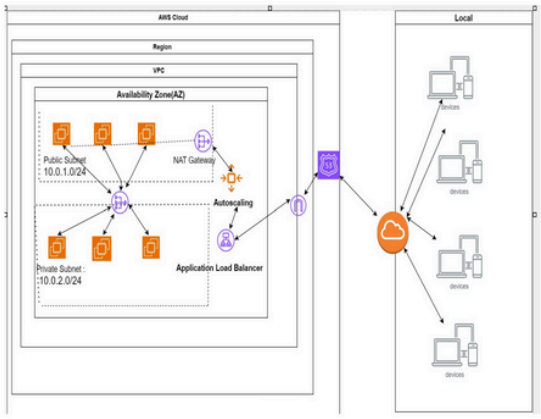
Networking and Security in Cloud(Project)

Diagram:-

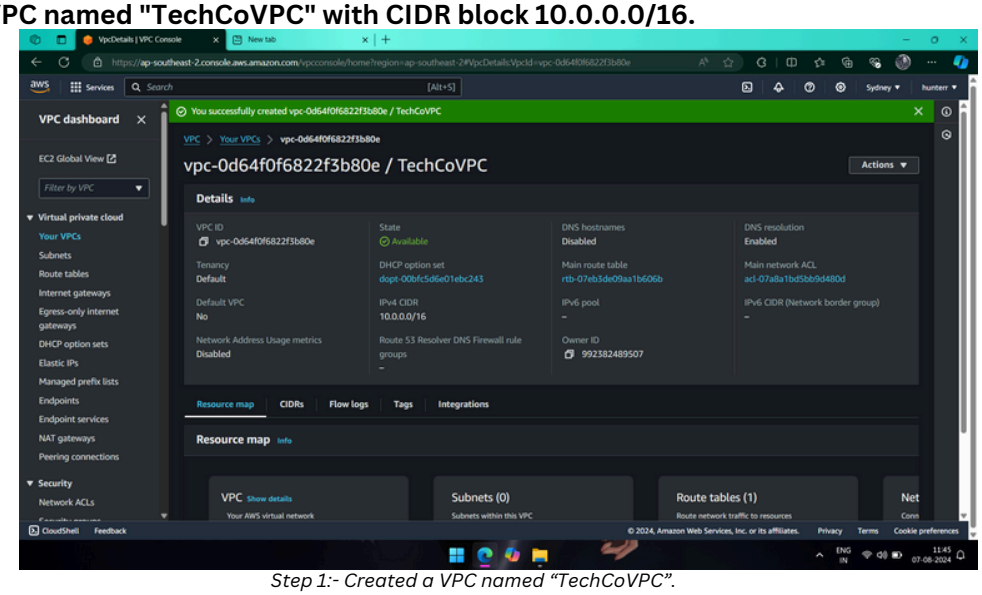


Objectives:-

- Design a VPC architecture that meets the requirements of the organization's applications and services.
- Configure subnets within the VPC to logically isolate different components and control traffic flow.
- Implement security measures such as security groups and network ACLs to control inbound and outbound traffic.
- Establish connectivity to the internet gateway and enable secure communication with external resources.
- Ensure high availability and fault tolerance by distributing resources across multiple availability zones

Task 1: VPC and Subnet Setup

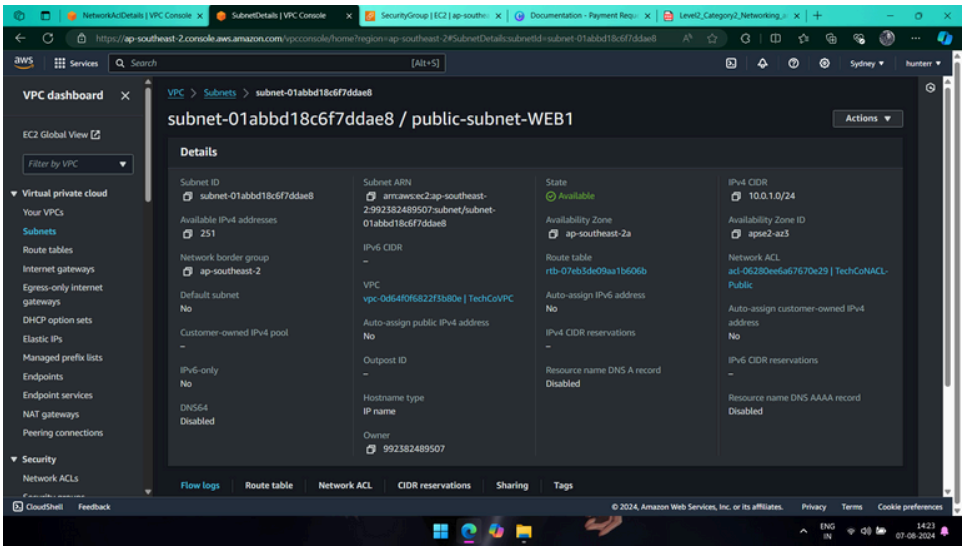
Step 1:- Create a VPC named "TechCoVPC" with CIDR block 10.0.0.0/16.



