Project 1
Deploying a Multi-Tier Website Using AWS EC2

Problem Statement

Project 1 - Deploying a Multi-Tier Website Using AWS EC2

Topic: Deploy a Multi-tier website using EC2

Description: Amazon Elastic Compute Cloud (Amazon EC2) provides scalable computing capacity in the Amazon Web Services (AWS) cloud. Using Amazon EC2 eliminates your need to invest in hardware up front, so you can develop and deploy applications faster. You can use Amazon EC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. Amazon EC2 enables you to scale up or down to handle changes in requirements or spikes in popularity, reducing your need to forecast traffic.

Problem Statement:

Company ABC wants to move their product to AWS. They have the following things setup right now:

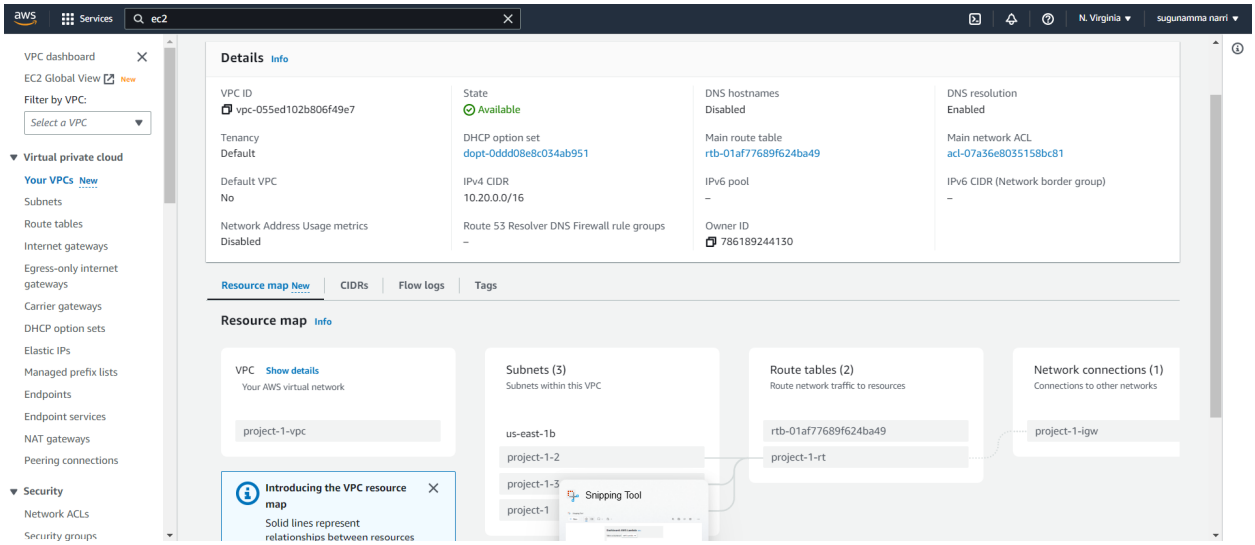
1. MySQL DB
2. Website (PHP)

The company wants high availability on this product, therefore wants autoscaling to be enabled on this website.

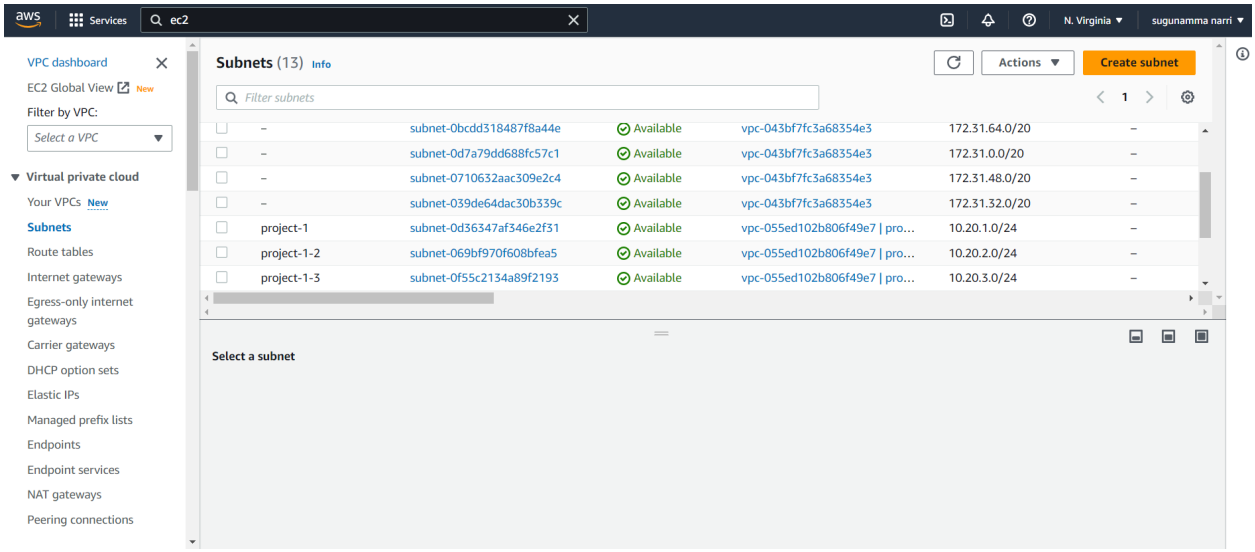
Steps to solve:

