

Assignment-1

SPCM

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B.TECH-CSE-DEVOPS

Terraform scripts to perform following tasks on AWS cloud Platform

1. Creating two T2 micro ec2 instances
2. Creating a VPN on AWS
3. Creating a S3 bucket

Steps:

1. Configure your aws credentials using aws configure

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

PS C:\Users\hp\Desktop\Sem VII\spcm> aws configure
AWS Access Key ID [*****7LOQ]: AKIAJSKUG4DCLUHJJYOQ
AWS Secret Access Key [*****9QF1]: xQqM4lAw9XG85pbx18leyCCuL0oSb2ii9bamaeOB
Default region name [ap-south-1]:
Default output format [None]:
```

Get your security credentials (secret and access key) from aws console

Your Security Credentials

Use this page to manage the credentials for your AWS account. To manage credentials for AWS Identity and Access Management (IAM) users, use the IAM Console.

To learn more about the types of AWS credentials and how they're used, see [AWS Security Credentials](#) in AWS General Reference.

▲ Password

▲ Multi-factor authentication (MFA)

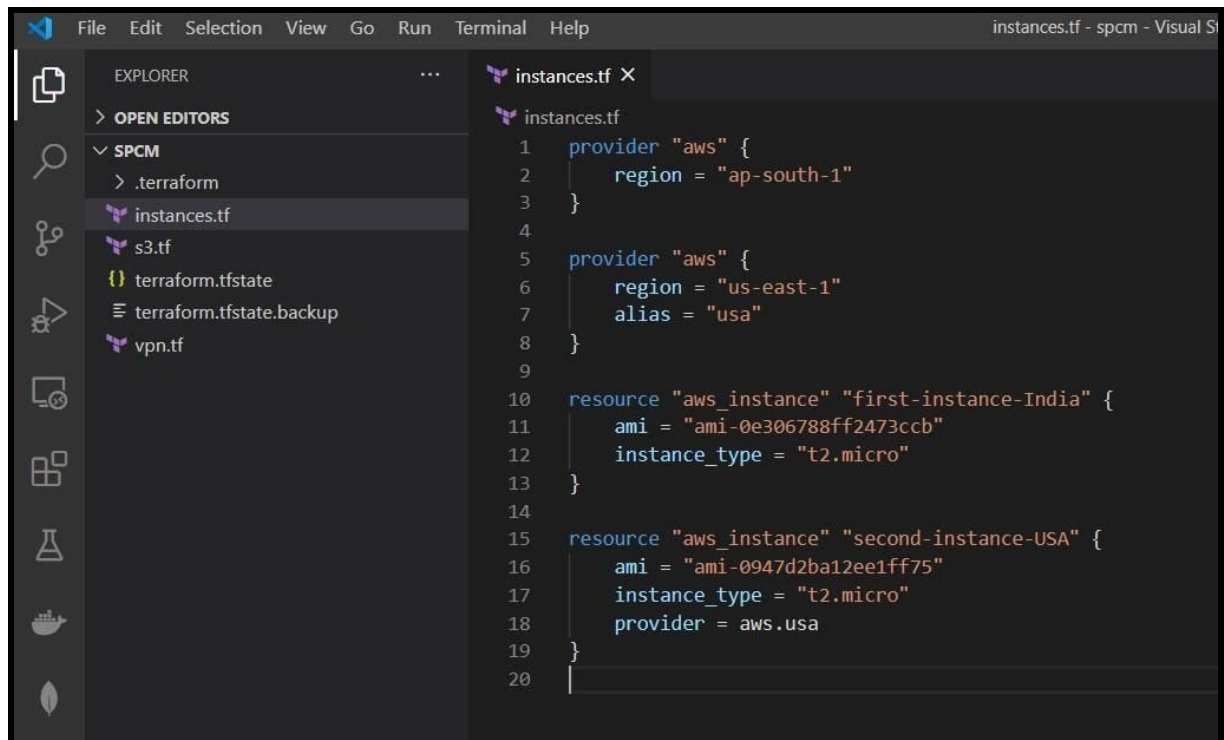
▼ Access keys (access key ID and secret access key)

Use access keys to make programmatic calls to AWS from the AWS CLI, Tools for PowerShell, the AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time. [Learn more](#)

Created	Access Key ID	Last Used	Last Used Region	Last Used Service	Status	Actions
Nov 18th 2020	AKIAIYHLVQZ4MLYU7PA	N/A	N/A	N/A	Active	Make Inactive Delete
Nov 18th 2020	AKIAJULJE53DJHO7ZHTQ	2020-11-18 15:37 UTC+0530	us-east-1	ec2	Active	Make Inactive Delete

[Create New Access Key](#)

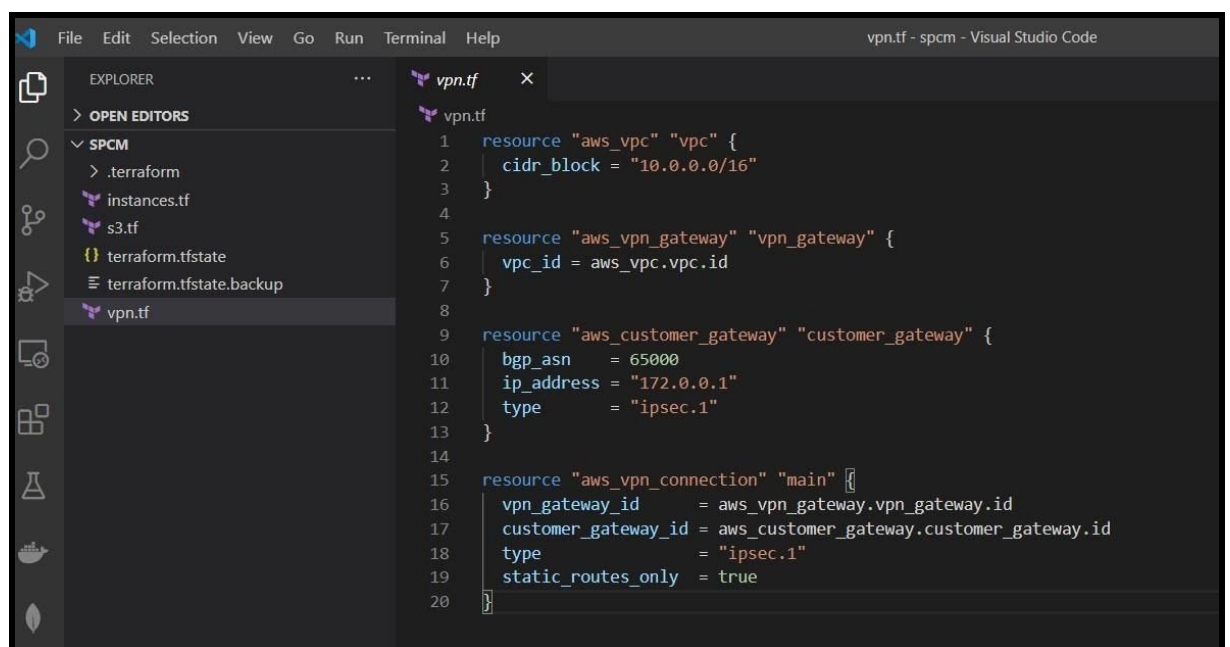
2. creating terraform scripts to fulfill above mentioned tasks



