Assignment-4:

Q) Create S3 bucket and upload a file in S3 bucket using terraform?

A) Terraform: It is an infrastructure as code tool that enables you to safely and predictably provision and manage infrastructure in any cloud.

Types of Blocks in Terraform;

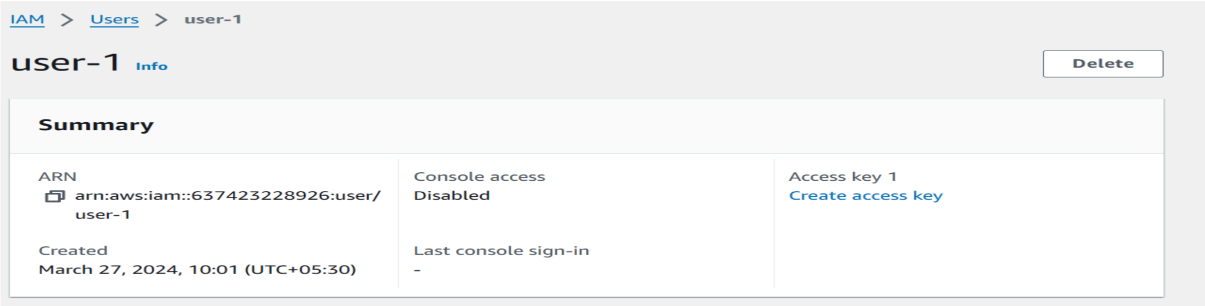
1. **Terraform Block** - It is used to define global configuration and behaviour for terraform execution.
2. **Provider Block** - Configuring the provider for a specific cloud or infrastructure platform.
3. **Data Block** - This block is used to fetch data from external sources or existing resources.
4. **Resource Block** - It is used to declare and define the provider for a specific cloud or infrastructure program.
5. **Module Block** - Defining and configuring reusable modules to encapsulate and manage infrastructure components.
6. **Variable Block** - Declaring input variables that can be provided during Terraform execution for flexible configurations.
7. **Output Block** - Defining values that are displayed as output after executing terraform apply
8. **Locals Block** - Declaring local variables within the Terraform configuration for easier code readability and reusability.

S3(Simple Storage Service): Amazon S3 is an object storage service that offers industry-leading scalability, data availability, security, and performance.

Store and protect any amount of data for a range of use cases, such as data lakes, websites, cloud-native applications, backups, archive, machine learning, and analytics.

Practical:

- Create a IAM user with administration access



Summary

ARN
arn:aws:iam::637423228926:user/user-1

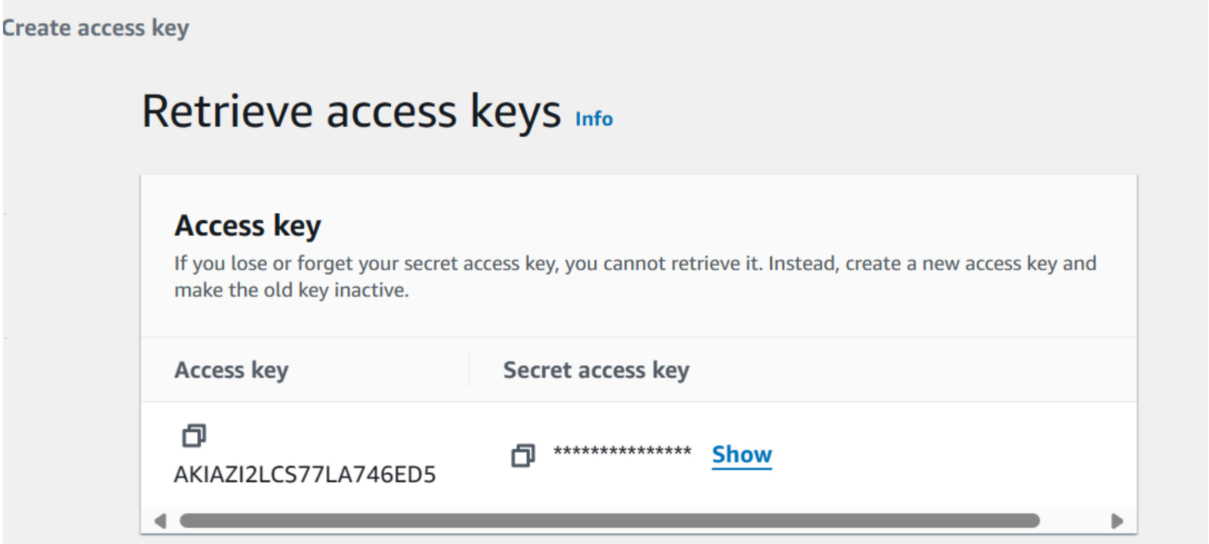
Created
March 27, 2024, 10:01 (UTC+05:30)

