

ANSIBLE Installation on AWS

SCOPE:

Ansible is a popular automation tool that allows you to automate IT tasks such as configuration management, application deployment, and infrastructure management. Its scope is vast, and it can be used to automate a wide range of applications and systems.

Some of the popular use cases for Ansible automation include:

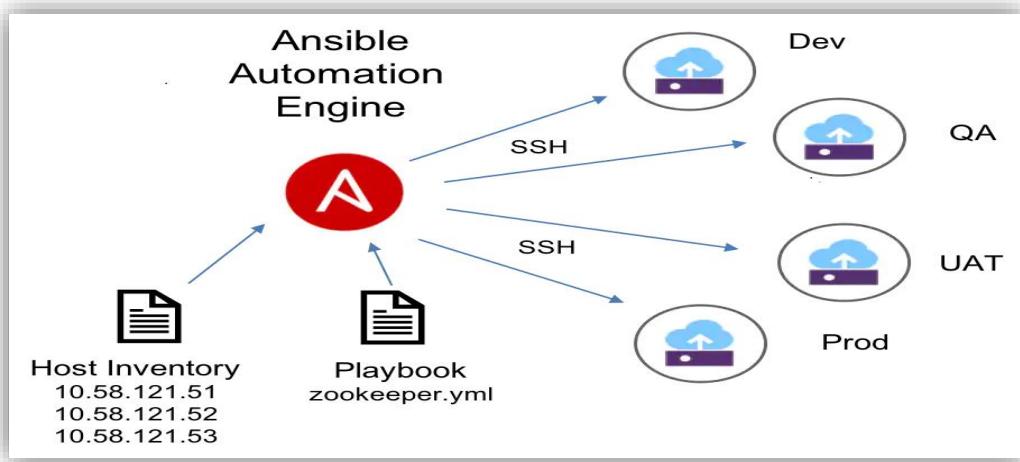
Configuration management: Ansible can be used to automate the configuration of servers, networking devices, and other IT resources. This includes tasks such as setting up users and permissions, installing software and packages, and configuring services.

Application deployment: Ansible can automate the deployment of applications and their dependencies, including web servers, databases, and load balancers. This can be particularly useful in environments where frequent updates and deployments are required.

Infrastructure management: Ansible can automate the provisioning of infrastructure resources such as virtual machines, containers, and cloud instances. This includes tasks such as creating and configuring network interfaces, storage volumes, and security groups.

Security automation: Ansible can be used to automate security-related tasks such as vulnerability scanning, patch management, and compliance auditing.

Overall, Ansible's flexibility and wide range of capabilities make it a valuable tool for automating various IT tasks and applications.



PURPOSE:

The purpose of automating applications using Ansible is to simplify and streamline IT operations. By automating routine tasks, such as software installation, configuration management, and infrastructure provisioning, Ansible can save time and reduce the risk of errors that can occur with manual processes.

Some of the key benefits of automating applications with Ansible include

Improved efficiency: Ansible enables you to automate repetitive tasks, freeing up time for IT teams to focus on more strategic work.

Consistency: Automation with Ansible ensures that IT operations are standardized and consistent, reducing the risk of errors and security vulnerabilities.

Speed: Ansible can execute tasks much faster than manual processes, reducing the time it takes to deploy applications and infrastructure.

TOOLS & TECHNOLOGIES USED:

Ansible:

- Ansible is an open-source automation tool.
- It uses YAML-based playbooks to define desired system state.
- Ansible is agentless, lightweight, and easy to set up.



Git & Git-Hub:

- Git is a distributed version control system.
- It allows developers to track changes to their code over time.
- Git enables collaboration among developers by allowing them to work on the same codebase simultaneously.



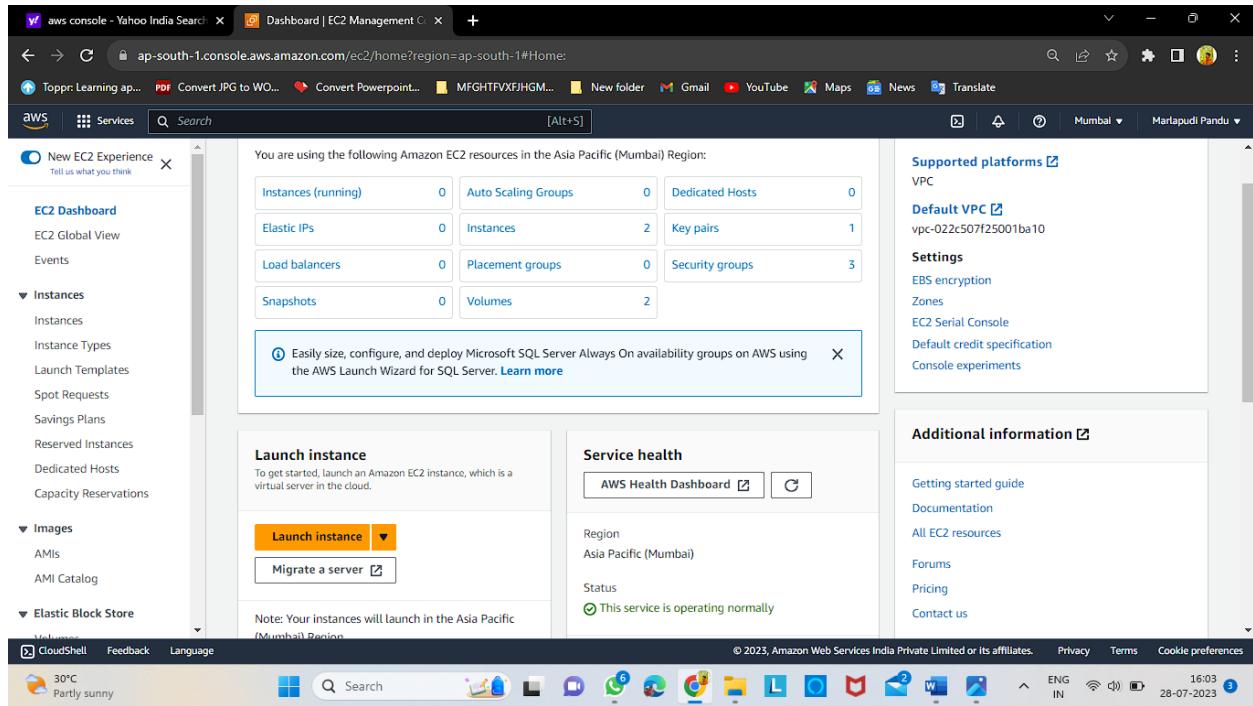
AWS:

- AWS (Amazon Web Services) is a cloud computing platform that provides a wide range of services and solutions for businesses and individuals.
- It offers on-demand computing resources, such as virtual machines, storage, and databases, that can be accessed over the internet.



PROOF OF CONCEPT :-

- Login to aws.amazon.com with your credentials and navigate to console home.



- Click on instances and select AMI (Amazon Machine Image) ubuntu.

The screenshot shows the AWS Lambda console interface. At the top, there's a search bar and a navigation bar with tabs like 'Lambda', 'Services', and 'Search'. Below the search bar, there's a 'Create Function' button. The main area is titled 'HelloWorld' and shows the 'Code' tab. The code editor contains the following Lambda@Edge code:

```
function handler(event, context) {  const response = {    statusCode: 200,    headers: { 'Content-Type': 'text/plain' },    body: 'Hello from Lambda!'  };  return response;}
```

On the right side, there's a sidebar with sections for 'Summary', 'Configuration', 'Logs', and 'Metrics'. The 'Summary' section shows basic details about the function.

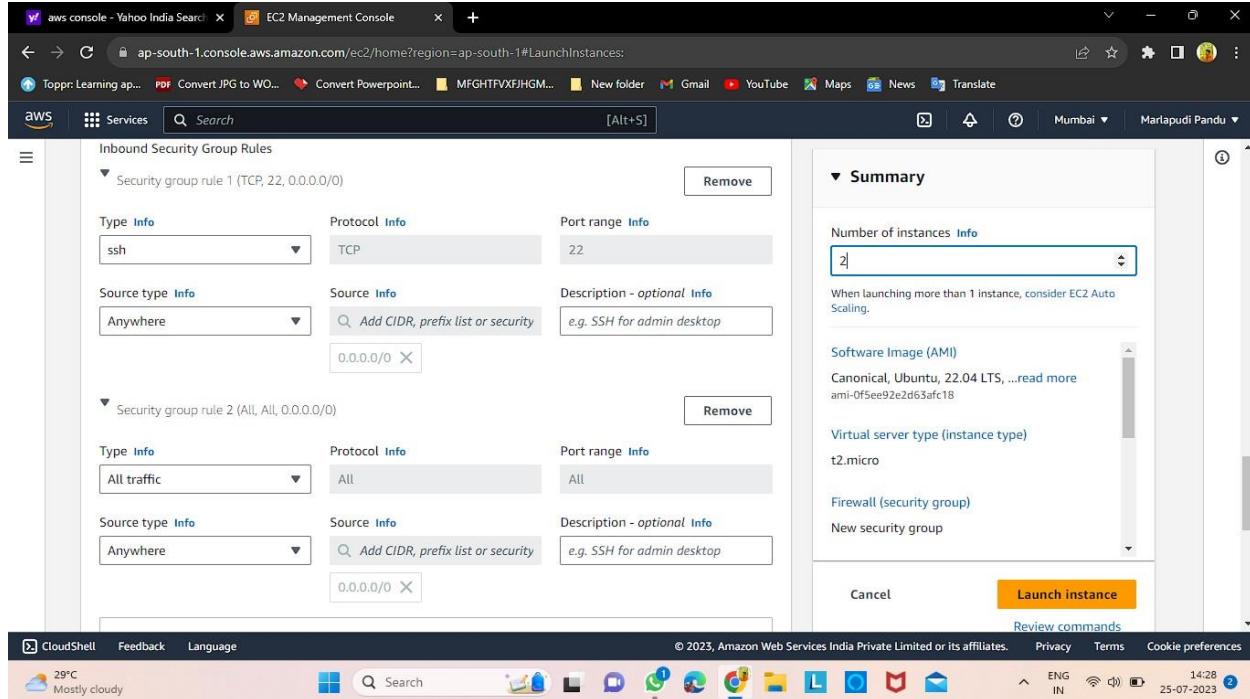
- Create a keypair, keypair allows you to connect to your instance.