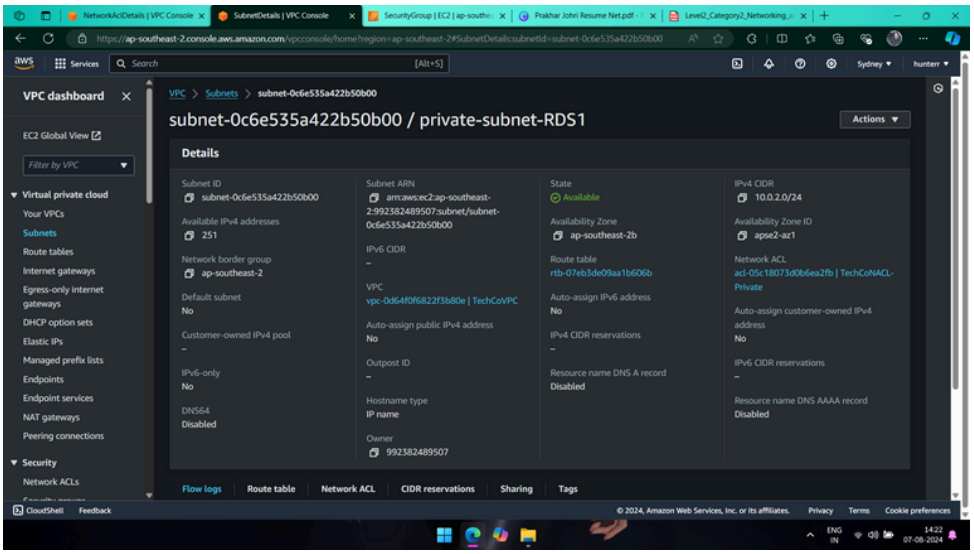
Step 1:- Created a VPC named "TechCoVPC".

Task 1.2:- Create two subnets:

- **Step 1.2.1:- Public Subnet: 10.0.1.0/24 (for web servers)**
- **Step 1.2.2:- Private Subnet: 10.0.2.0/24 (for database servers)**



Step 1.2.1:- Created a Public Subnet.

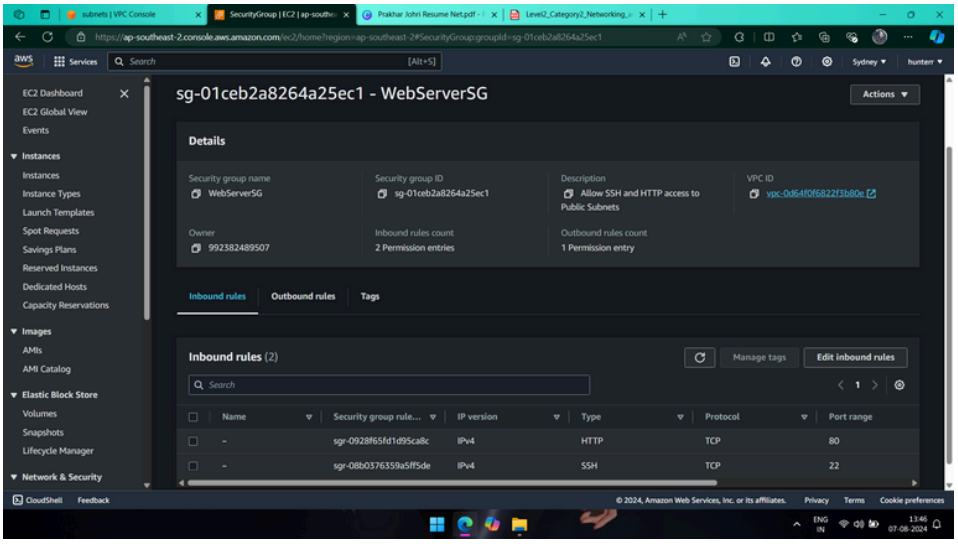


Step 1.2.2:- Created a Private Subnet.

Task 2: Security Configuration

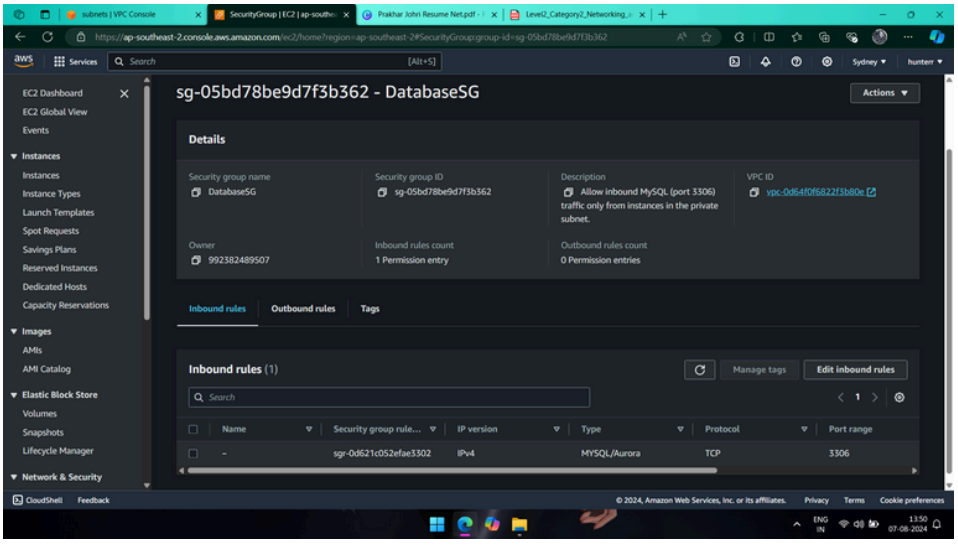
Configure Security Groups:

Step 1:- "WebServerSG": Allow inbound HTTP (port 80) and SSH (port 22) traffic from the internet to instances in the public subnet.



Step 1:- Created a Security Group named "WebServerSG" with ports 80 and 22 as allowed ports.

Step 2:- "DatabaseSG": Allow inbound MySQL (port 3306) traffic only from instances in the private subnet.

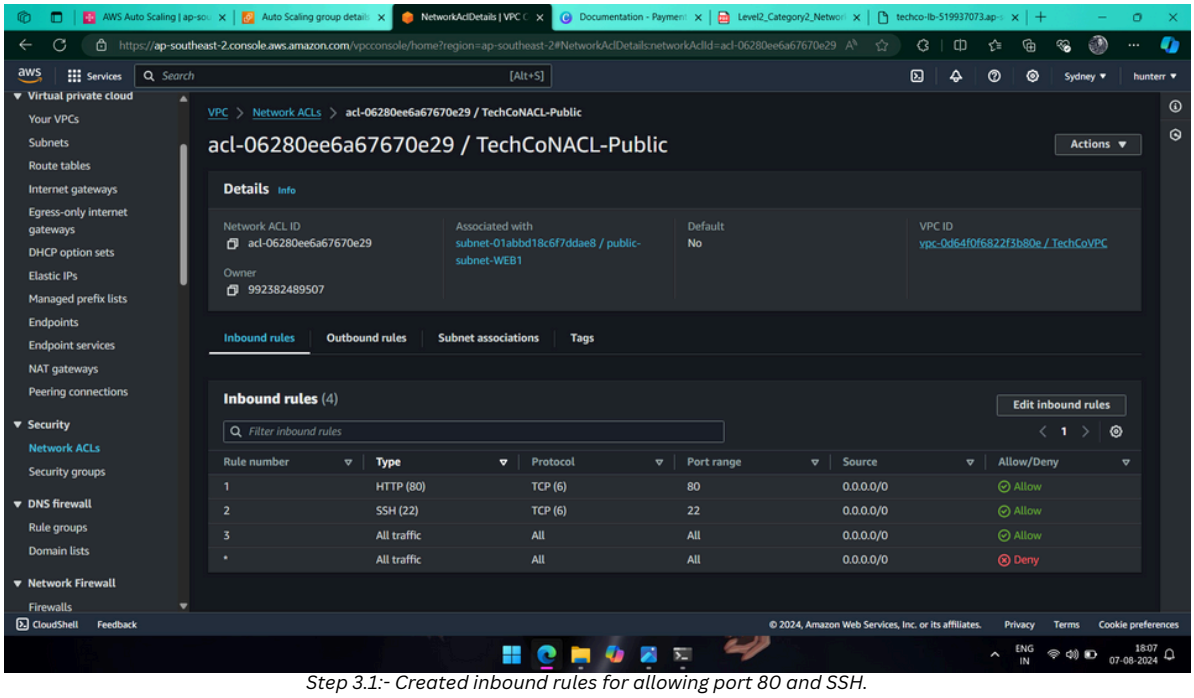


Step 2:- Created a Security Group named "DatabaseSG" with port 3306 as allowed port.

