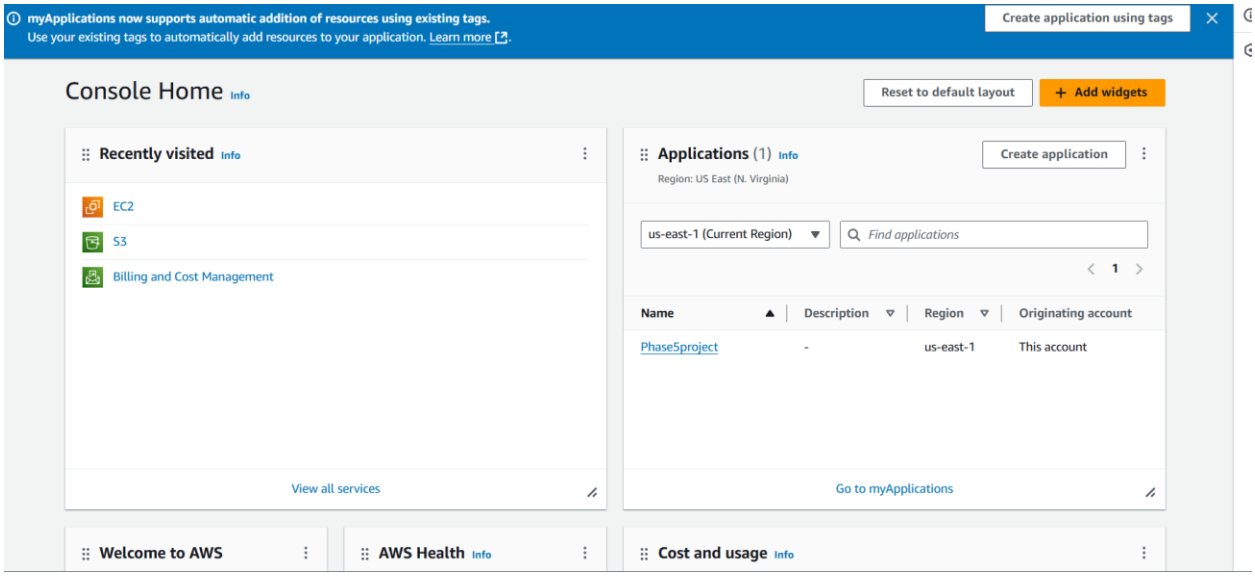
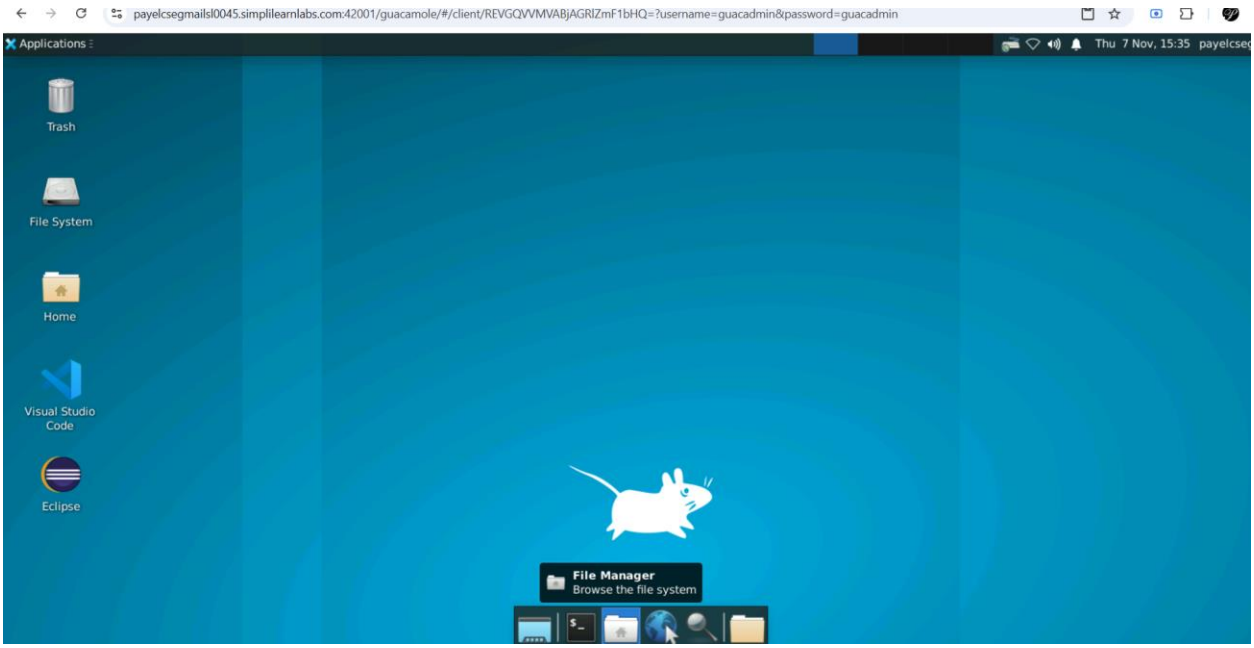
1. Launch an EC2 instance using Terraform

a. Connected to the AWS.



b. Connected to the DevOps Lab (Latest)



c. Set up Terraform components in Ubuntu machine.

Ran the below commands in the given sequence to set up the Terraform component:

pip install awscli

```
payelcsegmail@ip-172-31-34-27:~$ pip install awscli
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: awscli in ./.local/lib/python3.10/site-packages (1.35.20)
Requirement already satisfied: docutils<0.17,>=0.10 in ./.local/lib/python3.10/site-packages (from awscli) (0.16)
Requirement already satisfied: botocore==1.35.54 in ./.local/lib/python3.10/site-packages (from awscli) (1.35.54)
Requirement already satisfied: colorama<0.4.7,>=0.2.5 in /usr/lib/python3/dist-packages (from awscli) (0.4.4)
Requirement already satisfied: PyYAML<6.1,>=3.10 in /usr/lib/python3/dist-packages (from awscli) (5.4.1)
Requirement already satisfied: rsa<4.8,>=3.1.2 in ./.local/lib/python3.10/site-packages (from awscli) (4.7.2)
Requirement already satisfied: s3transfer<0.11.0,>=0.10.0 in ./.local/lib/python3.10/site-packages (from awscli) (0.10.3)
Requirement already satisfied: jmespath<2.0.0,>=0.7.1 in /usr/lib/python3/dist-packages (from botocore==1.35.54->awscli) (0.10.0)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in ./.local/lib/python3.10/site-packages (from botocore==1.35.54->awscli) (2.9.0.post0)
Requirement already satisfied: urllib3!=2.2.0,<3,>=1.25.4 in /usr/lib/python3/dist-packages (from botocore==1.35.54->awscli) (1.26.5)
Requirement already satisfied: pyasn1>=0.1.3 in /usr/lib/python3/dist-packages (from rsa<4.8,>=3.1.2->awscli) (0.4.8)
Requirement already satisfied: six>=1.5 in /usr/lib/python3/dist-packages (from python-dateutil<3.0.0,>=2.1->botocore==1.35.54->awscli) (1.16.0)
payelcsegmail@ip-172-31-34-27:~$
```

