What is Terraform?

Terraform is a tool for building, changing, and versioning infrastructure safely and efficiently. Terraform can manage existing and popular service providers as well as On-premise datacenters.

1. Terraform is popular IaC tool
2. It uses declarative configuration files for automation.

Infrastructure as Code

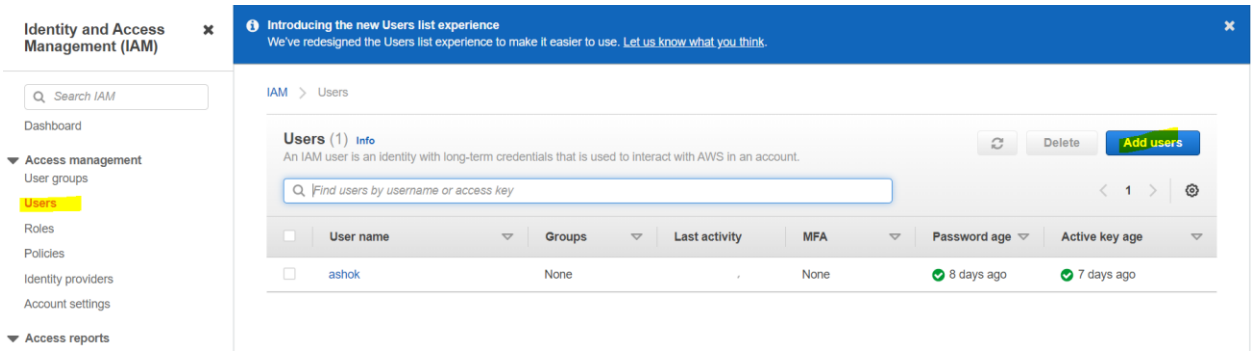
- It is a practice where we setup infrastructure using code
- Iac automates setting up infrastructure in cloud
- Using IaC we can recreate similar environments like dev, stg, prod
- We keep IaC in scm like git, it is easy to track infrastructure changes and it's easy to fix bugs.

Note: If you want to work as aws admin/architect strong knowledge on IaC is mandatory.
What are the tools available for implementing IaC?
1. Hashicorp Terraform (Open source and supports multiple cloud providers)
2. AWS cloudformation (This supports only in aws cloud)