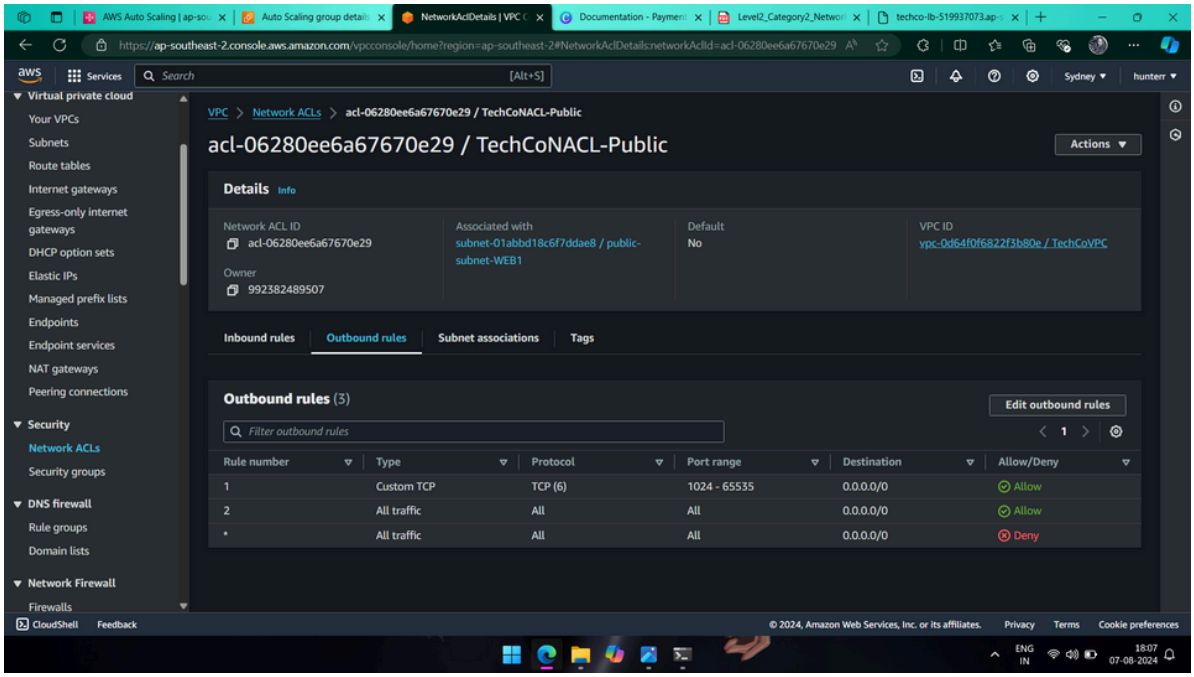
Configure Network ACLs:

Step 3:- For Public Subnet -

- Inbound: Allow HTTP (80) and SSH (22).
- Outbound: Allow all
- NACL Range : Open from 1024-65535



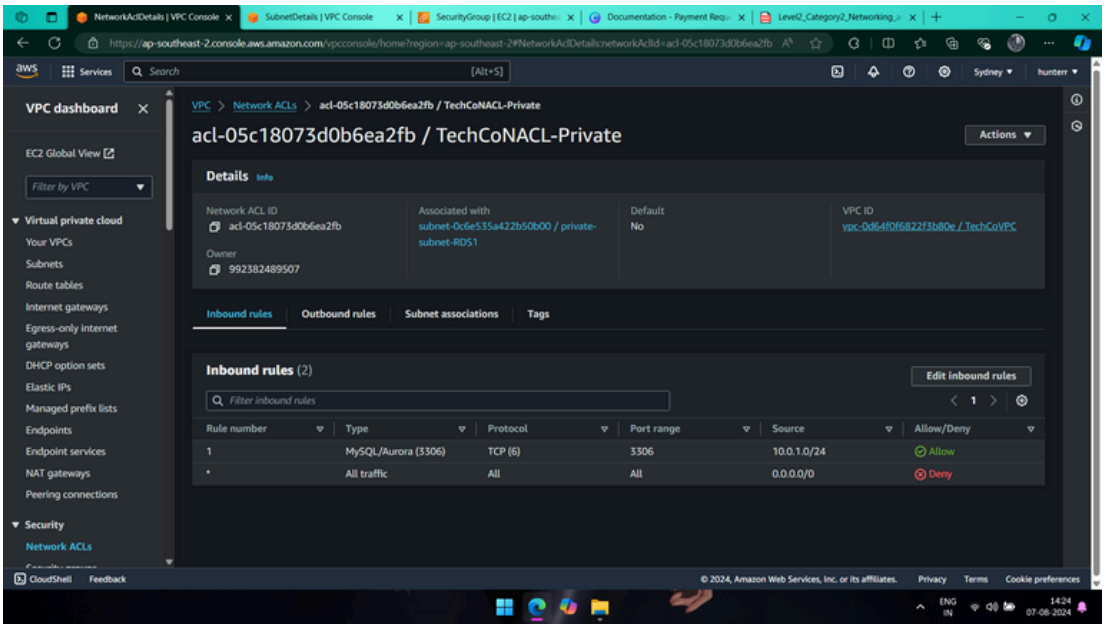
Step 3.1:- Created inbound rules for allowing port 80 and SSH.