sudo apt-get update

```
payelcsegmail@ip-172-31-34-27:~$ sudo apt-get update
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]
Hit:5 https://download.docker.com/linux/ubuntu jammy InRelease
Ign:6 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:7 https://pkg.jenkins.io/debian-stable binary/ Release
Get:8 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.28/deb  InRelease [1192 B]
Get:9 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [1911 kB]
Err:8 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes:/core:/stable:/v1.28/deb  InRelease
  The following signatures were invalid: EXPKEYSIG 234654DA9A296436 isv:kubernetes OBS Project <isv:kubernetes@build.opensuse.org>
Fetched 2169 kB in 1s (2269 kB/s)
Reading package lists... Done
W: An error occurred during the signature verification. The repository is not updated and the previous index files will be used. GPG error: https://prod-cdn.packages.k8
s.io/repositories/isv:/kubernetes:/core:/stable:/v1.28/deb  InRelease: The following signatures were invalid: EXPKEYSIG 234654DA9A296436 isv:kubernetes OBS Project <isv
:kubernetes@build.opensuse.org>
W: Failed to fetch https://pkgs.k8s.io/core:/stable:/v1.28/deb/InRelease  The following signatures were invalid: EXPKEYSIG 234654DA9A296436 isv:kubernetes OBS Project <
isv:kubernetes@build.opensuse.org>
W: Some index files failed to download. They have been ignored, or old ones used instead.
payelcsegmail@ip-172-31-34-27:~$
```

d. Create a Terraform execution plan to launch ec2 instance

Created a new folder to execute this project.

mkdir ec2project1

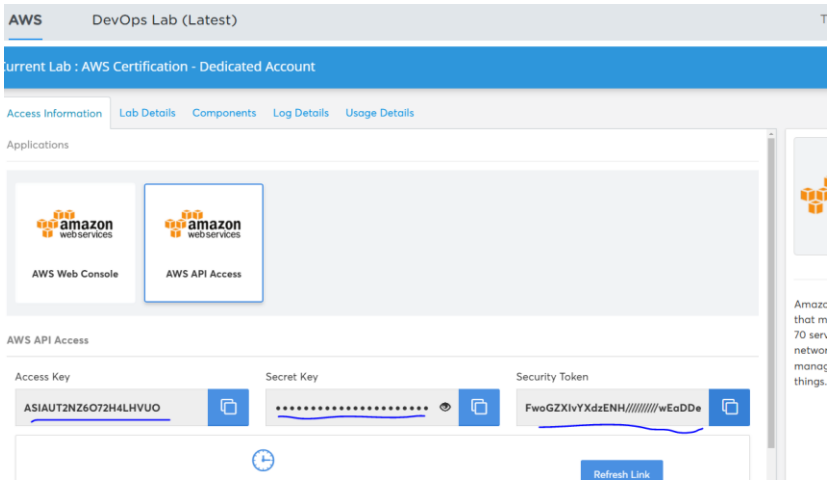
cd ec2project1

```
payelcsegmail@ip-172-31-34-27:~/test$ mkdir ec2project1
payelcsegmail@ip-172-31-34-27:~/test$ cd ec2
ec2back/     ec2project1/
payelcsegmail@ip-172-31-34-27:~/test$ cd ec2project1/
payelcsegmail@ip-172-31-34-27:~/test/ec2project1$
```

Created creds.tf file inside the ec2project1 folder.

vi creds.tf

Pasted the below code taking key details from AWS lab:



provider "aws" {

access_key = "ASIAUT2NZ6O72H4LHVUO"

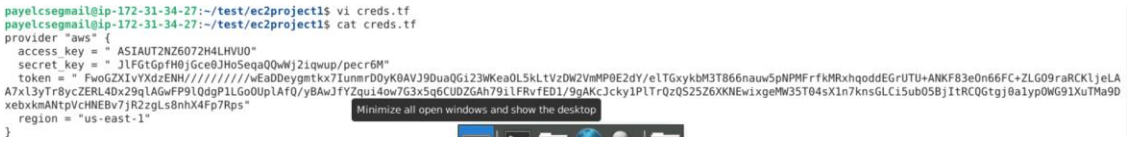
secret_key = "JlFGtGpfH0jGce0JHoSeqaQQwWj2iqwup/pecr6M"

token =

"FwoGZXIvYXdzENH/////////wEaDDeygmtkx7IunmrDOyK0AVJ9DuaQGi23WKeaOL5kLtVzDW2VmMP0E2dY/elTGxykbM3T866nauw5pNPMFrfkMRxhqoddEGrUTU+ANKF83eOn66FC+ZLGO9raRCKljeLAA7xl3yTr8ycZERL4Dx29qlAGwFP9lQdgP1LGoOUplAfQ/yBAwJfYZqui4ow7G3x5q6CUDZGAh79ilFRvfED1/9gAKcJcky1PlTrQzQS25Z6XKNEwixgeMW35T04sX1n7knsGLCi5ubO5BjItRCQGtgj0a1ypOWG91XuTMa9Dxebxkm ANtpVcHNEBv7jR2zgLs8nhX4Fp7Rps"

region = "us-east-1"

