**Project submitter : Vaibhav Kulkarni**

**Project objective : **Automating Infrastructure using Terraform****

****Tools required:** Terraform, AWS account with security credentials, Keypair**

Terraform is an open-source infrastructure as code (IaC) tool developed by HashiCorp. It enables users to define and manage their cloud infrastructure, such as virtual machines, networks, storage, and more, using a declarative configuration language. Terraform allows you to specify your desired infrastructure state in code, which it then uses to create, modify, and manage resources across various cloud providers like AWS, Azure, Google Cloud, and more. This approach enhances automation, consistency, and scalability in managing complex infrastructure setups.

First step is to setup Terraform on the lab. To setup the terraform on simiplilen lab we can use following commands :

1. Set up terraform on the Simplilearn lab:

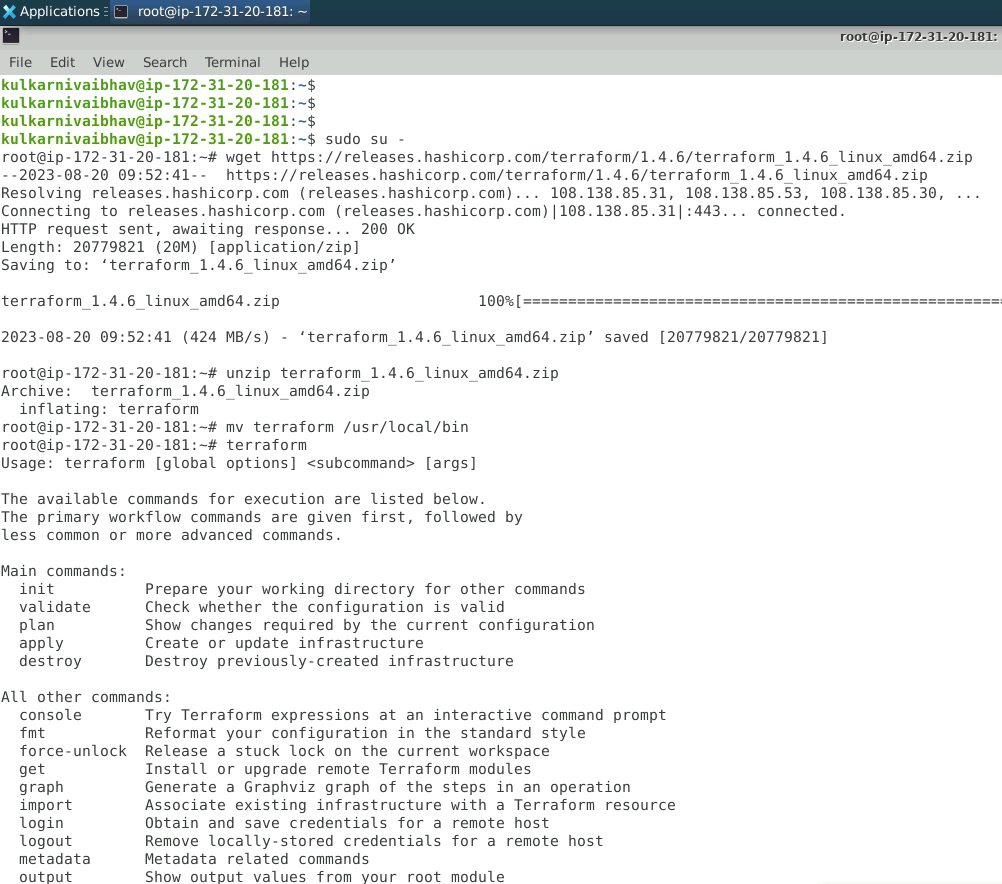
# sudo su -

# wget https://releases.hashicorp.com/terraform/1.4.6/terraform\_1.4.6\_linux\_amd64.zip

# unzip terraform\_1.4.6\_linux\_amd64.zip

# mv terraform /usr/local/bin

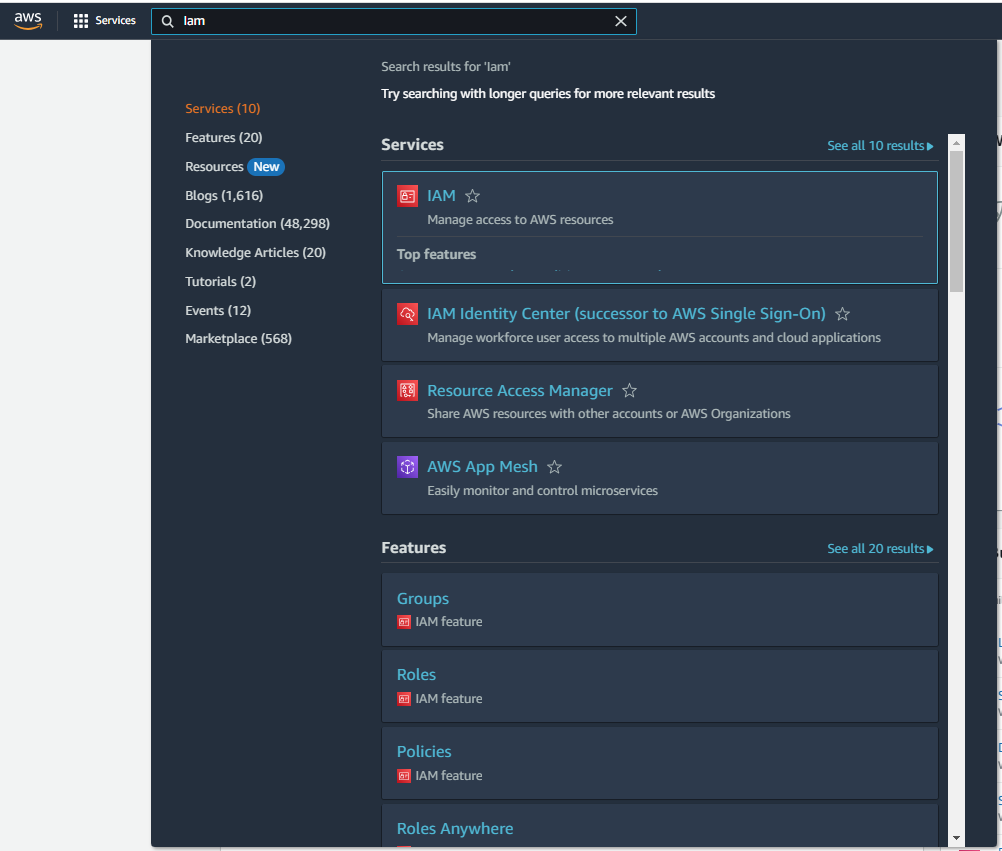
# terraform

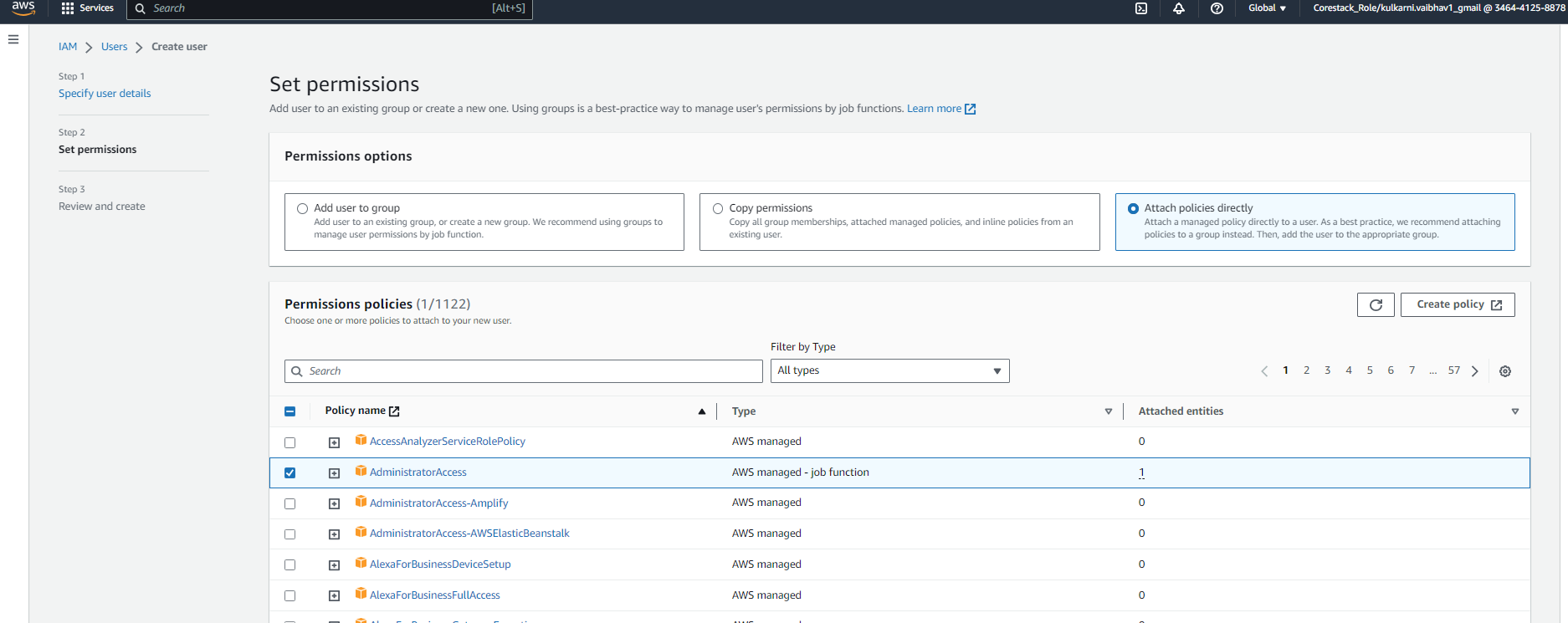


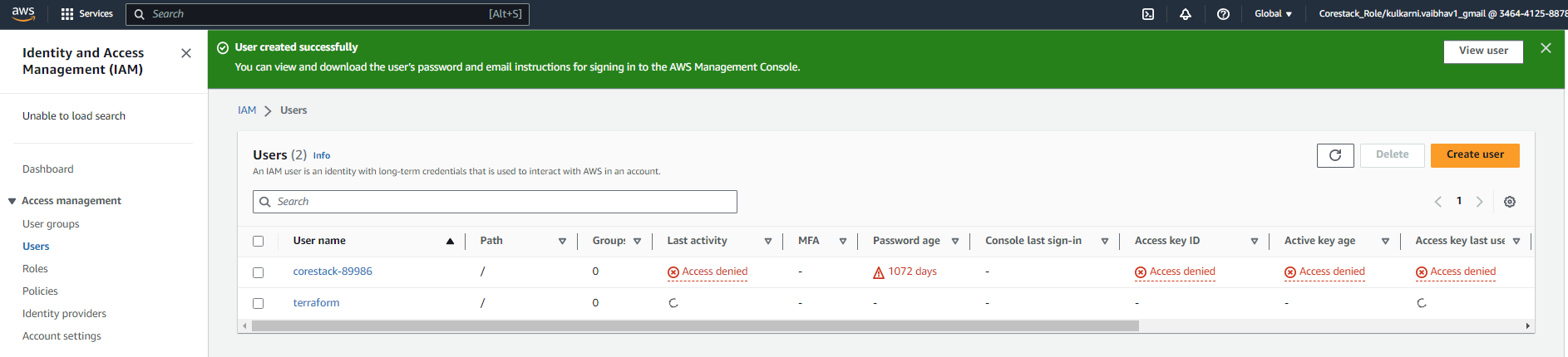
Second step is to setup AWS account : For that we will have to go to AWS or using AWS LAB provided by Simplilearn

To Set up AWS User and its security credentials

Create an IAM user and create accesskey and secret key >> In search box give IAM --> select IAM service