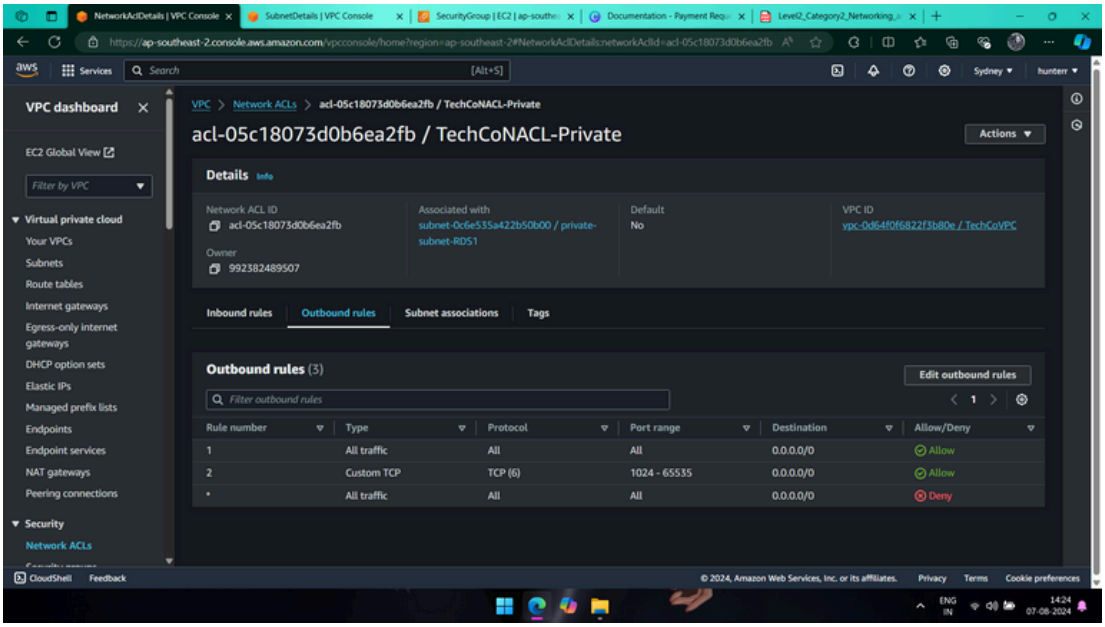
Step 3.1:- Created outbound rules for allowing port range from 1024 to 65535 and all traffic.

Step 4:- For Private Subnet -

- Inbound: Allow MySQL (3306) from public subnet.
- Outbound: Allow all.
- NACL Range : Open from 1024-65535



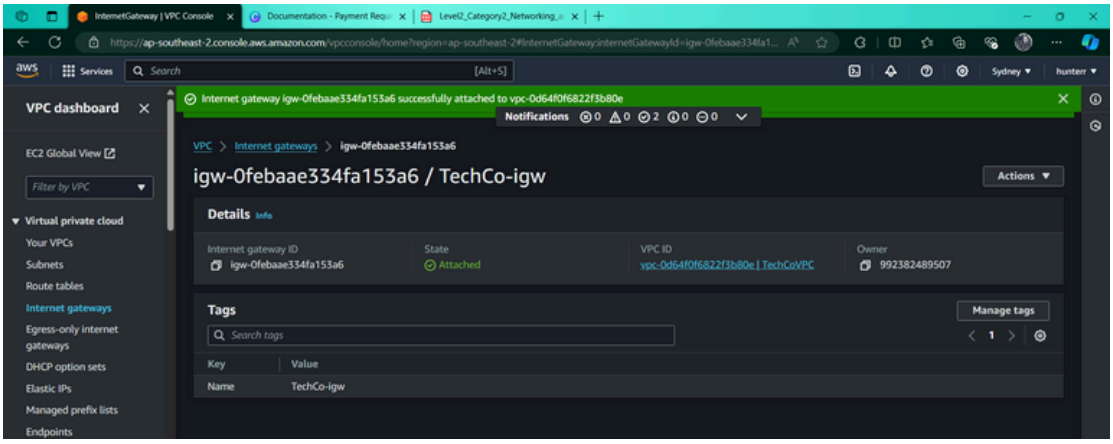
Step 4.1:- Created inbound rules for allowing port 3306.



Step 4.2:- Created outbound rules for allowing port range from 1024 to 65535 and all traffic.

Task 3: Internet Connectivity

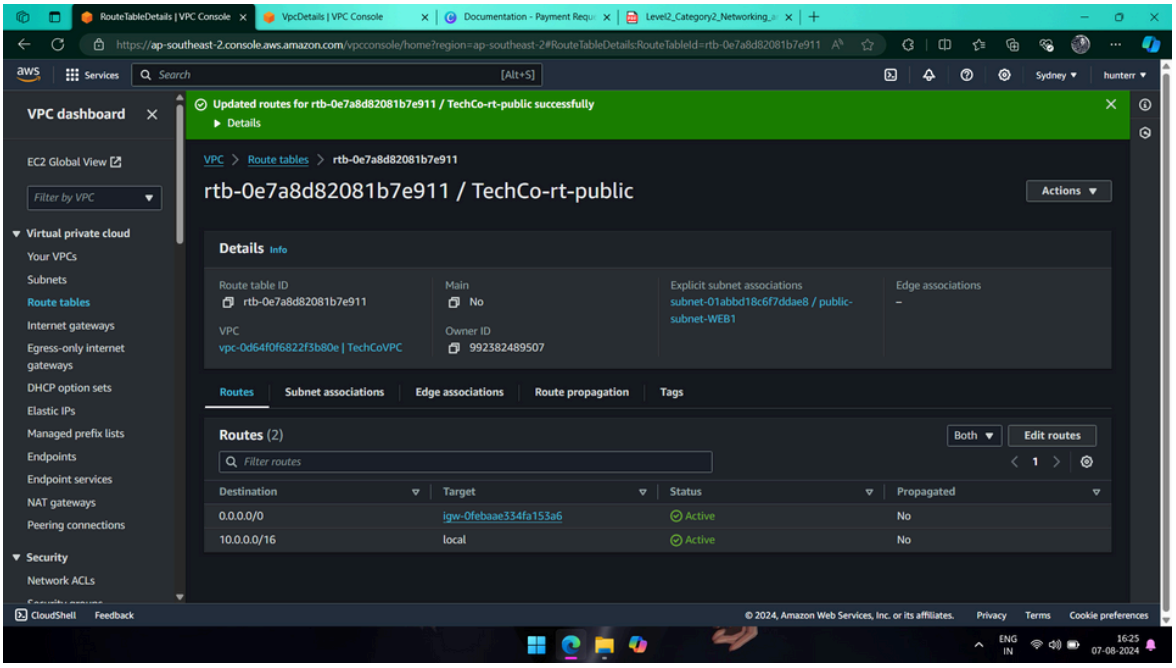
Step 1:- Attach an Internal Gateway to the VPC “TechCoVPC”