1. Launch an EC2 Instance
2. Enable Auto Scaling on these instances (minimum 2)
3. Create an RDS Instance
4. Create Database & Table in RDS Instance
    - Database name: intel
    - Table name: data
    - Database password: intel123
5. Change hostname in website
6. Allow traffic from EC2 to RDS Instance
7. Allow all-traffic to EC2 instance

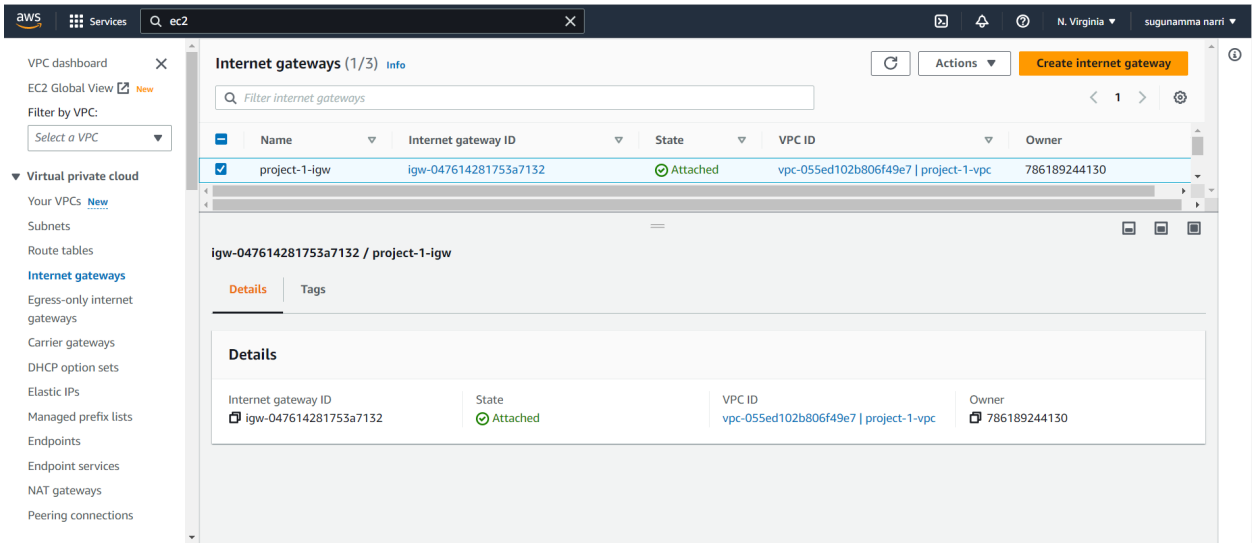
Created a VPC.



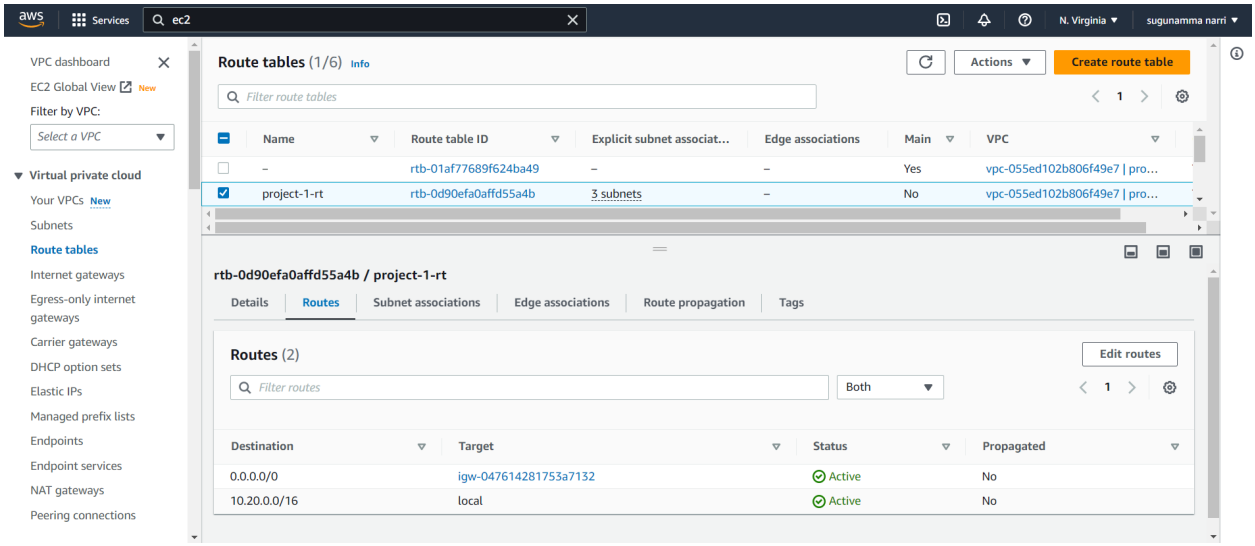
Created three subnets namely project-1,project1-2,project1-3.