}



Generated a key pair file **“ps-key-pair2**” in the path ***/home/payelcsegmail/test/ps-keys***

ssh-keygen -t rsa -b 2048

```
payelcsegmail@ip-172-31-34-27:~/test/ps-keys$ ssh-keygen -t rsa -b 2048
Generating public/private rsa key pair.
Enter file in which to save the key (/home/payelcsegmail/.ssh/id_rsa): /home/payelcsegmail/test/ps-keys/ps-key-pair2
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/payelcsegmail/test/ps-keys/ps-key-pair2
Your public key has been saved in /home/payelcsegmail/test/ps-keys/ps-key-pair2.pub
The key fingerprint is:
SHA256:QvgCG/ckDDdtGOTnGB2K0AwWB9TvFPhxabswlv8ar9Y payelcsegmail@ip-172-31-34-27
The key's randomart image is:
+---[RSA 2048]----+
|+O=o*+. .        |
|..+O.Bo=         |
|  + @.@ .        |
|   = ^ .         |
|  . * O S        |
|     o +         |
|       .o        |
|       .oE       |
|      .oo.       |
+----[SHA256]-----+
payelcsegmail@ip-172-31-34-27:~/test/ps-keys$
```

```
payelcsegmail@ip-172-31-34-27:~/test/ps-keys$ ls
ps-key-pair1  ps-key-pair1.pub  ps-key-pair2  ps-key-pair2.pub
```

Copied the content of ps-key-pair2.pub and save it text file.

ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQC9LkY6W+ulAq9hDQ9gN6xb++MX+Vm1Y2WDu5z5HTbeYva0z9yEaRoHl9py1UuejRBoy+nz4TX630eWmExSambd4l79c0JmqT9NoZo71vG9m2l2pbuEYSTYOz/i+fY80Wycd9zu/+gb7uhASw8pJXSK1SfYIY6JmOMcNkXLsmBiaYr9g6kVmrpdE7077koDnUsCEImEtOYoDQhkFFToHBWgTgNmthEAz2SG8yfWr3oAzxRzIOKEwGKGkzpfrJxvOyY6uVocXAz2uHKhhaxneRQKCUwlflECQsxZWs0eeAEtdGLDLbXKpobKyznRvjYCh++yuhS/AOurFL+4nqYo4eqX payelcsegmail@ip-172-31-34-27

Navigate to ec2project1 folder and created ec2main.tf file inside the ec2project1 folder.

vi ec2main.tf

Pasted the below to the file:

```
resource "aws_instance" "psawsec2" {
  ami           = "ami-0866a3c8686eaeeba"
  instance_type = "t2.micro"

  key_name = "ps-key-pair2"
```

```
  vpc_security_group_ids = [aws_security_group.allow_ssh.id]

  tags = {
    Name = "MyFirstPSEC2Instance"
  }
}

resource "aws_security_group" "allow_ssh" {
  name        = "allow_ssh"
  description = "Allow SSH access"
  ingress {
    from_port   = 22
    to_port     = 22
    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_key_pair" "deployer" {
  key_name   = "ps-key-pair2"
  public_key = "ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQC9LkY6W+ulAq9hDQ9gN6xb++MX+Vm1Y2W
Du5z5HTbeYva0z9yEaRoHl9py1UuejRBoy+nz4TX630eWmExSambd4l79c0JmqT9NoZo7
1vG9m2l2pbuEYSTYOz/i+fY80Wycd9zu/+gb7uhASw8pJXSK1SfYIY6JmOMcNkXLsmBiaYr
9g6kVmrpdE7077koDnUsCEImEtOYoDQhkFFToHBWgTgNmthEAz2SG8yfWr3oAzxRzIOK
EwGKGkzpfrJxvOyY6uVocXAz2uHKhhaxneRQKCUwlflECQsxZWs0eeAEtdGLDLbXKpobKy
znRvjYCh++yuhS/AOurFL+4nqYo4eqX payelcsegmail@ip-172-31-34-27"
}
```

```
payelcsegmail@ip-172-31-34-27:~/test/ec2project1$ cat ec2-main-ssh.tf
resource "aws_instance" "psawsec2" {
  ami           = "ami-0866a3c8686eaeeba"
  instance_type = "t2.micro"

  key_name = "ps-key-pair2"

  vpc_security_group_ids = [aws_security_group.allow_ssh.id]

  tags = {
    Name = "MyFirstPSEC2Instance"
  }
}

resource "aws_security_group" "allow_ssh" {
  name        = "allow_ssh"
  description = "Allow SSH access"
  ingress {
    from_port   = 22
    to_port     = 22
    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_key_pair" "deployer" {
  key_name   = "ps-key-pair2"
  public_key = " ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQC9LkY6W+ulAq9hDQ9gN6xb++MX+Vm1Y2WDu5z5HTbeYva0z9yEaRoHl9py1UuejRBoy+nz4TX630eWmExSambd4l79c0JmqT9NoZo71vG9m2l2pbu
```

Executed the command

terraform init

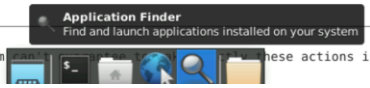
```
payelcsegmail@ip-172-31-34-27:~/test/ec2project1$ terraform init

Initializing the backend...

Initializing provider plugins...
- Finding latest version of hashicorp/aws...
- Installing hashicorp/aws v5.74.0...
- Installed hashicorp/aws v5.74.0 (signed by HashiCorp)

Terraform has created a lock file .terraform.lock.hcl to record the provider
selections it made above. Include this file in your version control repository
so that Terraform can guarantee to make the same selections by default when
you run "terraform init" in the future.

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
payelcsegmail@ip-172-31-34-27:~/test/ec2project1$
```

terraform validate

```
payelcsegmail@ip-172-31-34-27:~/test/ec2project1$ terraform validate
Success! The configuration is valid.

payelcsegmail@ip-172-31-34-27:~/test/ec2project1$
```

terraform plan

```
            + protocol         = "-1"
            + security_groups  = []
            + self             = false
            + to_port          = 0
          },
      ]
    + id                     = (known after apply)
    + ingress                = [
        + {
            + cidr_blocks      = [
                + "0.0.0.0/0",
              ]
            + description      = ""
            + from_port        = 22
            + ipv6_cidr_blocks = []
            + prefix_list_ids  = []
            + protocol         = "tcp"
            + security_groups  = []
            + self             = false
            + to_port          = 22
          },
      ]
    + name                   = "allow_ssh"
    + name_prefix            = (known after apply)
    + owner_id               = (known after apply)
    + revoke_rules_on_delete = false
    + tags_all               = (known after apply)
    + vpc_id                 = (known after apply)
  }

Plan: 3 to add, 0 to change, 0 to destroy.
```