The screenshot shows the AWS Lambda console interface. At the top, there's a search bar and a navigation bar with tabs like 'Lambda', 'Services', and 'Search'. Below the search bar, there's a 'Create Function' button. The main area is titled 'HelloWorld' and shows the 'Code' tab. The code editor contains the following Lambda@Edge code:

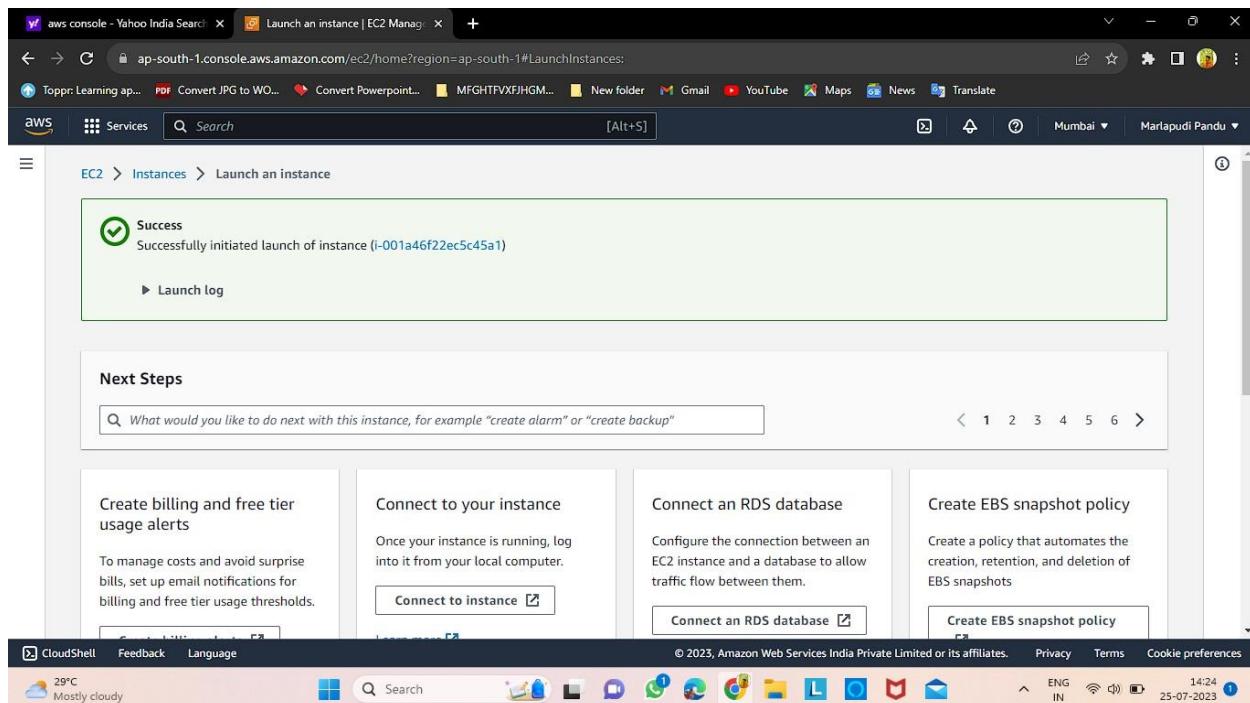
```
function handler(event, context) {  const response = {    statusCode: 200,    headers: { 'Content-Type': 'text/plain' },    body: 'Hello from Lambda!'  };  return response;}
```

On the right side, there's a sidebar with sections for 'Summary', 'Configuration', 'Logs', and 'Metrics'. The 'Summary' section shows basic details about the function.

- Select your keypair and VPC, subnet and enable auto assign public Ip. Select number of instances as 2.



- Click on create security group and select inbound security group rules. In our case select ALL Traffic, and select anywhere as a source type, finally click on launch instance.



- When instance launched. Name instances as ansible1,ansible2.

The screenshot shows the AWS EC2 Management Console. The left sidebar is collapsed. The main area displays the 'Instances' section with a table of two instances:

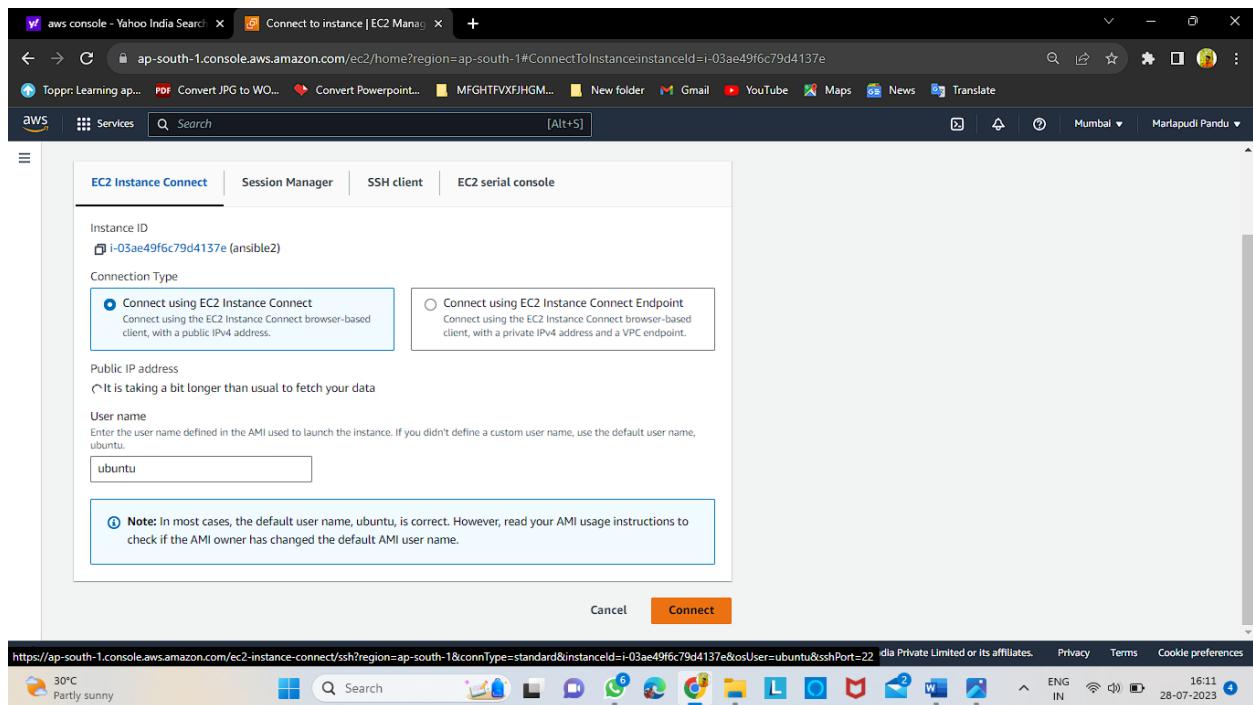
Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4 D
ansible1	i-002d358d1e52b60c9	Stopped	t2.micro	-	No alarms	ap-south-1a	-
ansible2	i-03ae49f6c79d4137e	Stopped	t2.micro	-	No alarms	ap-south-1a	-

Below the table, a message says "Instances: i-002d358d1e52b60c9 (ansible1), i-03ae49f6c79d4137e (ansible2)". A "Monitoring" section indicates "It is taking a bit longer than usual to fetch your data".

- Connect the ansible1 instance

The screenshot shows the 'Connect to instance' dialog for the instance with ID i-002d358d1e52b60c9 (ansible1). The 'EC2 Instance Connect' tab is selected. The connection type is set to 'Connect using EC2 Instance Connect'. The public IP address listed is 52.66.157.71. The user name is set to ubuntu. A note at the bottom states: "Note: In most cases, the default user name, ubuntu, is correct. However, read your AMI usage instructions to check if the AMI owner has changed the default AMI user name." At the bottom right are 'Cancel' and 'Connect' buttons.

- Simultaneously connect the ansible2.