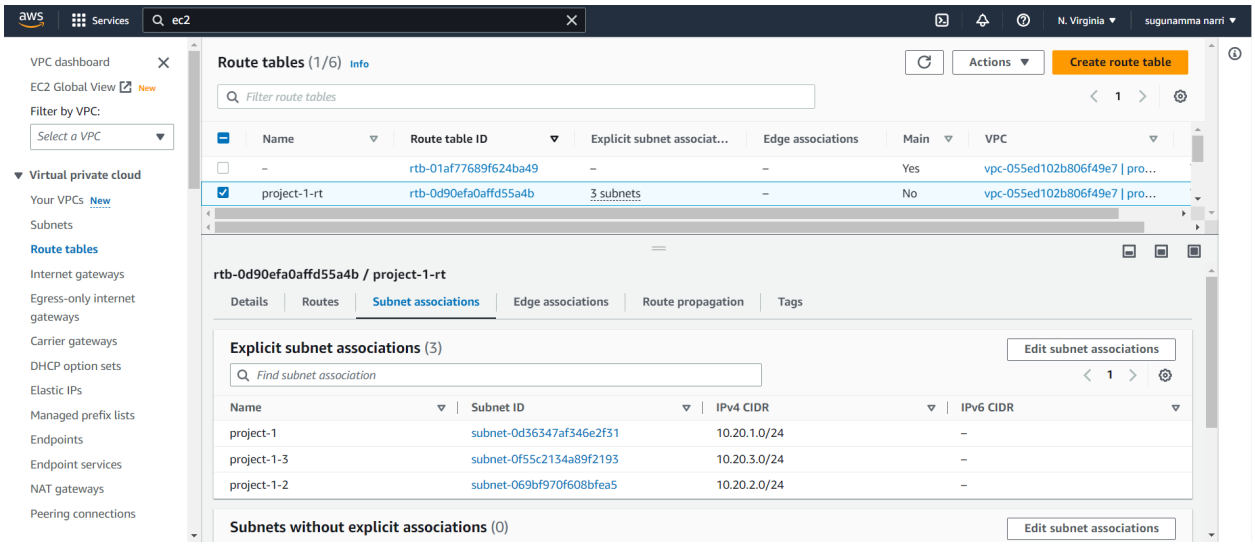
Created an internet gateway and attached to the VPC.



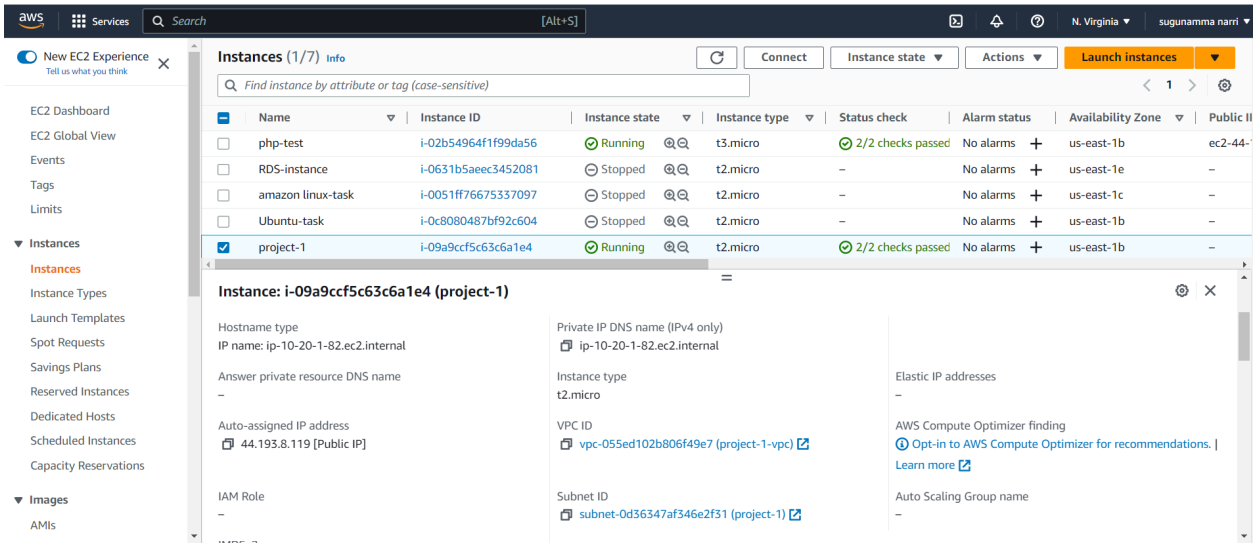
Created a route table and added internet gateway route



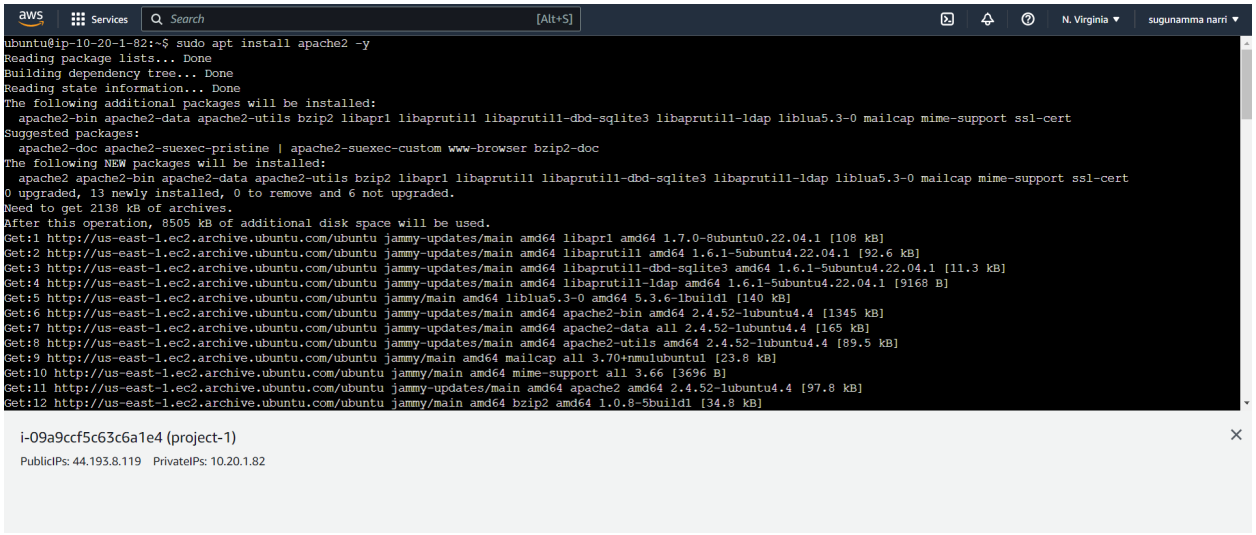
All the three subnets are made into public subnets by associating them with the public route table.