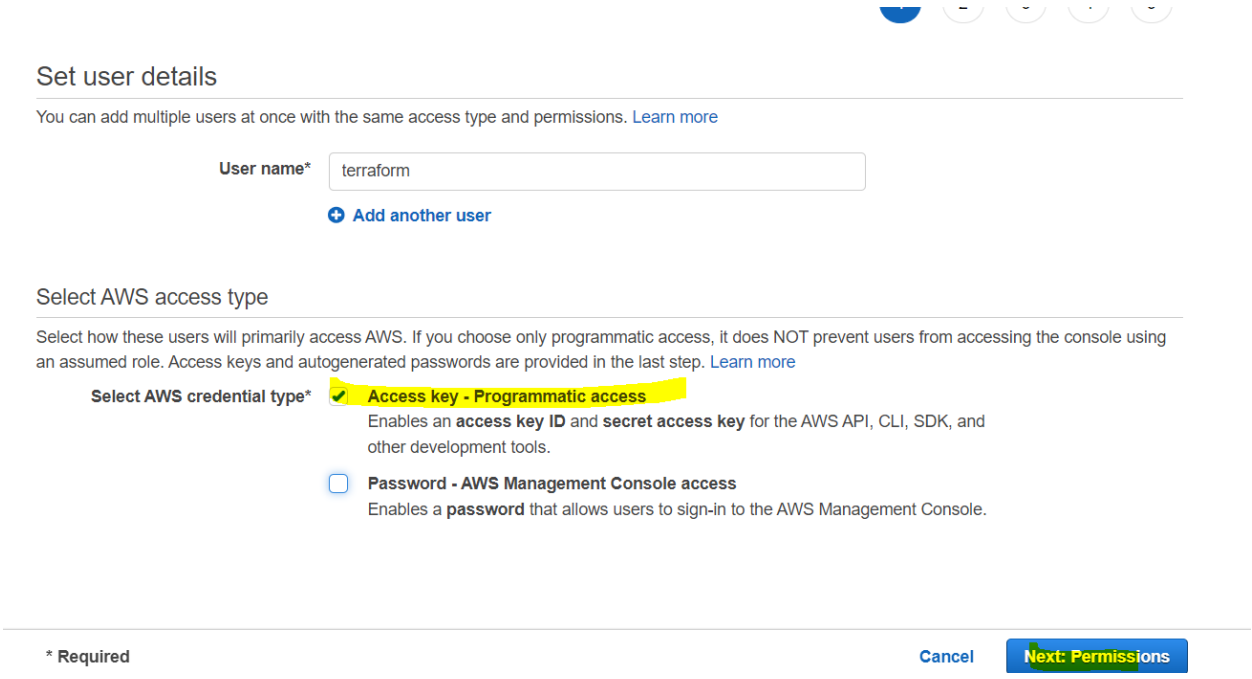
Aws User creation

create an IAM user with admin access on the AWS account. We are giving full admin access because using its access keys we will create AWS infra using terraform.

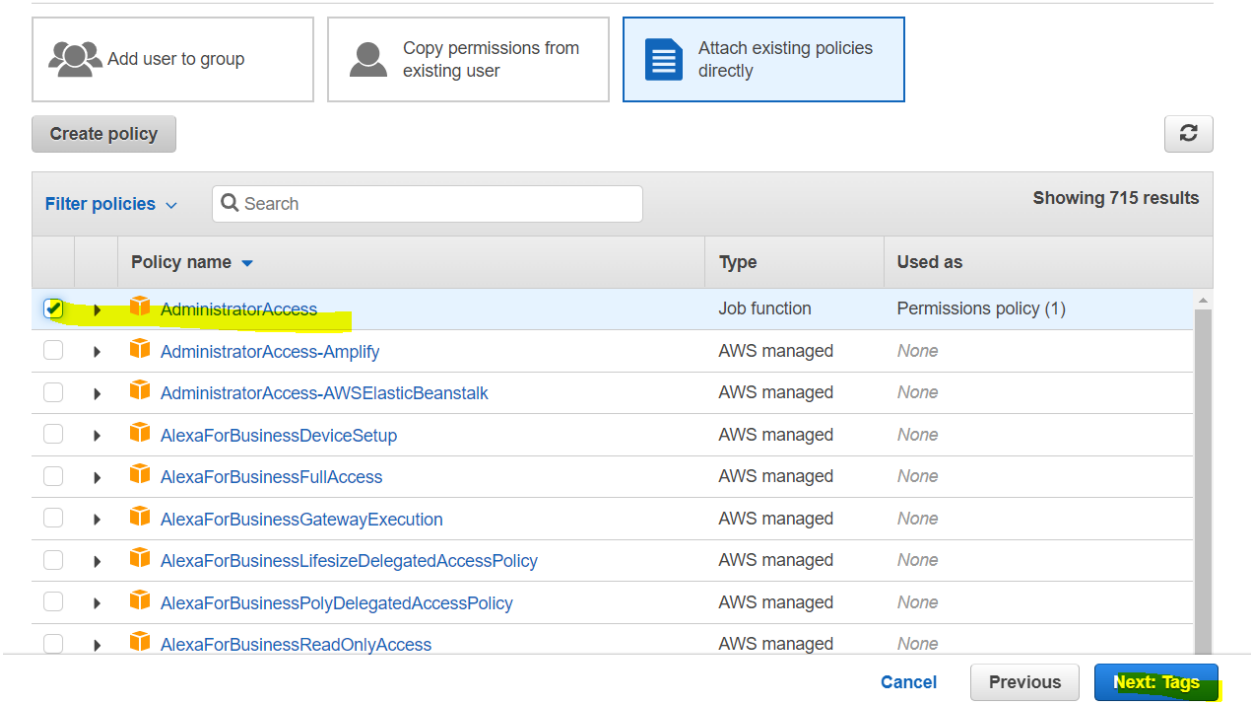
For this Go to AWS console –> Go to Services –> Go to IAM Service



Click on Users – Add User



Grant admin access to the user “terraform”, for this first create a group.



Review your choices. After you create the user, you can view and download the autogenerated password and access key.

User details

User name	terraform
AWS access type	Programmatic access - with an access key
Permissions boundary	Permissions boundary is not set

Permissions summary

The following policies will be attached to the user shown above.

