VPC 2-Tier Architecture:
Hosting a College Form Page with LEMP Stack

. Overview

In this project, we set up a two-tier architecture on AWS using a custom VPC. The architecture consists of:

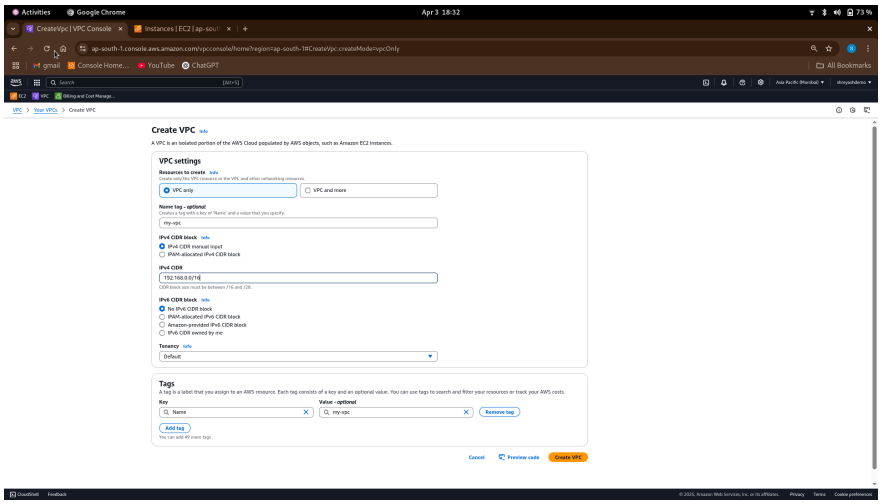
- A Web Server (public subnet) hosting a PHP form.
- A Database Server (private subnet) running MariaDB.
- Secure networking components: VPC, subnets, route tables, Internet Gateway (IGW), and NAT Gateway.

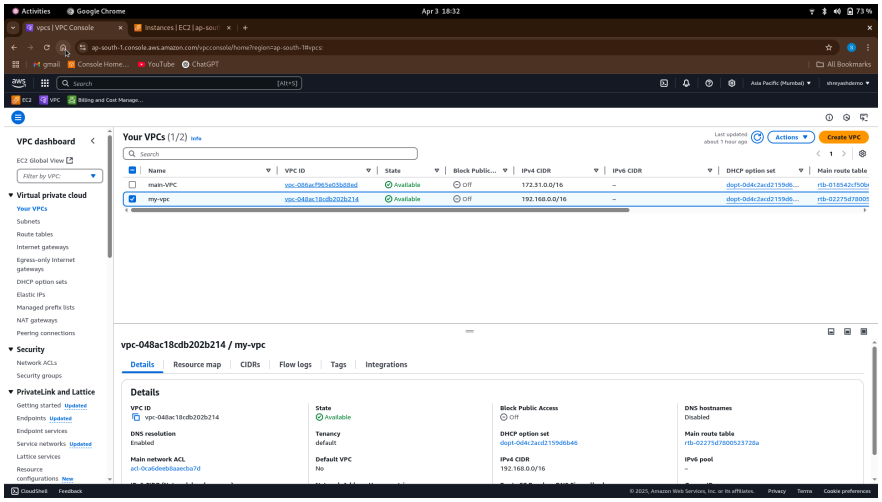
. VPC and Networking Setup

Step 1: Create a Custom VPC

- Go to AWS Management Console → VPC Service → Create VPC.
- Set Name: `my-vpc`.
- Set CIDR Block: `10.0.0.0/16`.
- Click Create VPC.

📌 Screenshot:

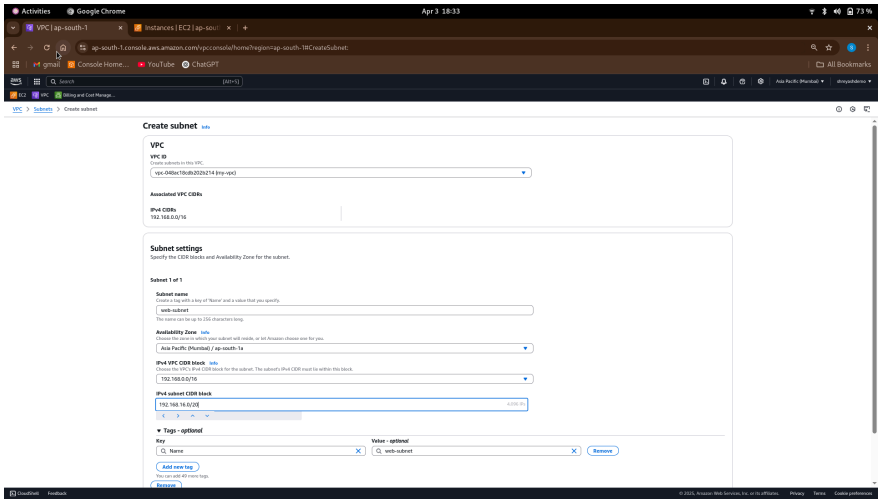


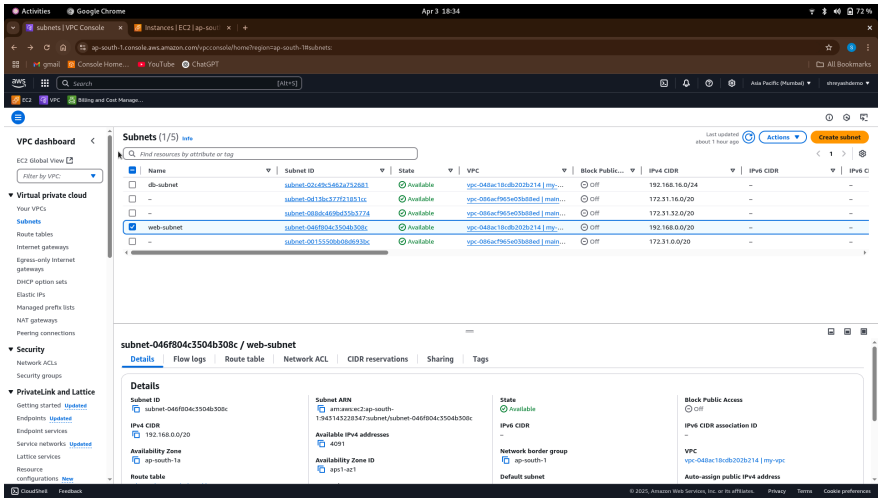


Step 2: Create Subnets

- Web Subnet
  - CIDR Block: `10.0.1.0/24`
  - Select `my-vpc`.
  - Enable Auto-assign public IP.
- Database Subnet
  - CIDR Block: `10.0.2.0/24`
  - Select `my-vpc`.
  - No auto-assign public IP.

📌 Screenshots:

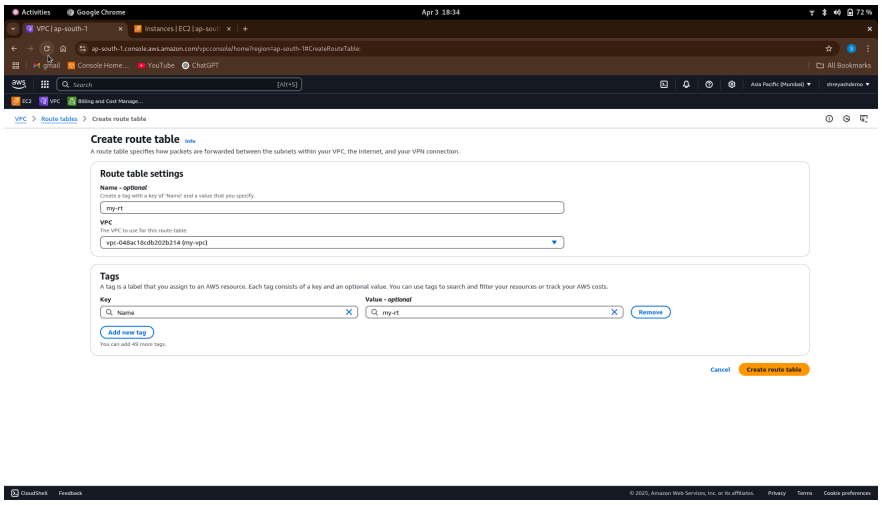


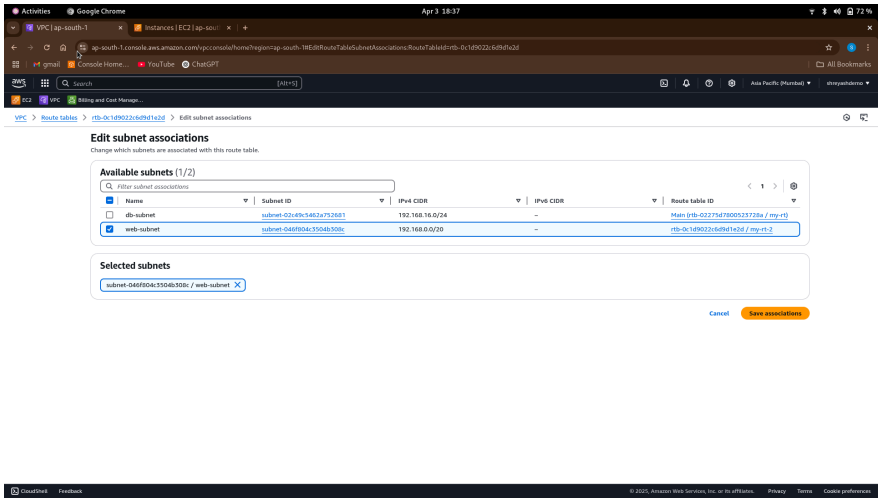


Step 3: Create Route Table and Attach to Web Subnet

- Go to Route Tables → Create Route Table.
- Set Name: `my-rt2`.
- Attach to `my-vpc`.
- Select `web-subnet` and associate it.

📌 Screenshots:

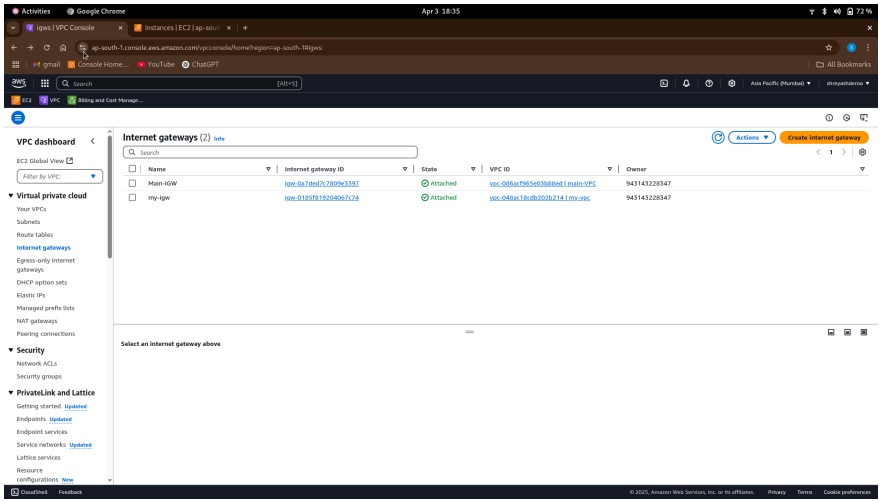


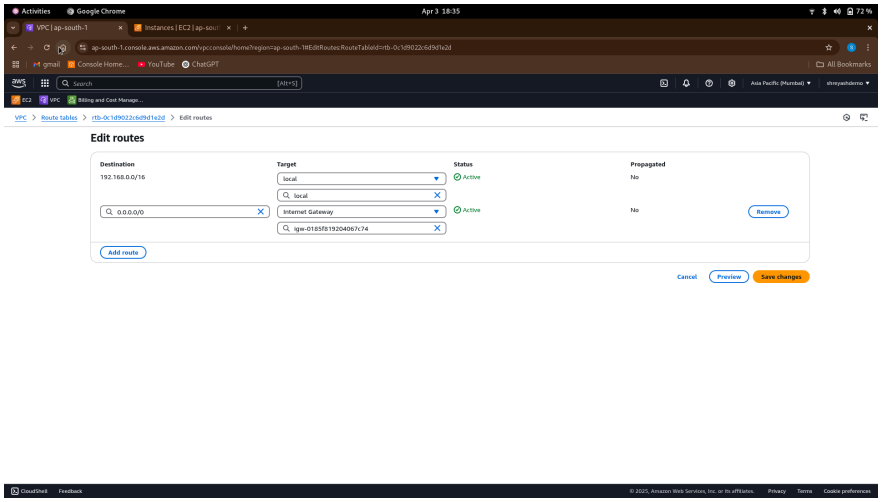


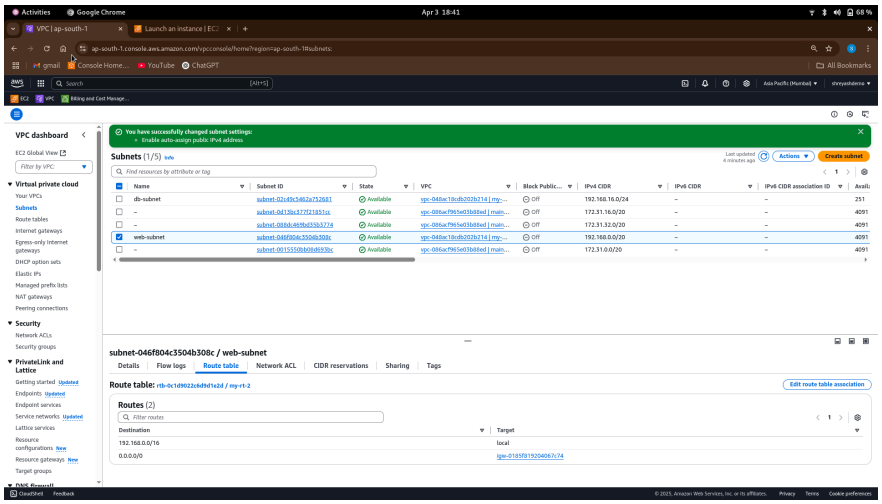
Step 4: Create an Internet Gateway

- Go to Internet Gateways → Create IGW.
- Name it `my-igw`.
- Attach it to `my-vpc`.
- Edit Route Table and add:
  - Destination: `0.0.0.0/0`
  - Target: `my-igw`

📌 Screenshots:







Step 5: Create a NAT Gateway

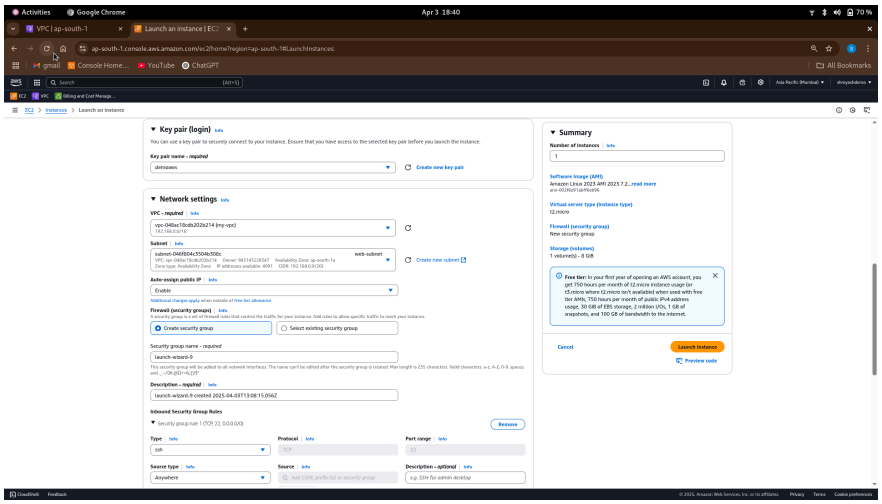
- Go to NAT Gateways → Create NAT Gateway.
- Attach it to `web-subnet`.
- Allocate an Elastic IP.
- Create a new Route Table for `db-subnet`:
  - Destination: `0.0.0.0/0`
  - Target: `NAT Gateway`
  - Do NOT use an Internet Gateway.