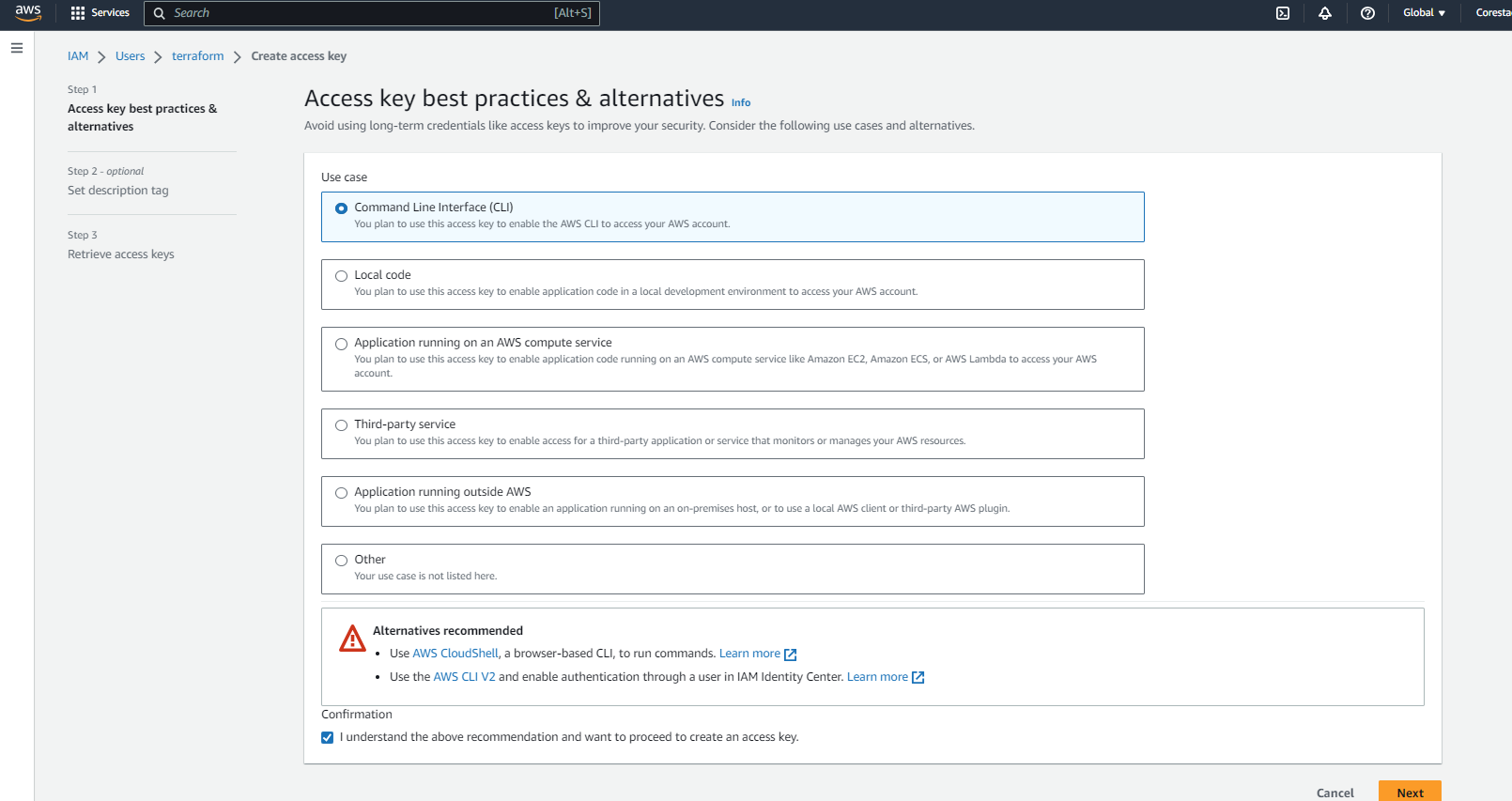
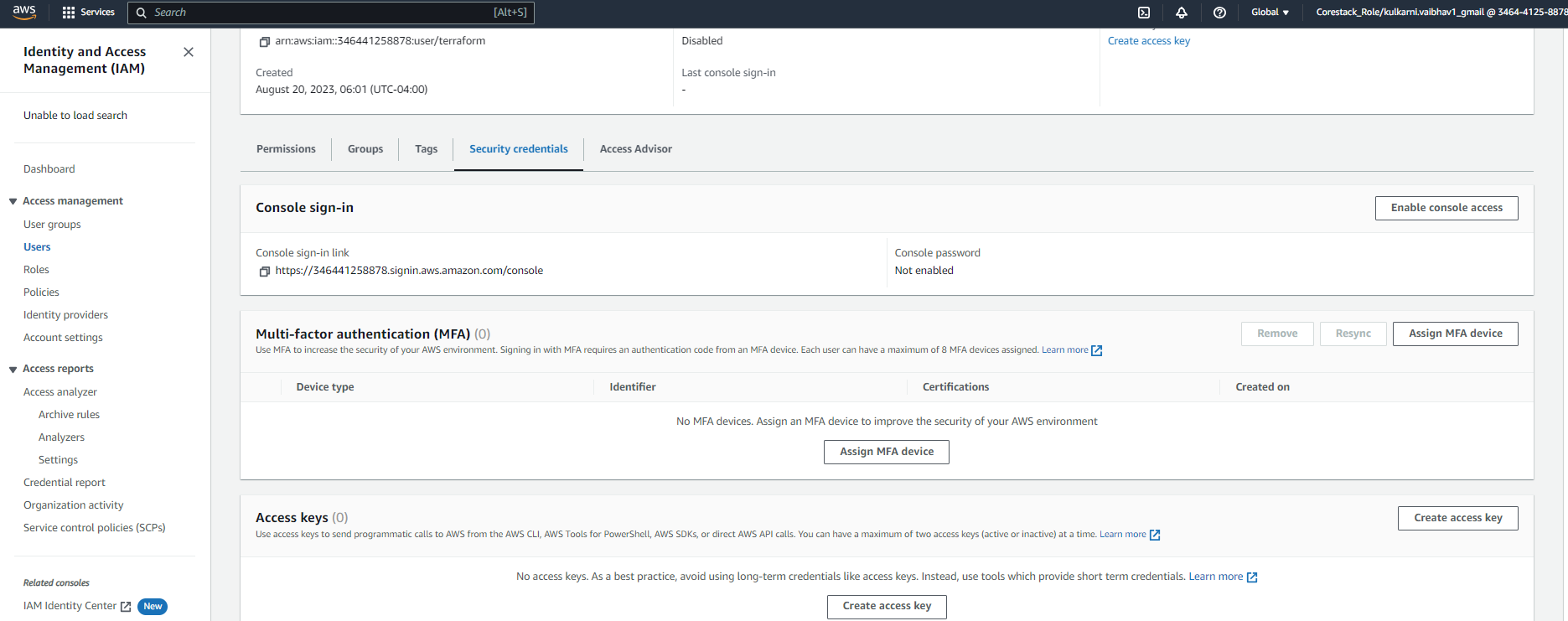
On left side click on USers and then click on ADD users >>> Give user name = terraform --> press next >>>> Select Add exsiiting permission --> select Administrator accesss--> press next --> click on Create User



