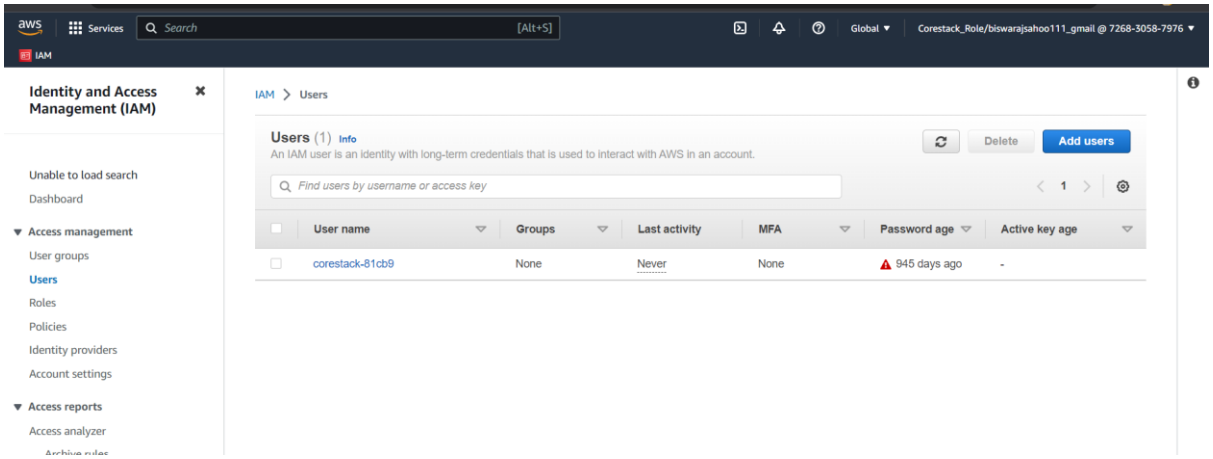
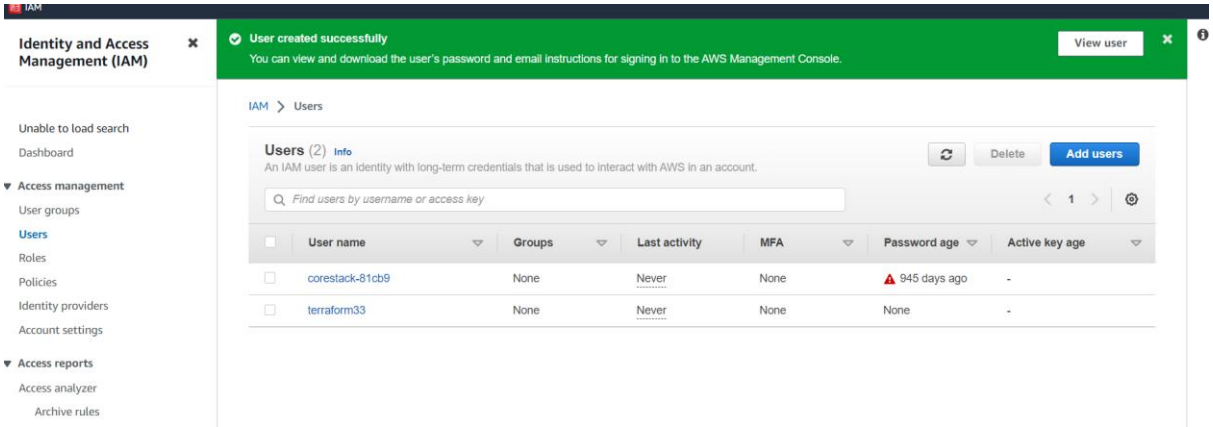
Automating Infrastructure using Terraform

Create EC2 instance

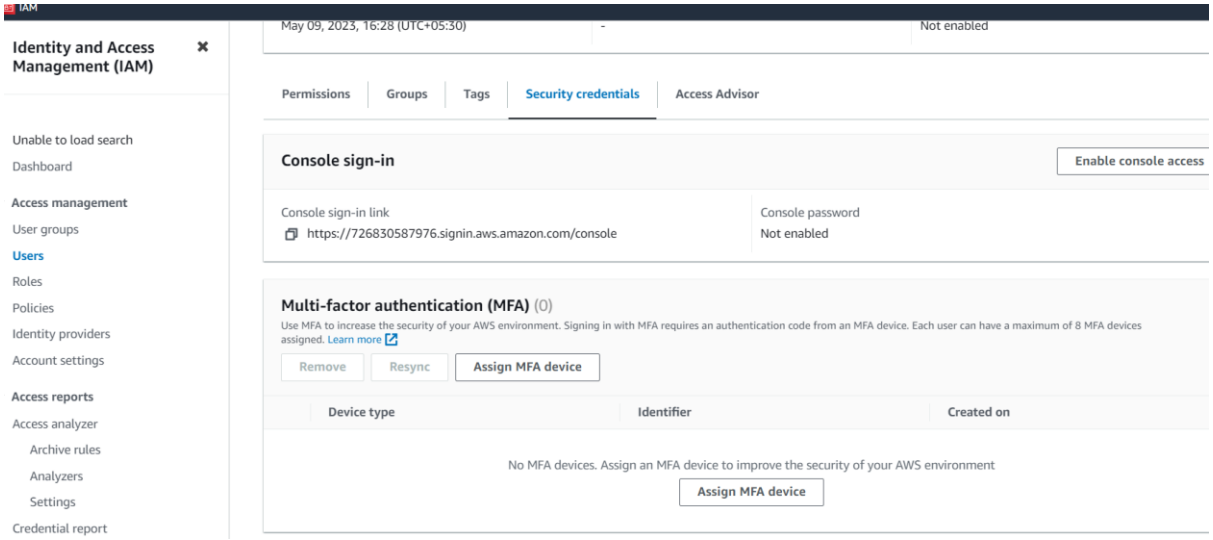
First create a user in aws services



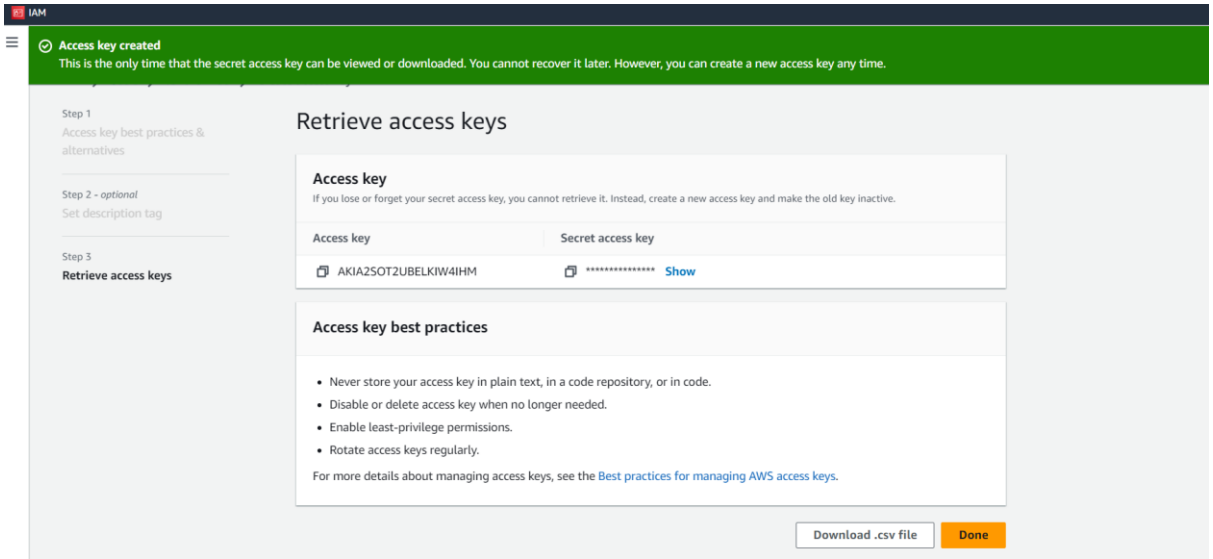
Name of the user = Terraform33



Now we will go to user (Terraform33) security credentials to create access key and security key