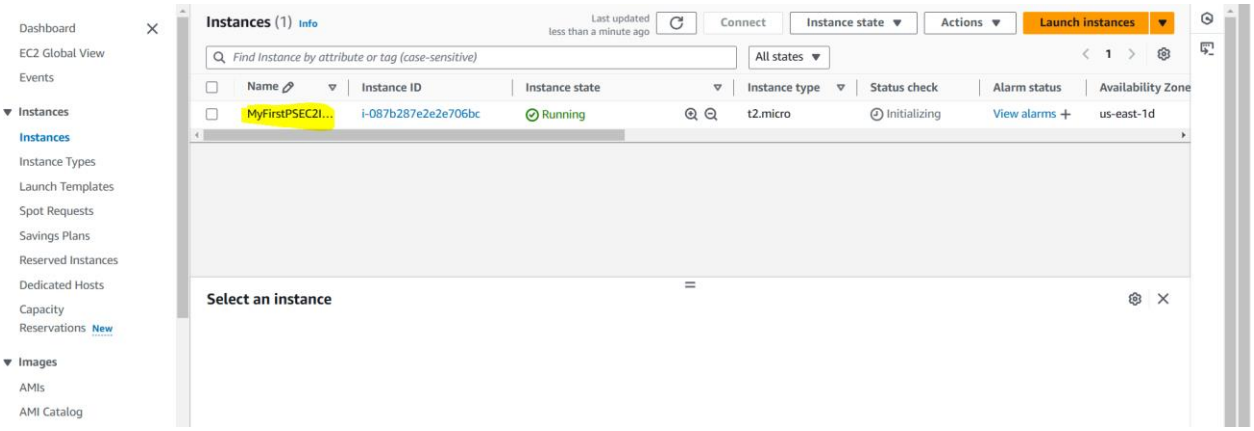

```
Note: You didn't use the -out option to save this plan, so Terraform can't guarantee to take exactly these actions if you run "terraform apply" now.
payelcsegmail@ip-172-31-34-27:~/test/ec2project1$
```