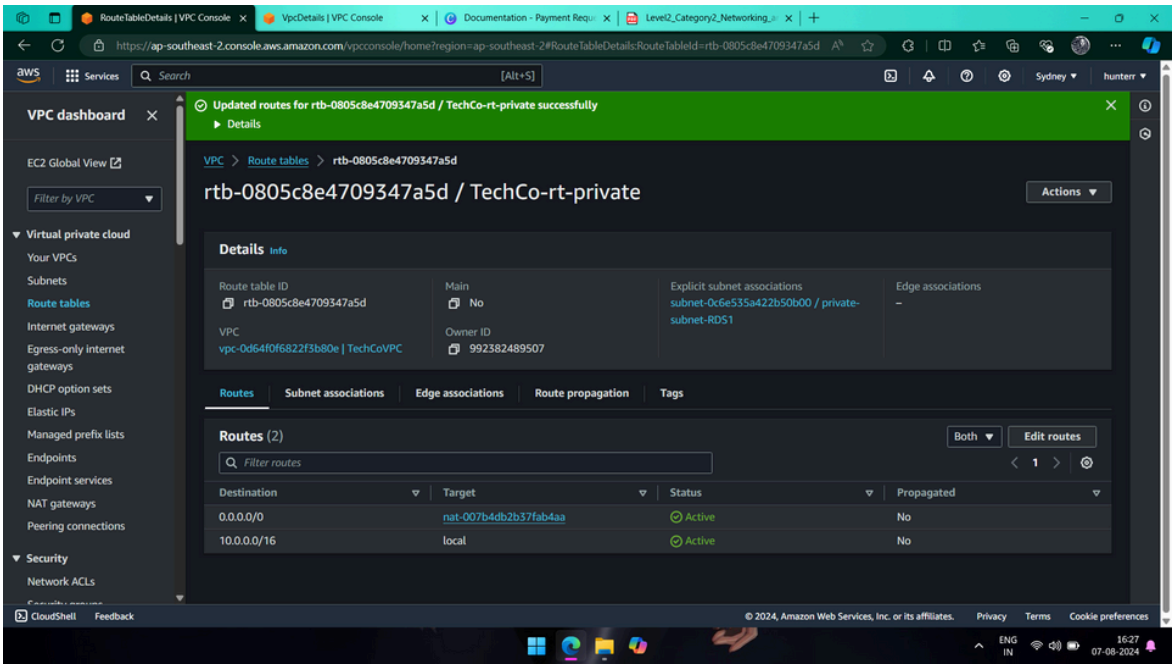
Step 1:- Attached an internet gateway for our VPC.

Step 2:- Update route tables -

- Step 2.1:- Direct public subnet traffic to the Internet Gateway.
- Step 2.2:- Keep private subnet routes internal or through a NAT Gateway for outbound access.