Create access key

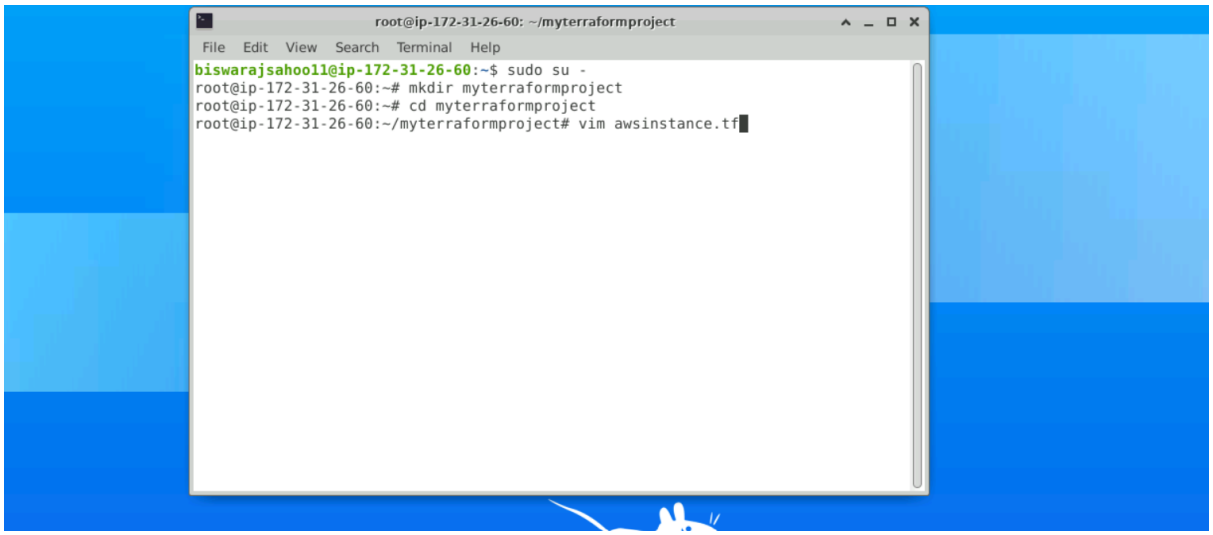


Access key and secret access key created

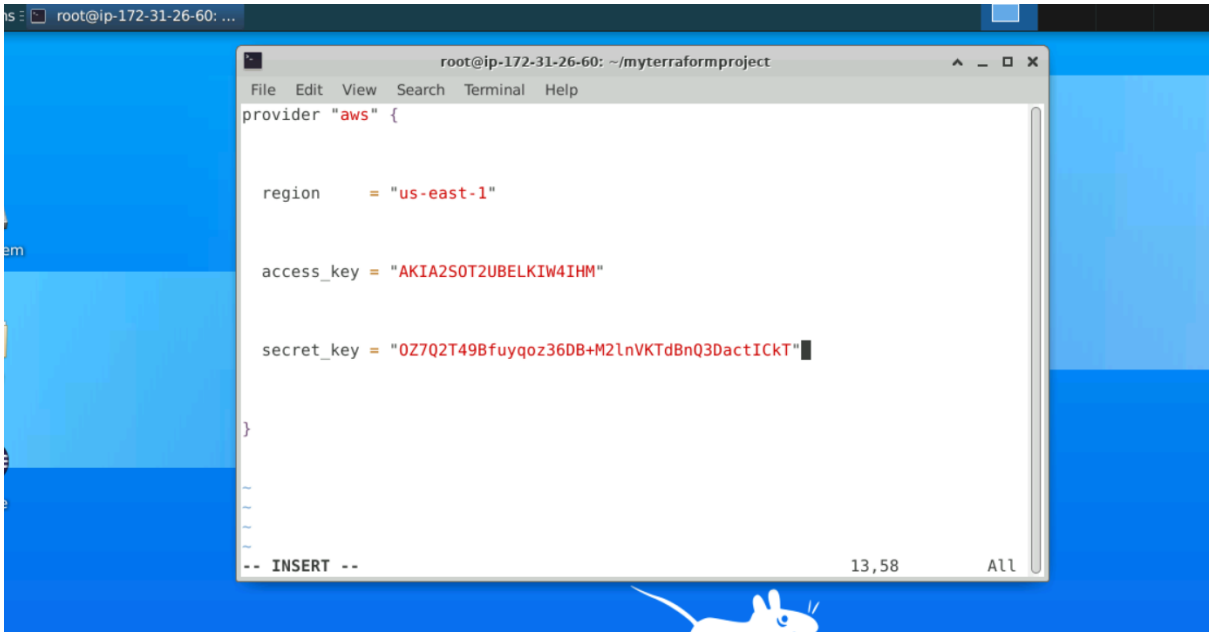
Connect to your lab terminal

Create a new directory (myterraformproject)

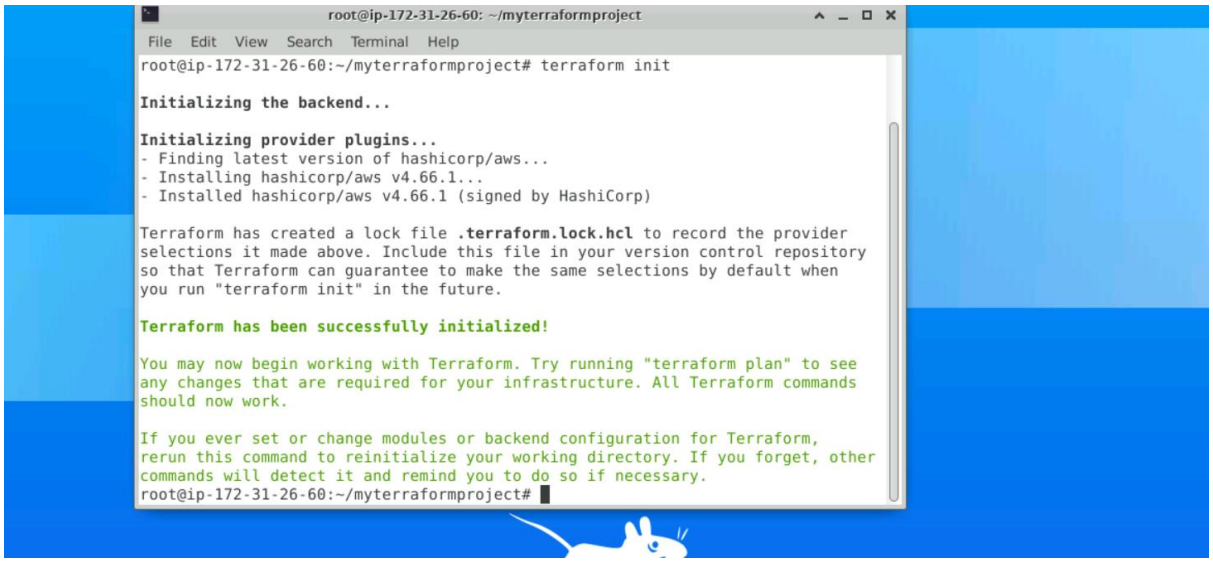
In this directory , we will mention AWS Infrastructure is our project code