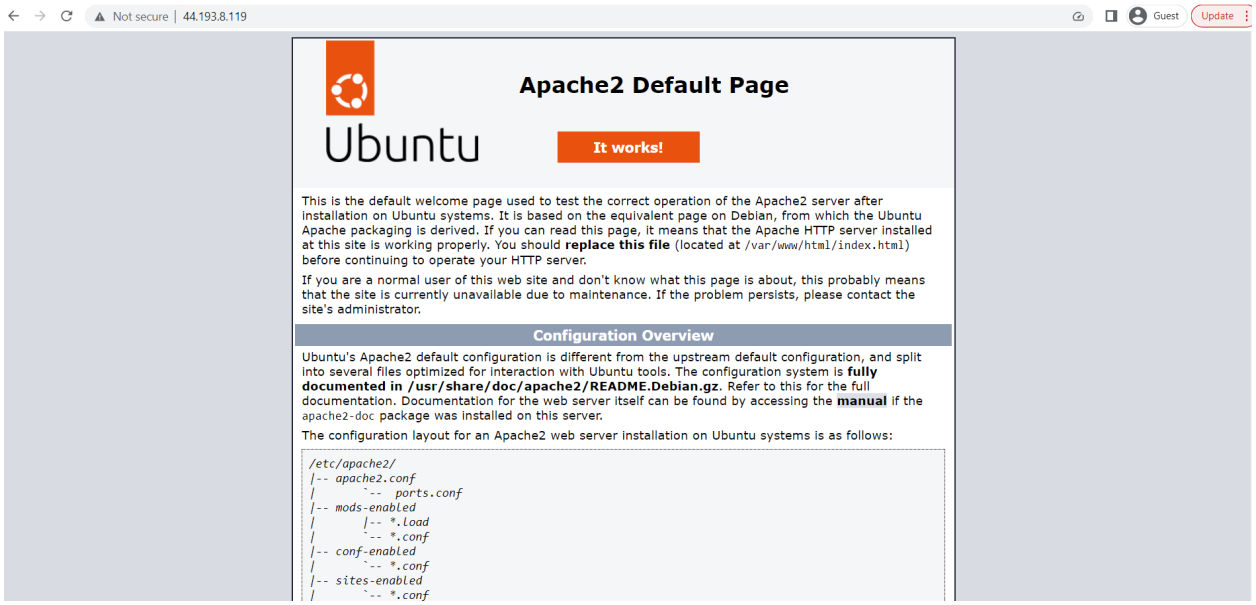
Launched an EC2 instance in one of the subnets.



Installed Apache2 in the EC2 instance to host the web server.