- We are successfully connected to ansible1.

```
aws console - Yahoo India Search | Connect to instance | EC2 Manager | EC2 Instance Connect | +  
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu&region=ap-south-1&ssh...  
Toppr: Learning ap... Convert JPG to WO... Convert Powerpoint... MGHTFVXFJHGM... New folder Gmail YouTube Maps News Translate  
AWS Services Search [Alt+S]  
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  
  
The programs included with the Ubuntu system are free software;  
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-172-31-40-247:~$  
i-002d358d1e52b60c9 (ansible1)  
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247
```

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➤ We are successfully connected to ansible2.

```
aws console - Yahoo India Search | Connect to instance | EC2 Manager | EC2 Instance Connect | +  
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-03ae49f6c79d4137e&osUser=ubuntu&ssh...  
Toppr: Learning ap... Convert JPG to WO... Convert Powerpoint... MGHTFVXFJHGM... New folder Gmail YouTube Maps News Translate  
AWS Services Search [Alt+S]  
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  
  
The programs included with the Ubuntu system are free software;  
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-172-31-40-83:~$  
i-03ae49f6c79d4137e (ansible2)  
PublicIPs: 13.235.135.178 PrivateIPs: 172.31.40.83
```

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- Execute (sudo apt-get update) command in ansible1 and ansible2.

```
ubuntu@ip-172-31-40-247:~$ sudo apt-get update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:6 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [631 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:9 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:10 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:11 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:12 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [850 kB]
Get:13 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [208 kB]
Get:14 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [15.4 kB]
Get:15 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [663 kB]
Get:16 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [106 kB]
Get:17 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [528 B]
Get:18 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [949 kB]
Get:19 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [204 kB]
Get:20 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [20.8 kB]
```

i-002d358d1e52b60c9 (ansible1)

PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247

```
ubuntu@ip-172-31-40-83:~$ sudo apt-get update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:6 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [631 kB]
Get:7 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:8 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:9 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:10 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:11 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:12 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [850 kB]
Get:13 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [148 kB]
Get:14 http://security.ubuntu.com/ubuntu jammy-security/main amd64 c-n-f Metadata [11.0 kB]
Get:15 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [651 kB]
Get:16 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [208 kB]
Get:17 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [15.4 kB]
Get:18 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [663 kB]
Get:19 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [106 kB]
Get:20 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [528 B]
Get:21 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [949 kB]
```

i-03ae49f6c79d4137e (ansible2)

PublicIPs: 13.235.135.178 PrivateIPs: 172.31.40.83

- Execute the following commands in ansible1 (sudo apt install software-properties-common).

```
ubuntu@ip-172-31-40-247:~$ sudo apt install software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  python3-software-properties
The following packages will be upgraded:
  python3-software-properties software-properties-common
2 upgraded, 0 newly installed, 0 to remove and 83 not upgraded.
Need to get 42.9 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] 
```

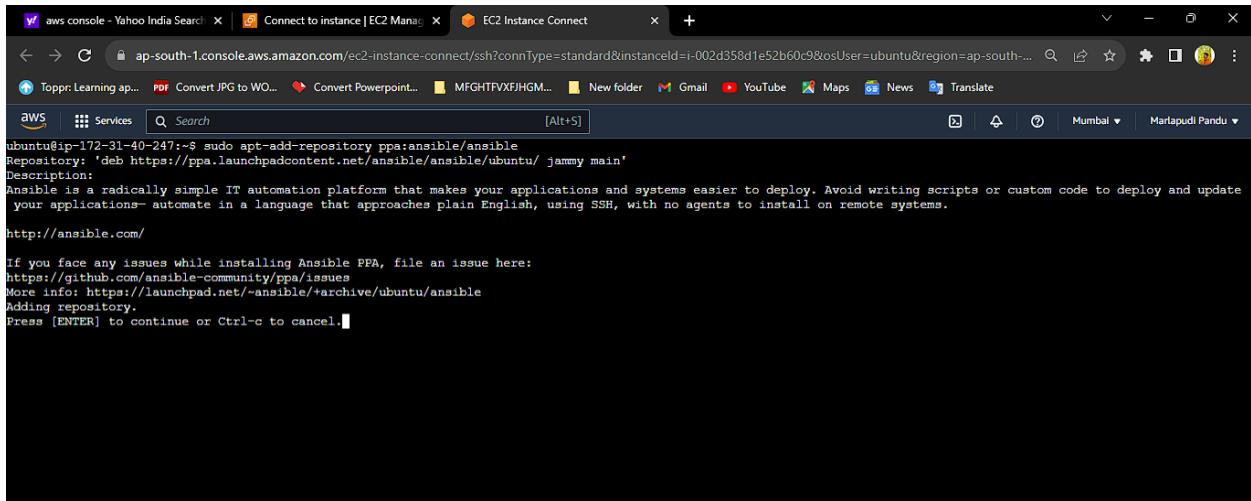
i-002d358d1e52b60c9 (ansible1)
Public IPs: 13.234.213.38 Private IPs: 172.31.40.247

- Click "Y" to continue

```
ubuntu@ip-172-31-40-247:~$ sudo apt install software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  python3-software-properties
The following packages will be upgraded:
  python3-software-properties software-properties-common
2 upgraded, 0 newly installed, 0 to remove and 83 not upgraded.
Need to get 42.9 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 software-properties-common all 0.99.22.7 [14.1 kB]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3-software-properties all 0.99.22.7 [28.8 kB]
Fetched 42.9 kB in 0s (143 kB/s)
(Reading database ... 64295 files and directories currently installed.)
Preparing to unpack .../software-properties-common_0.99.22.7_all.deb ...
Unpacking software-properties-common (0.99.22.7) over (0.99.22.6) ...
Preparing to unpack .../python3-software-properties_0.99.22.7_all.deb ...
Unpacking python3-software-properties (0.99.22.7) over (0.99.22.6) ...
Setting up python3-software-properties (0.99.22.7) ...
Setting up software-properties-common (0.99.22.7) ...
Setting up software-properties-common (2.10.2-1) ...
Processing triggers for man-db (2.10.2-1) ...
```

i-002d358d1e52b60c9 (ansible1)
Public IPs: 13.234.213.38 Private IPs: 172.31.40.247

- Enter (sudo apt-add-repository ppa:ansible/ansible) command :



```
aws console - Yahoo India Search | Connect to instance | EC2 Manager | EC2 Instance Connect | +  
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu&region=ap-south-1  
Toppr: Learning ap... Convert JPG to WO... Convert Powerpoint... MFHTVXFJHGM... New folder Gmail YouTube Maps News Translate  
AWS Services Search [Alt+S]  
ubuntu@ip-172-31-40-247:~$ 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 deploy. Avoid writing scripts or custom code to deploy and update your applications— automate in a language that approaches plain English, 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.■
```

i-002d358d1e52b60c9 (ansible1)
PublicIPs: 65.0.168.206 PrivateIPs: 172.31.40.247



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- Update the ansible 1. [sudo apt update]:

```

Adding disabled deb-src entry to /etc/apt/sources.list.d/ansible-ubuntu-jammy.list
Adding key to /etc/apt/trusted.gpg.d/ansible-ubuntu-ansible.gpg with fingerprint 6125E2A8C77F2818FB7BD15B93C4A3FD7BB9C367
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-security InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:5 https://ppa.launchpadcontent.net/ansible/ubuntu jammy/main amd64 Packages [1144 B]
Get:7 https://ppa.launchpadcontent.net/ansible/ubuntu jammy/main Translation-en [752 B]
Fetched 19.9 kB in 2s (10.5 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-40-247:~$ sudo apt update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:3 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Hit:5 https://ppa.launchpadcontent.net/ansible/ubuntu jammy InRelease
Fetched 226 kB in 1s (293 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
83 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-40-247:~$ 

```

i-002d358d1e52b60c9 (ansible1)
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247

➤ Install ansible in the master (ansible 1) using [sudo apt install ansible]

```

Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Hit:5 https://ppa.launchpadcontent.net/ansible/ubuntu jammy InRelease
Fetched 226 kB in 1s (293 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
83 packages can be upgraded. Run 'apt list --upgradable' to see them.
ubuntu@ip-172-31-40-247:~$ 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-kerberos
  python3-requests-ntlm python3-resolvelib python3-winrm python3-xmldict sshpass
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-requests-kerberos
  python3-requests-ntlm python3-resolvelib python3-winrm python3-xmldict sshpass
0 upgraded, 14 newly installed, 0 to remove and 83 not upgraded.
Need to get 17.3 MB of archives.
After this operation, 270 MB of additional disk space will be used.
Do you want to continue? [Y/n] 

```

i-002d358d1e52b60c9 (ansible1)
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247

➤ Execute [sudo apt-get install python3] command in ansible2.

```

ubuntu@ip-172-31-40-83:~$ sudo apt-get install python3
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3 is already the newest version (3.10.6-1~22.04).
0 upgraded, 0 newly installed, 0 to remove and 85 not upgraded.
ubuntu@ip-172-31-40-83:~$ 

```

i-03ae49f6c79d4137e (ansible2)

PublicIPs: 13.235.135.178 PrivateIPs: 172.31.40.83

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- Now execute the command :- ssh [ubuntu@13.235.135.178](ssh://ubuntu@13.235.135.178)(ip address of ansible2) in ansible1.

```

ubuntu@ip-172-31-40-247:~$ ssh ubuntu@13.235.135.178
The authenticity of host '13.235.135.178' (13.235.135.178) can't be established.
ED25519 key fingerprint is SHA256:Fe5vumG6y52Me6jdy3acnCQWWQcHGM/OyYEo9TL44.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '13.235.135.178' (ED25519) to the list of known hosts.
ubuntu@13.235.135.178: Permission denied (publickey).
ubuntu@ip-172-31-40-247:~$ cd ssh
-bash: cd: No such file or directory
ubuntu@ip-172-31-40-247:~$ cd .ssh
ubuntu@ip-172-31-40-247:~/.ssh$ 

```

i-002d358d1e52b60c9 (ansible1)

PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247

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- Now execute this in ansible1.

Now use cd .ssh to navigate in our linux environment.

