



BYOD 2

CSV -205

Reg No: 12303493

Part 1: Project Setup & Remote State Management (25 Marks)

This part focuses on establishing a collaborative and stable environment before creating any infrastructure.

1. Provider & Versioning (5 Marks)

- Create a providers.tf file.
- Configure the aws provider with a constraint to use a stable version (~> 5.0 or later).
- Use a terraform block to enforce a minimum Terraform version (e.g., required_version = ">= 1.3.0").

2. AWS Remote Backend Setup (15 Marks)

- **Prerequisite:** The S3 bucket and DynamoDB table must exist before running terraform init. You must create these resources manually using the AWS Console or AWS CLI.
 - o **S3 Bucket:** Name it [your-name]-terraform-state-bucket.
 - o **DynamoDB Table:** Name it [your-name]-terraform-lock-table with the primary key LockID (String type).
- Create a dedicated file named **backend.tf**.
- Configure the s3 backend within the terraform block in backend.tf.
 - o Use your newly created bucket and table names.
 - o Set the state file key to "prod/webserver/terraform.tfstate".
 - o Set the region to us-east-1 (or your preferred region).
 - o **Security:** Enable encrypt for server-side encryption.

3. Initialization (5 Marks)

- Run terraform init.
- **Deliverable:** A screenshot showing a successful initialization that explicitly states: "Successfully configured the backend 's3'."

```
> terraform init -reconfigure
Initializing the backend...
```

Successfully configured the backend "s3"! Terraform will automatically use this backend unless the backend configuration changes.

Initializing provider plugins...

- Reusing previous version of hashicorp/aws from the dependency lock file
- Using previously-installed hashicorp/aws v6.26.0

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.

Part 2: Networking (30 Marks)

Build the necessary network plumbing.

1. The VPC (10 Marks)

- Create a networking.tf file.
- Define an **AWS VPC** using the CIDR block **10.0.0.0/16**.
- **Tagging:** Tag the VPC with Name = "exam-vpc-[your-name]".

2. Internet Access (10 Marks)

- Create an **Internet Gateway** and attach it to your VPC.
- Create a **Public Subnet** with CIDR **10.0.1.0/24**.
- **Critical:** Ensure map_public_ip_on_launch is set to true.

3. Routing (10 Marks)

- Create a custom **Route Table** for the public subnet.
- Add a route that directs traffic 0.0.0.0/0 to the Internet Gateway.
- Association: Explicitly associate this Route Table with your Public Subnet.

The screenshot shows the AWS VPC console interface. On the left is a navigation menu with options like 'VPC dashboard', 'Your VPCs', 'Subnets', 'Route tables', 'Internet gateways', 'Egress-only internet gateways', 'Carrier gateways', and 'DHCP option sets'. The main panel displays the details for VPC 'vpc-03c51d2e3a910c187 / exam-vpc-rahul'. The details are organized into several sections: 'VPC ID' (vpc-03c51d2e3a910c187), 'DNS resolution' (Enabled), 'Main network ACL' (acl-02d21ecab3e4e24c5), 'IPv6 CIDR' (Network border group), 'Encryption control ID', 'State' (Available), 'Tenancy' (default), 'Default VPC' (No), 'Network Address Usage metrics' (Disabled), 'Encryption control mode', 'Block Public Access' (Off), 'DHCP option set' (dopt-0f52c0d48a1b932f6), 'IPv4 CIDR' (10.0.0.0/16), 'Route 53 Resolver DNS Firewall rule groups', 'DNS hostnames' (Enabled), 'Main route table' (rtb-0179f71f550618829), 'IPv6 pool', and 'Owner ID' (484907531725).

rtb-069ce507adff734bd / public-route-table-rahul Actions

Details Info

Route table ID
 rtb-069ce507adff734bd

VPC
vpc-03c51d2e3a910c187 | exam-vpc-rahul

Main
 No

Owner ID
 484907531725

Explicit subnet associations
subnet-0a930856d1136147b / public-subnet-rahul

Edge associations
-

Routes Subnet associations Edge associations Route propagation Tags

Routes (2) Both Edit routes

Destination	Target	Status	Propagated	Route Origin
0.0.0.0/0	igw-028220c1edbeaa304	Active	No	Create Route
10.0.0.0/16	local	Active	No	Create Route Table

igw-028220c1edbeaa304 / exam-igw-rahul Actions

Details Info

Internet gateway ID
 igw-028220c1edbeaa304

State
Attached

VPC ID
vpc-03c51d2e3a910c187 | exam-vpc-rahul

Owner
 484907531725

Tags (1) Manage tags

Key	Value
Name	exam-igw-rahul

Part 3: Security & Identity (15 Marks)

Secure the instance and prepare for access.