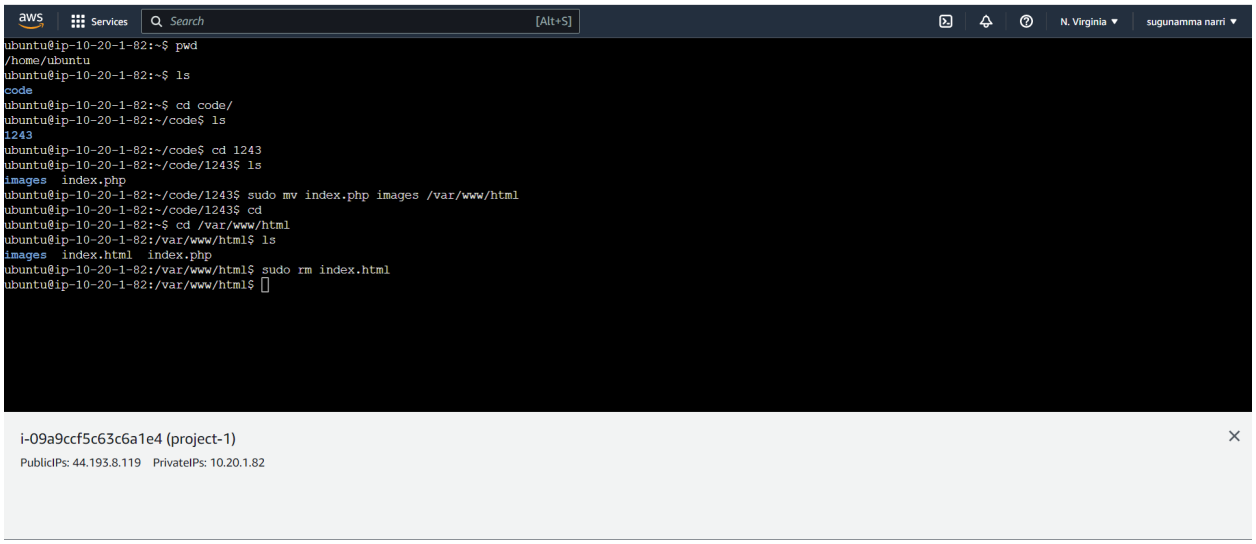


Default web page

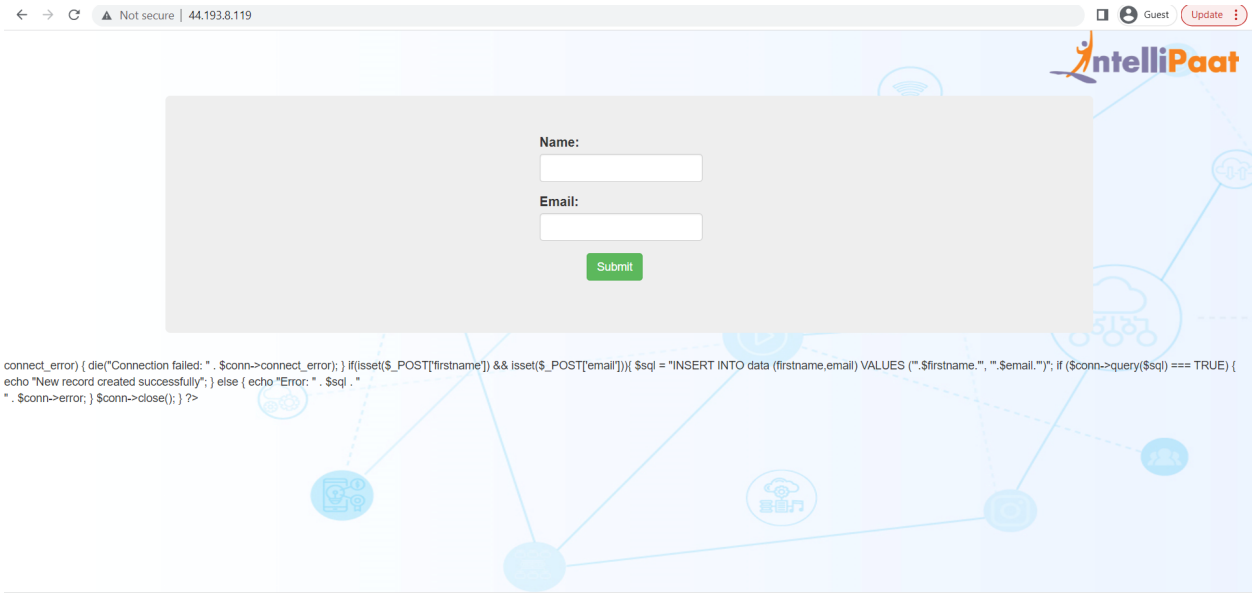


Copied the downloaded php code to the EC2 instance by using scp command.

Remove the default index.html file in the apache2 home directory (/var/www/html) and move the php code to this directory i.e., index.php and images dir.

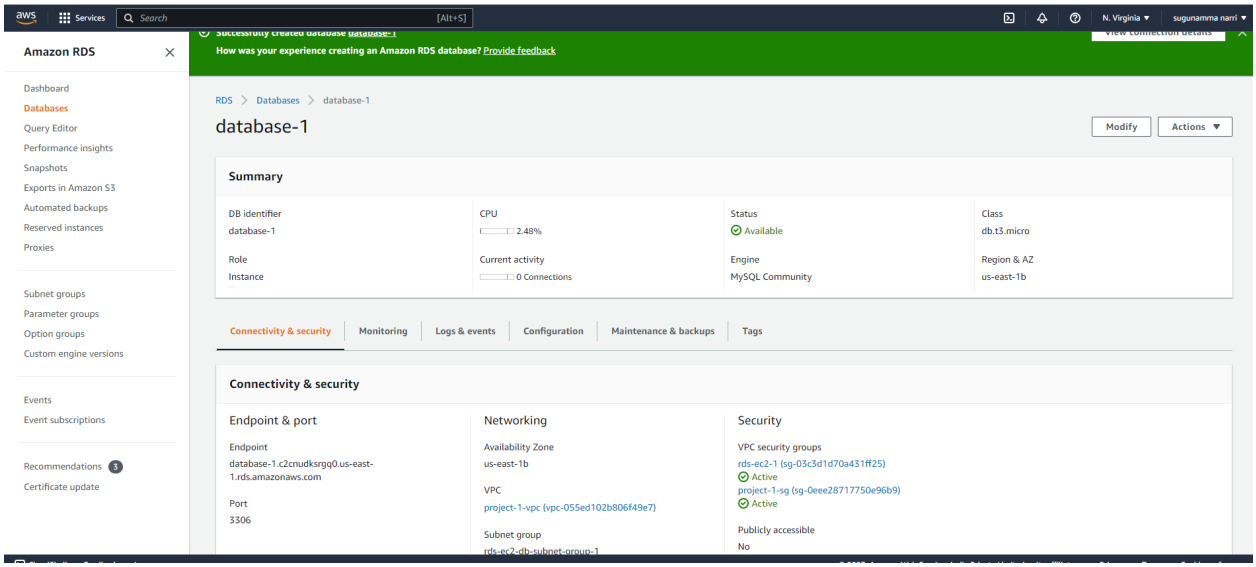


Now, browse to the public IP address and see the php app is running. However, we further notice that database connection is error-ed out since the proper details are not put in the php code running.