Console access
Disabled

Last console sign-in
-

Access key 1
Create access key

- Now create access key



Create access key

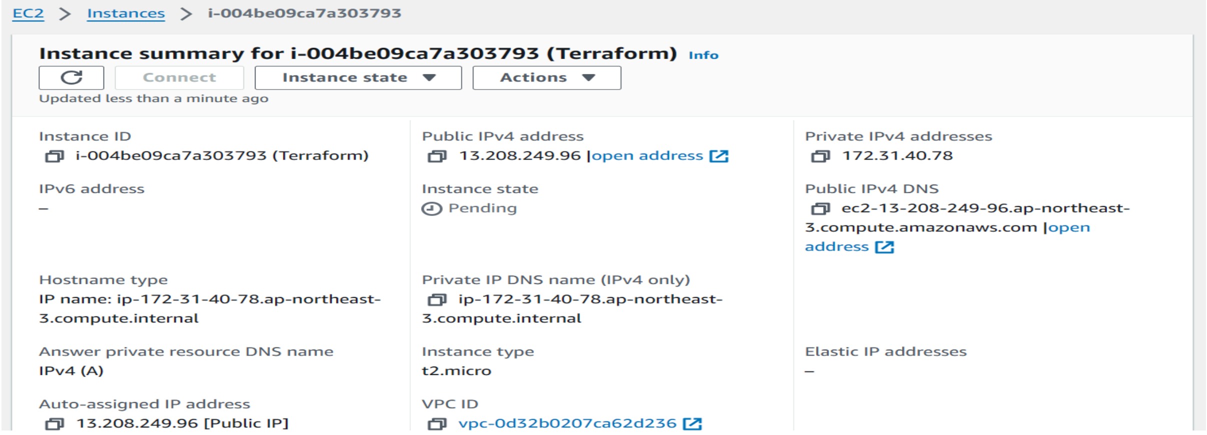
Retrieve access keys Info

Access key

If you lose or forget your secret access key, you cannot retrieve it. Instead, create a new access key and make the old key inactive.

Access key	Secret access key
AKIAZI2LCS77LA746ED5	*************** Show

- Lets launch the instance with all the required setting in an region



EC2 > Instances > i-004be09ca7a303793

Instance summary for i-004be09ca7a303793 (Terraform) Info

Updated less than a minute ago

Instance ID
i-004be09ca7a303793 (Terraform)

Public IPv4 address
13.208.249.96 |open address

Private IPv4 addresses
172.31.40.78

IPv6 address
–

Instance state
Pending

Public IPv4 DNS
ec2-13-208-249-96.ap-northeast-3.compute.amazonaws.com |open address

Hostname type
IP name: ip-172-31-40-78.ap-northeast-3.compute.internal

Private IP DNS name (IPv4 only)
ip-172-31-40-78.ap-northeast-3.compute.internal

Answer private resource DNS name
IPv4 (A)

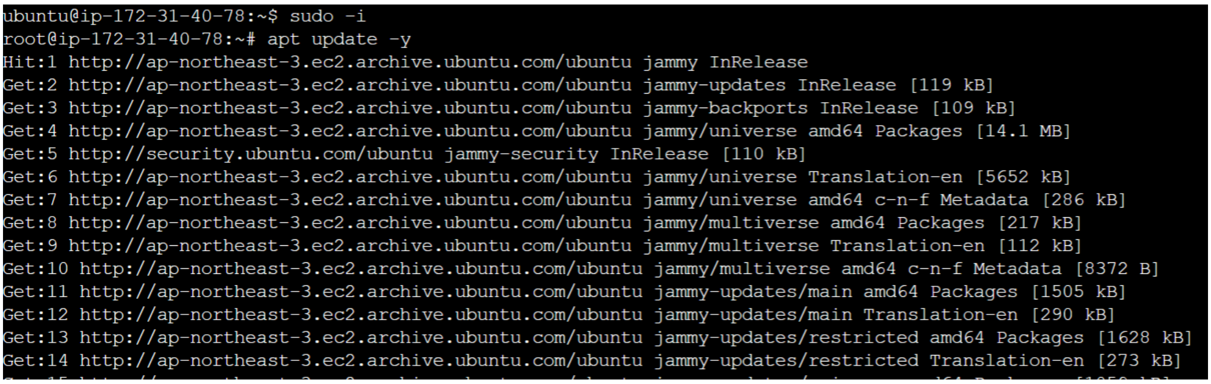
Instance type
t2.micro

Elastic IP addresses
–

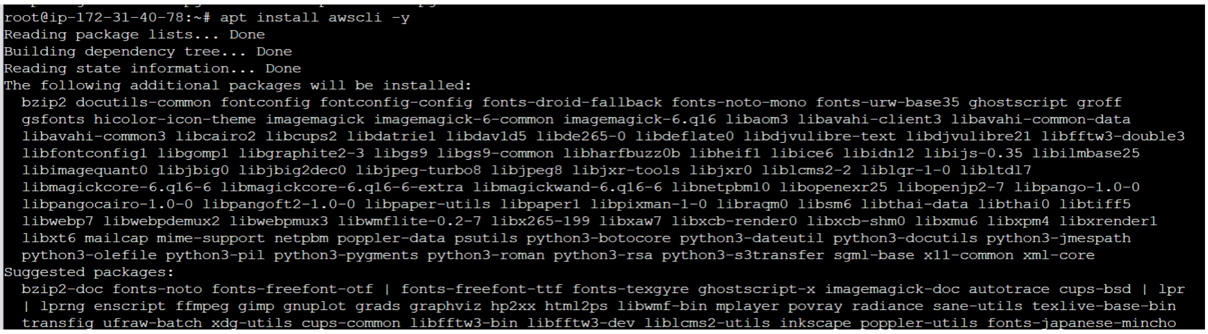
Auto-assigned IP address
13.208.249.96 [Public IP]