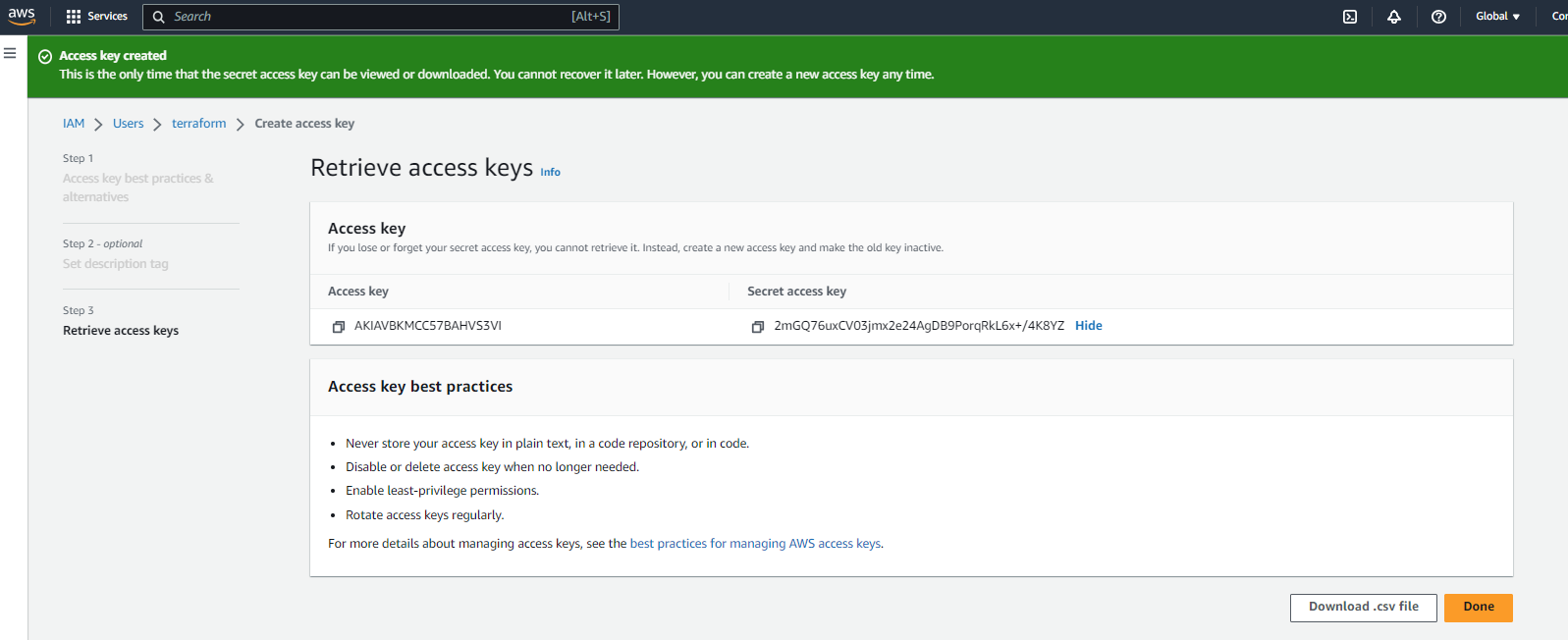
Add credentials to the USER in AWS

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Click on the user name terraform --> click on Security credentials --> scroll down to Access Key --> click on Create Access key >>>> Select Command Line Interface (CLI) --> scroll down and check the box for I understand the above recommendation and want to proceed to create an access key. >>> Press next and click on create access key >>> Copy the access key and secret key



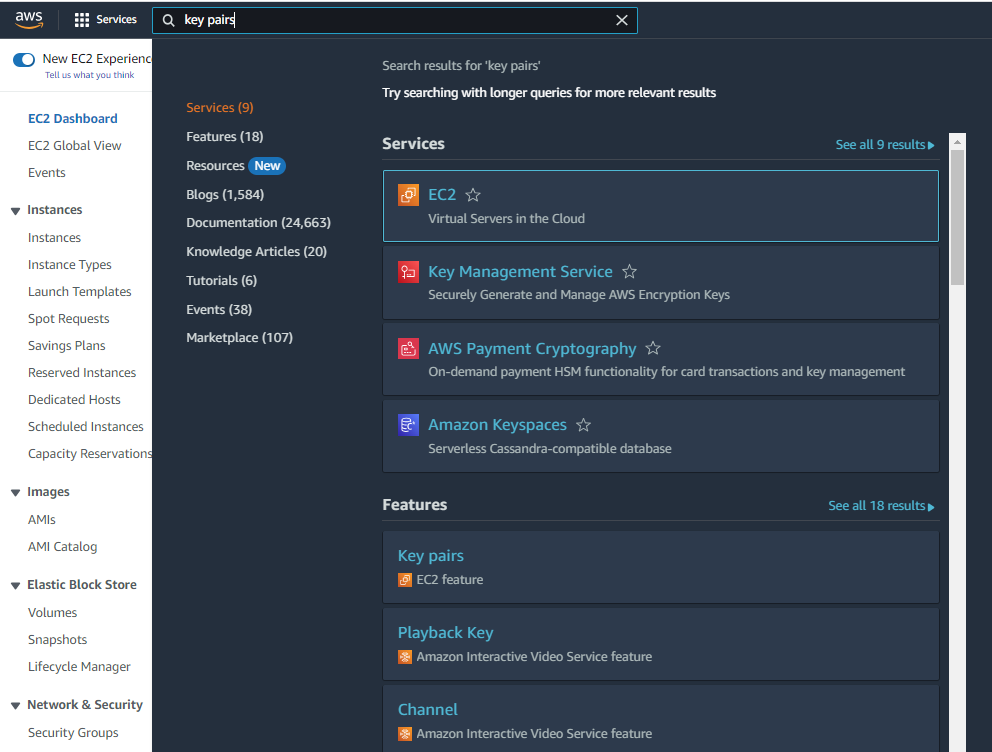
|  |  |
| --- | --- |
| Access key | Secret access key |
| AKIAVBKMCC57BAHVS3VI | 2mGQ76uxCV03jmx2e24AgDB9PorqRkL6x+/4K8YZ |