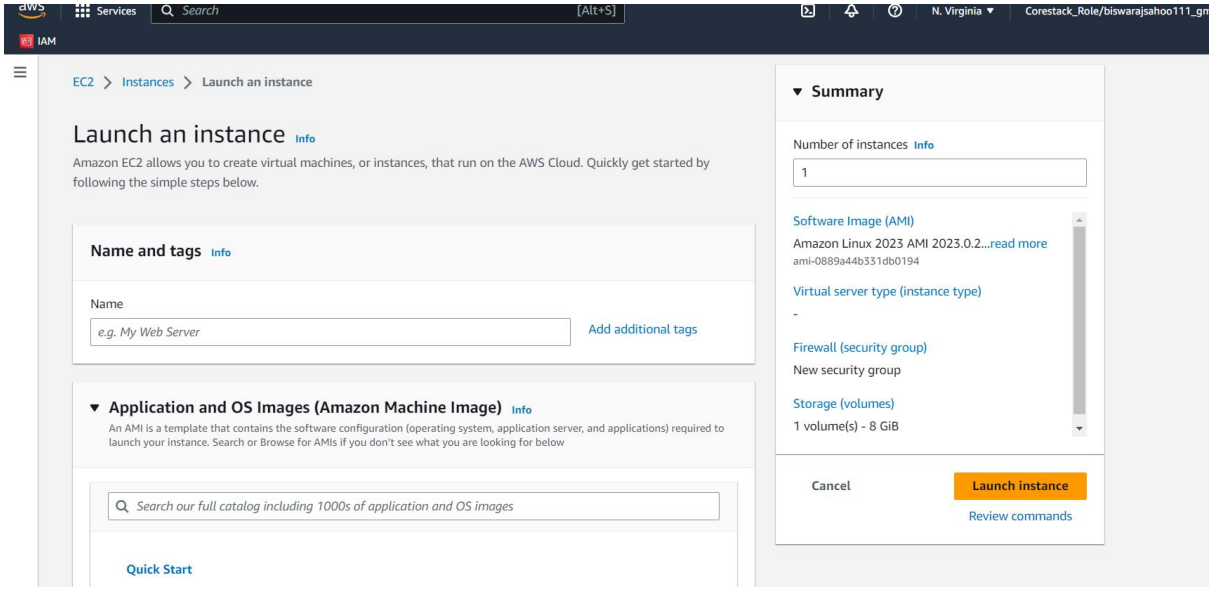
It’s a provider block. We have to add region, access key secret access key



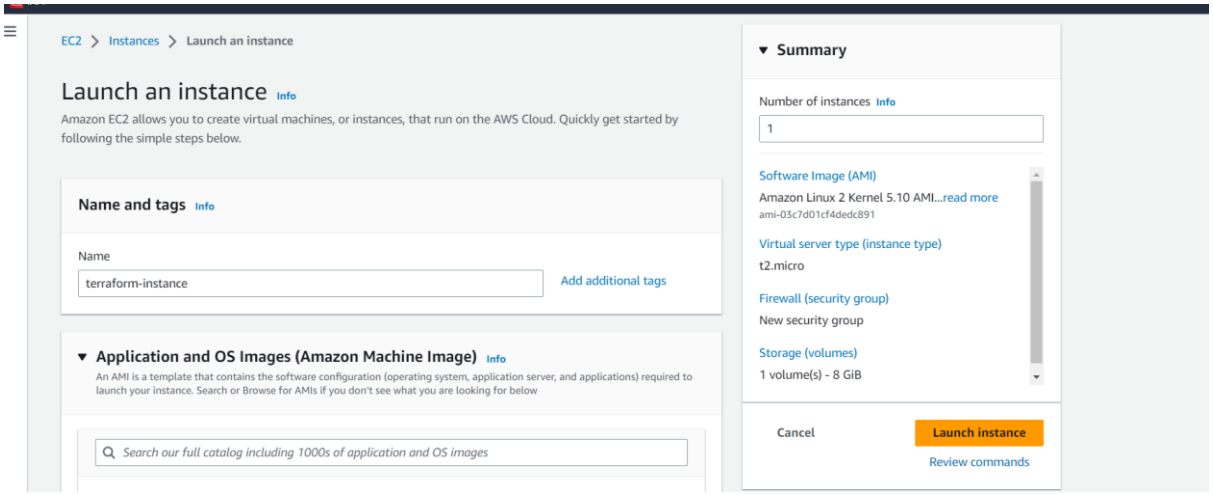
Then back to terminal and terraform init



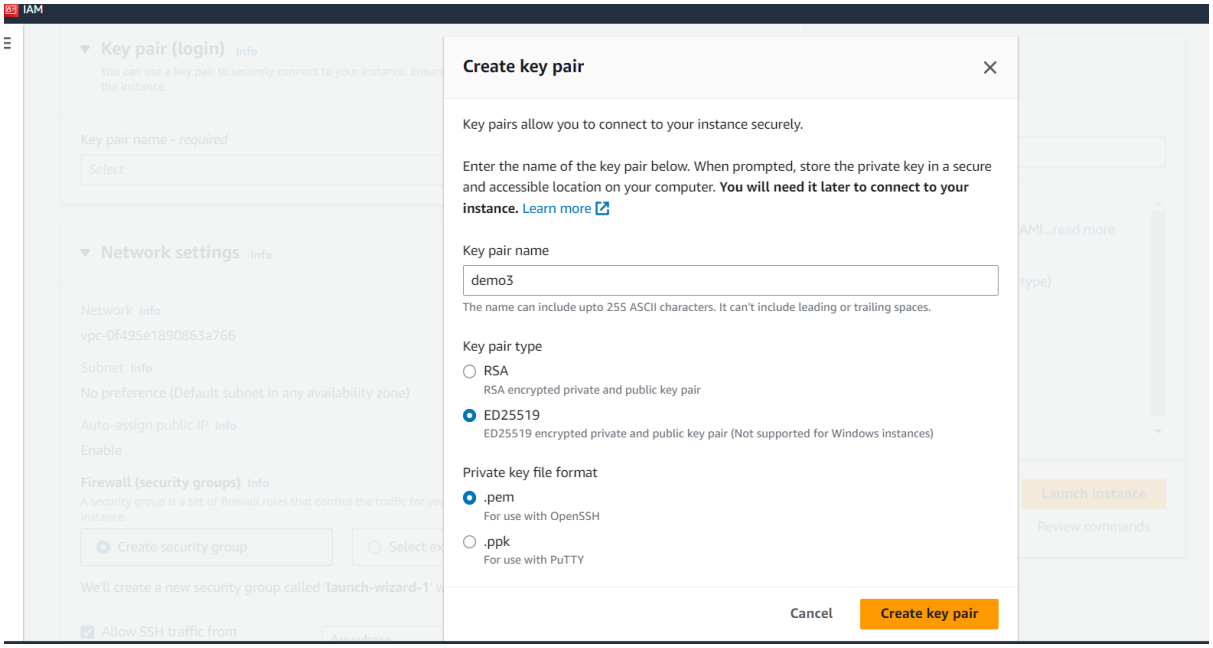
Now we are going to create EC2 instance and security group