VPC ID
vpc-0d32b0207ca62d236

- Now Update application package and install awscli (command line interface)

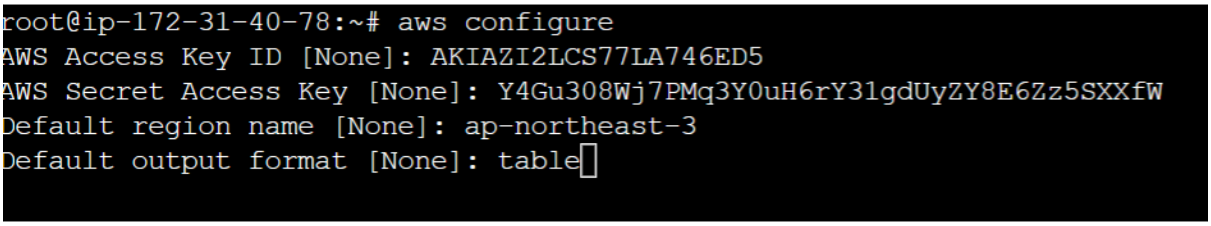


```
ubuntu@ip-172-31-40-78:~$ sudo -i
root@ip-172-31-40-78:~# apt update -y
Hit:1 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [109 kB]
Get:4 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:5 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:6 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:7 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:8 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:9 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:10 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:11 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1505 kB]
Get:12 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [290 kB]
Get:13 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [1628 kB]
Get:14 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [273 kB]
```



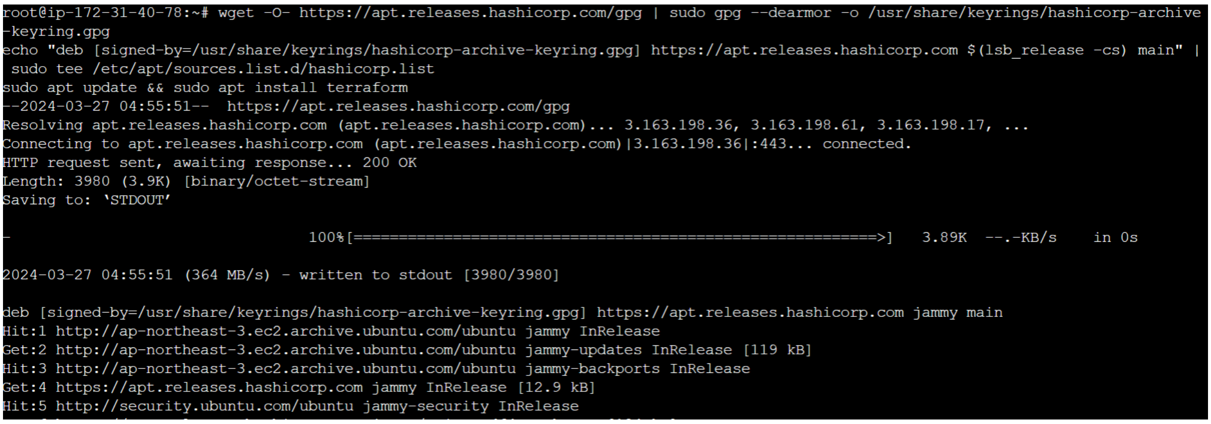
```
root@ip-172-31-40-78:~# apt install awscli -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  bzip2 docutils-common fontconfig fontconfig-config fonts-droid-fallback fonts-noto-mono fonts-urw-base35 ghostscript groff
  gsfonts hicolor-icon-theme imagemagick imagemagick-6-common imagemagick-6.q16 libaom3 libavahi-client3 libavahi-common-data
  libavahi-common3 libcairo2 libcups2 libdatrie1 libdav1d5 libde265-0 libdeflate0 libdjvulibre-text libdjvulibre21 libfftw3-double3
  libfontconfig1 libgomp1 libgraphite2-3 libgs9 libgs9-common libharfbuzz0b libheif1 libice6 libidn12 libijs-0.35 libilmbase25
  libimagequant0 libjbig0 libjbig2dec0 libjpeg-turbo8 libjpeg8 libjxr-tools libjxr0 liblcms2-2 liblqr-1-0 libltdl7
  libmagickcore-6.q16-6 libmagickcore-6.q16-6-extra libmagickwand-6.q16-6 libnetpbm10 libopenexr25 libopenjp2-7 libpango-1.0-0
  libpangocairo-1.0-0 libpangoft2-1.0-0 libpaper-utils libpaper1 libpixman-1-0 libraqm0 libsm6 libthai-data libthai0 libtiff5
  libwebp7 libwebpdemux2 libwebpmux3 libwmflite-0.2-7 libx265-199 libxaw7 libxcb-render0 libxcb-shm0 libxmu6 libxpm4 libxrender1
  libxt6 mailcap mime-support netpbm poppler-data psutils python3-botocore python3-dateutil python3-docutils python3-jmespath
  python3-olefile python3-pil python3-pygments python3-roman python3-rsa python3-s3transfer sgml-base x11-common xml-core
Suggested packages:
  bzip2-doc fonts-noto fonts-freefont-otf | fonts-freefont-ttf fonts-texgyre ghostscript-x imagemagick-doc autotrace cups-bsd | lpr
  | lprng enscript ffmpeg gimp gnuplot grads graphviz hp2xx html2ps libwmf-bin mplayer povray radiance sane-utils texlive-base-bin
  transfig ufraw-batch xdg-utils cups-common libfftw3-bin libfftw3-dev liblcms2-utils inkscape poppler-utils fonts-japanese-mincho
```

- By using Aws Configure we pass the access key & secret key to establish the connection over the aws resource.