3. Create KeyPiars in AWS

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In search box --> give key pairs --> click on keypairs under features >> Click on create key pair --> give name as project1 >>> Key pair type ---> ED25519 >>> Private key file format --> .pem >> Click on Create key pair



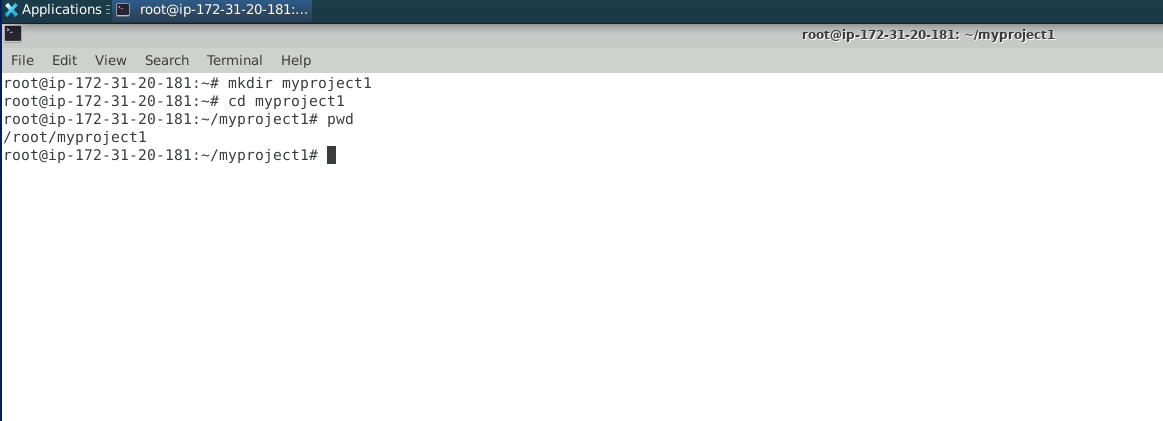
Expected Deliverables:

* Launch an EC2 instance using Terraform
* Connect to the instance
* Install Jenkins, Java and Python in the instance

On simplilearn lab follow the steps

# mkdir myproject1

# cd myproject1



Step now is to create terraform file which will have all detailed activity

# vim terraformproject.tf

provider "aws" {

region = "us-east-1"

access\_key = "AKIAVBKMCC57BAHVS3VI"

secret\_key = "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"

}

save the file

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root@ip-172-31-20-181:~/myproject1# cat terraformproject.tf

provider "aws" {

region = "us-east-1"

access\_key = "AKIAVBKMCC57BAHVS3VI"

secret\_key = "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"