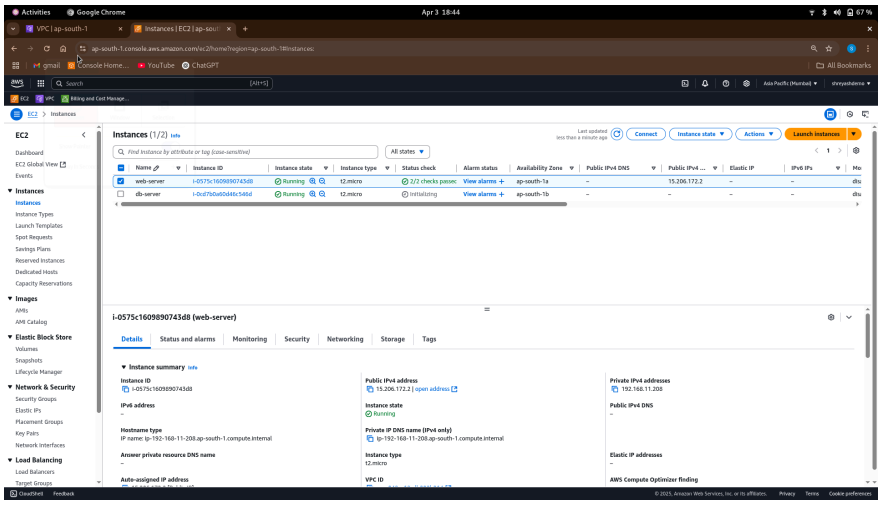
. Launching EC2 Instances

Step 6: Create Web and Database Servers

- Web Server
  - Ubuntu 22.04, in `web-subnet` (public)
  - Enable Auto-assign Public IP.
- Database Server
  - Ubuntu 22.04, in `db-subnet` (private)
  - No Public IP.

📌 Screenshot:

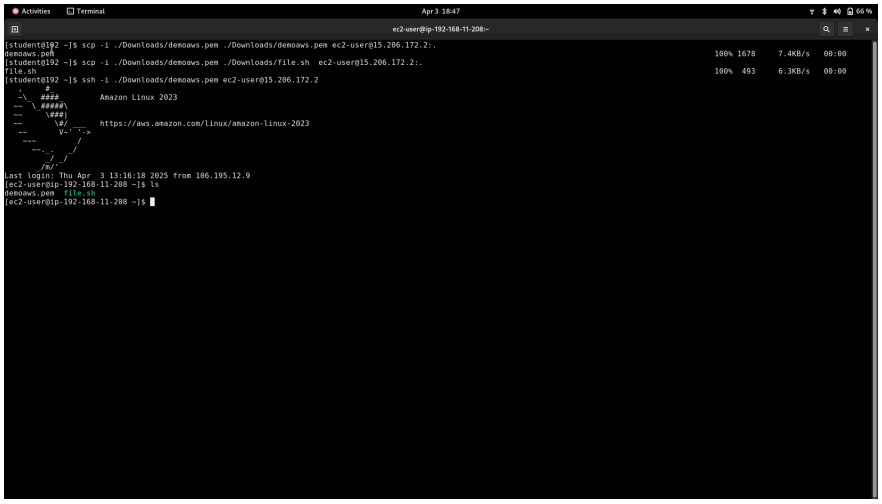




Transferring Files and Installing LEMP Stack

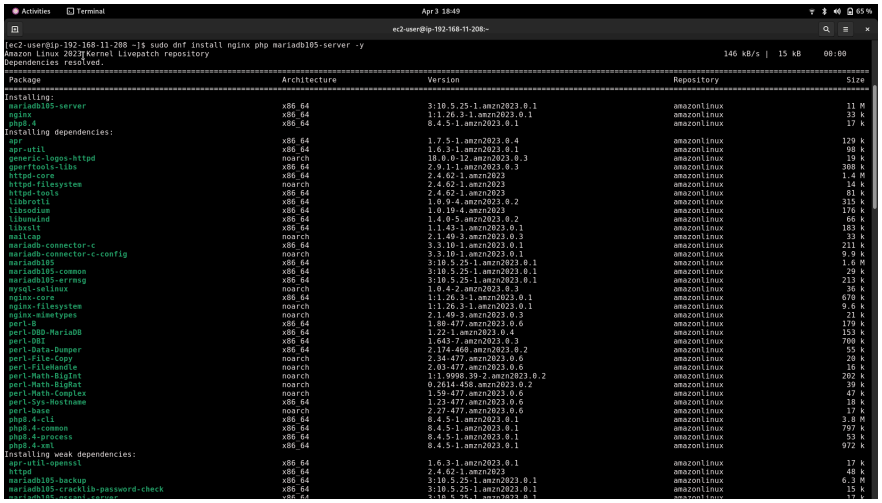
Step 7: Send Key Pair & LEMP Script to Web Server