Step 2.1

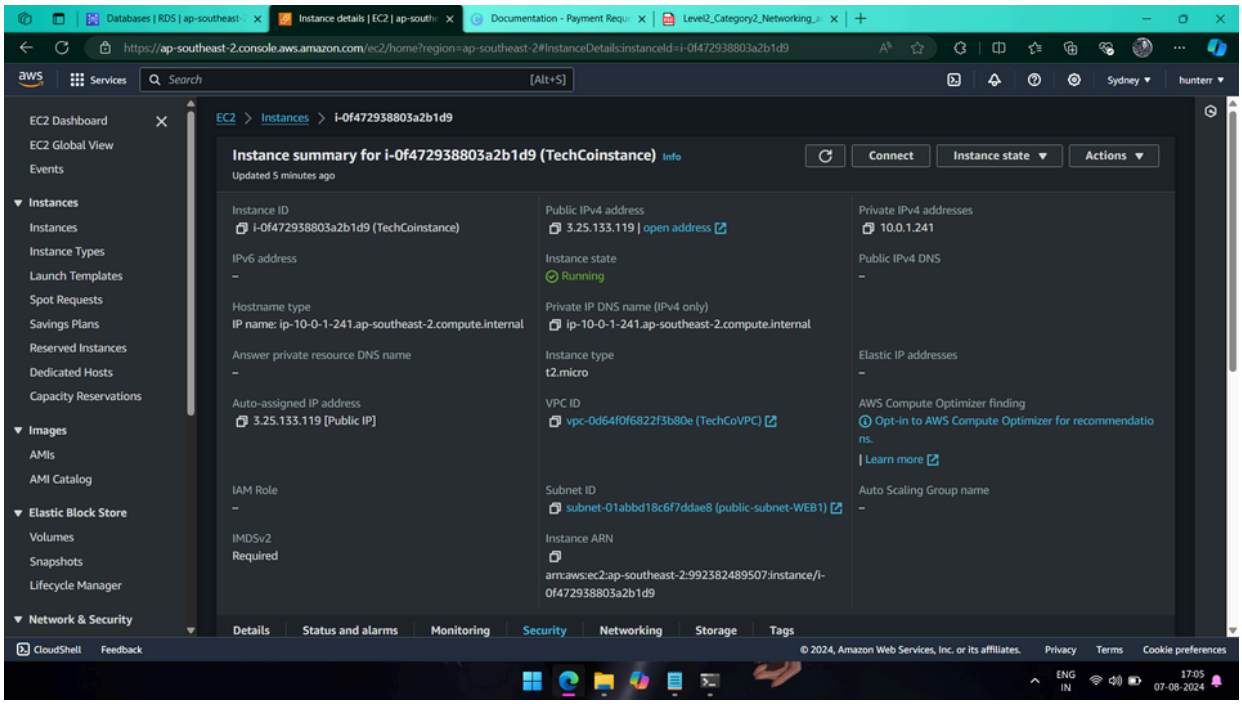


Step 2.2

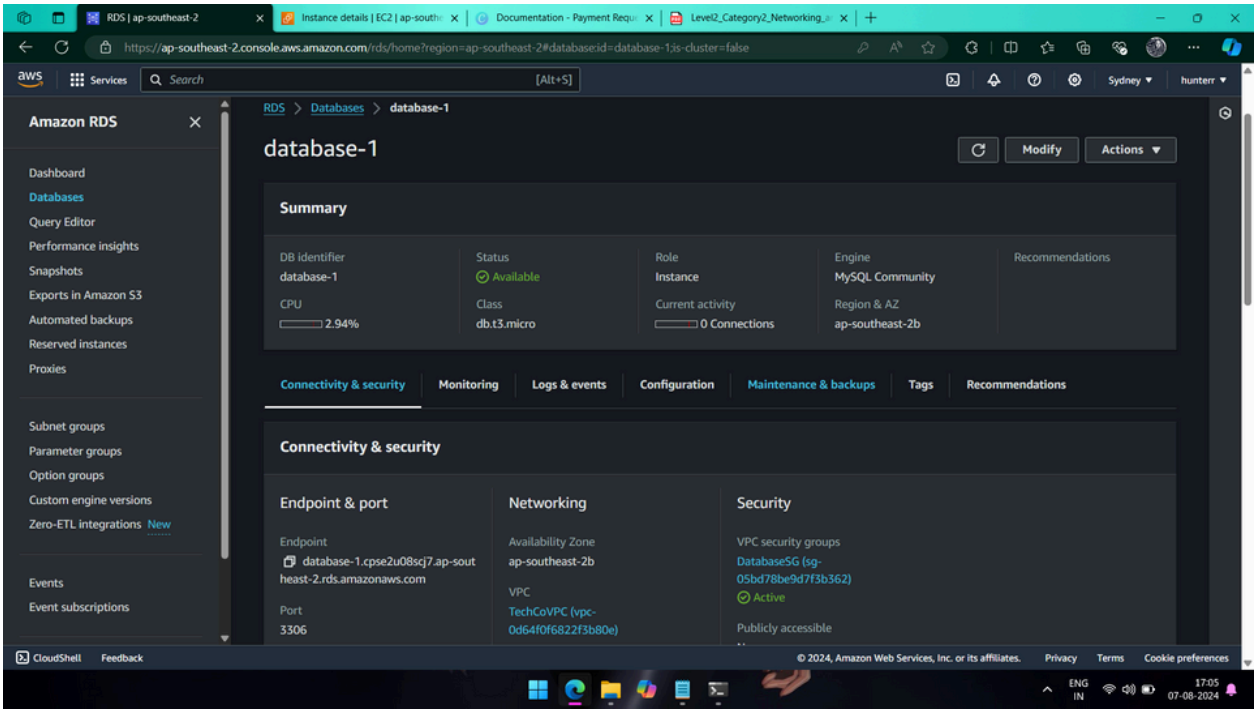
Task 4: Application Deployment

Step 1:- Launch EC2 instances:

- **Step 1.1:- Deploy web server instances (e.g., Amazon Linux) in the public subnet.**
- **Step 1.2:- Deploy database server instances (e.g., Amazon RDS MySQL) in the private subnet.**