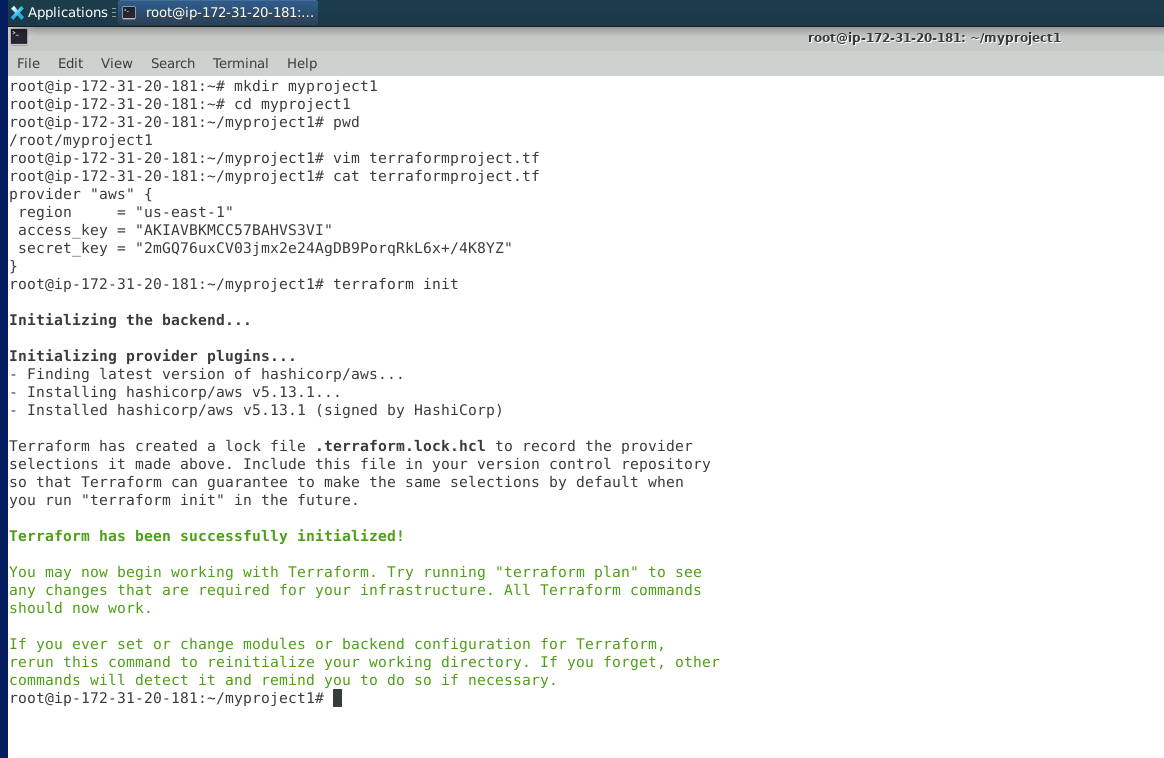
}

root@ip-172-31-20-181:~/myproject1#

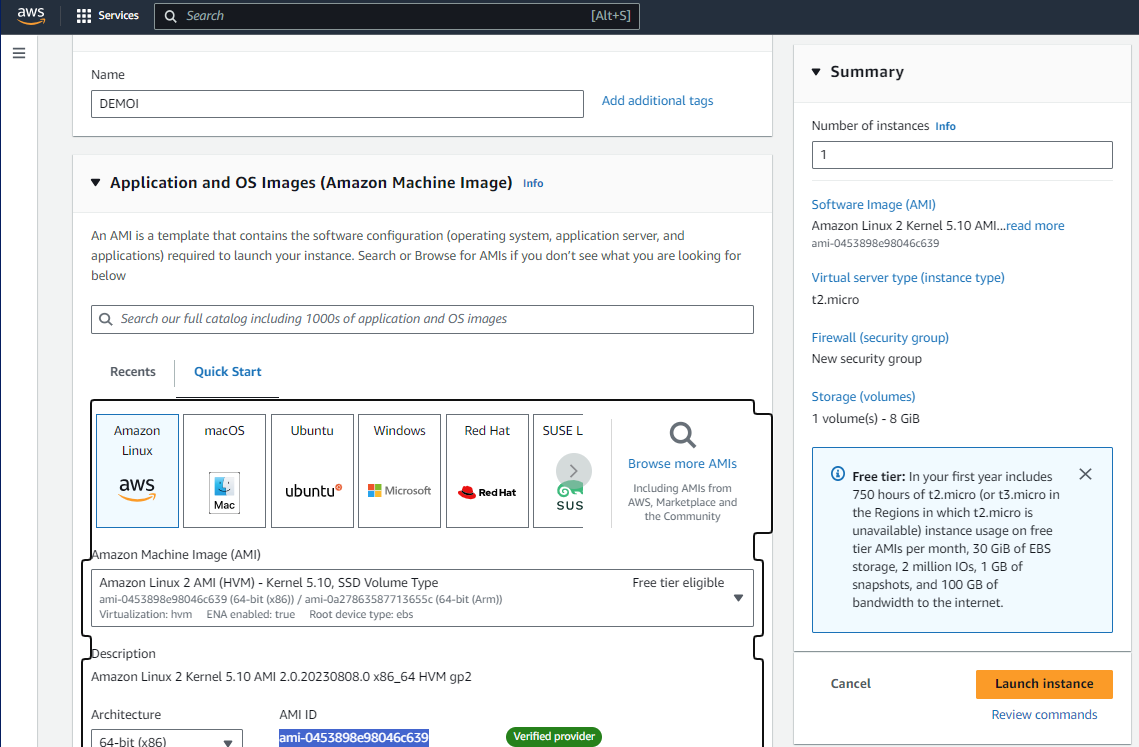
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Execute the command.

# terraform init



For ami id get the following

5. Launch an EC2 instance using Terraform **terraformproject.tf**

=================================================================

resource "aws\_security\_group" "Project1SG" {

name = "Proj1"

description = "Allow inbound SSH"

ingress {

from\_port = 22

to\_port = 22

protocol = "tcp"

cidr\_blocks = ["0.0.0.0/0"]

ipv6\_cidr\_blocks = ["::/0"]

}

ingress {

description = "HTTP"

from\_port = 8080

to\_port = 8080

protocol = "tcp"

cidr\_blocks = ["0.0.0.0/0"]

}

egress {

from\_port = 0

to\_port = 0

protocol = "-1"

cidr\_blocks = ["0.0.0.0/0"]

}

}

resource "aws\_instance" "Project-web1" {

ami = "ami-0453898e98046c639"

instance\_type = "t2.micro"

tags = {

Name = "Project1-web1"

}

key\_name = "project1"

user\_data = <<-EOF

#!/bin/bash

sudo yum install git -y

sudo amazon-linux-extras install java-openjdk11 -y

sudo wget -O /etc/yum.repos.d/jenkins.repo https://pkg.jenkins.io/redhat-stable/jenkins.repo

sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io-2023.key

sudo yum install jenkins -y

sudo systemctl start jenkins

sudo yum -y install gcc openssl-devel bzip2-devel libffi-devel zlib-devel

sudo wget https://www.python.org/ftp/python/3.11.4/Python-3.11.4.tgz

sudo tar xvf Python-3.11.4.tgz

sudo cd /home/ec2-user/Python-3.11.4/

sudo /home/ec2-user/Python-3.11.4/configure --enable-optimizations

sudo /home/ec2-user/Python-3.11.4/make altinstall

EOF

}

resource "aws\_network\_interface\_sg\_attachment" "sg\_attachment1"

{

security\_group\_id = aws\_security\_group.Project1SG.id

network\_interface\_id = aws\_instance.Project-web1.primary\_network\_interface\_id

}

================================================================

root@ip-172-31-20-181:~/myproject1# terraform plan

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:

+ create

Execute command

# terraform apply

Enter yes

After successful process of terraform

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Do you want to perform these actions?

Terraform will perform the actions described above.

Only 'yes' will be accepted to approve.

Enter a value: yes

aws\_security\_group.Project1SG: Creating...

aws\_instance.Project-web1: Creating...

aws\_security\_group.Project1SG: Creation complete after 2s [id=sg-065b9af60e62705c1]

aws\_instance.Project-web1: Still creating... [10s elapsed]

aws\_instance.Project-web1: Still creating... [20s elapsed]

aws\_instance.Project-web1: Still creating... [30s elapsed]

aws\_instance.Project-web1: Still creating... [40s elapsed]