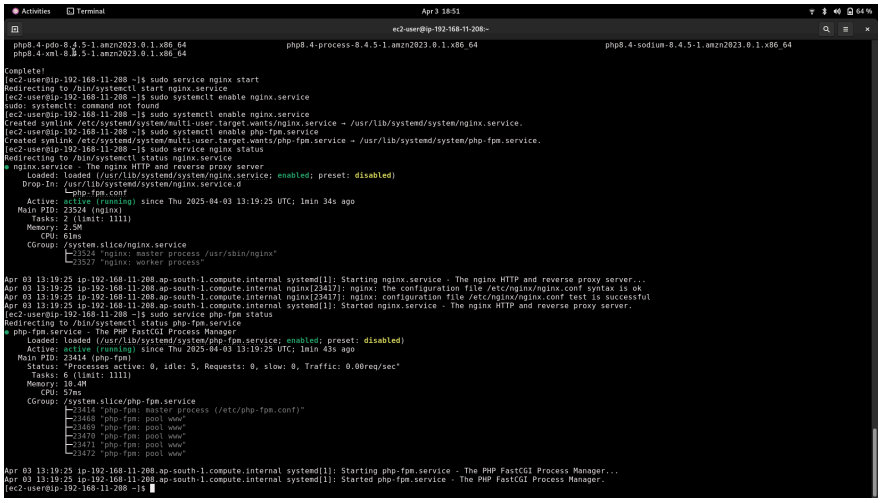
📌 Screenshot:



Step 8: Connect to Web Server & Install LEMP Stack

- **LEMP Setup:**
  - Install Nginx, PHP, MySQL Client (not MariaDB)
  - Start and enable Nginx & PHP
- 📌 Screenshot:





Step 9: Create Web Form Files

Create form.html:

📌 Screenshot:

Create `submit.php`:

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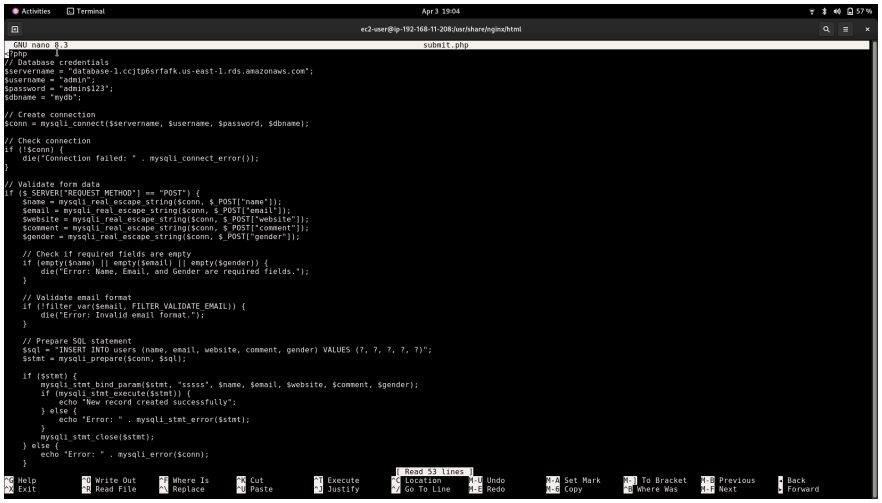