Now use ls command after executing this command it shows:

```

aws console - Yahoo India Search x | Connect to instance | EC2 Manager x | EC2 Instance Connect x | EC2 Instance Connect x | + 
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu&region=ap-south-1&ss... 
Toppr: Learning ap... PDF Convert JPG to WO... Convert Powerpoint... MGHTFVXFJHGM... New folder Gmail YouTube Maps News Translate 
Mumbai Marlapudi Pandu 
aws Services Search [Alt+S] 
ubuntu@ip-172-31-40-247:~/.ssh$ ls 
authorized_keys known_hosts 
ubuntu@ip-172-31-40-247:~/.ssh$ cat authorized_keys 
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQC5MC65EOKJHgLWObfuvAnfUnmy2K3DB54rXodVZyS+TC3OtWLYDqt+J7UI+5wzXystWqjkZLiUMUj6LtXNPZOzMkvM2+pmAu0DOauOpn/mpKN6a8 
fvtbMmLs5EH2VUFZ/ltng8OGPehp+Tti+WnQCYekzUm3Ykx44prf7fObEC2fmeUyE9g/PEtL3tCx5TmDvuiF2yk34f1k14KpBmpXwMy/em/jaH5X9+8GjMzpnBDIgtRqWL8E+c/W4ArW/D+aTx7cj7 
J+rIUH5h9yNzvawMM75v/CzNG6VuEqCZw1QVECv8sg61lmqfFSAd8NvG3lKyE521QLo/8QakEh0vh AWS project 
ubuntu@ip-172-31-40-247:~/.ssh$ 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:xa2RE8Zc7g8u+hW2FxmpVKr8Dh6V/grkcrp0E/MifXk ubuntu@ip-172-31-40-247 
The key's randomart image is: 
+---[RSA 3072]---+ 
| o=o . . | 
| +oo o | 
| . + . + | 
| = o o * | 
| S @ * . | 
| * o | 
| | 
| | 
| | 
i-002d358d1e52b60c9 (ansible1) 
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247 

```

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`authorized_keys known_hosts`

- Now use cd .ssh command in ansible2 and execute ls command it shows:

`authorized_keys`

```

ubuntu@ip-172-31-40-83:~$ sudo apt-get install python3
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3 is already the newest version (3.10.6-1~22.04).
0 upgraded, 0 newly installed, 0 to remove and 85 not upgraded.
ubuntu@ip-172-31-40-83:~$ cd .ssh
ubuntu@ip-172-31-40-83:~/ssh$ ls
authorized_keys
ubuntu@ip-172-31-40-83:~/ssh$ sudo nano authorized_keys
ubuntu@ip-172-31-40-83:~/ssh$ sudo nano authorized_keys
ubuntu@ip-172-31-40-83:~/ssh$ sudo nano authorized_keys
ubuntu@ip-172-31-40-83:~/ssh$ 

```

i-03ae49f6c79d4137e (ansible2)
PublicIPs: 13.235.135.178 PrivateIPs: 172.31.40.83

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- Now execute the [ssh-keygen] command in ansible1 it will generate a keypair.

```

ubuntu@ip-172-31-40-247:~/.ssh$ ls
authorized_keys known_hosts
ubuntu@ip-172-31-40-247:~/.ssh$ cat authorized_keys
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQG5MC65EPKJhgLWObfuwAnFUnmy2K3DB54rXodVzy8+TC3OtWLYDq+jJ7UI+5wzXystWqjk2LiUMJj6LtXNPZo2MkvM2+pmAu0DOauOpmpKN6a8
fvtbMmLz5EH2VUFZ/Ditn8gOGFehp+Tii+WnQCYekeUm3Ykx44prf7fObEc2fmeUyE9g/PEtI3tCx8TmDVuP2yk34f1kI4KpSmpXwMy/em/jaH5X9+SGjMzpnBDTgtRqWL8E+o/W4lrxrW/D+aTx7cj7
J/+rIUNH5h9yWNzavWM5v7CzN6ubrqC2w1OPECv8sg6llmqffFSAd8NvG3IkyE521Qlo/8QAkEb00vh AWS project
ubuntu@ip-172-31-40-247:~/.ssh$ ssh-keygen
Generating public/private 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:xa2RE82c7g0u+hW2FxmpVKr8Dh6V/grkrp0E/MifXk ubuntu@ip-172-31-40-247
The key's randomart image is:
----[RSA 3072]----+
|   o=.
|   +oo o |
|   . + . +
|   = o o *
|   S   @ * .
|   * % o |

```

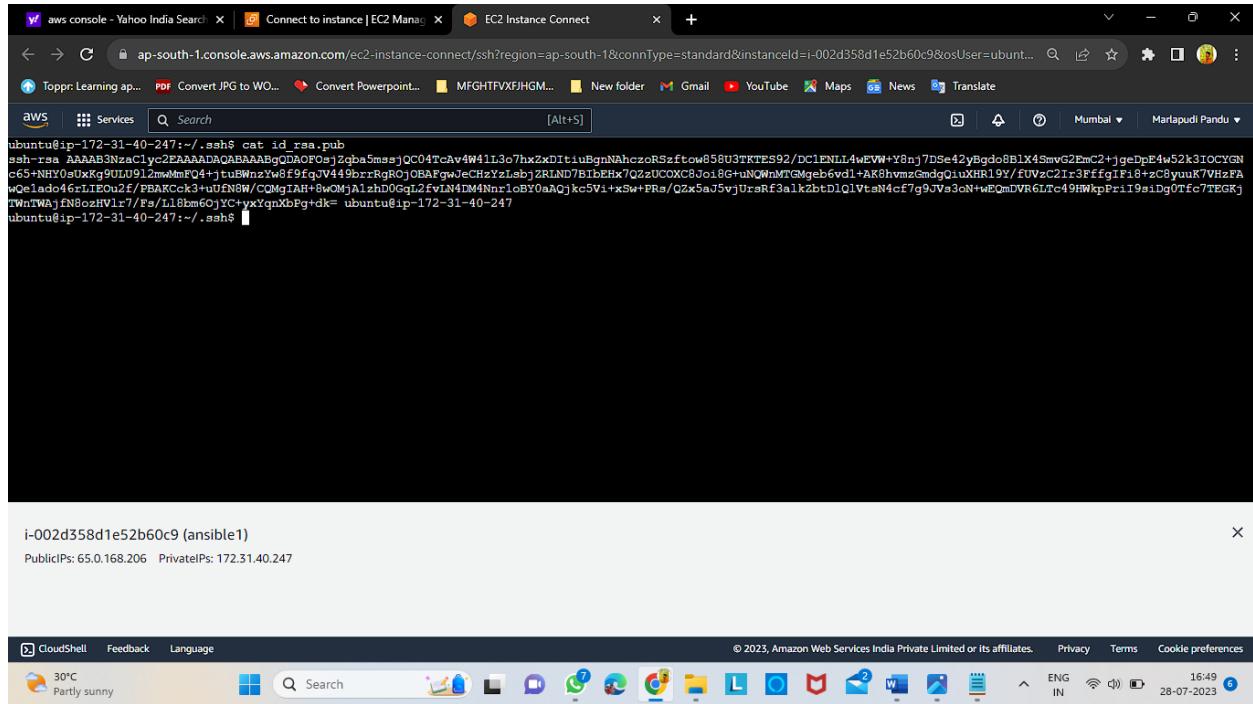
i-002d358d1e52b60c9 (ansible1)
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247

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- After that now execute ls command it shows:-

[authorized_keys id_rsa id_rsa.pub known_hosts]

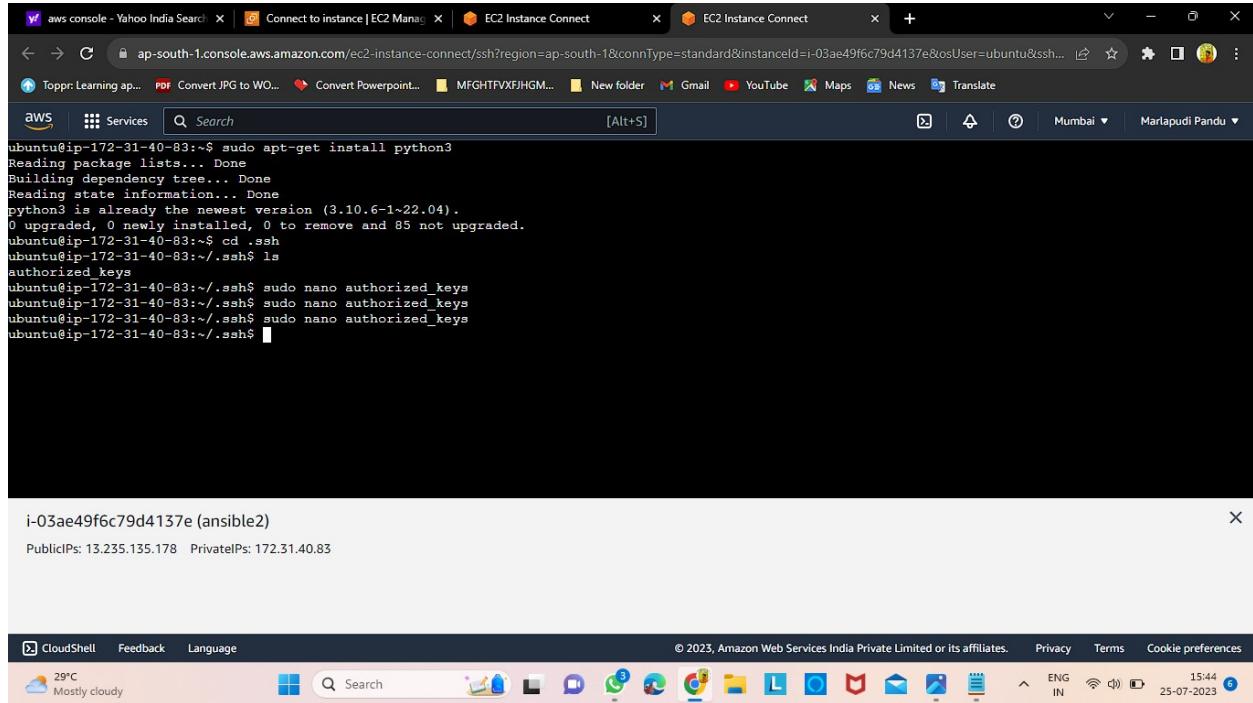
Now execute (cat id_rsa.pub) command it will generate a code copy that code.



```
ubuntu@ip-172-31-40-247:~/.ssh$ cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAQADAAQAAAQBgODAOFOsJ2gb5mssjQC04TcAv4W41L3o7hx2xDtluBgnNAhczoSzftow858U3TKTES92/DC1ENLL4wEVW+Y8nj7DSe42yBgd08BlX4SmvG2EmC2+jgeDpE4w52k3IOCYGN
c65+NHY0stxKg9UL912mMmF04+juB8WnzYe8f9fg;V449brxRgRo1OBAPgwJcHzYzLsbjZBLND7B1bEHx7QztCOXC8Joi8G+uNCWtMTGMgeb6vdl+AK8hvzmzGmdQiuXHRI9Y/FUVzc2Ir3FFqfIFi8+zC8yuuK7VHzPA
wQe1ad046xLIEQ2lE/PBARCc3+uEN5W/C0MgIAH-BwQMyA1zhD0Gq12fyLN41DM4nr1cBY0aAQjkcsV1+xs+PRA/02x5a75vjUrsRf3alkZbtD1Q1VtAn4cF7g9Jv3ch+N+xEQmDVR6LTc49HWkpPriI9s1Dg0Tfc-7TEGKj
TWnTWA)fn8ozHvlr7/Fs/L18km6QjYC+yxYqnXbPg+dk= ubuntu@ip-172-31-40-247:~/.ssh$
```