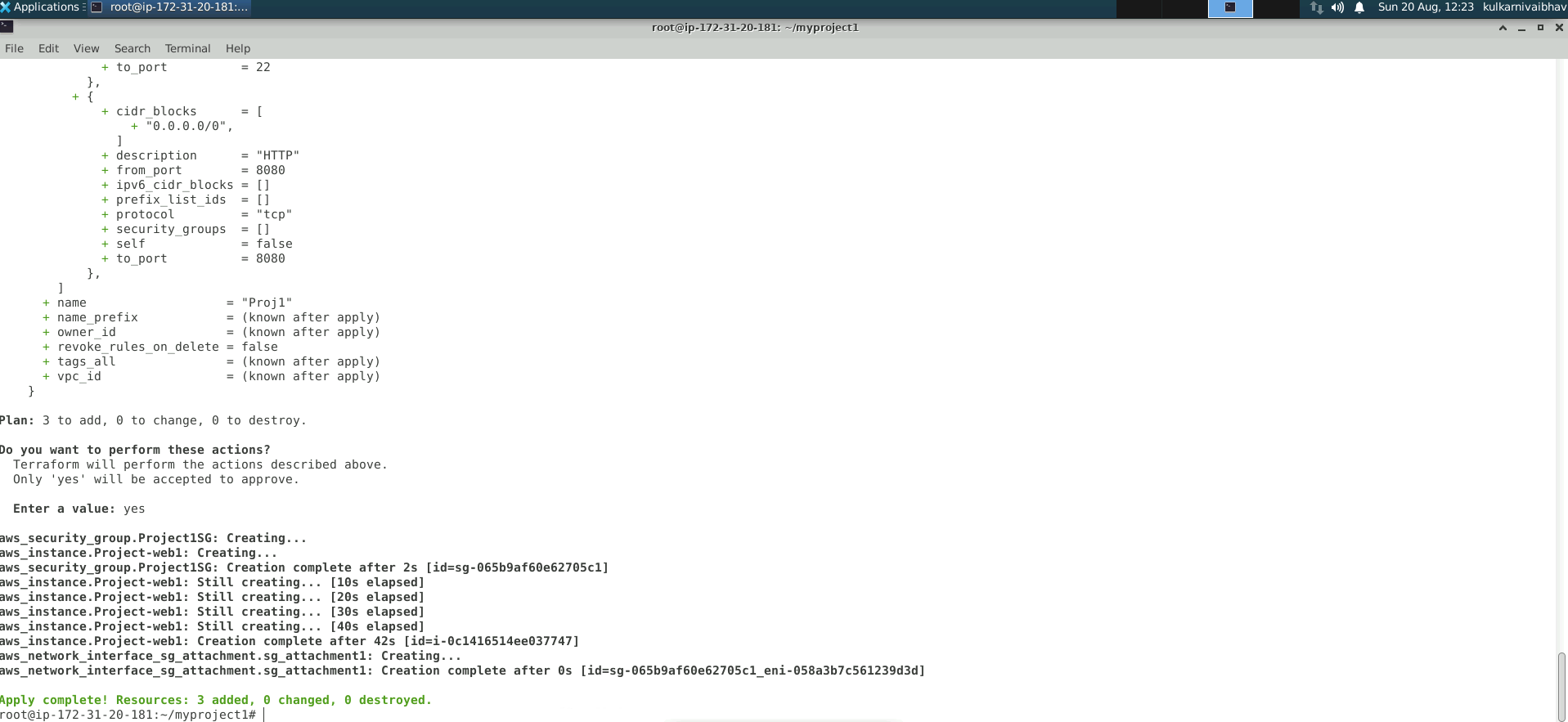
aws\_instance.Project-web1: Creation complete after 42s [id=i-0c1416514ee037747]

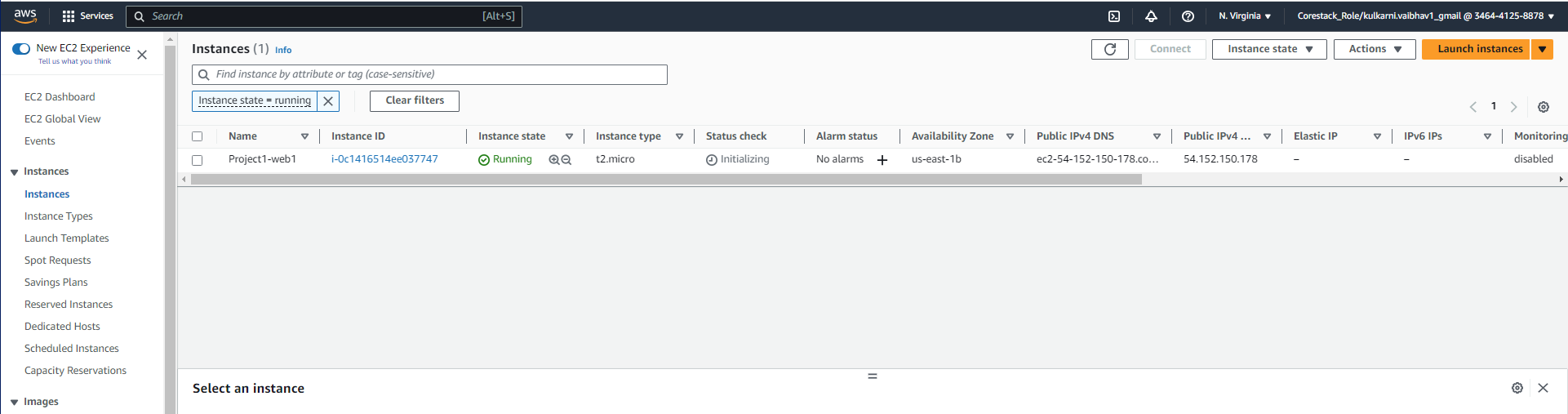
aws\_network\_interface\_sg\_attachment.sg\_attachment1: Creating...