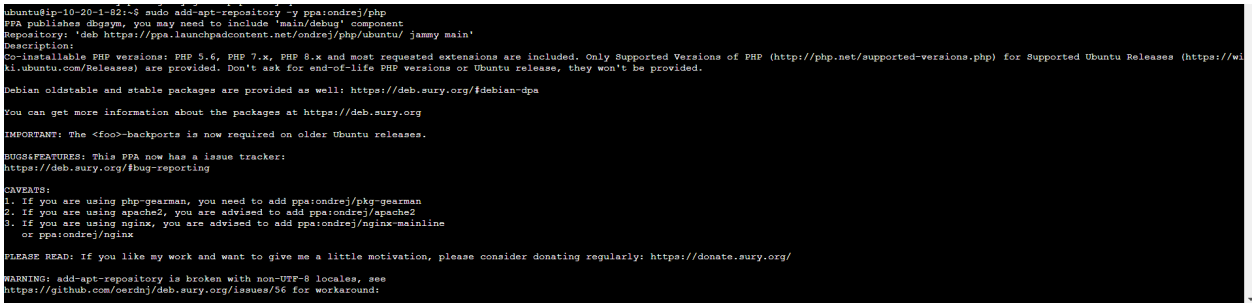


Create Database & Table in RDS Instance

- Database name: intel
- Table name: data
- Database password: intel123.



Connected to the EC2 instance and installed a mysql client in it.




```
ubuntu@ip-10-20-1-82:~$ sudo apt install php5.6 mysql-client php5.6-mysqli
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'php5.6-mysql' instead of 'php5.6-mysqli'
The following additional packages will be installed:
  libapache2-mod-php5.6 mysql-client-8.0 mysql-client-core-8.0 mysql-common php-common php5.6-cli php5.6-common php5.6-json php5.6-opcache php5.6-readline
Suggested packages:
  php-pear
The following NEW packages will be installed:
  libapache2-mod-php5.6 mysql-client mysql-client-8.0 mysql-client-core-8.0 mysql-common php-common php5.6 php5.6-cli php5.6-common php5.6-json php5.6-mysql
  php5.6-opcache php5.6-readline
0 upgraded, 13 newly installed, 0 to remove and 8 not upgraded.
Need to get 6799 kB of archives.
After this operation, 76.8 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 mysql-client-core-8.0 amd64 8.0.32-0ubuntu0.22.04.2 [2677 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 mysql-common all 5.8+1.0.8 [7212 B]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 mysql-client-8.0 amd64 8.0.32-0ubuntu0.22.04.2 [22.7 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 mysql-client all 8.0.32-0ubuntu0.22.04.2 [9350 B]
Get:5 https://ppa.launchpadcontent.net/ondrej/php/ubuntu jammy/main amd64 php-common all 2:93+ubuntu22.04.1+deb.sury.org+2 [16.6 kB]
Get:6 https://ppa.launchpadcontent.net/ondrej/php/ubuntu jammy/main amd64 php5.6-common amd64 5.6.40-65+ubuntu22.04.1+deb.sury.org+1 [767 kB]
Get:7 https://ppa.launchpadcontent.net/ondrej/php/ubuntu jammy/main amd64 php5.6-json amd64 5.6.40-65+ubuntu22.04.1+deb.sury.org+1 [18.8 kB]
Get:8 https://ppa.launchpadcontent.net/ondrej/php/ubuntu jammy/main amd64 php5.6-opcache amd64 5.6.40-65+ubuntu22.04.1+deb.sury.org+1 [67.7 kB]
Get:9 https://ppa.launchpadcontent.net/ondrej/php/ubuntu jammy/main amd64 php5.6-readline amd64 5.6.40-65+ubuntu22.04.1+deb.sury.org+1 [14.0 kB]
Get:10 https://ppa.launchpadcontent.net/ondrej/php/ubuntu jammy/main amd64 php5.6-cli amd64 5.6.40-65+ubuntu22.04.1+deb.sury.org+1 [1412 kB]
```