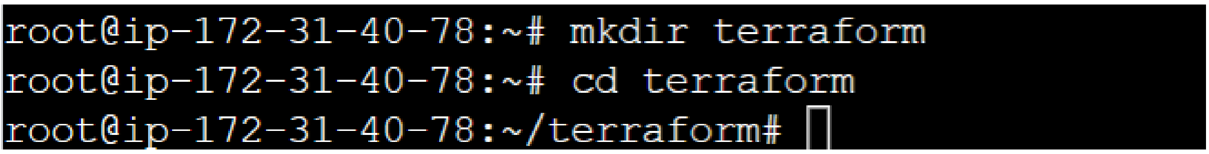
```
root@ip-172-31-40-78:~# aws configure
AWS Access Key ID [None]: AKIAZI2LCS77LA746ED5
AWS Secret Access Key [None]: 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
Default region name [None]: ap-northeast-3
Default output format [None]: table
```

- Install terraform from the hashicorp for ubuntu



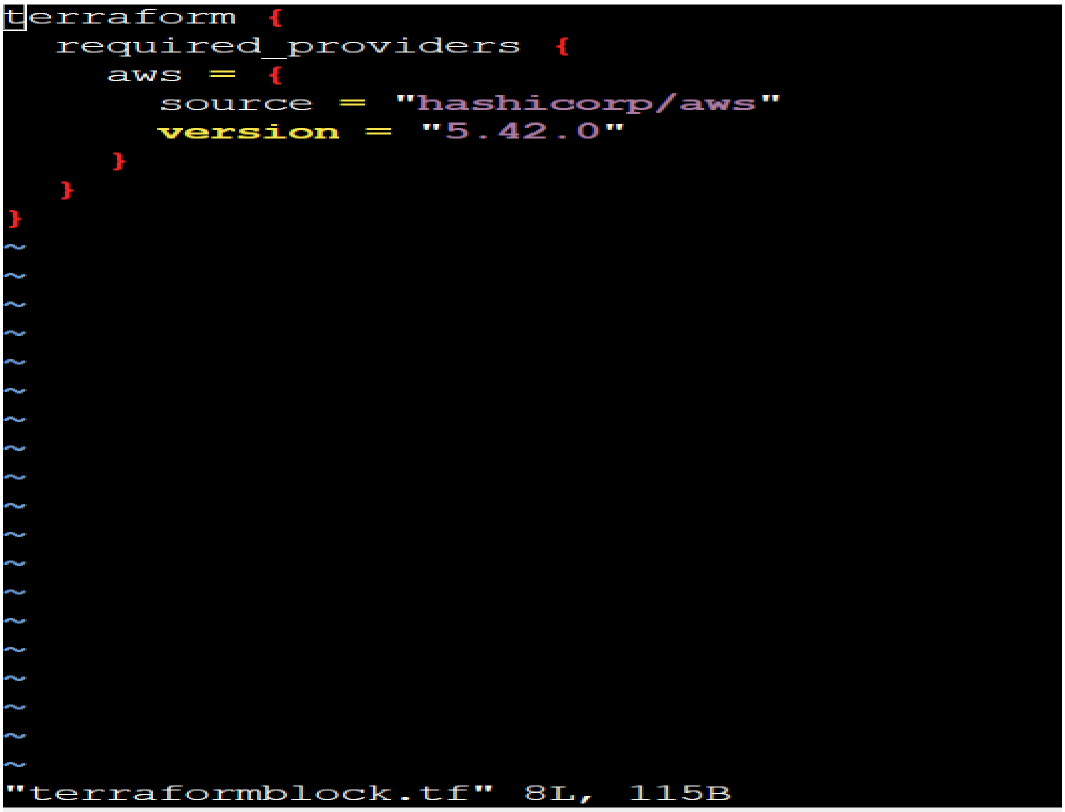
```
root@ip-172-31-40-78:~# wget -O- https://apt.releases.hashicorp.com/gpg | sudo gpg --dearmor -o /usr/share/keyrings/hashicorp-archive
-keyring.gpg
echo "deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.releases.hashicorp.com $(lsb_release -cs) main" |
 sudo tee /etc/apt/sources.list.d/hashicorp.list
sudo apt update && sudo apt install terraform
--2024-03-27 04:55:51--  https://apt.releases.hashicorp.com/gpg
Resolving apt.releases.hashicorp.com (apt.releases.hashicorp.com)... 3.163.198.36, 3.163.198.61, 3.163.198.17, ...
Connecting to apt.releases.hashicorp.com (apt.releases.hashicorp.com)|3.163.198.36|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3980 (3.9K) [binary/octet-stream]
Saving to: 'STDOUT'

-                                  100%[=========================================================>]   3.89K  --.-KB/s    in 0s

2024-03-27 04:55:51 (364 MB/s) - written to stdout [3980/3980]

deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg] https://apt.releases.hashicorp.com jammy main
Hit:1 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:3 http://ap-northeast-3.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:4 https://apt.releases.hashicorp.com jammy InRelease [12.9 kB]
Hit:5 http://security.ubuntu.com/ubuntu jammy-security InRelease
```