```
instances.tf
1 provider "aws" {
2   region = "ap-south-1"
3 }
4
5 provider "aws" {
6   region = "us-east-1"
7   alias = "usa"
8 }
9
10 resource "aws_instance" "first-instance-India" {
11   ami = "ami-0e306788ff2473ccb"
12   instance_type = "t2.micro"
13 }
14
15 resource "aws_instance" "second-instance-USA" {
16   ami = "ami-0947d2ba12ee1ff75"
17   instance_type = "t2.micro"
18   provider = aws.usa
19 }
20
```

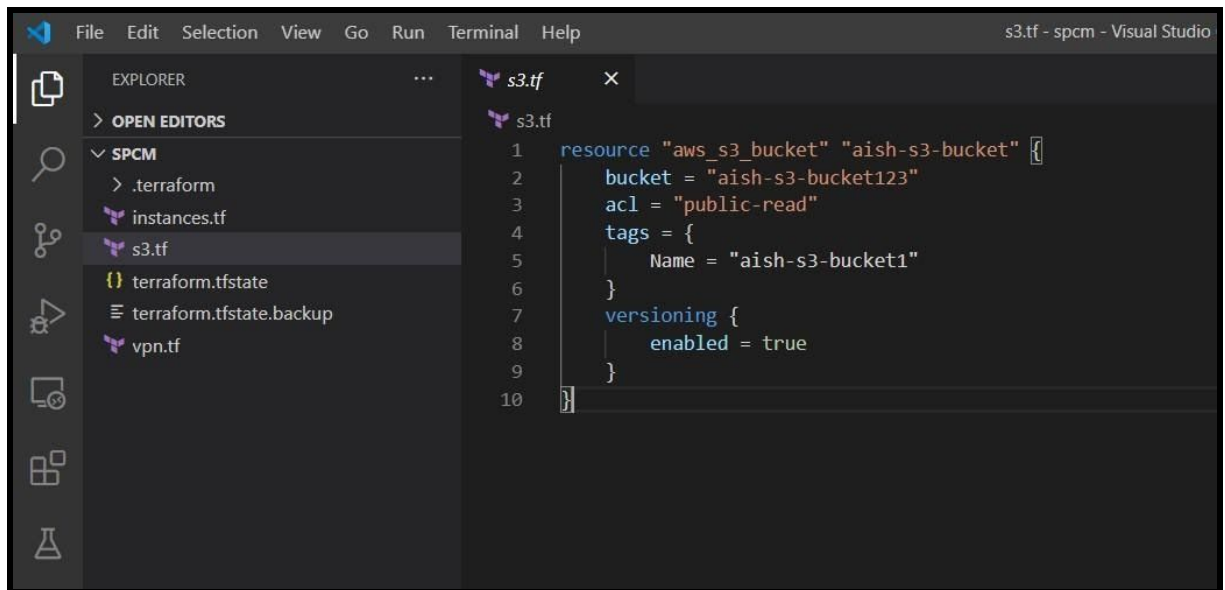
We create 2 aws providers, one in ap-south-1(Mumbai region) which is the default region and the other in us-east-1(Virginia region - USA)

- Creating VPN