Type	Name
Managed policy	AdministratorAccess

Tags

The new user will receive the following tag

Key	Value
terraform	(empty)

Cancel | Previous | Create user

Add user

1 2 3 4 5

Success

You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.

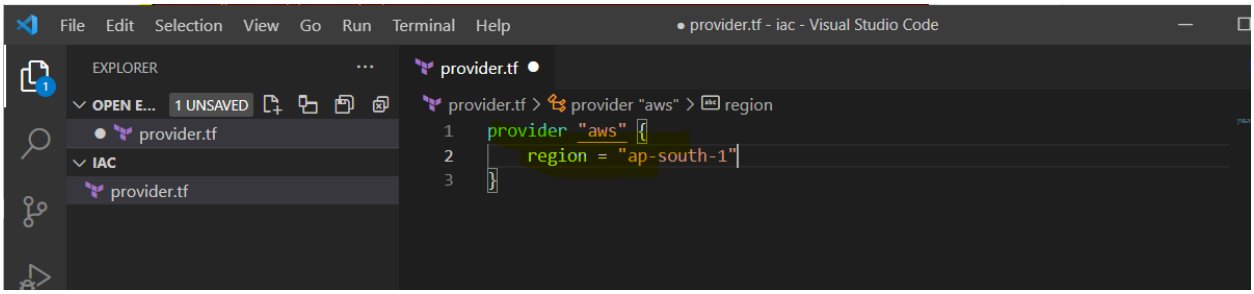
Users with AWS Management Console access can sign-in at: https://615086145317.signin.aws.amazon.com/console

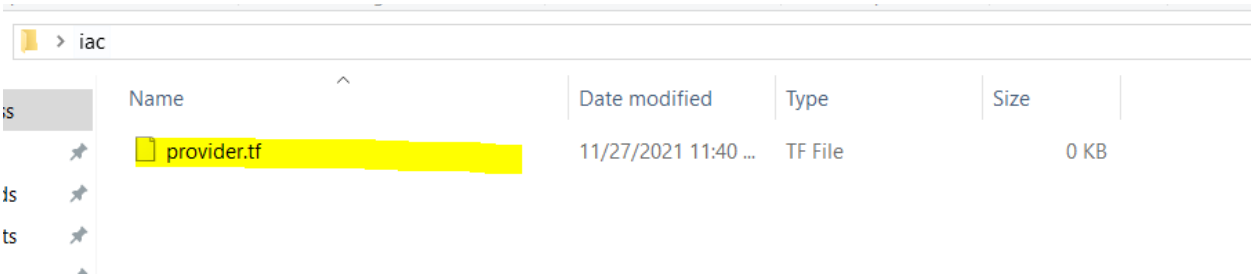
Download .csv

User	Access key ID	Secret access key
terraform	AKIAY6NP5X4SW6VRGB7I	******** Show

```
Administrator: Command Prompt
operable program or batch file.

C:\Windows\system32>aws configure
AWS Access Key ID [****************RTGY]: AKIAY6NP5X4SW6VRGB7I
AWS Secret Access Key [****************4Mo0]: 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
Default region name [ap-south-1]: ap-south-1
Default output format [text]:

C:\Windows\system32>
```