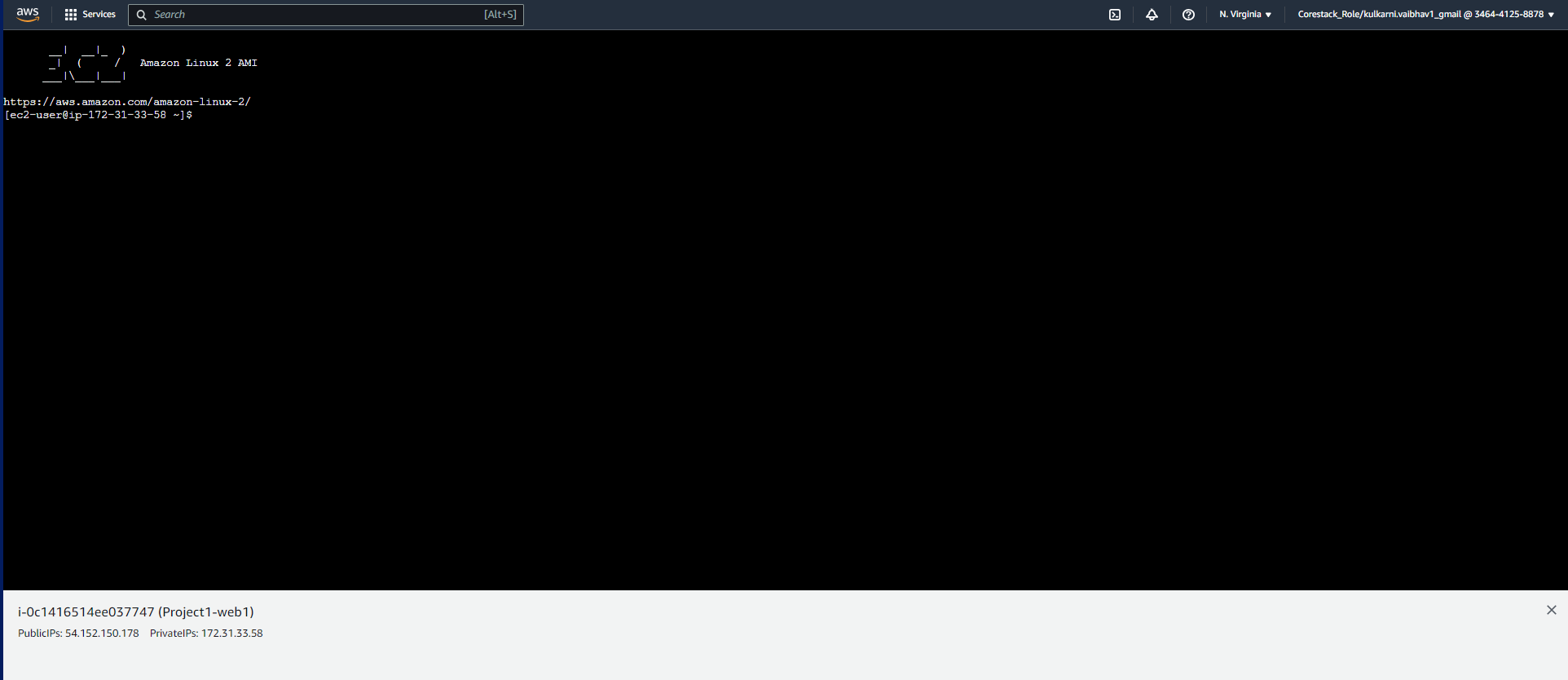
aws\_network\_interface\_sg\_attachment.sg\_attachment1: Creation complete after 0s [id=sg-065b9af60e62705c1\_eni-058a3b7c561239d3d]

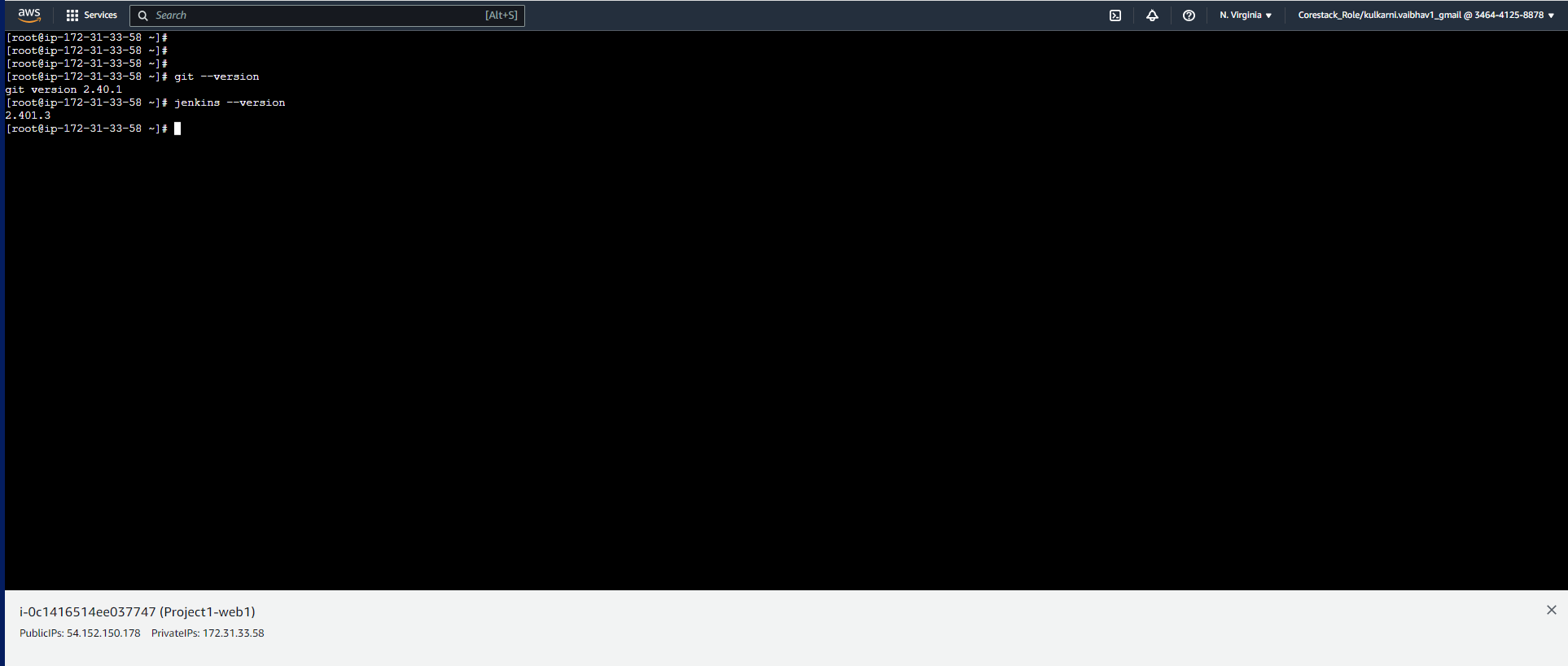
Apply complete! Resources: 3 added, 0 changed, 0 destroyed.

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[root@ip-172-31-33-58 ~]#

[root@ip-172-31-33-58 ~]# git --version

git version 2.40.1

[root@ip-172-31-33-58 ~]# jenkins --version

2.401.3

[root@ip-172-31-33-58 ~]#

[root@ip-172-31-33-58 /]# /bin/python --version

Python 2.7.18

[root@ip-172-31-33-58 /]# nano hello.py

[root@ip-172-31-33-58 /]# python3 hello.py

Hello, World!

[root@ip-172-31-33-58 /]#

Jenkins login URL : http://54.152.150.178:8080/