terraform apply

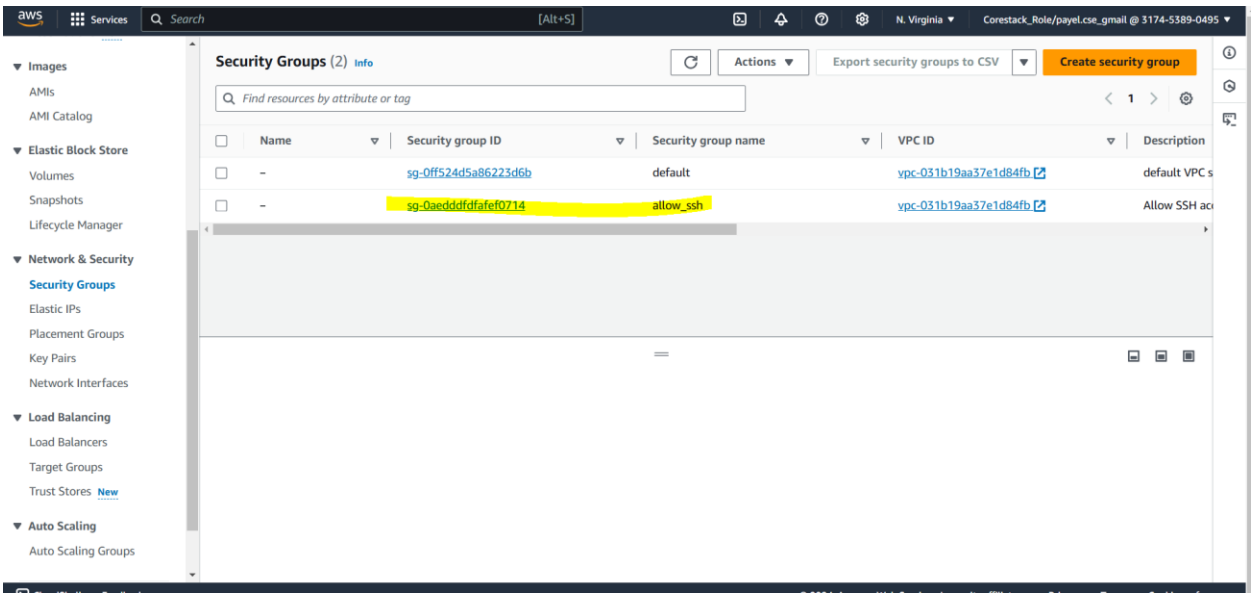
```
            + description      = ""
            + from_port        = 22
            + ipv6_cidr_blocks = []
            + prefix_list_ids  = []
            + protocol         = "tcp"
            + security_groups  = []
            + self             = false
            + to_port          = 22
          },
      ]
    + name                   = "allow_ssh"
    + name_prefix            = (known after apply)
    + owner_id               = (known after apply)
    + revoke_rules_on_delete = false
    + tags_all               = (known after apply)
    + vpc_id                 = (known after apply)
  }

Plan: 3 to add, 0 to change, 0 to destroy.

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_key_pair.deployer: Creating...
aws_security_group.allow_ssh: Creating...
aws_key_pair.deployer: Creation complete after 0s [id=ps-key-pair2]
aws_security_group.allow_ssh: Creation complete after 2s [id=sg-0aedddfdfafef0714]
aws_instance.psawsec2: Creating...
aws_instance.psawsec2: Still creating... [10s elapsed]
aws_instance.psawsec2: Creation complete after 13s [id=i-087b287e2e2e706bc]

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

Verified the creation of resources in the AWS Management console

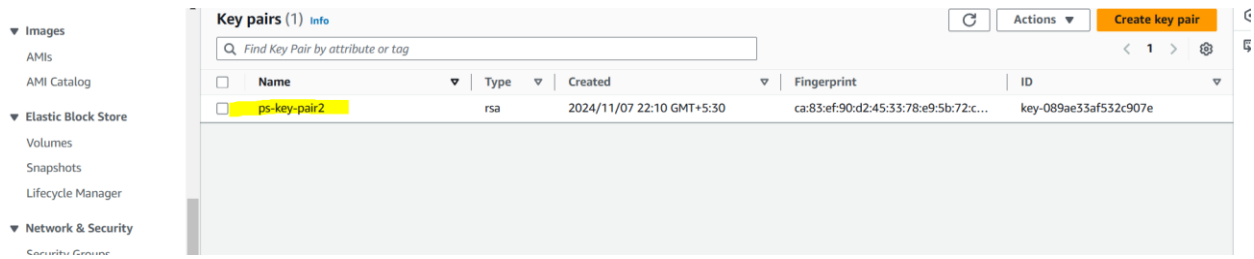
Ec2 instance:



Security group:

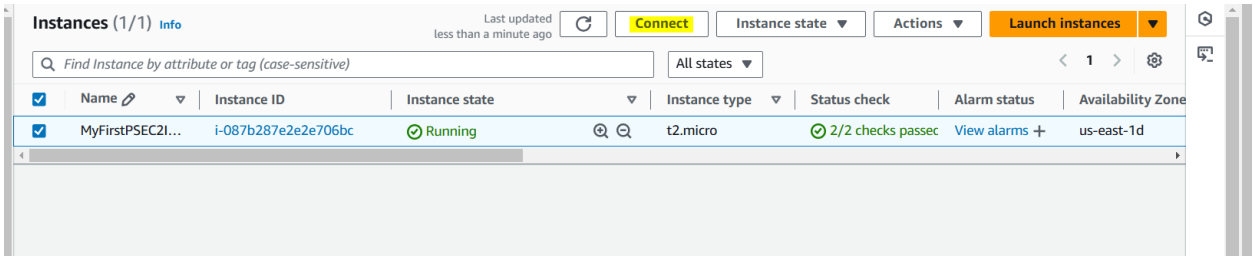


Key pair:

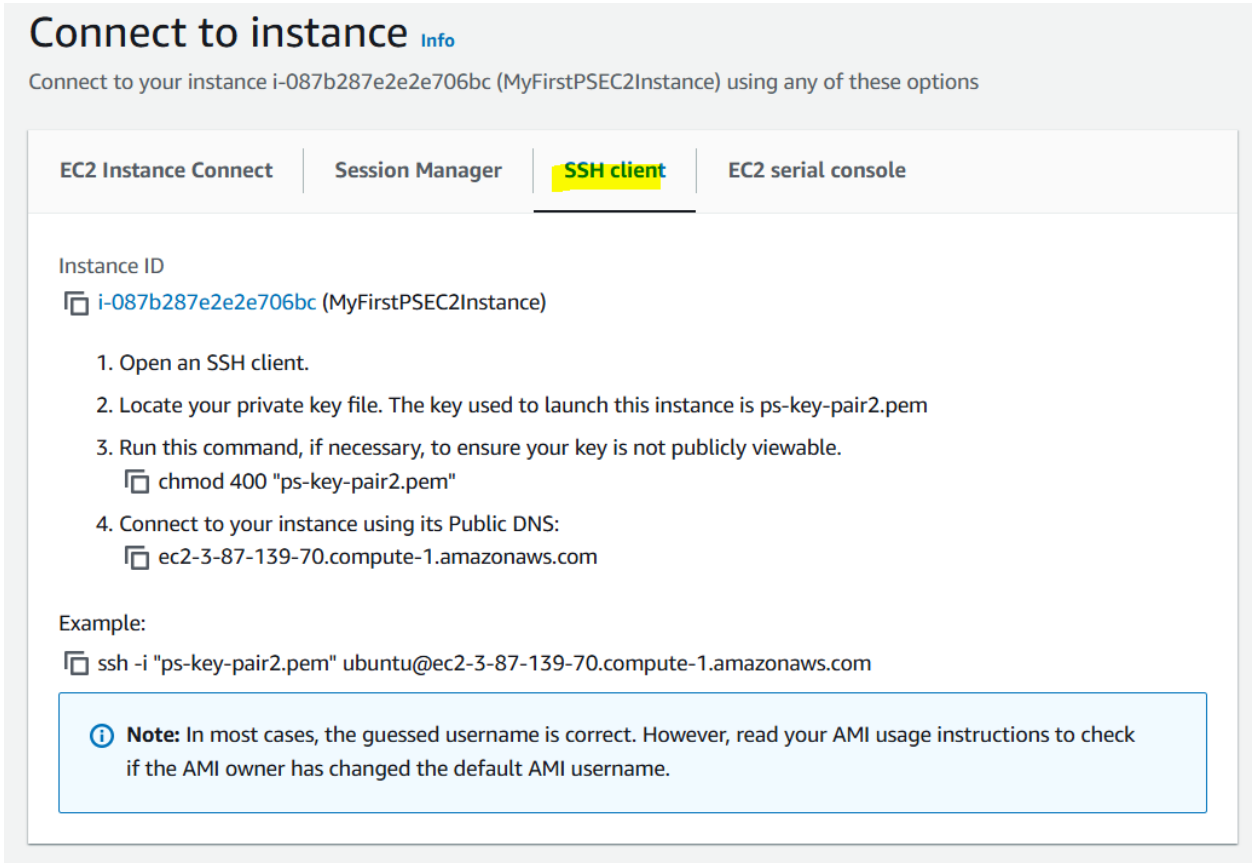


e. Connect ec2 instance:

In AWS console, selected the EC2 instance and click on connect.



Clicked on SSH client tab.



Ran the command in lab machine navigating to path /home/payelcsegmail/test/ps-keys.

chmod 400 "ps-key-pair2"

```
payelcsegmail@ip-172-31-34-27:~/test/ps-keys$ pwd
/home/payelcsegmail/test/ps-keys
payelcsegmail@ip-172-31-34-27:~/test/ps-keys$ chmod 400 "ps-key-pair2"
payelcsegmail@ip-172-31-34-27:~/test/ps-keys$
```

Ran the following command to SSH connect to ec2 instance:

ssh -i "ps-key-pair2" ubuntu@ec2-3-87-139-70.compute-1.amazonaws.com

```
payelcsegmail@ip-172-31-34-27:~/test/ps-keys$ ssh -i "ps-key-pair2" ubuntu@ec2-3-87-139-70.compute-1.amazonaws.com
The authenticity of host 'ec2-3-87-139-70.compute-1.amazonaws.com (3.87.139.70)' can't be established.
ED25519 key fingerprint is SHA256:CQ3Z8lPKip1aaxpkQ+BDD3ARdx6mdz8jvZXWL2sJ/MM.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'ec2-3-87-139-70.compute-1.amazonaws.com' (ED25519) to the list of known hosts.
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1016-aws x86_64)