Open the Visual studio like below





Refer below link for terraform documentation

https://registry.terraform.io/providers/hashicorp/aws/latest/docs

terraform init

Initialize terraform project with provider plugins

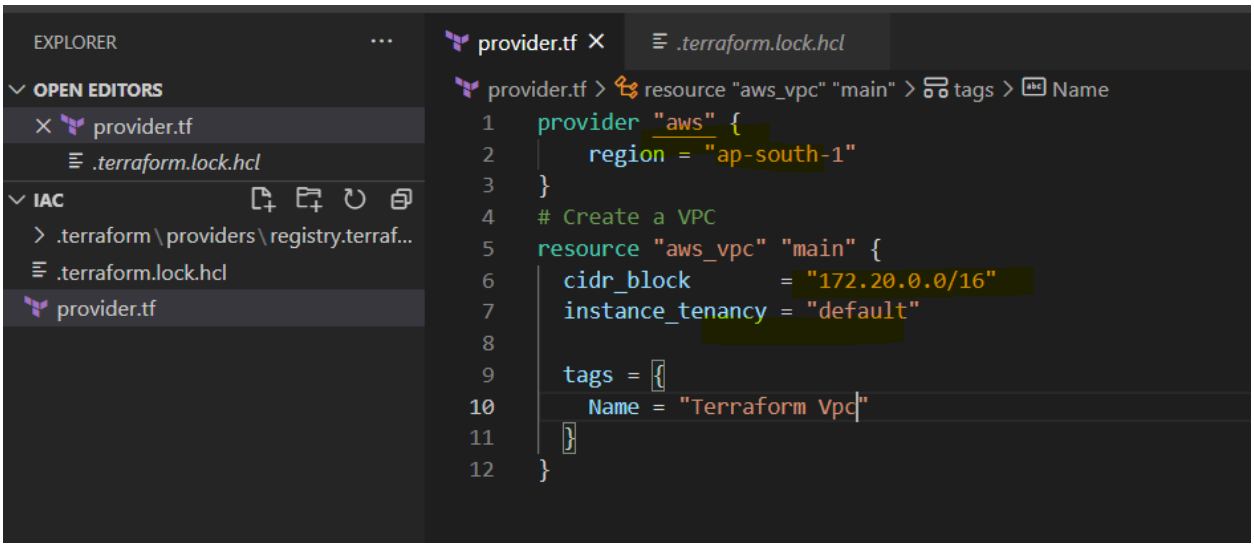
Run the following command from project root

The above command executed while initializing the project and some special cases only

```
C:\Users\Admin\Desktop\iac>terraform init

[0m[1mInitializing the backend...[0m

[0m[1mInitializing provider plugins...[0m
- Finding latest version of hashicorp/aws...
- Installing hashicorp/aws v3.67.0...
- Installed hashicorp/aws v3.67.0 (signed by HashiCorp)

Terraform has created a lock file [1m.terraform.lock.hcl[0m 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.[0m

[0m[1m[32mTerraform has been successfully initialized![0m[32m[0m
[0m[32m
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.[0m
```