```
vpn.tf
1 resource "aws_vpc" "vpc" {
2   cidr_block = "10.0.0.0/16"
3 }
4
5 resource "aws_vpn_gateway" "vpn_gateway" {
6   vpc_id = aws_vpc.vpc.id
7 }
8
9 resource "aws_customer_gateway" "customer_gateway" {
10   bgp_asn = 65000
11   ip_address = "172.0.0.1"
12   type = "ipsec.1"
13 }
14
15 resource "aws_vpn_connection" "main" {
16   vpn_gateway_id = aws_vpn_gateway.vpn_gateway.id
17   customer_gateway_id = aws_customer_gateway.customer_gateway.id
18   type = "ipsec.1"
19   static_routes_only = true
20 }
```

- Creating S3 bucket

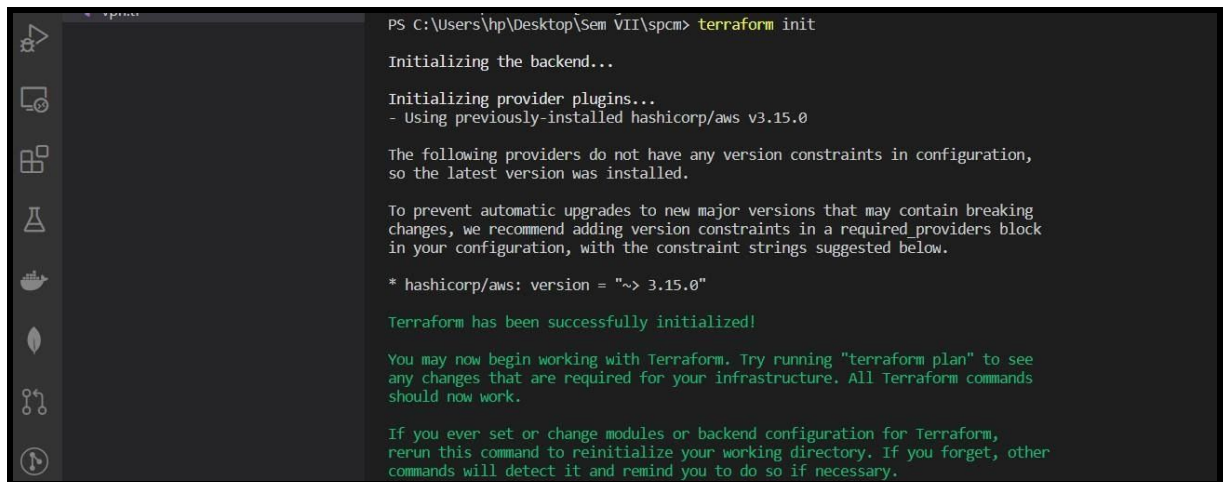


The screenshot shows the Visual Studio interface with the Explorer pane on the left displaying the project structure. The file `s3.tf` is selected. The main editor pane shows the content of `s3.tf`:

```
1 resource "aws_s3_bucket" "aish-s3-bucket" {  
2     bucket = "aish-s3-bucket123"  
3     acl = "public-read"  
4     tags = {  
5         Name = "aish-s3-bucket1"  
6     }  
7     versioning {  
8         enabled = true  
9     }  
10 }
```

3. we will initialise , validate , plan , apply terraform which is installed on your system by running the following commands:

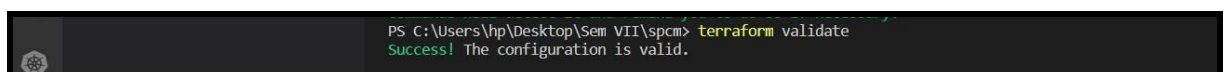
Terraform init



The screenshot shows a PowerShell terminal window with the following output for the `terraform init` command:

```
PS C:\Users\hp\Desktop\Sem VII\spcm> terraform init  
  
Initializing the backend...  
  
Initializing provider plugins...  
- Using previously-installed hashicorp/aws v3.15.0  
  
The following providers do not have any version constraints in configuration,  
so the latest version was installed.  
  
To prevent automatic upgrades to new major versions that may contain breaking  
changes, we recommend adding version constraints in a required_providers block  
in your configuration, with the constraint strings suggested below.  
  
* hashicorp/aws: version = "~> 3.15.0"  
  
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.
```

Terraform validate



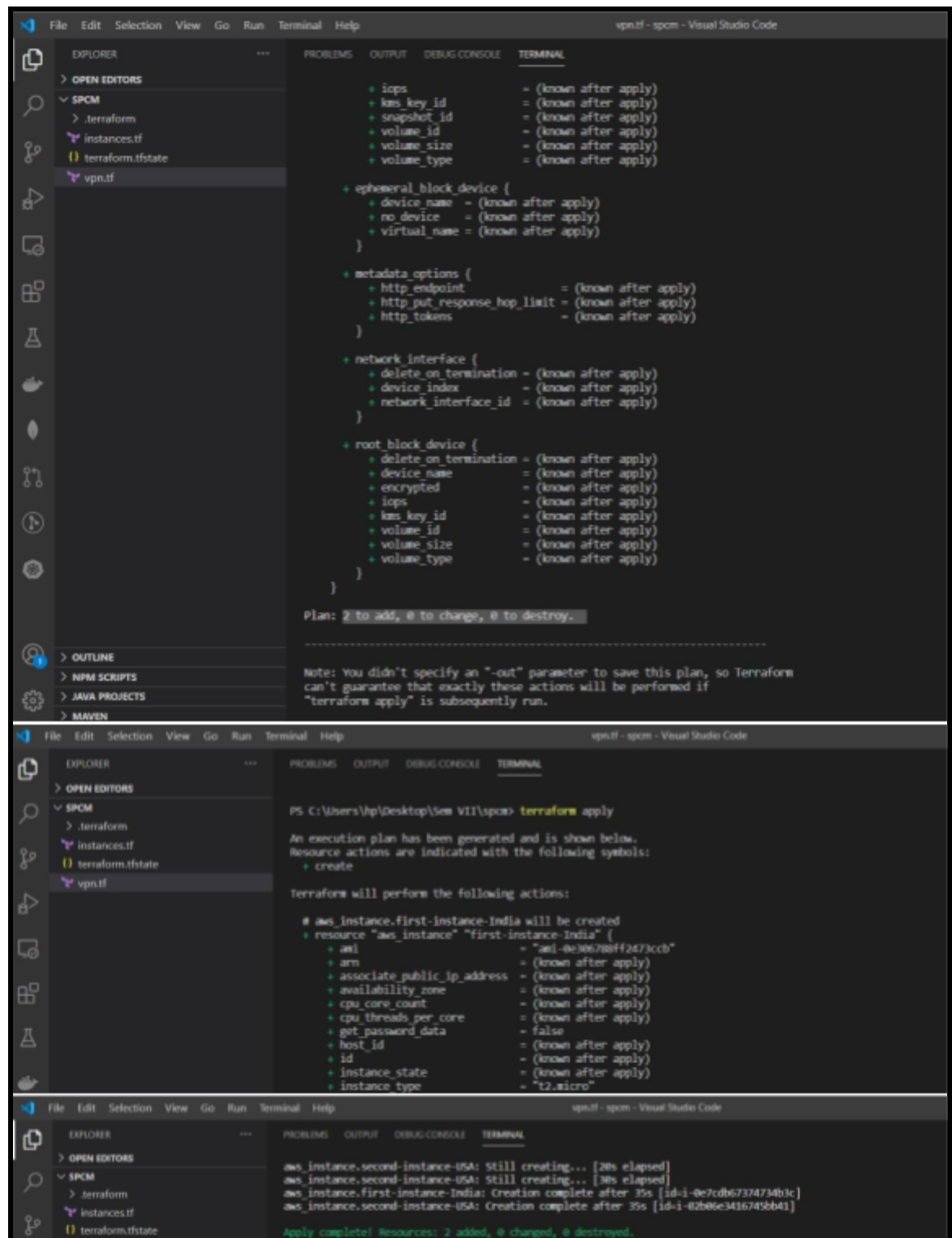
The screenshot shows a PowerShell terminal window with the following output for the `terraform validate` command:

```
PS C:\Users\hp\Desktop\Sem VII\spcm> terraform validate  
Success! The configuration is valid.
```

Terraform plan

```
PS C:\Users\hp\Desktop\Sem VII\spcm> terraform plan
Refreshing Terraform state in-memory prior to plan...
The refreshed state will be used to calculate this plan, but will not be
persisted to local or remote state storage.
```

Terraform apply



The first screenshot shows the Visual Studio Code interface with the Explorer pane on the left displaying the file structure of a project named 'SPCM'. The file 'vpn.tf' is selected. The Terminal pane on the right shows the output of the 'terraform plan' command, which lists the resources to be added, changed, or destroyed. The resources include 'iops', 'kms_key_id', 'snapshot_id', 'volume_id', 'volume_size', 'volume_type', 'ephemeral_block_device', 'metadata_options', 'network_interface', and 'root_block_device'. The plan indicates that all these resources will be added ('+').

The second screenshot shows the Visual Studio Code interface with the Explorer pane on the left displaying the file structure of a project named 'SPCM'. The file 'vpn.tf' is selected. The Terminal pane on the right shows the output of the 'terraform apply' command. It indicates that an execution plan has been generated and is shown below. The plan shows that the resource 'aws_instance' will be created. The plan also shows that the resource 'aws_instance' will be created. The plan also shows that the resource 'aws_instance' will be created.

The third screenshot shows the Visual Studio Code interface with the Explorer pane on the left displaying the file structure of a project named 'SPCM'. The file 'vpn.tf' is selected. The Terminal pane on the right shows the output of the 'terraform apply' command. It indicates that an execution plan has been generated and is shown below. The plan shows that the resource 'aws_instance' will be created. The plan also shows that the resource 'aws_instance' will be created. The plan also shows that the resource 'aws_instance' will be created.

- the instances, VPN and S3 bucket have been created on your AWS cloud. One t2-micro ec2-instance is created in Mumbai region and the other in N. Virginia region.

The image displays three screenshots of the AWS Management Console, illustrating the setup of various AWS services.

Top Screenshot: EC2 Instances

The console shows the 'Instances' page with two running t2.micro instances. The filter 'Instance state: running' is applied. The table lists the instances with their names, IDs, states, types, status checks, alarm statuses, availability zones, and public IP addresses.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IP
jenkins_insta...	i-0F264579bd714b80a	Running	t2.micro	Initializing	No alarms	us-east-1c	ec2-54-24...
jenkins_insta...	i-04bc9d88af95671fc	Running	t2.micro	Initializing	No alarms	us-east-1c	ec2-54-22...

Middle Screenshot: Customer Gateway

The console shows the 'Customer Gateway' page with one available gateway. The table lists the gateway with its name, ID, state, type, IP address, BGP ASN, and certificate ARN.

Name	ID	State	Type	IP Address	BGP ASN	Certificate ARN
cpw-9d61170f6e8586	cpw-9d61170f6e8586	available	ipsec.1	172.16.0.1	65502	

Bottom Screenshot: Amazon S3 Buckets

The console shows the 'Buckets' page with one bucket. The table lists the bucket with its name, region, access, and creation date.

Name	Region	Access	Creation date
s3bucket7995	US East (N. Virginia) us-east-1	Objects can be public	November 18, 2020, 15:19 (UTC+05:30)