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

 System information as of Thu Nov  7 16:54:48 UTC 2024

  System load:  0.0               Processes:             104
  Usage of /:   22.9% of 6.71GB   Users logged in:       0
  Memory usage: 20%               IPv4 address for enX0: 172.31.42.61
  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


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.
```

```
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.8.0-1016-aws x86_64)

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

 System information as of Thu Nov  7 16:54:48 UTC 2024

  System load:  0.0               Processes:             104
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  Memory usage: 20%               IPv4 address for enX0: 172.31.42.61
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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-172-31-42-61:~$
```
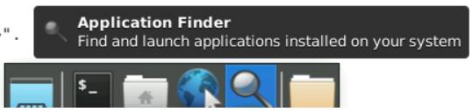
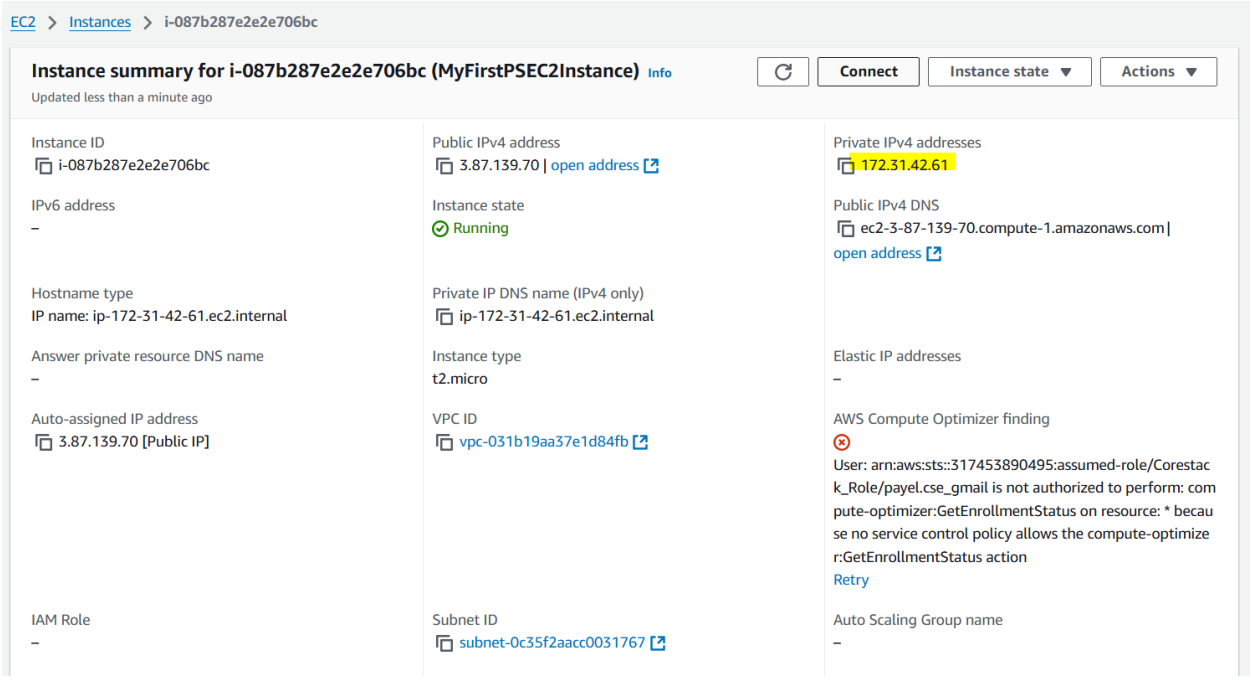





Install Jenkins, Java, and Python in the instance

f. Install Jenkins, Java, and Python in the instance:

Update the System:

sudo apt update -y && sudo apt upgrade -y

```
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [19.9 kB]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [428 kB]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [82.7 kB]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 c-n-f Metadata [424 B]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [15.0 kB]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [3820 B]
Get:28 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [552 B]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [208 B]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [112 B]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [10.6 kB]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [10.8 kB]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [21.1 kB]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1104 B]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:37 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
Get:38 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:39 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:40 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [97.2 kB]
Get:41 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [7216 B]
Get:42 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [5892 B]
Get:43 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [557 kB]
Get:44 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [149 kB]
Get:45 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [51.9 kB]
Get:46 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [13.5 kB]
Get:47 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [425 kB]
Get:48 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [82.2 kB]
Get:49 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]
Get:50 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [424 B]
Get:51 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [12.2 kB]
Get:52 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [2940 B]
Get:53 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]
Get:54 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [356 B]
Fetched 30.6 MB in 6s (5548 kB/s)
```

```
Generating grub configuration file ...
GRUB_FORCE_PARTUUID is set, will attempt initrdless boot
Found linux image: /boot/vmlinuz-6.8.0-1018-aws
Found initrd image: /boot/microcode.cpio /boot/initrd.img-6.8.0-1018-aws
Found linux image: /boot/vmlinuz-6.8.0-1016-aws
Found initrd image: /boot/microcode.cpio /boot/initrd.img-6.8.0-1016-aws
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
Scanning processes...
Scanning candidates...
Scanning linux images...

Pending kernel upgrade!
Running kernel version:
  6.8.0-1016-aws
Diagnostics:
  The currently running kernel version is not the expected kernel version 6.8.0-1018-aws.

Restarting the system to load the new kernel will not be handled automatically, so you should consider rebooting.

Restarting services...
 systemctl restart multipathd.service packagekit.service

Service restarts being deferred:
 systemctl restart unattended-upgrades.service

No containers need to be restarted.