Creating VPC on aws

My Vpc terraform code

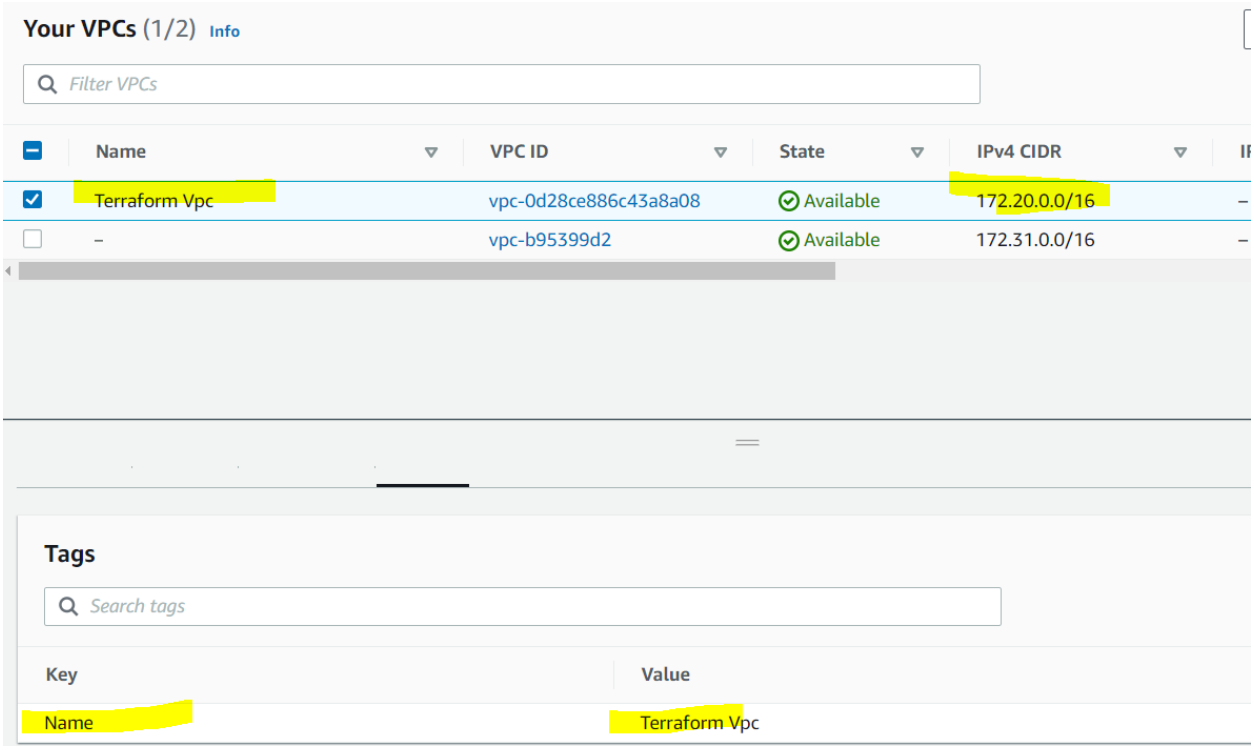


Creating our first AWS resource through terraform

terraform apply

```
C:\Users\Admin\Desktop\iac>terraform apply

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
  [32m+[0m create
[0m
Terraform will perform the following actions:

[1m  # aws_vpc.main[0m will be created[0m[0m
[0m  [32m+[0m[0m resource "aws_vpc" "main" {
      [32m+[0m [0m[0m[1m[0marn[0m[0m                                = (known after apply)
      [32m+[0m [0m[0m[1m[0massign_generated_ipv6_cidr_block[0m[0m[0m = false
      [32m+[0m [0m[0m[1m[0mcidr_block[0m[0m[0m                      = "172.20.0.0/16"
      [32m+[0m [0m[0m[1m[0mdefault_network_acl_id[0m[0m[0m          = (known after apply)
      [32m+[0m [0m[0m[1m[0mdefault_route_table_id[0m[0m[0m          = (known after apply)
      [32m+[0m [0m[0m[1m[0mdefault_security_group_id[0m[0m[0m       = (known after apply)
      [32m+[0m [0m[0m[1m[0mdhcp_options_id[0m[0m[0m                 = (known after apply)
      [32m+[0m [0m[0m[1m[0menable_classiclink[0m[0m[0m              = (known after apply)
      [32m+[0m [0m[0m[1m[0menable_classiclink_dns_support[0m[0m[0m  = (known after apply)
      [32m+[0m [0m[0m[1m[0menable_dns_hostnames[0m[0m[0m            = (known after apply)
      [32m+[0m [0m[0m[1m[0menable_dns_support[0m[0m[0m              = true
      [32m+[0m [0m[0m[1m[0mid[0m[0m[0m                             = (known after apply)
      [32m+[0m [0m[0m[1m[0minstance_tenancy[0m[0m[0m               = "default"
      [32m+[0m [0m[0m[1m[0mipv6_association_id[0m[0m[0m            = (known after apply)
      [32m+[0m [0m[0m[1m[0mipv6_cidr_block[0m[0m[0m                = (known after apply)
      [32m+[0m [0m[0m[1m[0mmain_route_table_id[0m[0m[0m            = (known after apply)
      [32m+[0m [0m[0m[1m[0mowner_id[0m[0m[0m                       = (known after apply)
      [32m+[0m [0m[0m[1m[0mtags[0m[0m[0m                           = {
          [32m+[0m [0m"Name" = "Terraform Vpc"
        }
      [32m+[0m [0m[0m[1m[0mtags_all[0m[0m[0m                       = {
          [32m+[0m [0m"Name" = "Terraform Vpc"
        }
    }

[0m[1mPlan:[0m 1 to add, 0 to change, 0 to destroy.
[0m[0m[1m
Do you want to perform these actions?[0m
  Terraform will perform the actions described above.
  Only 'yes' will be accepted to approve.

  [1mEnter a value:[0m [0myes

[0m[1maws_vpc.main: Creating...[0m[0m
[0m[1maws_vpc.main: Creation complete after 2s [id=vpc-0d28ce886c43a8a08][0m
[0m[1m[32m
Apply complete! Resources: 1 added, 0 changed, 0 destroyed.
[0m
```

Verify on Aws Console


Your VPCs (1/2) Info
Filter VPCs
Name
VPC ID
State
IPv4 CIDR
Terraform Vpc
vpc-0d28ce886c43a8a08
Available
172.20.0.0/16
–
vpc-b95399d2
Available
172.31.0.0/16
Tags
Search tags
Key
Value
Name
Terraform Vpc