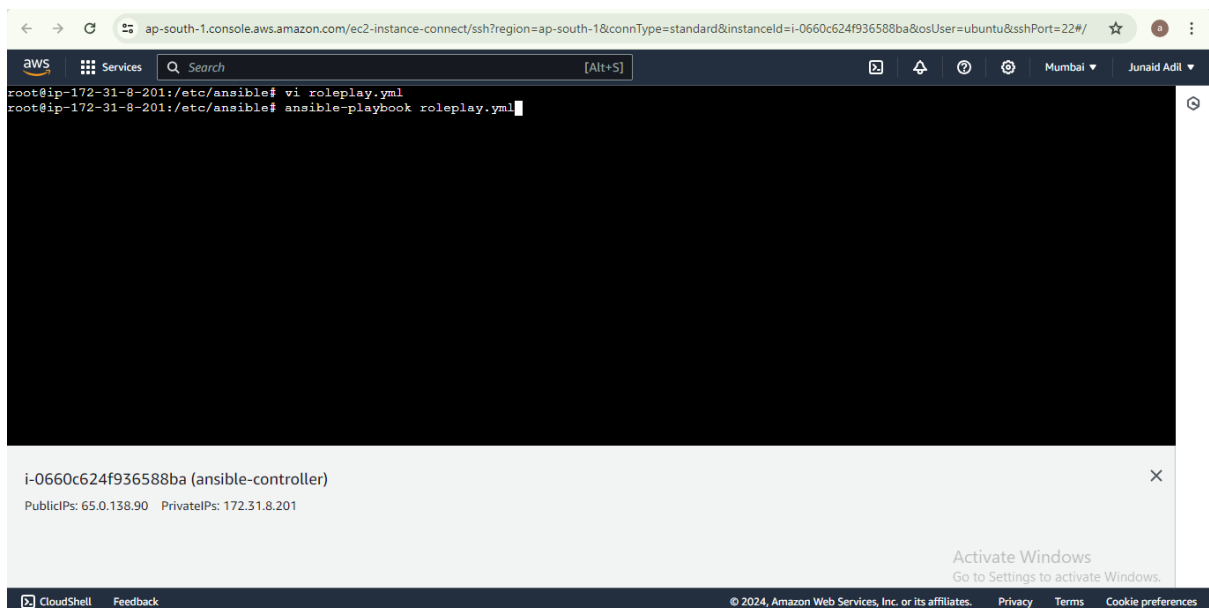


The screenshot shows the AWS CloudShell interface. The terminal window displays the following Ansible role configuration in a file named `roleplay.yml`:

```
--  
- name: executing roles  
  hosts: testnodes  
  become: yes  
  roles:  
    - nginx
```

The cursor is positioned at the end of the `nginx` line. Below the terminal, a metadata bar shows the instance ID `i-0660c624f936588ba` (ansible-controller) and its public/private IP addresses. The bottom status bar includes the AWS logo, "CloudShell", "Feedback", and copyright information for Amazon Web Services, Inc. (2024).

Step 7: Now execute the created “ roleplay.yml “ file using command “ ansible-playbook roleplay.yml “



The screenshot shows the AWS CloudShell interface with the terminal window displaying the execution of the `roleplay.yml` file. The commands entered are:

```
root@ip-172-31-8-201:/etc/ansible# vi roleplay.yml  
root@ip-172-31-8-201:/etc/ansible# ansible-playbook roleplay.yml
```

The cursor is at the end of the `ansible-playbook roleplay.yml` command. The metadata bar and bottom status bar are identical to the previous screenshot.

```
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-0660c624f936588ba&osUser=ubuntu&sshPort=22#/  
aws  
Services  
Search [Alt+S]  
root@ip-172-31-8-201:/etc/ansible/roles/nginx/handlers# vi main.yml  
root@ip-172-31-8-201:/etc/ansible/roles/nginx/handlers# cd ../../..  
root@ip-172-31-8-201:/etc/ansible# ls  
ansible.cfg  hosts  roleplay.yml  roles  
root@ip-172-31-8-201:/etc/ansible# ansible-playbook roleplay.yml  
  
PLAY [executing roles] *****  
  
TASK [Gathering Facts] *****  
ok: [ansible-target]  
  
TASK [nginx : Update APT package index] *****  
changed: [ansible-target]  
  
TASK [nginx : Install Nginx] *****  
ok: [ansible-target]  
  
TASK [nginx : Ensure Nginx is started and enabled] *****  
ok: [ansible-target]  
  
PLAY RECAP *****  
ansible-target : ok=4 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0  
  
root@ip-172-31-8-201:/etc/ansible#  
  
i-0660c624f936588ba (ansible-controller)  
PublicIPs: 65.0.138.90 PrivateIPs: 172.31.8.201  
  
Activate Windows  
Go to Settings to activate Windows.  
  
CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences
```

We can see the role file has been successfully executed.

```
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-069f864d0f3ab6c87&osUser=ubuntu&sshPort=22#/  
aws  
Services  
Search [Alt+S]  
ubuntu@ip-172-31-10-229:~$ dpkg -l | grep nginx  
ii  libnginx-mod-http-geoip2      1.18.0-6ubuntu14.4      amd64      GeoIP2 HTTP module for Nginx  
ii  libnginx-mod-http-image-filter 1.18.0-6ubuntu14.4      amd64      HTTP image filter module for Nginx  
ii  libnginx-mod-http-xslt-filter  1.18.0-6ubuntu14.4      amd64      XSLT Transformation module for Nginx  
ii  libnginx-mod-mail             1.18.0-6ubuntu14.4      amd64      Mail module for Nginx  
ii  libnginx-mod-stream           1.18.0-6ubuntu14.4      amd64      Stream module for Nginx  
ii  libnginx-mod-stream-geoip2     1.18.0-6ubuntu14.4      amd64      GeoIP2 Stream module for Nginx  
ii  nginx                         1.18.0-6ubuntu14.4      amd64      small, powerful, scalable web/proxy server  
ii  nginx-common                 1.18.0-6ubuntu14.4      all        small, powerful, scalable web/proxy server - common files  
n files  
ii  nginx-core                   1.18.0-6ubuntu14.4      amd64      nginx web/proxy server (standard version)  
ubuntu@ip-172-31-10-229:~$  
  
i-069f864d0f3ab6c87 (ansible-target)  
PublicIPs: 3.108.252.44 PrivateIPs: 172.31.10.229  
  
Activate Windows  
Go to Settings to activate Windows.  
  
CloudShell Feedback © 2024, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences
```