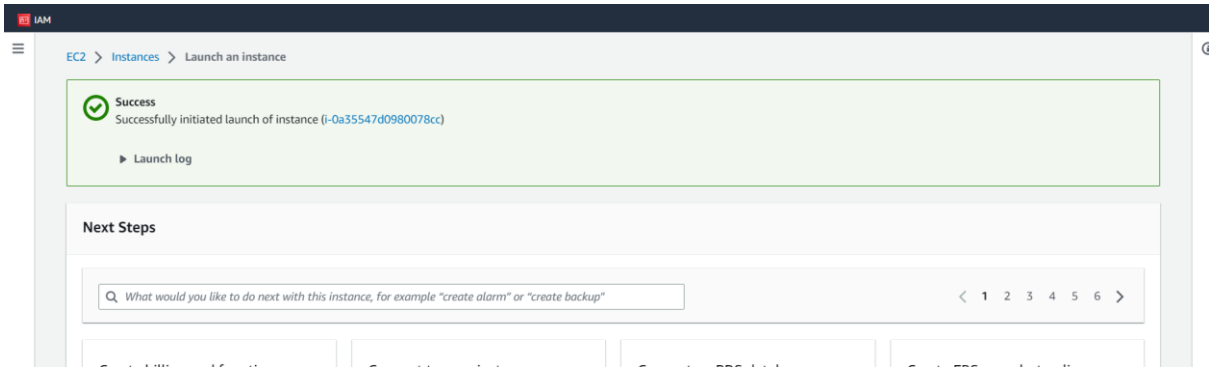


Instance name = terraform-instance

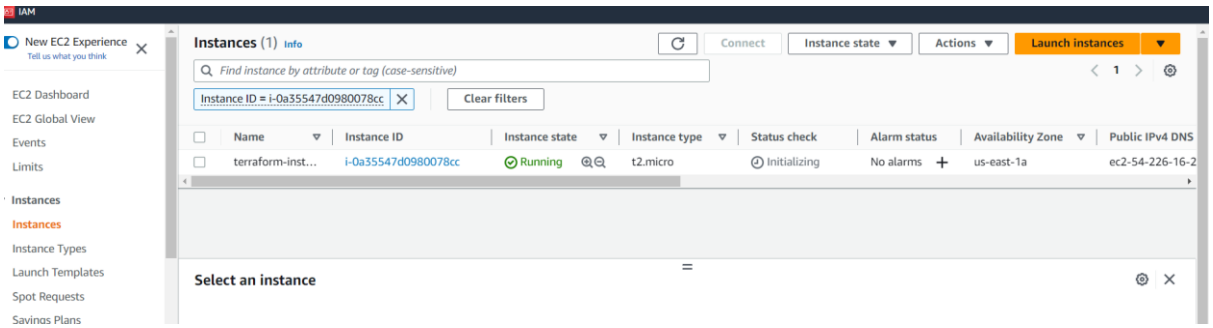


Create key pair

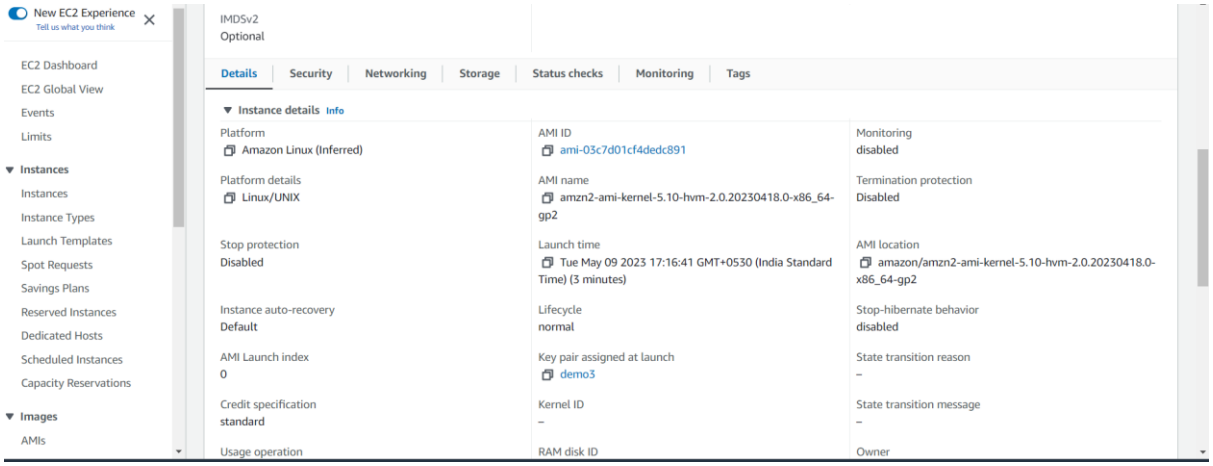




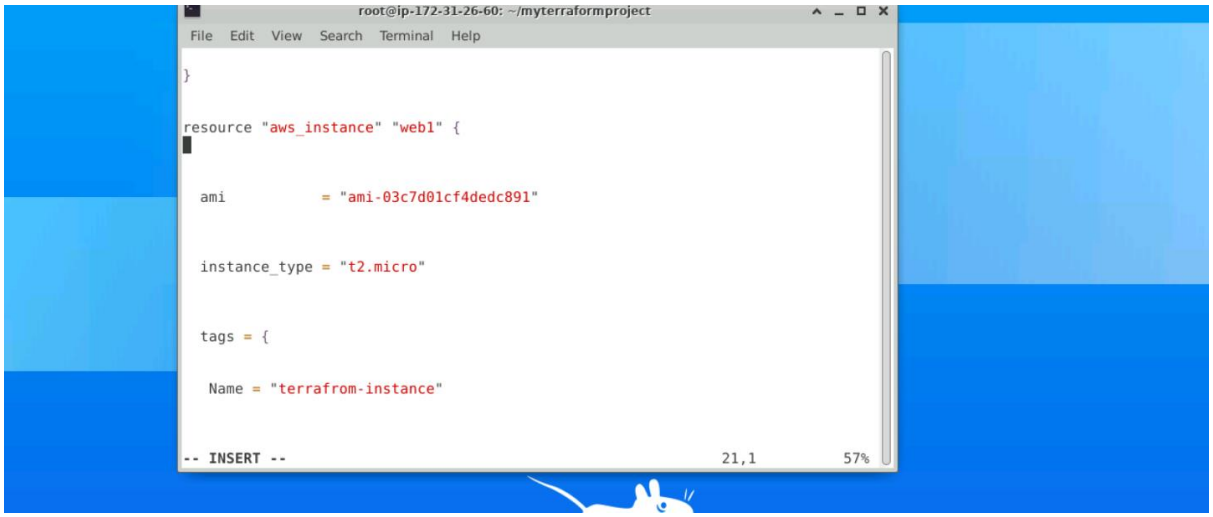
Launch instance successfully



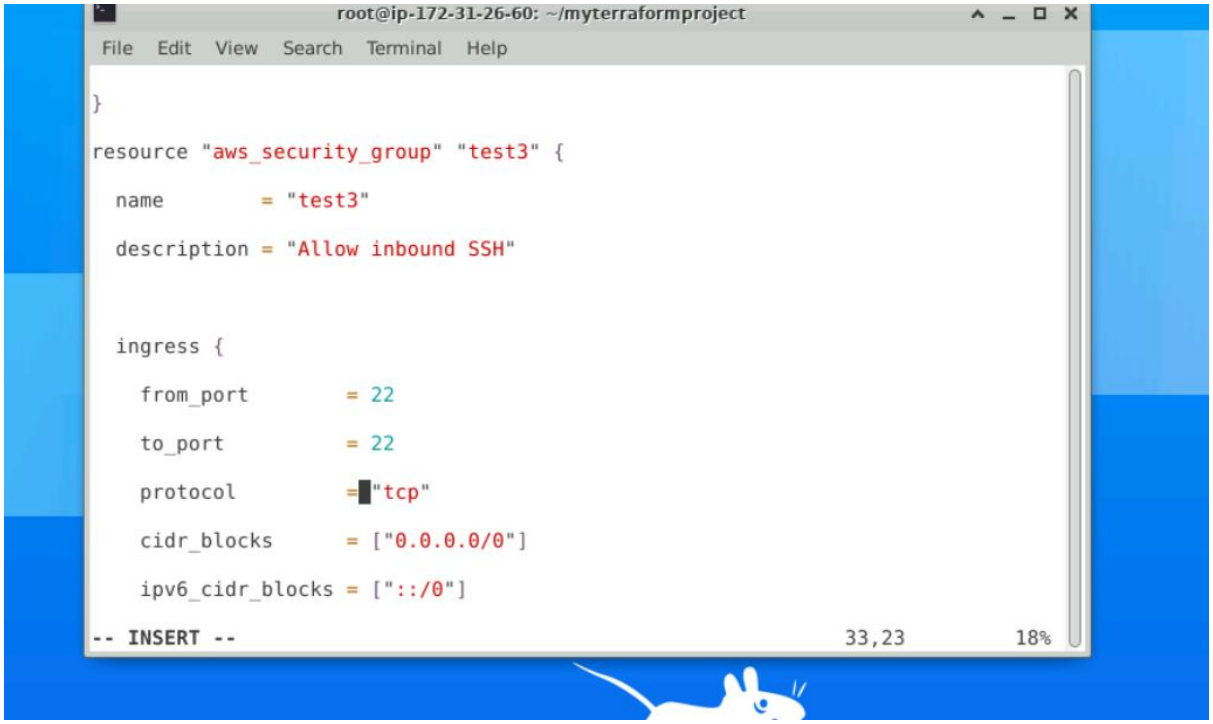
Instance details

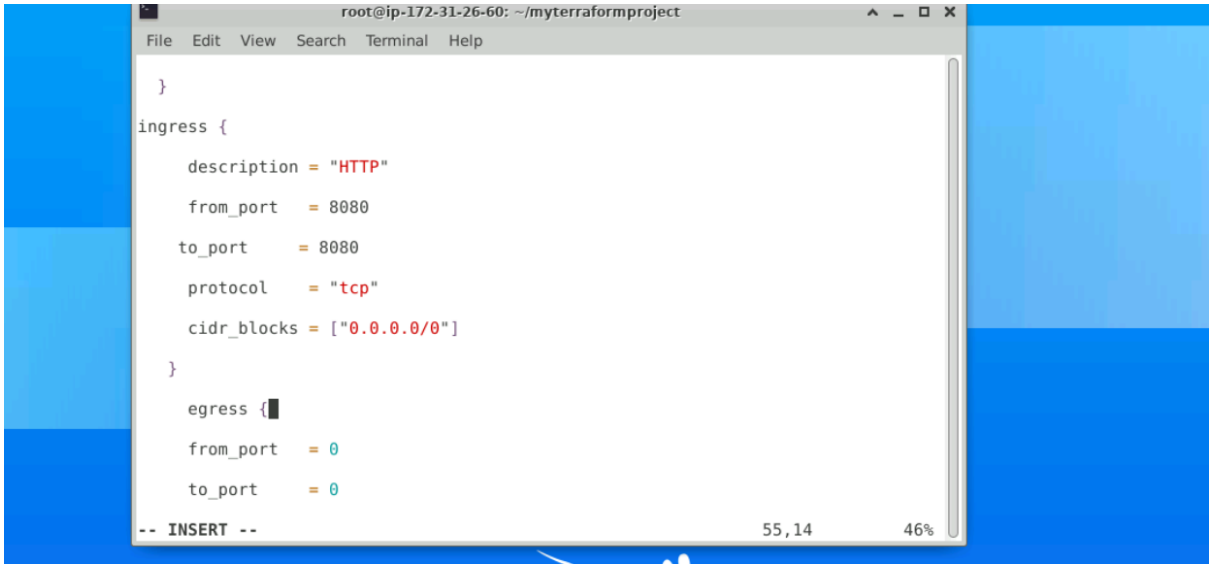