i-002d358d1e52b60c9 (ansible1)
PublicIPs: 65.0.168.206 PrivateIPs: 172.31.40.247

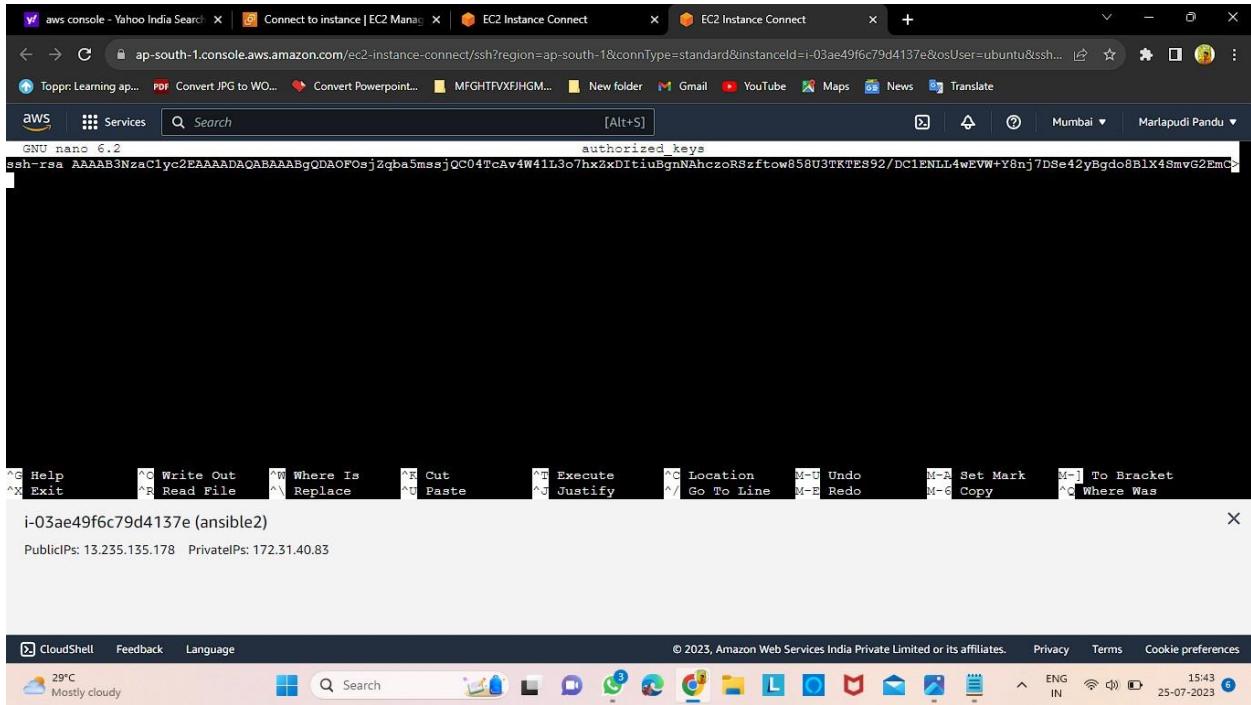
➤ Now execute the following code in ansible2.



```
ubuntu@ip-172-31-40-83:~$ sudo apt-get install python3
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3 is already the newest version (3.10.6-1~22.04).
0 upgraded, 0 newly installed, 0 to remove and 85 not upgraded.
ubuntu@ip-172-31-40-83:~$ cd .ssh
ubuntu@ip-172-31-40-83:~/.ssh$ ls
authorized_keys
ubuntu@ip-172-31-40-83:~/.ssh$ sudo nano authorized_keys
ubuntu@ip-172-31-40-83:~/.ssh$ sudo nano authorized_keys
ubuntu@ip-172-31-40-83:~/.ssh$ sudo nano authorized_keys
ubuntu@ip-172-31-40-83:~/.ssh$
```

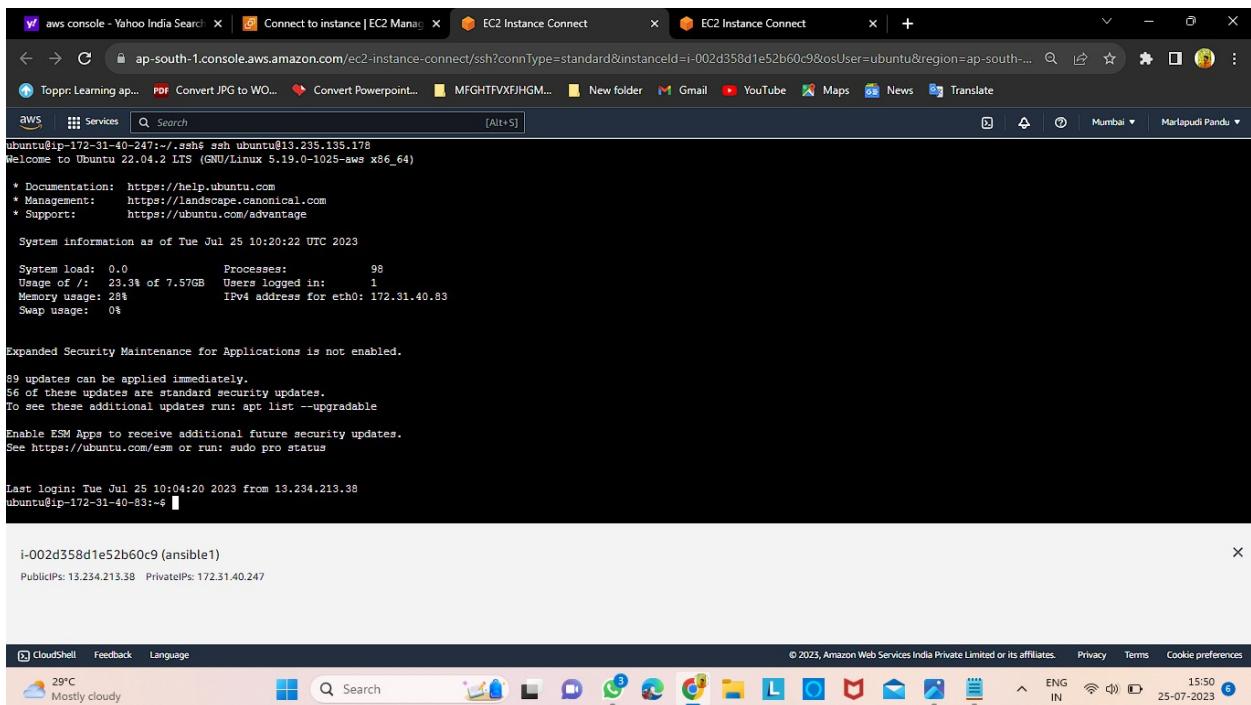
i-03ae49f6c79d4137e (ansible2)
PublicIPs: 13.235.135.178 PrivateIPs: 172.31.40.83

- Paste the copied code in after executing `sudo nano authorized_keys` :



```
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQgQDAOFosjZqba5mssjQC04TcAv4W41L3o7hxZxDitibgnNahczoR8zftow858U3TKTES92/DC1ENLL4wEVW+Y8nj7DSe42yBgdo8B1x4SmvG2EmC>
```

- Now go to ansible1 and execute [ssh [ubuntu@13.235.135.178](ssh://ubuntu@13.235.135.178)] (pub. Ip address of ansible2) command.



```
ubuntu@ip-172-31-40-247:~/.ssh$ ssh ubuntu@13.235.135.178
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.19.0-1025-aws x86_64)

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

System information as of Tue Jul 25 10:20:22 UTC 2023

System load:  0.0          Processes:      98
Usage of /:   23.3% of 7.57GB  Users logged in:  1
Memory usage: 28%
Swap usage:   0%
IPv4 address for eth0: 172.31.40.83

Expanded Security Maintenance for Applications is not enabled.

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

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

Last login: Tue Jul 25 10:04:20 2023 from 13.234.213.38
ubuntu@ip-172-31-40-83:~
```

- You can clearly see that the ansible1 got logged into ansible2.

```

aws console - Yahoo India Search | Connect to instance | EC2 Manager | EC2 Instance Connect | EC2 Instance Connect | + 
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu&region=ap-south-1
Toppr: Learning ap... PDF Convert JPG to WO... Convert Powerpoint... MGHTFVXFJHGM... New folder Gmail YouTube Maps News Translate
AWS Services Search [Alt+S]
Support: https://ubuntu.com/advantage
System information as of Tue Jul 25 10:20:22 UTC 2023
System load: 0.0 Processes: 98
Usage of /: 23.3% of 7.57GB Users logged in: 1
Memory usage: 28% IPv4 address for eth0: 172.31.40.83
Swap usage: 0%
Expanded Security Maintenance for Applications is not enabled.
89 updates can be applied immediately.
56 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status
Last login: Tue Jul 25 10:04:20 2023 from 13.234.213.38
ubuntu@ip-172-31-40-83:~$ exit
logout
Connection to 13.235.135.178 closed.
ubuntu@ip-172-31-40-247:~/.ssh$ 
i-002d358d1e52b60c9 (ansible1)
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247
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29°C Mostly cloudy Search
ENG IN 15:51 25-07-2023