Connected to the created database by giving endpoint,data name and password in mysql command.

```
ubuntu@ip-10-20-1-82:~$ mysql -h database-1.c2cnudksrgq0.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 18
Server version: 8.0.28 Source distribution

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| intel              |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
5 rows in set (0.00 sec)

mysql> use intel;
Database changed
mysql> create table data(firstname varchar(20), email varchar(20));
Query OK, 0 rows affected (0.03 sec)
```

```
mysql> show tables;
+-----------------+
| Tables_in_intel |
+-----------------+
| data            |
+-----------------+
1 row in set (0.00 sec)

mysql> exit
Bye
ubuntu@ip-10-20-1-82:~$ cd -
/var/www/html
ubuntu@ip-10-20-1-82:/var/www/html$ ls
images  index.php
ubuntu@ip-10-20-1-82:/var/www/html$ vi index.php
ubuntu@ip-10-20-1-82:/var/www/html$ mysql -h database-1.c2cnudksrgq0.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 23
Server version: 8.0.28 Source distribution

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Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use intel;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> select * from data;
Empty set (0.00 sec)
```
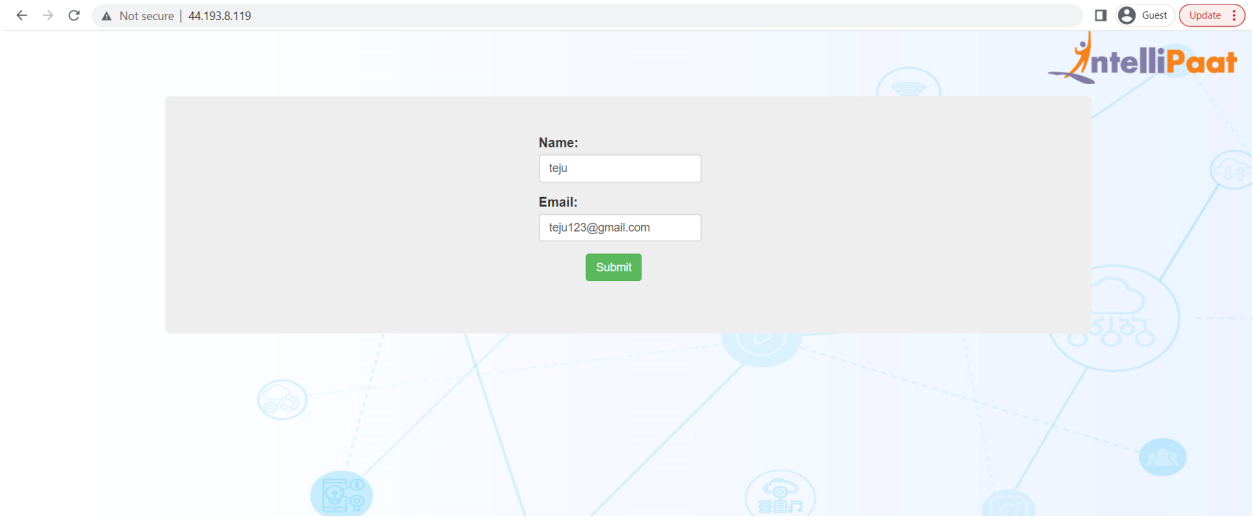
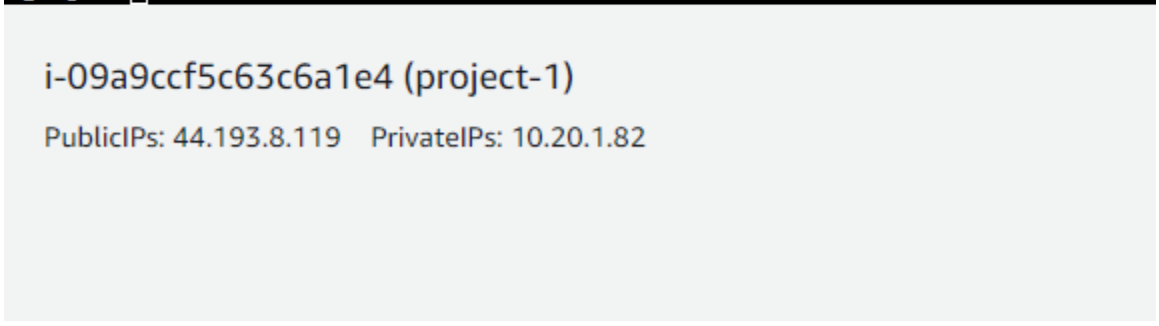

Enter the data in the application running on the web server.

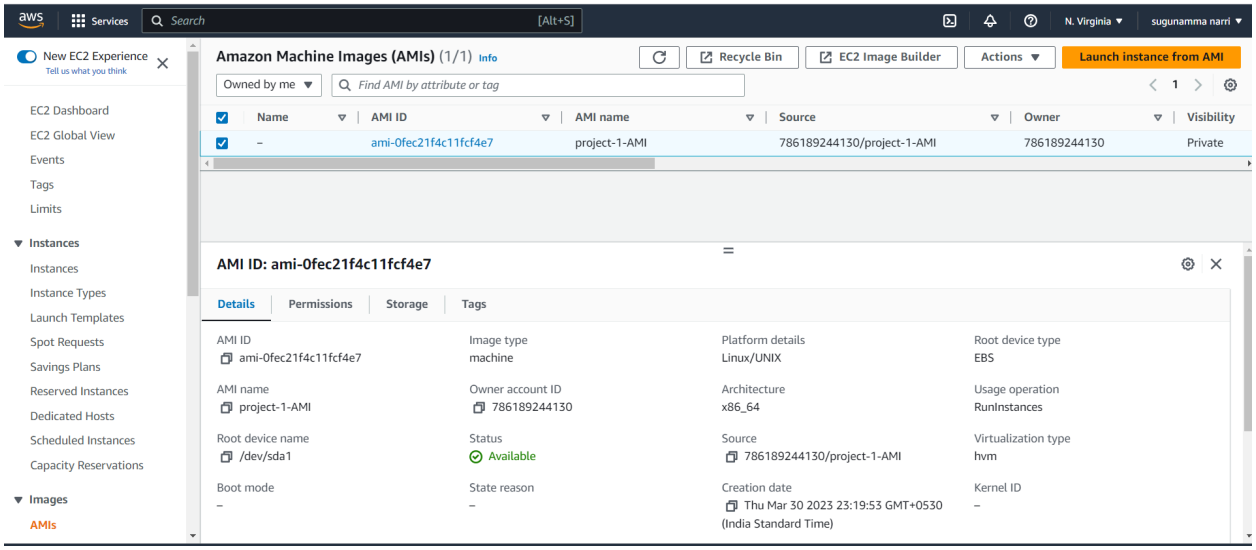


The data entered is stored in the RDS database and which can be shown in the tables of the database created.

```
Database changed
mysql> select * from data;
Empty set (0.00 sec)

mysql> select * from data;
+-----------+--------------------+
| firstname | email              |
+-----------+--------------------+
| teju      | teju123@gmail.com  |
+-----------+--------------------+
1 row in set (0.00 sec)

mysql>
```