- Create a directory for terraform and cd (change-directory) to root to terraform



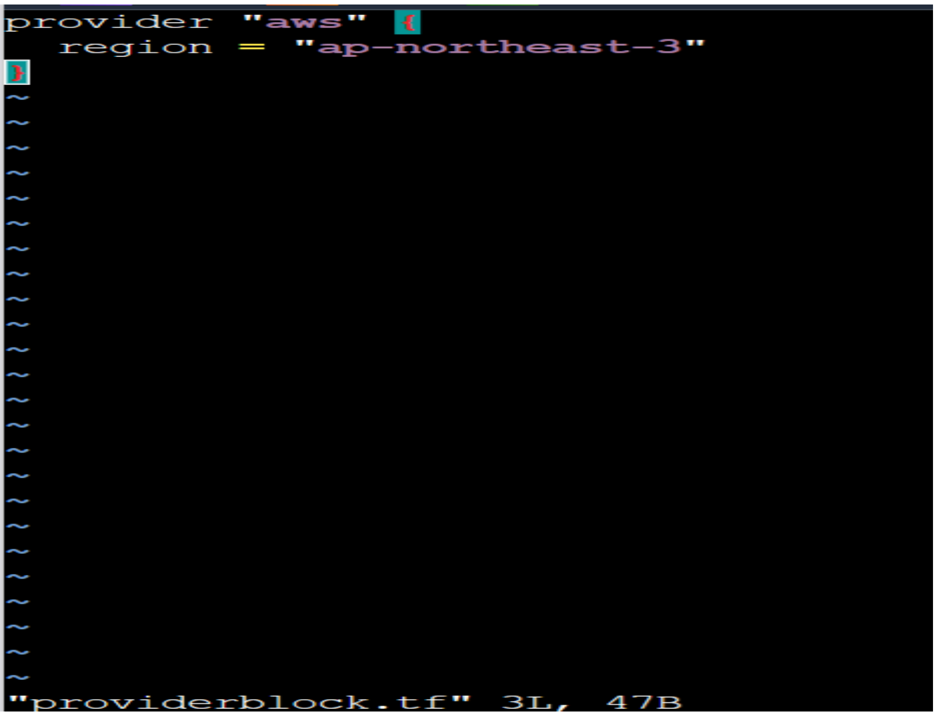
```
root@ip-172-31-40-78:~# mkdir terraform
root@ip-172-31-40-78:~# cd terraform
root@ip-172-31-40-78:~/terraform#
```

- Create a terraformblock.tf file for aws provider



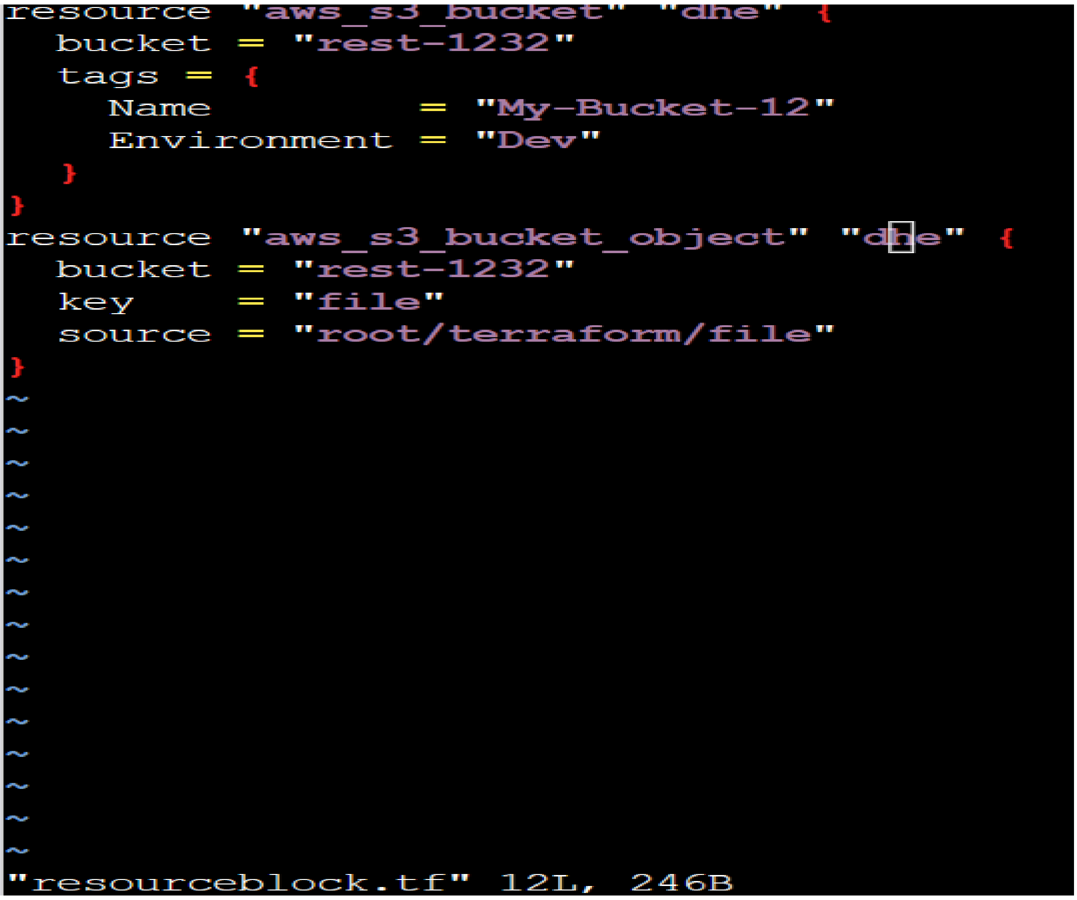
```
terraform {
  required_providers {
    aws = {
      source = "hashicorp/aws"
      version = "5.42.0"
    }
  }
}
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
"terraformblock.tf" 8L, 115B
```