```

- Now execute the [sudo nano /etc/ansible/hosts] commands in ansible1.

```

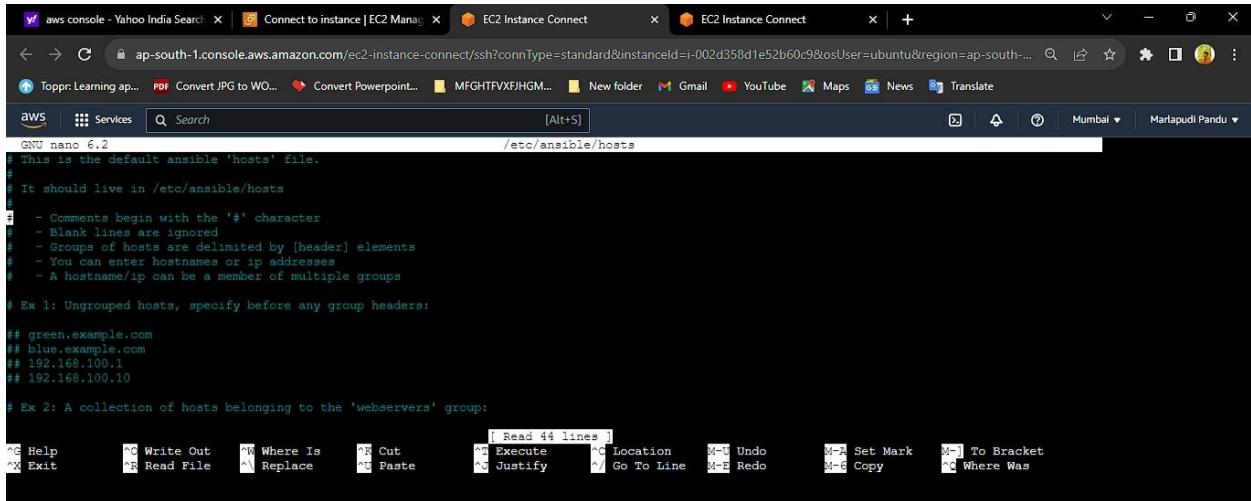
aws console - Yahoo India Search | Connect to instance | EC2 Manager | EC2 Instance Connect | EC2 Instance Connect | + 
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu...
Toppr: Learning ap... PDF Convert JPG to WO... Convert Powerpoint... MGHTFVXFJHGM... New folder Gmail YouTube Maps News Translate
AWS Services Search [Alt+S]
ubuntu@ip-172-31-40-247:~/.ssh$ sudo nano /etc/ansible/hosts
ubuntu@ip-172-31-40-247:~/.ssh$ 
i-002d358d1e52b60c9 (ansible1)
PublicIPs: 65.0.168.206 PrivateIPs: 172.31.40.247
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30°C Partly sunny Search
ENG IN 16:58 28-07-2023

```

- After running the command its shows like this

Here [production] is called as group which is created now and also slave which is here slave1.

write the following command:- slave1 ansible_ssh_host=(ansible2 public ip address).



```

GNU nano 6.2
/etc/ansible/hosts
This is the default ansible 'hosts' file.
It should live in /etc/ansible/hosts

# Comments begin with the '#' character
# Blank lines are ignored
# Groups of hosts are delimited by [header] elements
# You can enter hostnames or ip addresses
# A hostname/ip can be a member of multiple groups

# Ex 1: Ungrouped hosts, specify before any group headers:

## green.example.com
## blue.example.com
## 192.168.100.1
## 192.168.100.10

# Ex 2: A collection of hosts belonging to the 'webservers' group:

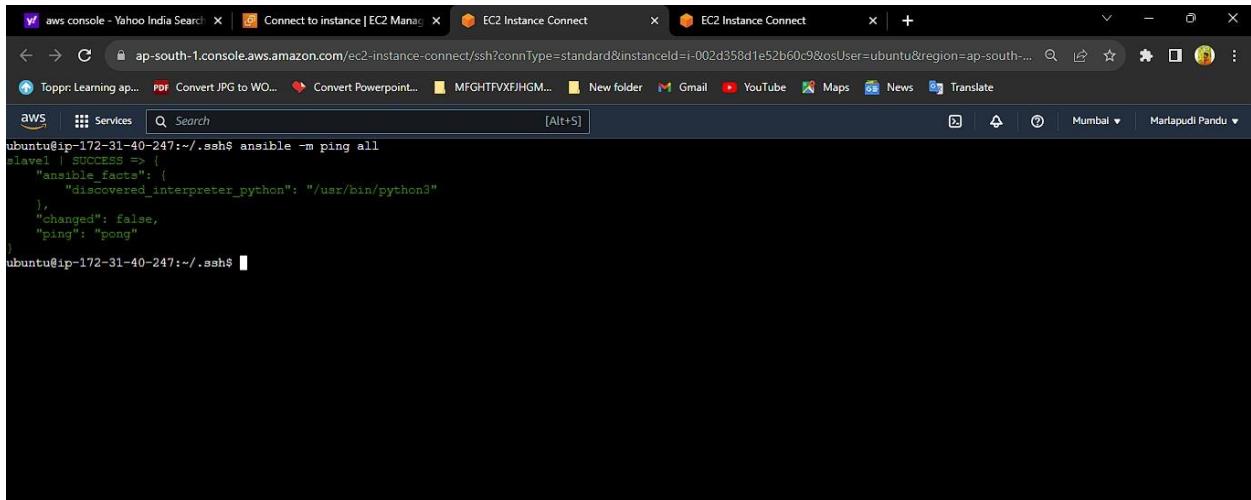
^G Help      ^C Write Out   ^W Where Is    ^K Cut        ^E Execute [ Read 44 lines ]
^X Exit      ^R Read File   ^V Replace     ^A Paste      ^L Location
^T Justify    ^D Go To Line  ^U Undo       ^M Set Mark
^F Copy      ^C Where Was

```

i-002d358d1e52b60c9 (ansible1)
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247



- Execute the [ansible -m ping all] commands in ansible1.



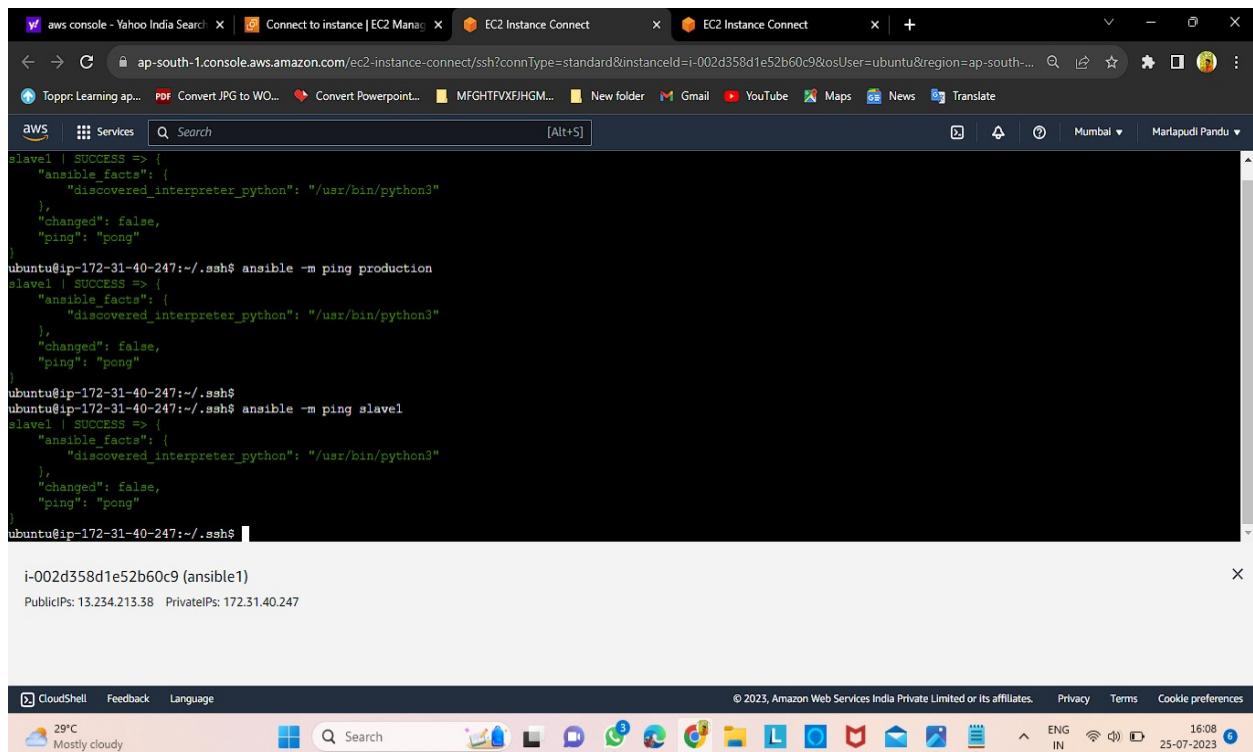
```

ubuntu@ip-172-31-40-247:~/.ssh$ ansible -m ping all
slave1 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python3"
  },
  "changed": false,
  "ping": "pong"
}
ubuntu@ip-172-31-40-247:~/.ssh$ 

```

i-002d358d1e52b60c9 (ansible1)
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247