User sessions running outdated binaries:
 ubuntu @ session #2: apt[1484]

No VM guests are running outdated hypervisor (qemu) binaries on this host.
ubuntu@ip-172-31-42-61:~$
```

Install Java

sudo apt install openjdk-21-jdk -y

```
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 gtk-update-icon-cache amd64 3.24.41-4ubuntu1.2 [51.8 kB]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 hicolor-icon-theme all 0.17-2 [9976 B]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 humanity-icon-theme all 0.6.16 [1282 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 ubuntu-mono all 24.04-0ubuntu1 [151 kB]
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 adwaita-icon-theme all 46.0-1 [723 kB]
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 alsa-topology-conf all 1.2.5.1-2 [15.5 kB]
Get:17 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libasound2-data all 1.2.11-1build2 [21.0 kB]
Get:18 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libasound2t64 amd64 1.2.11-1build2 [399 kB]
Get:19 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 alsa-ucm-conf all 1.2.10-1ubuntu5 [63.1 kB]
Get:20 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 at-spi2-common all 2.52.0-1build1 [8674 B]
Get:21 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libxi6 amd64 2:1.8.1-1build1 [32.4 kB]
Get:22 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libatspi2.0-0t64 amd64 2.52.0-1build1 [80.5 kB]
Get:23 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 x11-common all 1:7.7+23ubuntu3 [21.7 kB]
Get:24 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libxtst6 amd64 2:1.2.3-1.1build1 [12.6 kB]
Get:25 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libdconf1 amd64 0.40.0-4build2 [39.4 kB]
Get:26 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 dconf-service amd64 0.40.0-4build2 [27.5 kB]
Get:27 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 dconf-gsettings-backend amd64 0.40.0-4build2 [22.1 kB]
Get:28 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 session-migration amd64 0.3.9build1 [9034 B]
Get:29 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 gsettings-desktop-schemas all 46.1-0ubuntu1 [35.6 kB]
Get:30 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 at-spi2-core amd64 2.52.0-1build1 [56.6 kB]
Get:31 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 ca-certificates-java all 20240118 [11.6 kB]
Get:32 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 fonts-dejavu-mono all 2.37-8 [502 kB]
Get:33 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 fonts-dejavu-core all 2.37-8 [835 kB]
Get:34 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 fontconfig-config amd64 2.15.0-1.1ubuntu2 [37.3 kB]
Get:35 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libfontconfig1 amd64 2.15.0-1.1ubuntu2 [139 kB]
Get:36 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 fontconfig amd64 2.15.0-1.1ubuntu2 [180 kB]
Get:37 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 fonts-dejavu-extra all 2.37-8 [1947 kB]
Get:38 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 java-common all 0.75+exp1 [6798 B]
Get:39 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libatk1.0-0t64 amd64 2.52.0-1build1 [55.3 kB]
Get:40 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libatk-bridge2.0-0t64 amd64 2.52.0-1build1 [66.0 kB]
Get:41 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libglvnd0 amd64 1.7.0-1build1 [69.6 kB]
Get:42 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 libglapi-mesa amd64 24.0.9-0ubuntu0.2 [42.3 kB]
Get:43 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libx11-xcb1 amd64 2:1.8.7-1build1 [7800 B]
Get:44 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libxcb-dri2-0 amd64 1.15-1ubuntu2 [7222 B]
Get:45 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libxcb-dri3-0 amd64 1.15-1ubuntu2 [7142 B]
10% [45 libxcb-dri3-0 7142 B/7142 B 100%]
```

```
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jps to provide /usr/bin/jps (jps) in auto mode
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jrunscript to provide /usr/bin/jrunscript (jrunscript) in auto mode
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jshell to provide /usr/bin/jshell (jshell) in auto mode
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jstack to provide /usr/bin/jstack (jstack) in auto mode
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jstat to provide /usr/bin/jstat (jstat) in auto mode
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jstatd to provide /usr/bin/jstatd (jstatd) in auto mode
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jwebserver to provide /usr/bin/jwebserver (jwebserver) in auto mode
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/serialver to provide /usr/bin/serialver (serialver) in auto mode
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jhsdb to provide /usr/bin/jhsdb (jhsdb) in auto mode
Setting up openjdk-21-jdk:amd64 (21.0.4+7-1ubuntu2~24.04) ...
update-alternatives: using /usr/lib/jvm/java-21-openjdk-amd64/bin/jconsole to provide /usr/bin/jconsole (jconsole) in auto mode
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
Processing triggers for libgdk-pixbuf-2.0-0:amd64 (2.42.10+dfsg-3ubuntu3.1) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Pending kernel upgrade!
Running kernel version:
  6.8.0-1016-aws
Diagnostics:
  The currently running kernel version is not the expected kernel version 6.8.0-1018-aws.

Restarting the system to load the new kernel will not be handled automatically, so you should consider rebooting.

Restarting services...

Service restarts being deferred:
 systemctl restart unattended-upgrades.service

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.
ubuntu@ip-172-31-42-61:~$
```

To verify java version

java -version

```
ubuntu@ip-172-31-42-61:~$ java -version
openjdk version "21.0.4" 2024-07-16
OpenJDK Runtime Environment (build 21.0.4+7-Ubuntu-1ubuntu224.04)
OpenJDK 64-Bit Server VM (build 21.0.4+7-Ubuntu-1ubuntu224.04, mixed mode, sharing)
ubuntu@ip-172-31-42-61:~$
```

Install Jenkins

Add the Jenkins GPG key with the following command:

sudo wget -O /usr/share/keyrings/jenkins-keyring.asc
https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key

```
ubuntu@ip-172-31-42-61:~$ sudo wget -O /usr/share/keyrings/jenkins-keyring.asc https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
--2024-11-07 17:05:35--  https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key
Resolving pkg.jenkins.io (pkg.jenkins.io)... 146.75.34.133, 2a04:4e42:78::645
Connecting to pkg.jenkins.io (pkg.jenkins.io)|146.75.34.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3175 (3.1K) [application/pgp-keys]
Saving to: '/usr/share/keyrings/jenkins-keyring.asc'

/usr/share/keyrings/jenkins-keyring.asc   100%[=========================================================================================>]   3.10K  --.-KB/s    in 0s

2024-11-07 17:05:35 (51.4 MB/s) - '/usr/share/keyrings/jenkins-keyring.asc' saved [3175/3175]
```

Added the Jenkins repository because it is not added by default in the Ubuntu 24.04 sources list

echo "deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc]" https://pkg.jenkins.io/debian-stable binary/ | sudo tee \ /etc/apt/sources.list.d/jenkins.list > /dev/null

```
ubuntu@ip-172-31-42-61:~$ echo "deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc]" https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
/etc/apt/sources.list.d/jenkins.list > /dev/null
ubuntu@ip-172-31-42-61:~$
```

Update the system again

sudo apt update -y

```
ubuntu@ip-172-31-42-61:~$ sudo apt update -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Ign:4 https://pkg.jenkins.io/debian-stable binary/ InRelease
Get:5 https://pkg.jenkins.io/debian-stable binary/ Release [2044 B]
Get:6 https://pkg.jenkins.io/debian-stable binary/ Release.gpg [833 B]
Hit:7 http://security.ubuntu.com/ubuntu noble-security InRelease
Get:8 https://pkg.jenkins.io/debian-stable binary/ Packages [28.0 kB]
Fetched 30.9 kB in 1s (48.1 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
ubuntu@ip-172-31-42-61:~$
```

Installed the jenkins

sudo apt install jenkins -y