Now we will go to terminals and create terraform resource which will create AWS security group for attach with EC2 instance

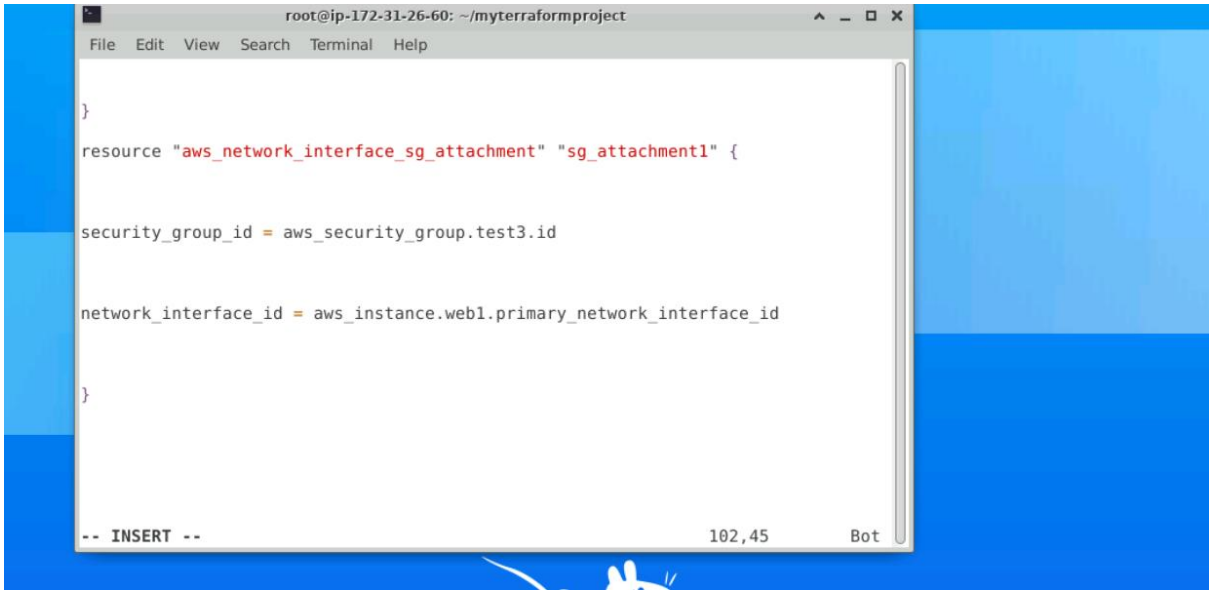


Now **Create a terraform resource which will create AWS security group rules(firewall rules) for the ec2 instance ,so that we can connect and install applications on it.**



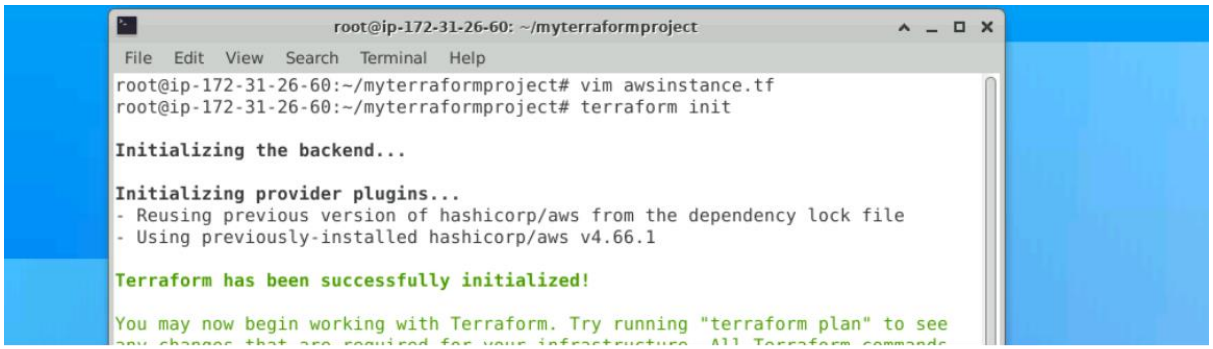


Now we need to attach the security group to AWS instance .