- Create a Providerblock.tf



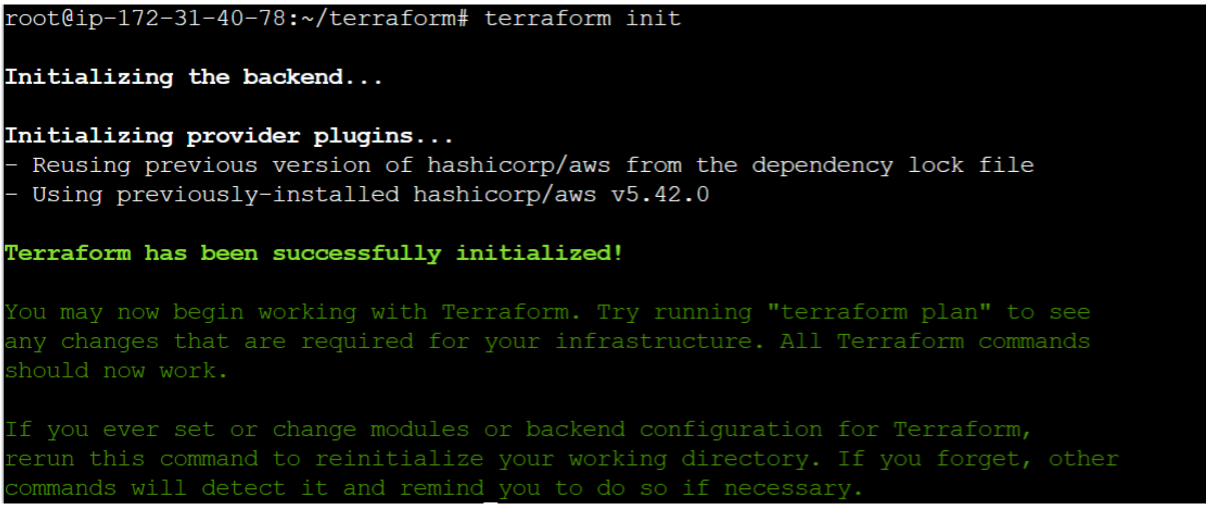
```
provider "aws" {
  region = "ap-northeast-3"
}
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
"providerblock.tf" 3L, 47B
```

- Create a resourceblock.tf for launching the s3 bucket and adding object to it

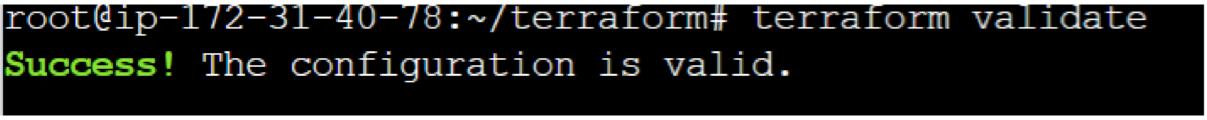


```
resource "aws_s3_bucket" "dhe" {
  bucket = "rest-1232"
  tags = {
    Name        = "My-Bucket-12"
    Environment = "Dev"
  }
}
resource "aws_s3_bucket_object" "dhe" {
  bucket = "rest-1232"
  key    = "file"
  source = "root/terraform/file"
}
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
"resourceblock.tf" 12L, 246B
```