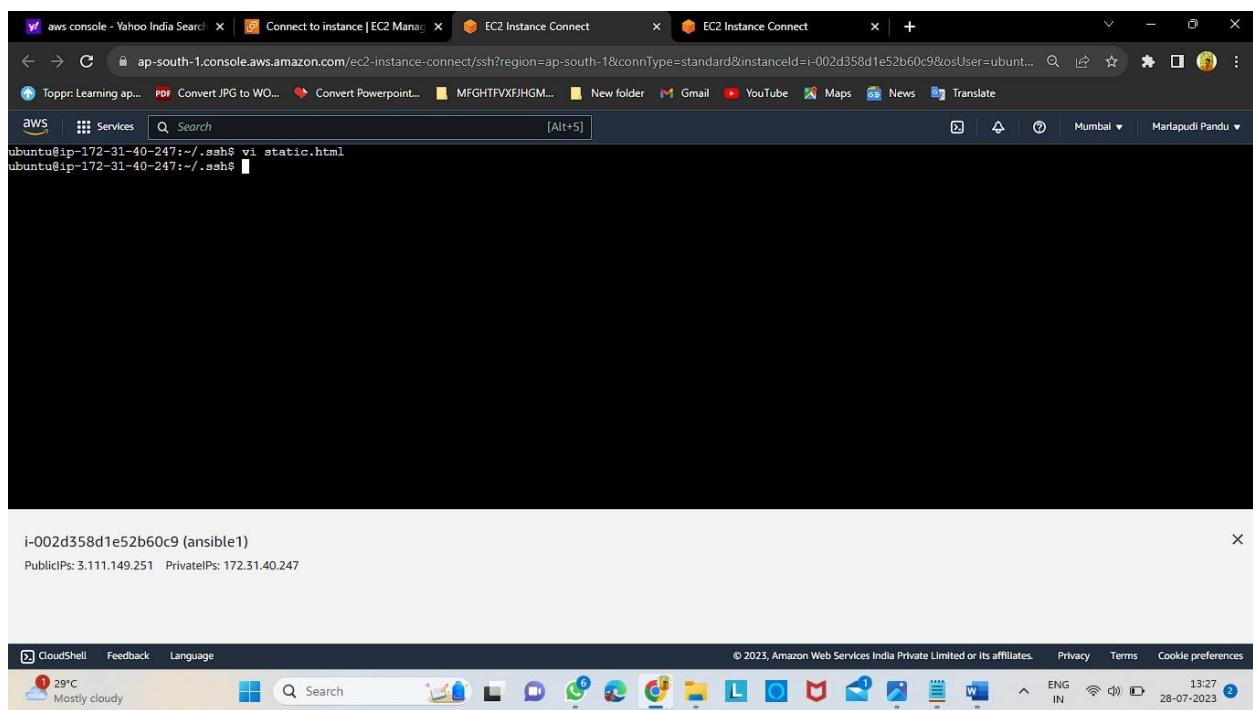




```
aws console - Yahoo India Search | Connect to instance | EC2 Manager | EC2 Instance Connect | EC2 Instance Connect | +  
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu&region=ap-south-1  
Toppr: Learning ap... PDF Convert JPG to WO... Convert Powerpoint... MGHTFVXFJHGM... New folder Gmail YouTube Maps News Translate  
AWS Services Search [Alt+S]  
slave1 | SUCCESS => {  
  "ansible_facts": {  
    "discovered_interpreter_python": "/usr/bin/python3"  
  },  
  "changed": false,  
  "ping": "pong"  
}  
ubuntu@ip-172-31-40-247:~/ssh$ ansible -m ping production  
slave1 | SUCCESS => {  
  "ansible_facts": {  
    "discovered_interpreter_python": "/usr/bin/python3"  
  },  
  "changed": false,  
  "ping": "pong"  
}  
ubuntu@ip-172-31-40-247:~/ssh$  
ubuntu@ip-172-31-40-247:~/ssh$ ansible -m ping slave1  
slave1 | SUCCESS => {  
  "ansible_facts": {  
    "discovered_interpreter_python": "/usr/bin/python3"  
  },  
  "changed": false,  
  "ping": "pong"  
}  
ubuntu@ip-172-31-40-247:~/ssh$  
  
i-002d358d1e52b60c9 (ansible1)  
PublicIPs: 13.234.213.38 PrivateIPs: 172.31.40.247
```

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➤ Now in ansible1 create a file. (ex: vi static.html)



```
aws console - Yahoo India Search | Connect to instance | EC2 Manager | EC2 Instance Connect | EC2 Instance Connect | +  
ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu...  
Toppr: Learning ap... PDF Convert JPG to WO... Convert Powerpoint... MGHTFVXFJHGM... New folder Gmail YouTube Maps News Translate  
AWS Services Search [Alt+S]  
ubuntu@ip-172-31-40-247:~/ssh$ vi static.html  
ubuntu@ip-172-31-40-247:~/ssh$  
  
i-002d358d1e52b60c9 (ansible1)  
PublicIPs: 3.111.149.251 PrivateIPs: 172.31.40.247
```

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- Write the html code in the file..:

```
<!DOCTYPE html>
<!--[if IE 7 ]>    <html lang="en-gb" class="isie ie7 oldie no-js"> <![endif]-->
<!--[if IE 8 ]>    <html lang="en-gb" class="isie ie8 oldie no-js"> <![endif]-->
<!--[if IE 9 ]>    <html lang="en-gb" class="isie ie9 no-js"> <![endif]-->
<!--[if (gt IE 9) | !IE)]>!-->
<html lang="en-gb" class="no-js">
<!--[endif]-->
<head>
<meta charset="utf-8">
<meta name="viewport" content="width=device-width, initial-scale=1, maximum-scale=1">
<!--[if lt IE 9]>
    <meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1">
    <![endif]-->
<title>Medplus a medical bootstrap web template</title>
<meta name="description" content="">
<meta name="author" content="WebThemez">
<!--[if lt IE 9]>
    <script src="http://html5shim.googlecode.com/svn/trunk/html5.js"></script>
    <![endif]-->
<!--[if lte IE 8]>
    <script type="text/javascript" src="http://explorercanvas.googlecode.com/svn/trunk/excanvas.js"></script>
    <![endif]-->
<link rel="stylesheet" href="css/bootstrap.min.css" />
<link rel="stylesheet" type="text/css" href="css/isotope.css" media="screen" />
```

i-002d358d1e52b60c9 (ansible1)
PublicIPs: 3.111.149.251 PrivateIPs: 172.31.40.247

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- Create 1 .yaml file in the ssh folder. (ex: vi ansi.yaml)

```
ubuntu@ip-172-31-40-247:~/ssh$ vi ansible.yaml
```

i-002d358d1e52b60c9 (ansible1)
PublicIPs: 3.111.149.251 PrivateIPs: 172.31.40.247

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- Write the yaml code in the file to connect the web page to ansible.

```

- name: install nginx server
  hosts: production
  become: true
  tasks:
    - name: install server
      apt:
        name: nginx
        state: present
      handlers:
        - name: Restart nginx
          service:
            name: nginx
            state: restarted
    ...
  ...
```
"ansible.yaml" 13L, 253B

```

i-002d358d1e52b60c9 (ansible1)  
Public IPs: 3.111.149.251 Private IPs: 172.31.40.247

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- Now execute the following command.

## Ansible-playbook :-

The primary way of using ansible to automate tasks is through “playbooks” , an ‘ansible-playbook’ is the command used to execute the playbooks. Playbooks are written in YAML

```

did not find expected '*' indicator
The error appears to be in '/home/ubuntu/.ssh/ansible.yaml': line 2, column 2, but may
be elsewhere in the file depending on the exact syntax problem.
The offending line appears to be:
- name: install nginx server
 hosts: production
 ^ here
ubuntu@ip-172-31-40-247:~/ssh$ vi ansible.yaml
ubuntu@ip-172-31-40-247:~/ssh$ ansible-playbook ansible.yaml
PLAY [install nginx server] ****
TASK [Gathering Facts] ****
ok: [slave1]
TASK [install server] ****
changed: [slave1]
PLAY RECAP ****
slave1 : ok=2 changed=1 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
ubuntu@ip-172-31-40-247:~/ssh$

```

i-002d358d1e52b60c9 (ansible1)  
Public IPs: 3.111.149.251 Private IPs: 172.31.40.247

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29°C Mostly cloudy Search ENG IN 13:44 28-07-2023

format.

- Now here copy the public ip address of ansible2. (ex:13.235.135.88)

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with navigation links like EC2 Dashboard, EC2 Global View, Events, Instances (with a sub-link for Instances), Instance Types, Launch Templates, Spot Requests, Savings Plans, Reserved Instances, Dedicated Hosts, Capacity Reservations, Images (AMIs, AMI Catalog), and Elastic Block Store. The main area displays a table of instances:

| Name     | Instance ID         | Instance state | Instance type | Status check      | Alarm status | Availability Zone | Public IPv4 D |
|----------|---------------------|----------------|---------------|-------------------|--------------|-------------------|---------------|
| ansible1 | i-002d358d1e52b60c9 | Running        | t2.micro      | 2/2 checks passed | No alarms    | ap-south-1a       | ec2-3-111-14  |
| ansible2 | i-03ae49f6c79d4137e | Running        | t2.micro      | 2/2 checks passed | No alarms    | ap-south-1a       | ec2-35-154-1  |

Below the table, the details for instance i-03ae49f6c79d4137e (ansible2) are expanded. The Public IPv4 address is listed as 35.154.170.193, with a tooltip indicating it has been copied. Other details shown include Instance ID (i-03ae49f6c79d4137e), Instance state (Running), and Private IPv4 addresses (172.31.40.83).

- Paste it in the chrome, and u will see welcome page.

The screenshot shows a browser window with the URL 35.154.170.193. The page title is "Welcome to nginx!". The content includes:

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to [nginx.org](http://nginx.org). Commercial support is available at [nginx.com](http://nginx.com).

Thank you for using nginx.

At the bottom of the browser window, there's a taskbar with various icons and system status indicators.

- Now create another file i.e (vi filename.yaml)

The screenshot shows a CloudShell terminal window with the following content:

```
i-002d358d1e52b60c9 (ansible1)
PublicIPs: 3.111.149.251 PrivateIPs: 172.31.40.247
```

- Here src:give the file path of html file we have created before.ie./home/ubuntu/.ssh/static.html

aws console - Yahoo India Se × Instances | EC2 Management × EC2 Instance Connect × EC2 Instance Connect × Welcome to nginx! ×

ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu... Search

Toppr: Learning ap... PDF Convert JPG to WO... Convert Powerpoint... MFIGHTFVXFJHGM... New folder Gmail YouTube Maps News Translate

AWS Services Search [Alt+S] Mumbai Martapudi Pandu

```
name: host static web application
hosts: production
become: true
tasks:
 - name: copy html file to remote server
 copy:
 src: /home/ubuntu/.ssh/static.html
 dest: /var/www/html/index.html
 notify:
 - Restart Nginx
handlers:
 - name: Restart Nginx
 service:
 name: nginx
 state: restarted

-- INSERT --
```

i-002d358d1e52b60c9 (ansible1)

PublicIPs: 3.111.149.251 PrivateIPs: 172.31.40.247

```
wf aws console - India Se Instances | EC2 Management EC2 Instance Connect EC2 Instance Connect Welcome to nginx!
← → C ap-south-1.console.aws.amazon.com/ec2-instance-connect/ssh?region=ap-south-1&connType=standard&instanceId=i-002d358d1e52b60c9&osUser=ubuntu... Search ☆
Toppr: Learning ap... PDF Convert JPG to WO... Convert Powerpoint... MFIGHTVXJHGM... New folder Gmail YouTube Maps News Translate
AWS Services Search [Alt+S]
ubuntu@ip-172-31-40-247:~/.ssh$ vi ansi.yaml
ubuntu@ip-172-31-40-247:~/.ssh$ ansible-playbook ansi.yaml

PLAY [host static web application] ****
TASK [Gathering Facts] ****
ok: [slave1]

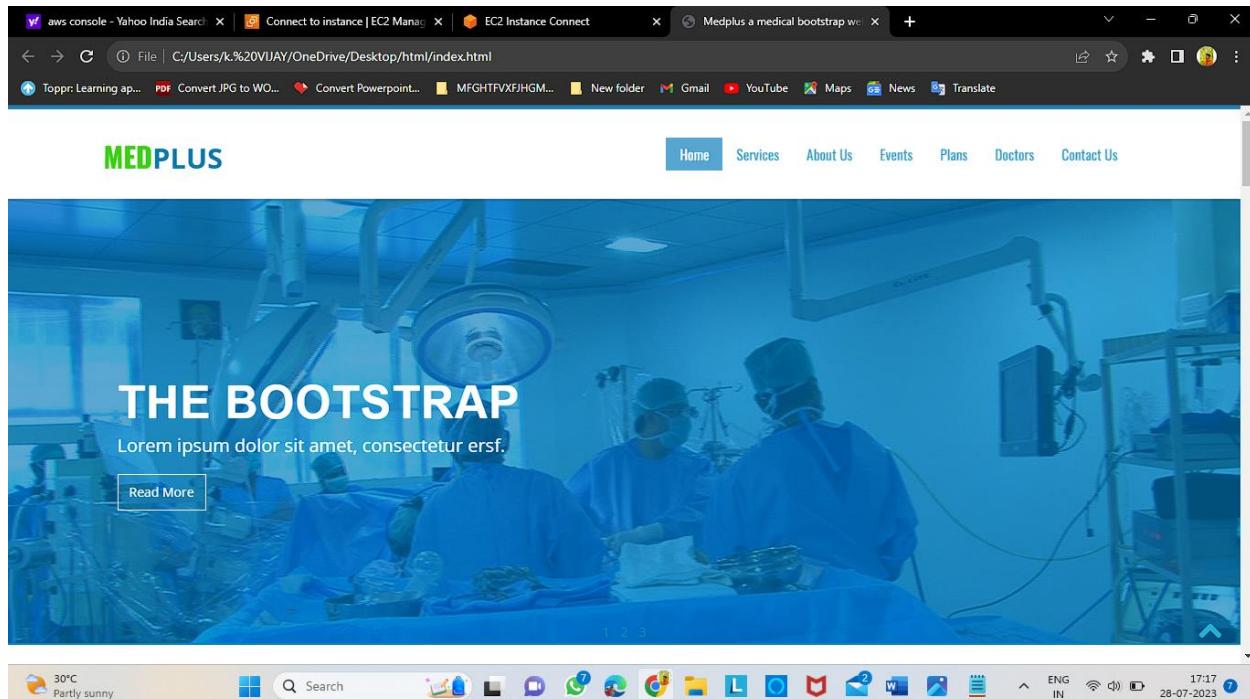
TASK [copy html file to remote server] ****
changed: [slave1]

RUNNING HANDLER [Restart Nginx] ****
changed: [slave1]

PLAY RECAP ****
slave1 : ok=3 changed=2 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

ubuntu@ip-172-31-40-247:~/.ssh$
```

- Now once again copy the public ip address of ansible2 and paste it, now our web page is open.



## **OUTCOME:**

**Improved efficiency:** Ansible can automate repetitive tasks, such as software installation, configuration management, and infrastructure provisioning. This can save time and reduce the risk of errors that can occur with manual processes. As a result, IT teams can be more efficient and productive, focusing on more strategic work that adds value to the organization.

**Increased consistency:** Automation with Ansible ensures that IT operations are standardized and consistent, reducing the risk of errors and security vulnerabilities. Ansible allows you to define playbooks and roles that can be used across your organization, ensuring that tasks are executed in a consistent manner. This can help to improve the reliability and stability of your IT environment.

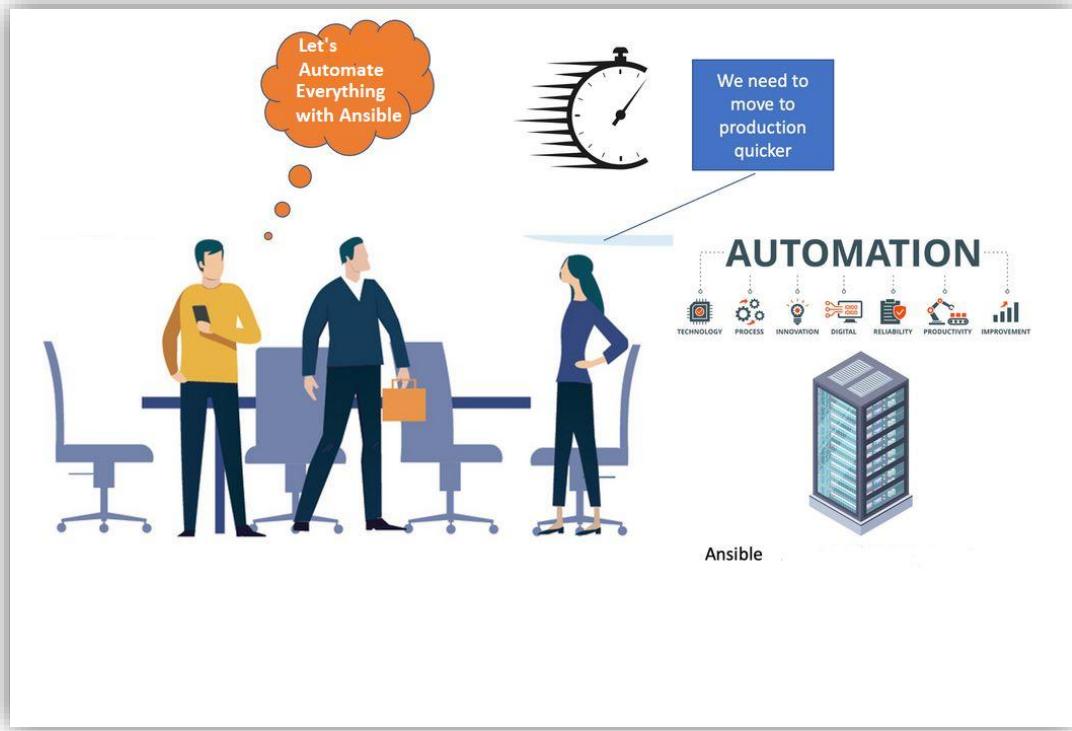
**Enhanced scalability:** Ansible is highly scalable and can automate tasks across large numbers of servers and devices. This makes it a valuable tool for organizations that need to manage complex IT environments. Ansible allows you to define groups of hosts and execute tasks across those groups, allowing you to easily scale your automation efforts as your environment grows.

**Reduced costs:** By automating routine tasks, Ansible can help organizations save time and reduce labour costs associated with manual processes. Ansible can also help organizations to avoid costly downtime by automating tasks such as system patching and updates.

**Improved collaboration:** Ansible provides a platform for collaboration between IT teams, allowing for the sharing of playbooks and roles that can be used across the organization. This can help to improve communication and coordination between teams, leading to a more efficient and effective IT operation.

**Enhanced security:** Ansible can help organizations maintain a strong security posture by automating tasks such as patch management, vulnerability scanning, and compliance auditing. Ansible can also help to enforce security policies across your environment by automating the configuration of firewalls, security groups, and other security-related tasks.

In summary, automating applications using Ansible can lead to significant improvements in efficiency, consistency, scalability, cost savings, collaboration, and security. These outcomes can help organizations to streamline their IT operations, improve productivity, and reduce the risk of downtime and security breaches.



## **CONCLUSION:**

In conclusion, automating applications using Ansible can provide numerous benefits for organizations looking to improve their IT operations. Ansible is a powerful open-source automation tool that can be used to automate a wide range of tasks, from software installation and configuration management to infrastructure provisioning and deployment.

By automating routine tasks, organizations can improve efficiency, consistency, and scalability, while reducing the costs associated with manual processes. Ansible can also help enhance collaboration between IT teams, allowing for the sharing of playbooks and roles that can be used across the organization.

Additionally, Ansible can help organizations maintain a strong security posture by automating tasks such as patch management, vulnerability scanning, and compliance auditing. By leveraging Ansible's capabilities, organizations can achieve greater efficiency, cost savings, and security, while freeing up IT teams to focus on more strategic work.