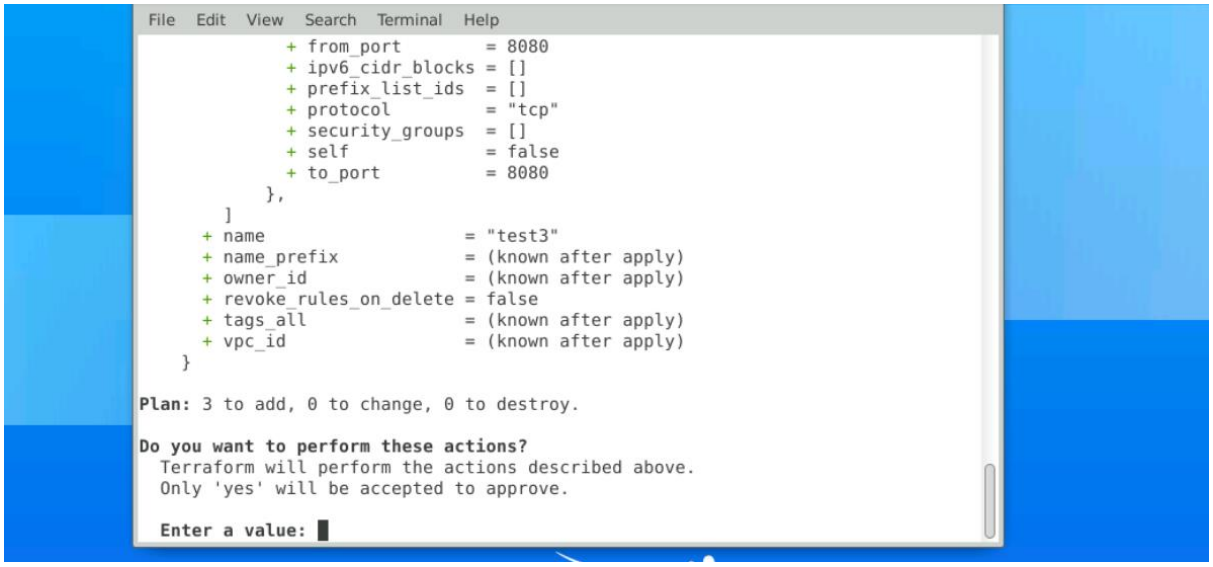
Save the file.