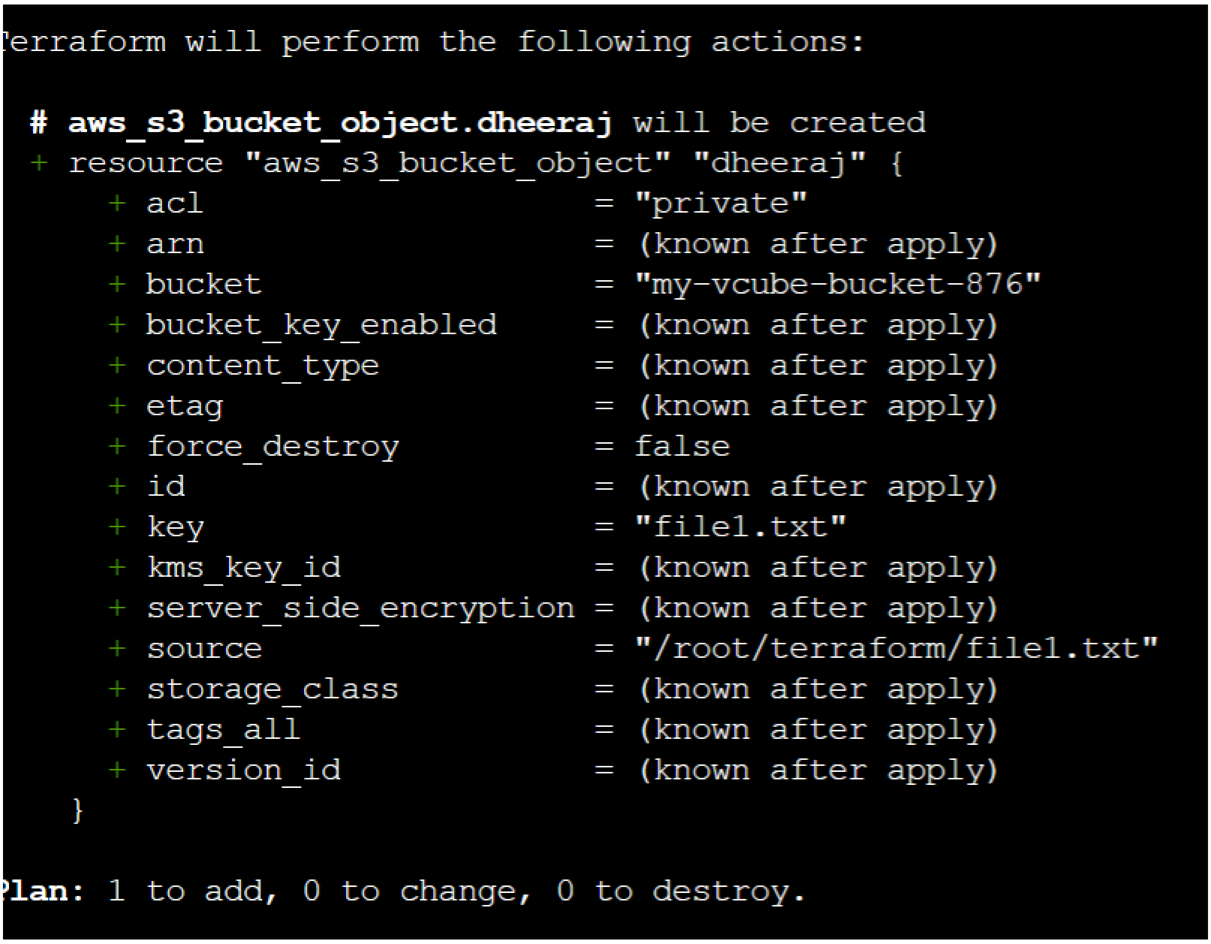
- Let init, validate, plan, and apply the task that needed to be done after the execution of terraform



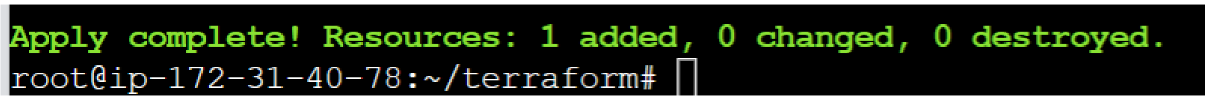
```
root@ip-172-31-40-78:~/terraform# terraform init

Initializing the backend...

Initializing provider plugins...
- Reusing previous version of hashicorp/aws from the dependency lock file
- Using previously-installed hashicorp/aws v5.42.0

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.
```



```
root@ip-172-31-40-78:~/terraform# terraform validate
Success! The configuration is valid.
```

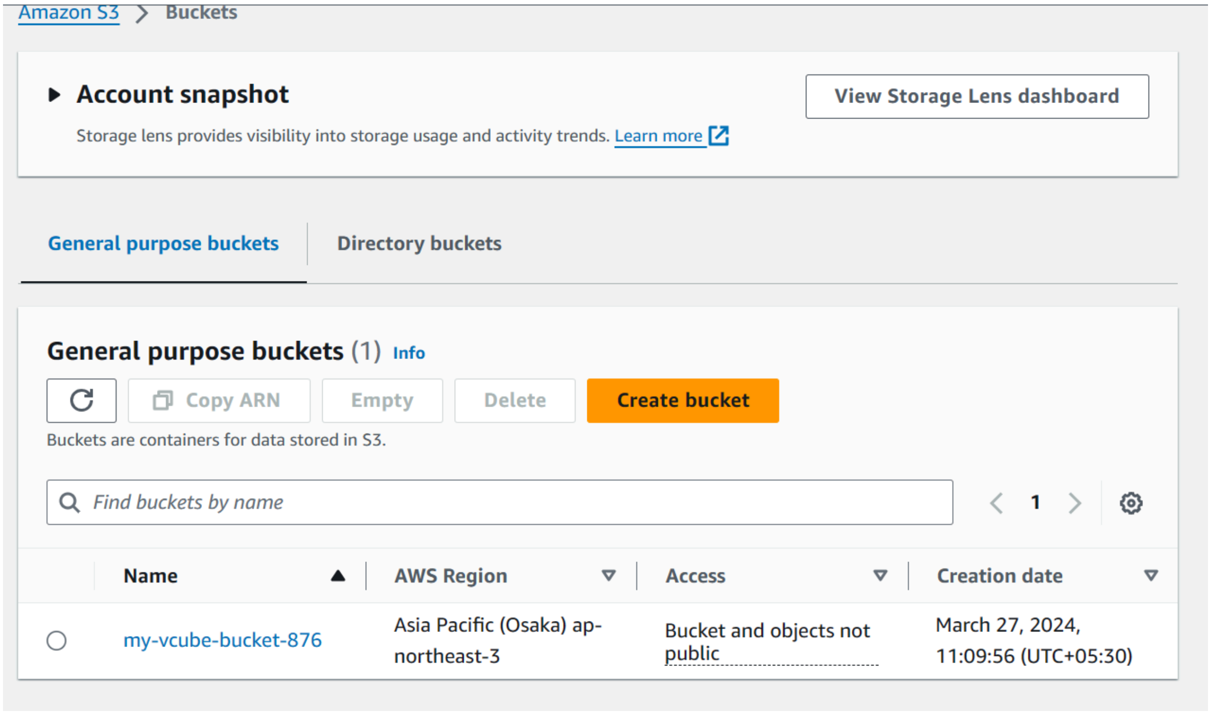


```
Terraform will perform the following actions:

  # aws_s3_bucket_object.dheeraj will be created
  + resource "aws_s3_bucket_object" "dheeraj" {
      + acl                    = "private"
      + arn                    = (known after apply)
      + bucket                 = "my-vcube-bucket-876"
      + bucket_key_enabled     = (known after apply)
      + content_type           = (known after apply)
      + etag                   = (known after apply)
      + force_destroy          = false
      + id                     = (known after apply)
      + key                    = "file1.txt"
      + kms_key_id             = (known after apply)
      + server_side_encryption = (known after apply)
      + source                 = "/root/terraform/file1.txt"
      + storage_class          = (known after apply)
      + tags_all               = (known after apply)
      + version_id             = (known after apply)
    }

Plan: 1 to add, 0 to change, 0 to destroy.
```



```
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
root@ip-172-31-40-78:~/terraform#
```