1. SSH Key Pair (5 Marks)

- Use the `aws_key_pair` resource to upload your local public key to AWS.

2. Security Groups (10 Marks)

- Create a Security Group named `web-server-sg`.
- Ingress Rules:**
 - Allow HTTP (Port 80) from `0.0.0.0/0`.
 - Allow SSH (Port 22) from your specific IP (or `0.0.0.0/0` if necessary for the exam).
- Egress Rules:**
 - Allow all traffic outbound (`0.0.0.0/0`).

```
resource "aws_key_pair" "my_key" {
  key_name     = "rahul-key-pair"
  public_key   = file("~/ssh/id_rsa.pub")
}
```

sg-076a7244987585a7b - web-server-sg

Actions

Details

Security group name

web-server-sg

Security group ID

sg-076a7244987585a7b

Description

Security group for web server

VPC ID

vpc-03c51d2e3a910c187

Owner

484907531725

Inbound rules count

2 Permission entries

Outbound rules count

1 Permission entry

Inbound rules

Outbound rules

Sharing

VPC associations

Tags

Inbound rules (2)

Manage tags

Edit inbound rules

Search

Name	Security group rule ID	IP version	Type	Protocol	Port range	Source	Description
-	sgr-034e2dad5bfee3647	IPv4	SSH	TCP	22	0.0.0.0/0	SSH access
-	sgr-09e609ff5f1e7d251	IPv4	HTTP	TCP	80	0.0.0.0/0	HTTP from anywhere

sg-076a7244987585a7b - web-server-sg

Actions

Details

Security group name

web-server-sg

Security group ID

sg-076a7244987585a7b

Description

Security group for web server

VPC ID

vpc-03c51d2e3a910c187

Owner

484907531725

Inbound rules count

2 Permission entries

Outbound rules count

1 Permission entry

Inbound rules

Outbound rules

Sharing

VPC associations

Tags

Outbound rules (1)

Manage tags

Edit outbound rules

Search

<input type="checkbox"/>	Name	Security group rule ID	IP version	Type	Protocol	Port range	Destination	Description
<input type="checkbox"/>	-	sgr-06858f052cf07c0f7	IPv4	All traffic	All	All	0.0.0.0/0	Allow all outbound

Part 4: Compute, Variables & Outputs (30 Marks)

Deploy the server and finalize the configuration.

1. Variables (5 Marks)

- Create a variables.tf file.
- Define variables for: region, vpc_cidr, and instance_type.
- Reference these variables in your configuration.

2. The EC2 Instance (5 Marks)

- Deploy a **t3.micro** EC2 instance into your **Public Subnet**.
- Use a data source to look up the latest **Amazon Linux 2** AMI.
- Attach the correct Security Group and Key Pair.

3. User Data Configuration (15 Marks)

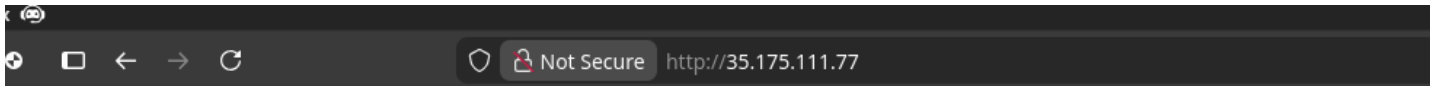
- Use the user_data argument.
- The Script Logic:**
 - Install the Nginx web server.
 - Start and enable the Nginx service.
 - Custom Challenge:** Overwrite the default Nginx welcome page with an HTML file that contains the text:

"<h1>Project Genesis SUCCESS! Deployed by [Your Name]</h1>"

4. Outputs (5 Marks)

- Create an outputs.tf file.
- Output the **Web URL** of the server (e.g., http://<public-ip>).

Web url for website <http://35.175.111.77/>



Project Genesis SUCCESS! Deployed by Rahul

GITHUB LINK : <https://github.com/Rahulx0/BYOD2.git>