Now terraform init

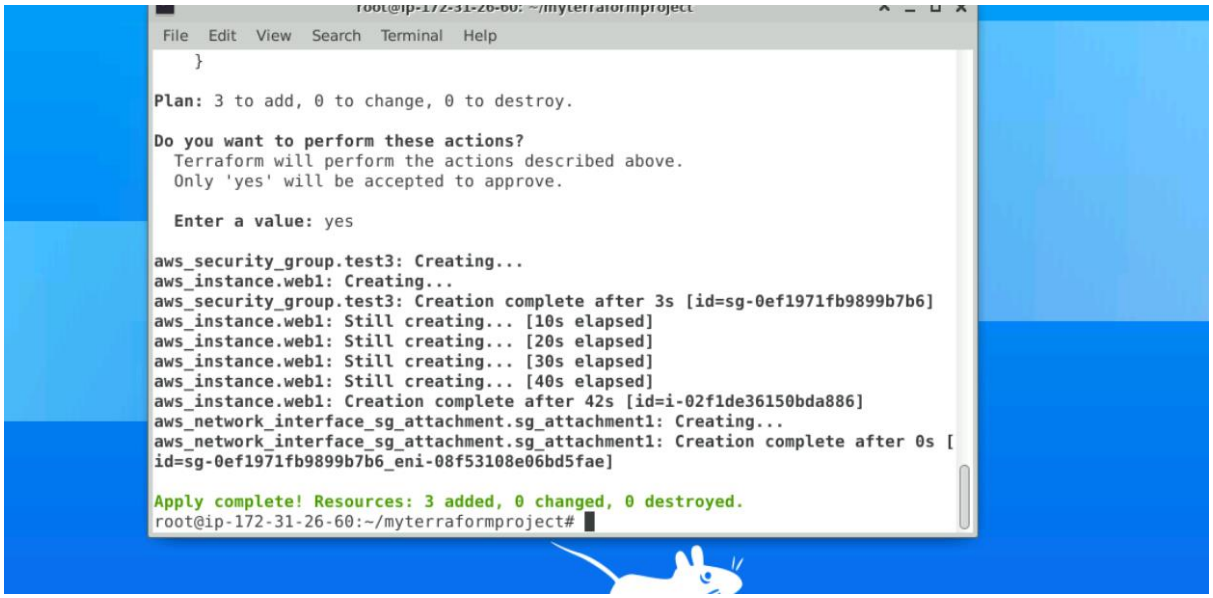


Terraform initialise successfully

Now apply Terraform

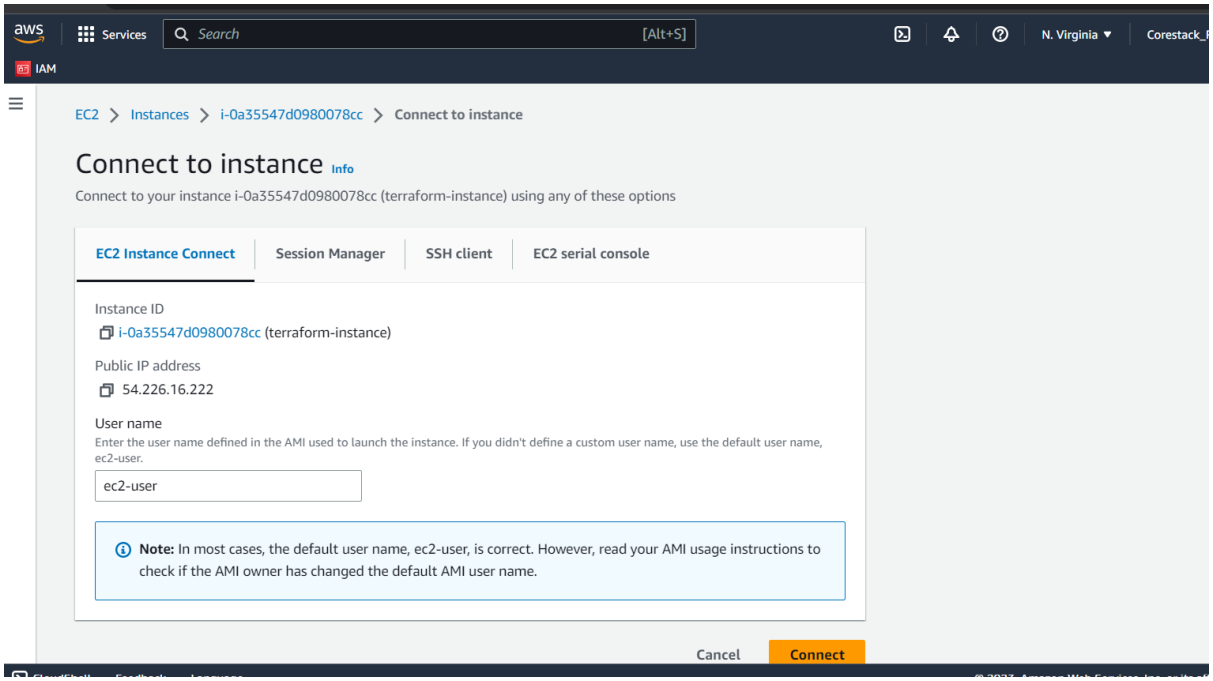


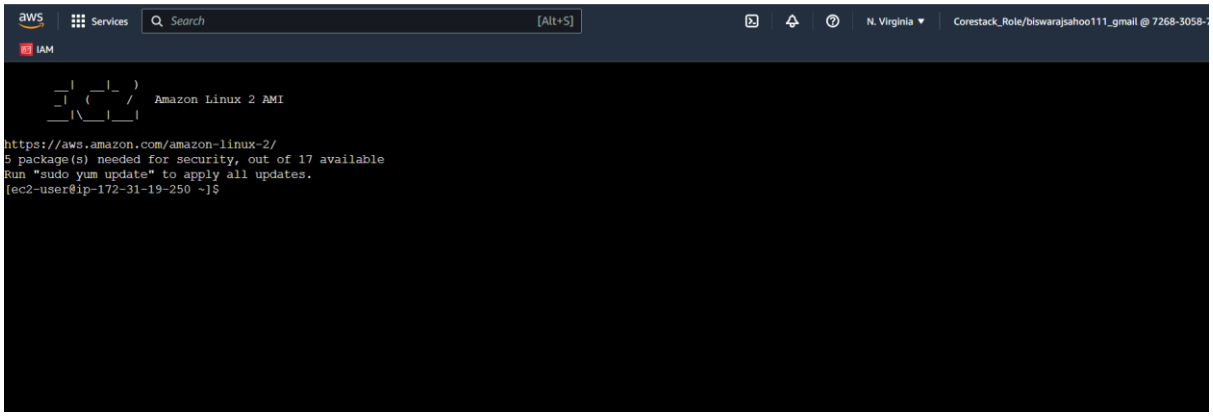
Type yes to perform action



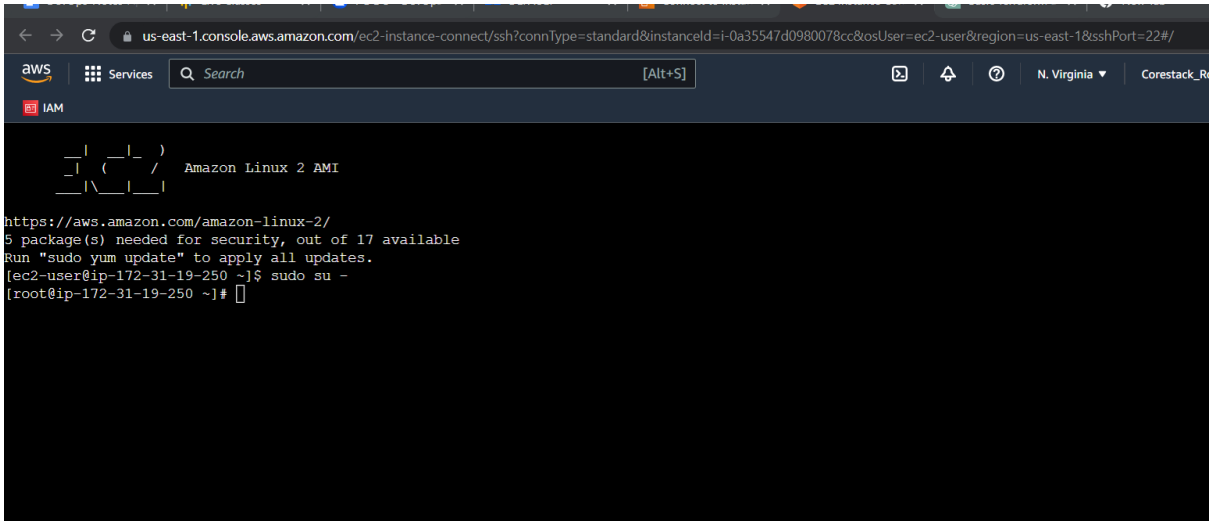
Terraform apply completion

Now connect it to instance

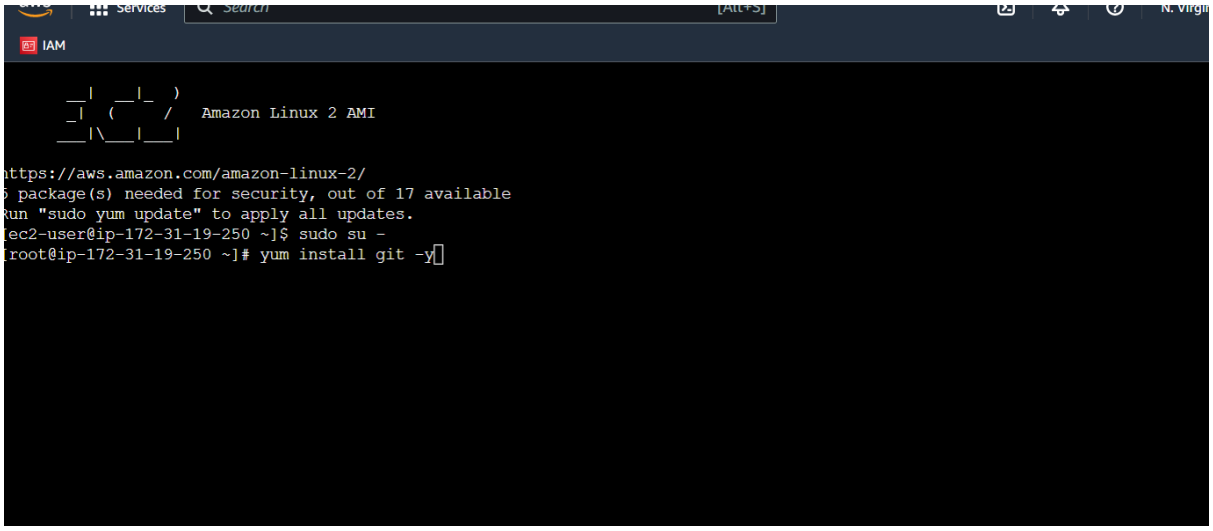


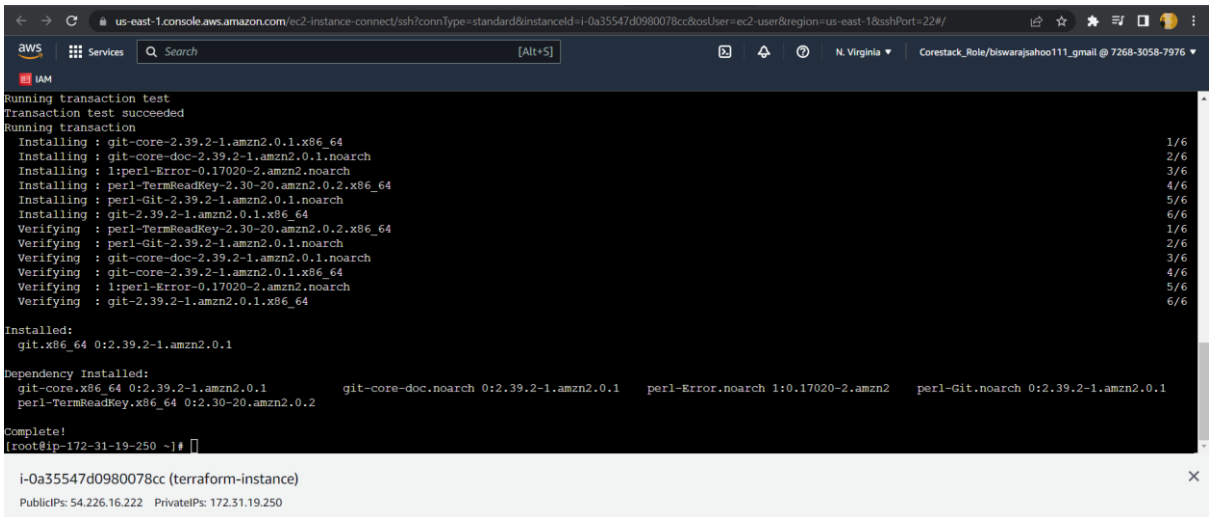


Connected via browser



Now in EC2 we are going to install GIT





Git installed

Now we are going to install python

Sudo yum install python

```
Last login: Tue May  9 12:48:10 2023 from ec2-18-206-107-29.compute-1.amazonaws.com

       __|  __|_  )
       _|  (     /   Amazon Linux 2 AMI
      ___|\___|___|

https://aws.amazon.com/amazon-linux-2/
5 package(s) needed for security, out of 17 available
Run "sudo yum update" to apply all updates.
[ec2-user@ip-172-31-19-250 ~]$ sudo su -
Last login: Tue May  9 12:49:46 UTC 2023 on pts/0
[root@ip-172-31-19-250 ~]#  apt-get install python
-bash: apt-get: command not found
[root@ip-172-31-19-250 ~]# Sudo apt-get install python
-bash: Sudo: command not found
[root@ip-172-31-19-250 ~]# Sudo apt-get install python3.7
-bash: Sudo: command not found
[root@ip-172-31-19-250 ~]# python --version
Python 2.7.18
[root@ip-172-31-19-250 ~]# sudo yum install python
Loaded plugins: extras_suggestions, langpacks, priorities, update-motd
amzn2-core                                                                                                  | 3.7 kB  00:00:00
Package python-2.7.18-1.amzn2.0.6.x86_64 already installed and latest version
Nothing to do
[root@ip-172-31-19-250 ~]#
```

i-0a35547d0980078cc (terraform-instance)