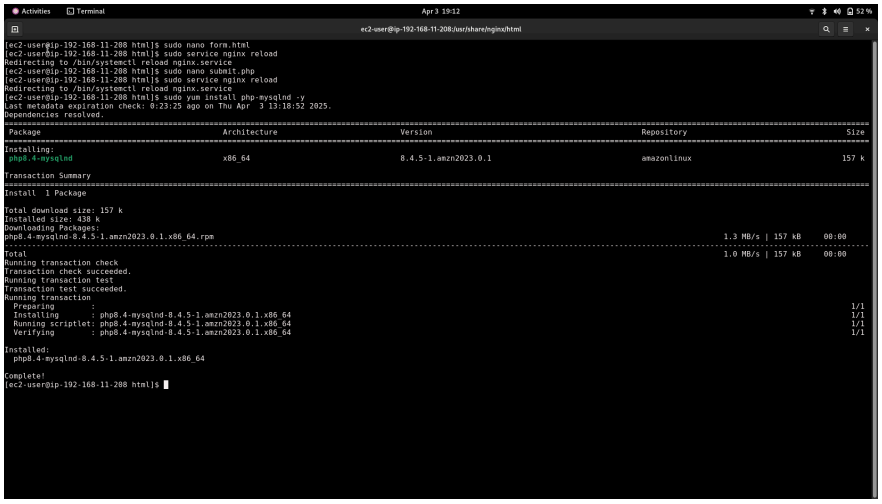

. Configuring Database Server

Step 10: Connect from Web Server to Database Server

Install MariaDB on Database Server

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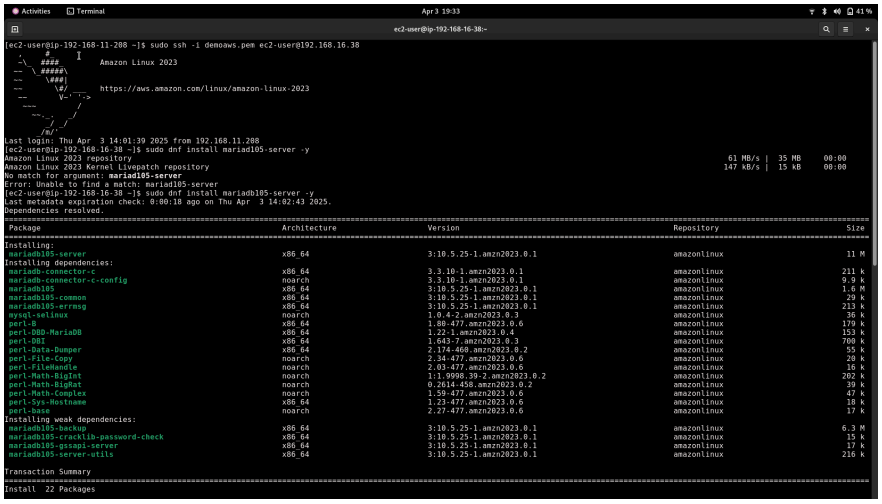

Step 11: Add Web Server Sg to DB Server

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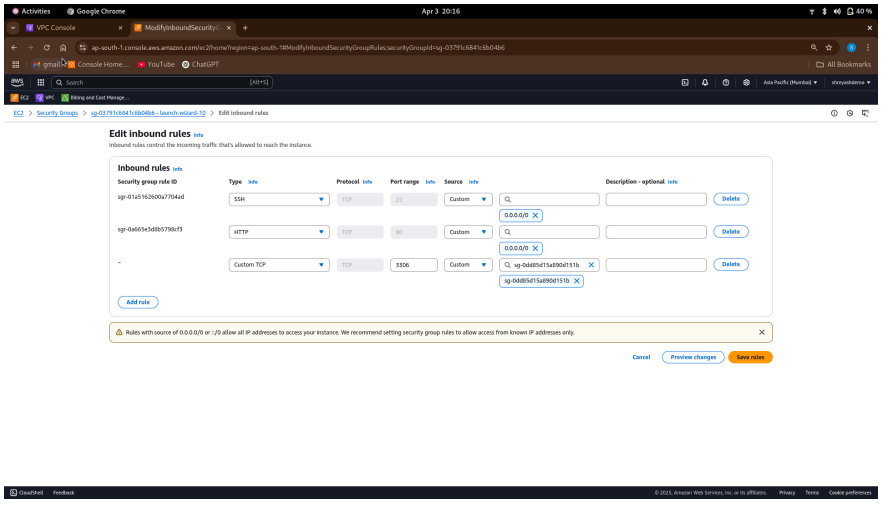