- Now we can see that S3 buckets is created with a new object

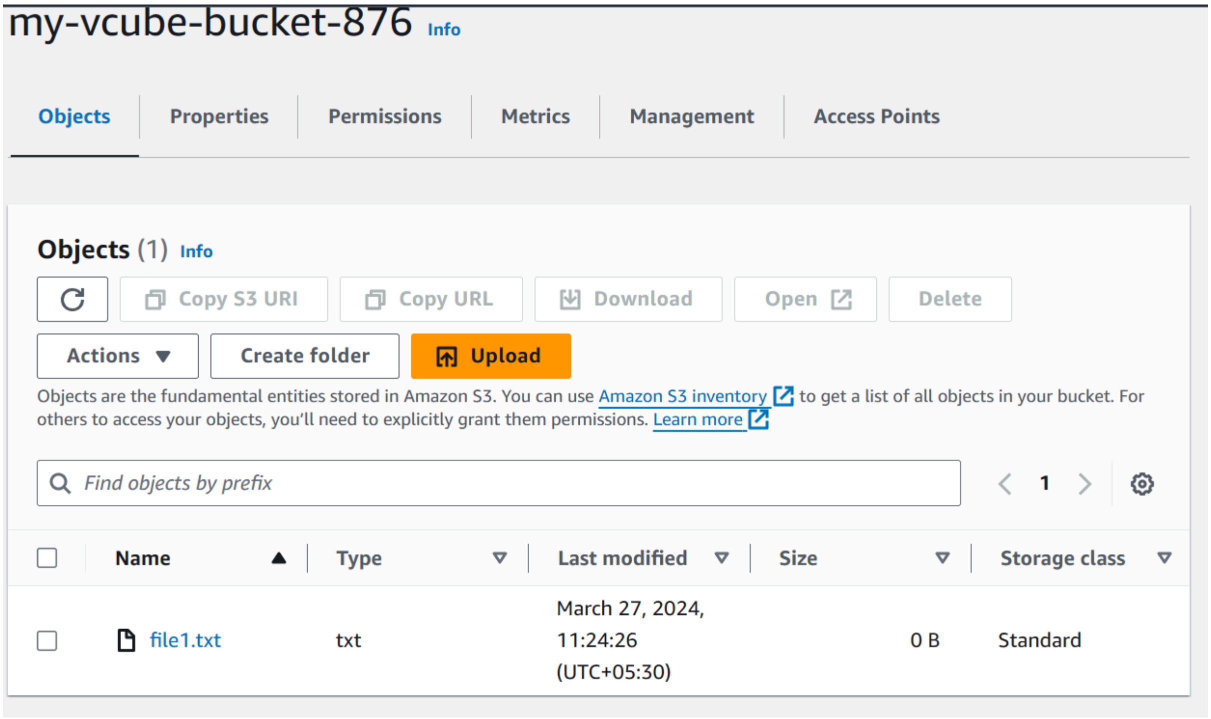


Storage lens provides visibility into storage usage and activity trends. Learn more

General purpose buckets (1) Info

Buckets are containers for data stored in S3.

	Name	AWS Region	Access	Creation date
○	my-vcube-bucket-876	Asia Pacific (Osaka) ap-northeast-3	Bucket and objects not public	March 27, 2024, 11:09:56 (UTC+05:30)



Objects (1) Info

Objects are the fundamental entities stored in Amazon S3. You can use Amazon S3 inventory to get a list of all objects in your bucket. For others to access your objects, you'll need to explicitly grant them permissions. Learn more

□	Name	Type	Last modified	Size	Storage class
□	file1.txt	txt	March 27, 2024, 11:24:26 (UTC+05:30)	0 B	Standard