```
ubuntu@ip-172-31-42-61:~$ sudo apt install jenkins -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  net-tools
The following NEW packages will be installed:
  jenkins net-tools
0 upgraded, 2 newly installed, 0 to remove and 1 not upgraded.
Need to get 94.3 MB of archives.
After this operation, 96.9 MB of additional disk space will be used.
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble/main amd64 net-tools amd64 2.10-0.1ubuntu4 [204 kB]
Get:2 https://pkg.jenkins.io/debian-stable binary/ jenkins 2.479.1 [94.1 MB]
46% [2 jenkins 42.1 MB/94.1 MB 45%]


Get:2 https://pkg.jenkins.io/debian-stable binary/ jenkins 2.479.1 [94.1 MB]
Fetched 94.3 MB in 1min 6s (1434 kB/s)
Selecting previously unselected package net-tools.
(Reading database ... 116703 files and directories currently installed.)
Preparing to unpack .../net-tools_2.10-0.1ubuntu4_amd64.deb ...
Unpacking net-tools (2.10-0.1ubuntu4) ...
Selecting previously unselected package jenkins.
Preparing to unpack .../jenkins_2.479.1_all.deb ...
Unpacking jenkins (2.479.1) ...
Setting up net-tools (2.10-0.1ubuntu4) ...
Setting up jenkins (2.479.1) ...
Created symlink /etc/systemd/system/multi-user.target.wants/jenkins.service → /usr/lib/systemd/system/jenkins.service.
Processing triggers for man-db (2.12.0-4build2) ...
Scanning processes...
Scanning candidates...
Scanning linux images...

Pending kernel upgrade!
Running kernel version:
  6.8.0-1016-aws
Diagnostics:
  The currently running kernel version is not the expected kernel version 6.8.0-1018-aws.

Restarting the system to load the new kernel will not be handled automatically, so you should consider rebooting.

Restarting services...

Service restarts being deferred:
 systemctl restart unattended-upgrades.service

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.
ubuntu@ip-172-31-42-61:~$
```

Start and enable the Jenkins service:

sudo systemctl start jenkins && sudo systemctl enable Jenkins

```
ubuntu@ip-172-31-42-61:~$ sudo systemctl start jenkins && sudo systemctl enable jenkins
Synchronizing state of jenkins.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable jenkins
ubuntu@ip-172-31-42-61:~$
```

Check the status of Jenkins.

sudo systemctl status Jenkins

Install Python.

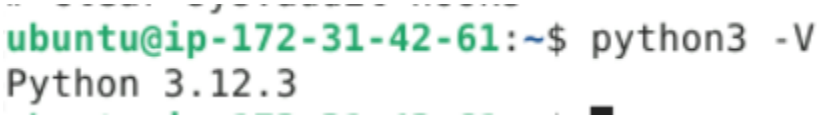
Update the system packages to their latest versions

sudo apt update -y && sudo apt upgrade -y

```
ubuntu@ip-172-31-42-61:~$ sudo apt update -y && sudo apt upgrade -y
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu noble-backports InRelease
Ign:4 https://pkg.jenkins.io/debian-stable binary/ InRelease
Hit:5 https://pkg.jenkins.io/debian-stable binary/ Release
Hit:6 http://security.ubuntu.com/ubuntu noble-security InRelease
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
1 package can be upgraded. Run 'apt list --upgradable' to see it.
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following upgrades have been deferred due to phasing:
  mtr-tiny
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
```

Checked the version of python

python3 -V



g. Destroying all the resources:

Terraform destroy

```
      - id                      = "sg-0aedddfdfafef0714" -> null
      - ingress                 = [
          - {
              - cidr_blocks      = [
                  - "0.0.0.0/0",
                ]
              - description      = ""
              - from_port        = 22
              - ipv6_cidr_blocks = []
              - prefix_list_ids  = []
              - protocol         = "tcp"
              - security_groups  = []
              - self             = false
              - to_port          = 22
            },
        ] -> null
      - name                    = "allow_ssh" -> null
      - owner_id                = "317453890495" -> null
      - revoke_rules_on_delete = false -> null
      - tags                    = {} -> null
      - tags_all                = {} -> null
      - vpc_id                  = "vpc-031b19aa37e1d84fb" -> null
    }

Plan: 0 to add, 0 to change, 3 to destroy.

Do you really want to destroy all resources?
  Terraform will destroy all your managed infrastructure, as shown above.
  There is no undo. Only 'yes' will be accepted to confirm.

  Enter a value: yes

aws_key_pair.deployer: Destroying... [id=ps-key-pair2]
aws_instance.psawsec2: Destroying... [id=i-087b287e2e2e706bc]
aws_key_pair.deployer: Destruction complete after 0s
```


```
aws_key_pair.deployer: Destroying... [id=ps-key-pair2]
aws_instance.psawsec2: Destroying... [id=i-087b287e2e2e706bc]
aws_key_pair.deployer: Destruction complete after 0s
aws_instance.psawsec2: Still destroying... [id=i-087b287e2e2e706bc, 10s elapsed]
aws_instance.psawsec2: Still destroying... [id=i-087b287e2e2e706bc, 20s elapsed]
aws_instance.psawsec2: Still destroying... [id=i-087b287e2e2e706bc, 30s elapsed]
aws_instance.psawsec2: Still destroying... [id=i-087b287e2e2e706bc, 40s elapsed]
aws_instance.psawsec2: Still destroying... [id=i-087b287e2e2e706bc, 50s elapsed]
aws_instance.psawsec2: Still destroying... [id=i-087b287e2e2e706bc, 1m0s elapsed]
aws_instance.psawsec2: Still destroying... [id=i-087b287e2e2e706bc, 1m10s elapsed]
aws_instance.psawsec2: Still destroying... [id=i-087b287e2e2e706bc, 1m20s elapsed]
aws_instance.psawsec2: Destruction complete after 1m20s
aws_security_group.allow_ssh: Destroying... [id=sg-0aedddfdfafef0714]
aws_security_group.allow_ssh: Destruction complete after 1s

Destroy complete! Resources: 3 destroyed.
pavelcsegmail@ip-172-31-34-27:~/test/ec2project1$
```