PublicIPs: 54.226.16.222 PrivateIPs: 172.31.19.250

Now install java

Sudo yum install java

```
us-east-1.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-0a35547d0980078cc&osUser=ec2-user&region=us-east-1&sshPort=22#/
aws  Services  Search  [Alt+S]  N. Virginia  Corestack_Role/biswarajsahoo111_gmail @ 7268-3058-7976
IAM
  Verifying  : dejavu-sans-mono-fonts-2.33-6.amzn2.noarch                                                    21/28
  Verifying  : python-lxml-3.2.1-4.amzn2.0.4.x86_64                                                          22/28
  Verifying  : libxslt-1.1.28-6.amzn2.x86_64                                                                 23/28
  Verifying  : python-javapackages-3.4.1-11.amzn2.noarch                                                     24/28
  Verifying  : libXtst-1.2.3-1.amzn2.0.2.x86_64                                                              25/28
  Verifying  : alsa-lib-1.1.4.1-2.amzn2.x86_64                                                               26/28
  Verifying  : libICE-1.0.9-9.amzn2.0.2.x86_64                                                               27/28
  Verifying  : javapackages-tools-3.4.1-11.amzn2.noarch                                                      28/28

nstalled:
  java-17-amazon-corretto.x86_64 1:17.0.7+7-1.amzn2.1

ependency Installed:
  alsa-lib.x86_64 0:1.1.4.1-2.amzn2                    dejavu-fonts-common.noarch 0:2.33-6.amzn2      dejavu-sans-fonts.noarch 0:2.33-6.amzn2
  dejavu-sans-mono-fonts.noarch 0:2.33-6.amzn2         dejavu-serif-fonts.noarch 0:2.33-6.amzn2       fontconfig.x86_64 0:2.13.0-4.3.amzn2
  fontpackages-filesystem.noarch 0:1.44-8.amzn2        giflib.x86_64 0:4.1.6-9.amzn2.0.2              java-17-amazon-corretto-headless.x86_64 1:17.0.7+7-1.amzn2.1
  javapackages-tools.noarch 0:3.4.1-11.amzn2           libICE.x86_64 0:1.0.9-9.amzn2.0.2              libSM.x86_64 0:1.2.2-2.amzn2.0.2
  libX11.x86_64 0:1.6.7-3.amzn2.0.2                    libX11-common.noarch 0:1.6.7-3.amzn2.0.2       libXau.x86_64 0:1.0.8-2.1.amzn2.0.2
  libXext.x86_64 0:1.3.3-3.amzn2.0.2                   libXi.x86_64 0:1.7.9-1.amzn2.0.2               libXinerama.x86_64 0:1.1.3-2.1.amzn2.0.2
  libXrandr.x86_64 0:1.5.1-2.amzn2.0.3                 libXrender.x86_64 0:0.9.10-1.amzn2.0.2         libXt.x86_64 0:1.1.5-3.amzn2.0.2
  libXtst.x86_64 0:1.2.3-1.amzn2.0.2                   libxcb.x86_64 0:1.12-1.amzn2.0.2               libxslt.x86_64 0:1.1.28-6.amzn2
  log4j-cve-2021-44228-hotpatch.noarch 0:1.3-7.amzn2   python-javapackages.noarch 0:3.4.1-11.amzn2    python-lxml.x86_64 0:3.2.1-4.amzn2.0.4

omplete!
root@ip-172-31-19-250 ~]#
```

Java –version

```
  libXrandr.x86_64 0:1.5.1-2.amzn2.0.3                 libXrender.x86_64 0:0.9.10-1.amzn2.0.2         libXt.x86_64 0:1.1.5-3.amzn2.0.2
  libXtst.x86_64 0:1.2.3-1.amzn2.0.2                   libxcb.x86_64 0:1.12-1.amzn2.0.2               libxslt.x86_64 0:1.1.28-6.amzn2
  log4j-cve-2021-44228-hotpatch.noarch 0:1.3-7.amzn2   python-javapackages.noarch 0:3.4.1-11.amzn2    python-lxml.x86_64 0:3.2.1-4.amzn2.0.4

Complete!
[root@ip-172-31-19-250 ~]# java --version
openjdk 17.0.7 2023-04-18 LTS
OpenJDK Runtime Environment Corretto-17.0.7.7.1 (build 17.0.7+7-LTS)
OpenJDK 64-Bit Server VM Corretto-17.0.7.7.1 (build 17.0.7+7-LTS, mixed mode, sharing)
[root@ip-172-31-19-250 ~]#
```

Now install Jenkins

Sudo yum install java-1.8.0

```
Dependencies Resolved

================================================================================================================================
 Package                                    Arch                    Version                                  Repository                    Size
================================================================================================================================
Installing:
 java-1.8.0-openjdk-devel                   x86_64                  1:1.8.0.362.b08-1.amzn2.0.1              amzn2-core                    9.8 M

Transaction Summary
================================================================================================================================
Install  1 Package

Total download size: 9.8 M
Installed size: 40 M
Is this ok [y/d/N]: y
Downloading packages:
java-1.8.0-openjdk-devel-1.8.0.362.b08-1.amzn2.0.1.x86_64.rpm                                                  | 9.8 MB  00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : 1:java-1.8.0-openjdk-devel-1.8.0.362.b08-1.amzn2.0.1.x86_64                                                1/1
```

i-0a35547d0980078cc (terraform-instance)

PublicIPs: 54.226.16.222 PrivateIPs: 172.31.19.250

```
Install  1 Package

Total download size: 94 M
Installed size: 94 M
Downloading packages:
Delta RPMs disabled because /usr/bin/applydeltarpm not installed.
jenkins-2.387.3-1.1.noarch.rpm
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : jenkins-2.387.3-1.1.noarch
  Verifying  : jenkins-2.387.3-1.1.noarch

Installed:
  jenkins.noarch 0:2.387.3-1.1

Complete!
[ec2-user@ip-172-31-19-250 ~]$
```

```
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================================================================
 Package                                    Arch                    Version                                  Repository                    Size
================================================================================================================================
Installing:
 jenkins                                    noarch                  2.404-1.1                                jenkins                       90 M

Transaction Summary
================================================================================================================================
Install  1 Package

Total size: 90 M
Installed size: 90 M
Is this ok [y/d/N]: Exiting on user command
```

```
May 09 15:03:16 ip-172-31-19-250.ec2.internal jenkins[11354]: ************************
May 09 15:03:16 ip-172-31-19-250.ec2.internal jenkins[11354]: ************************
May 09 15:03:16 ip-172-31-19-250.ec2.internal jenkins[11354]: ************************
May 09 15:03:43 ip-172-31-19-250.ec2.internal jenkins[11354]: 2023-05-09 15:03:43.054
May 09 15:03:43 ip-172-31-19-250.ec2.internal jenkins[11354]: 2023-05-09 15:03:43.088
May 09 15:03:43 ip-172-31-19-250.ec2.internal systemd[1]: Started Jenkins Continuous
May 09 15:03:43 ip-172-31-19-250.ec2.internal jenkins[11354]: 2023-05-09 15:03:43.217
May 09 15:03:43 ip-172-31-19-250.ec2.internal jenkins[11354]: 2023-05-09 15:03:43.218
Hint: Some lines were ellipsized, use -l to show in full.
[ec2-user@ip-172-31-19-250 ~]$ -1
-bash: -1: command not found
[ec2-user@ip-172-31-19-250 ~]$ jenkins --version
2.387.3
[ec2-user@ip-172-31-19-250 ~]$
```

Jenkins installed.

infrastructure automation is critical. We tend to put the most emphasis on software development processes, but infrastructure deployment strategy is just as important. Infrastructure automation not only aids disaster recovery, but it also facilitates testing and development.

Terraform is an open-source infrastructure as code (IAC) tool that can be used to automate the provisioning and management of infrastructure in the cloud. AWS provides a rich set of services that can be leveraged with Terraform to automate the deployment and management of infrastructure.