Step 12: Secure and Configure MySQL

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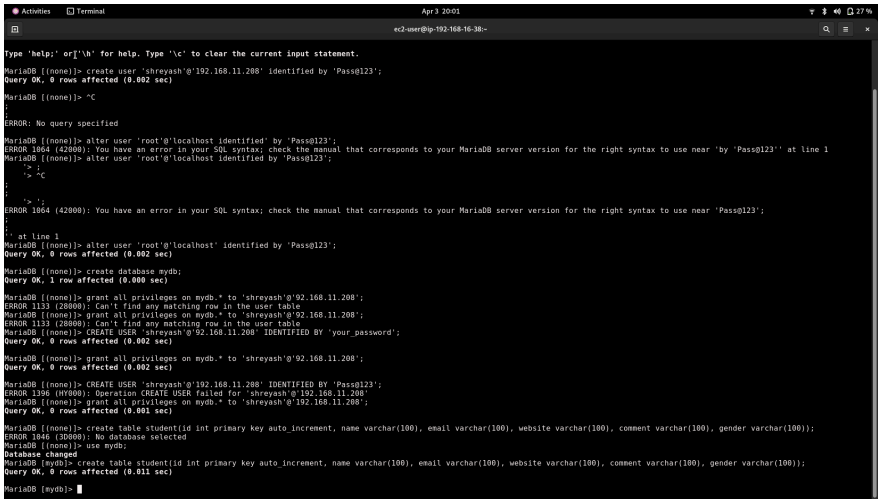

. Final Validation and Testing

Step 15: Access the Web Form

- Open the browser and go to: `http://web-server-public-ip/form.html`
- Submit the form and check if data is stored in `mydb`.

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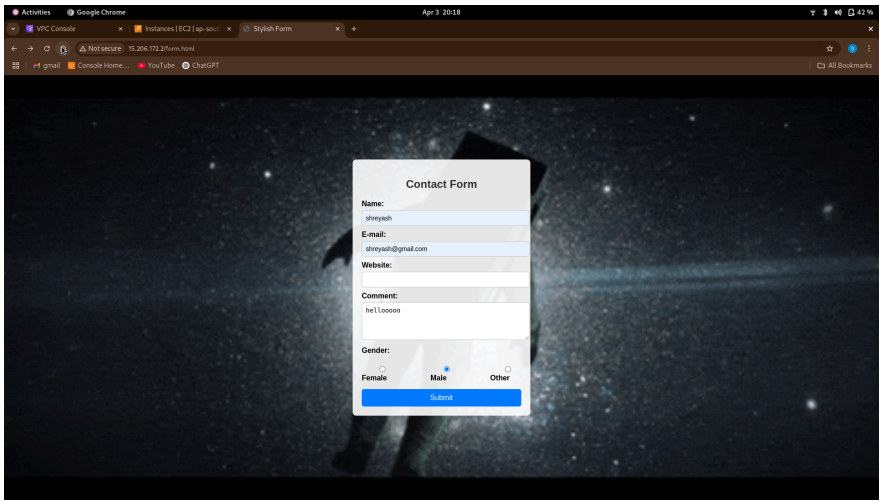

Step 16: Verify Data in Database

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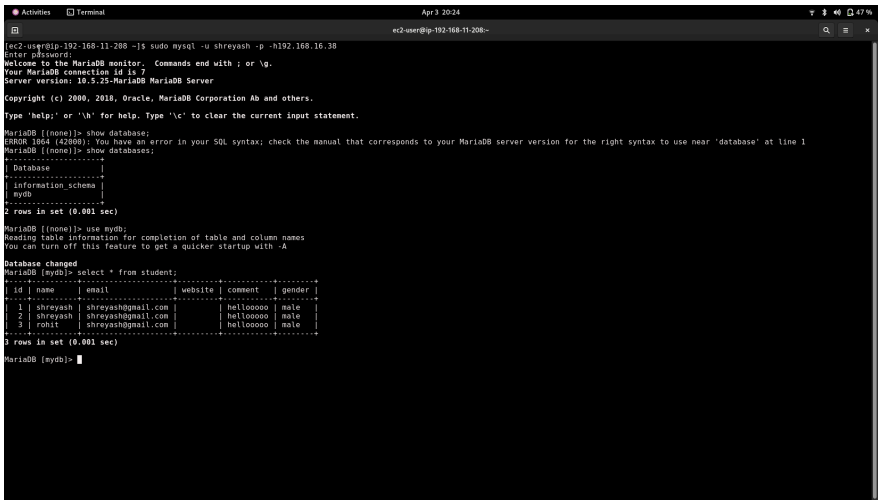

. Conclusion

In this project, we establish a two-tier architecture on AWS using a custom VPC to host a college form page powered by the LEMP stack. The architecture includes a public subnet for the web server running PHP and a private subnet for the database server with MariaDB. Key steps involve setting up secure networking components, launching EC2 instances, transferring files, and installing necessary software. We conclude by validating the setup through form submission and database verification.