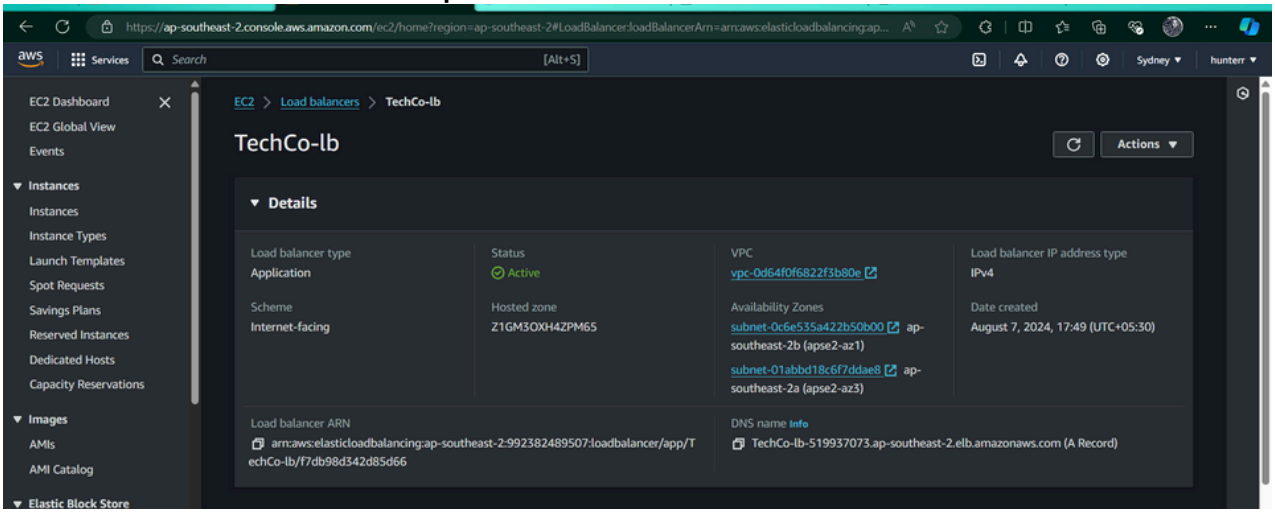
Step 1.1



Step 1.2

Step 2:- Set up Application Load Balancer (ALB):

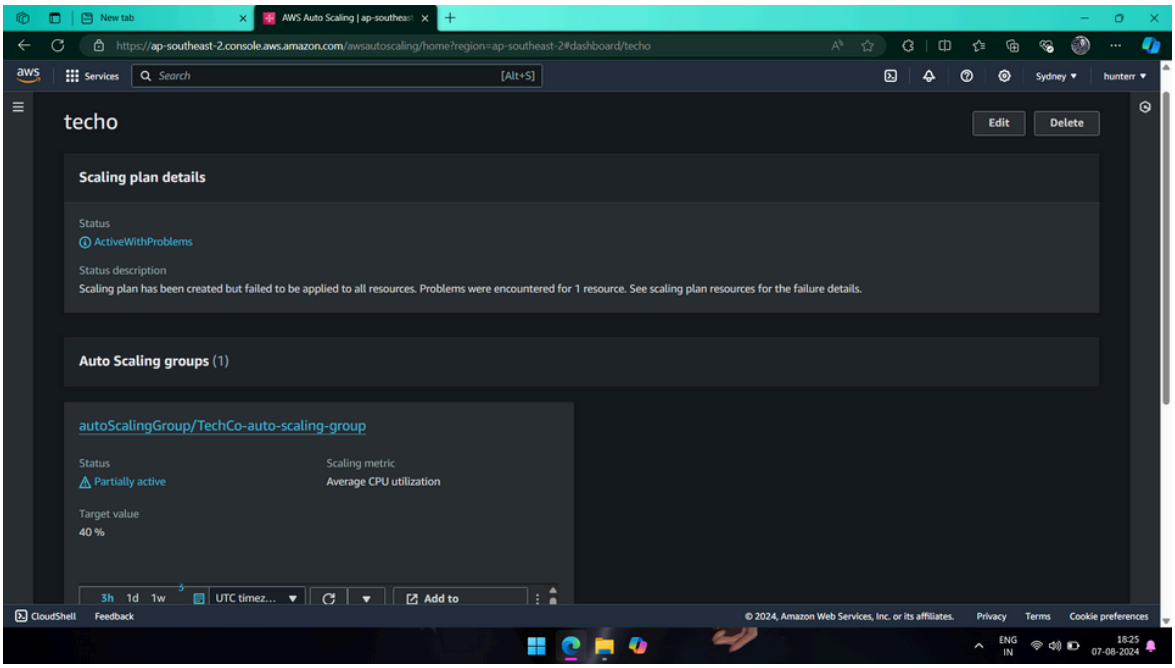
- **Configure ALB to distribute incoming HTTP traffic across web server instances in multiple AZs.**



Step 2

Step 3:- Implement Auto Scaling:

- **Set up Auto Scaling groups for web server instances to adjust capacity based on traffic patterns.**
- **Configure health checks and scaling policies.**



Step 3