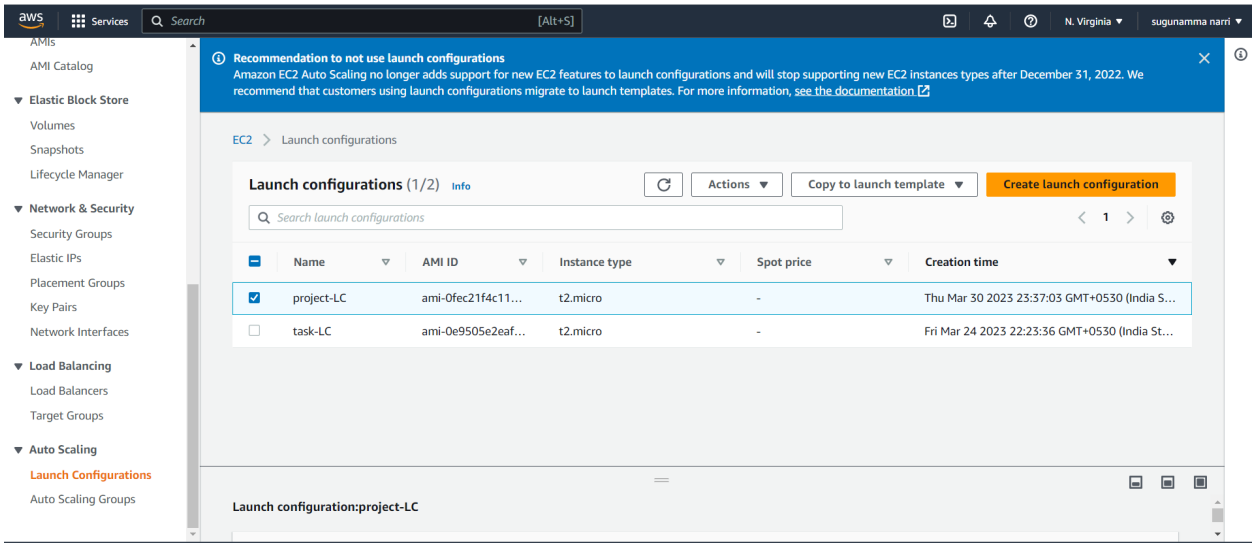


Created an AMI image of the instance.

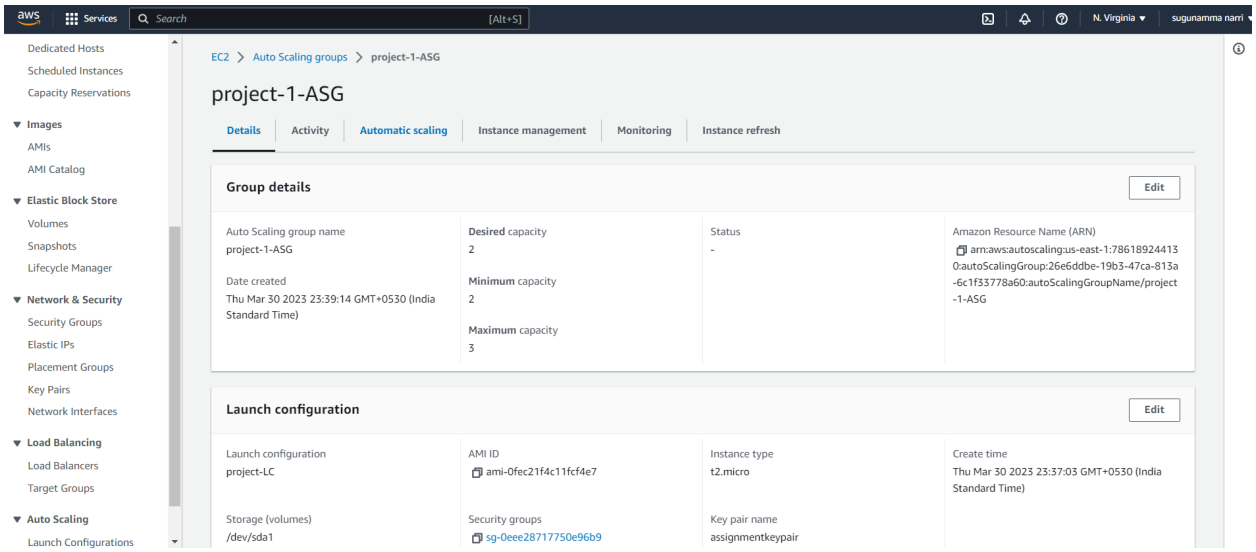


Created a launch configuration with the AMI created above.

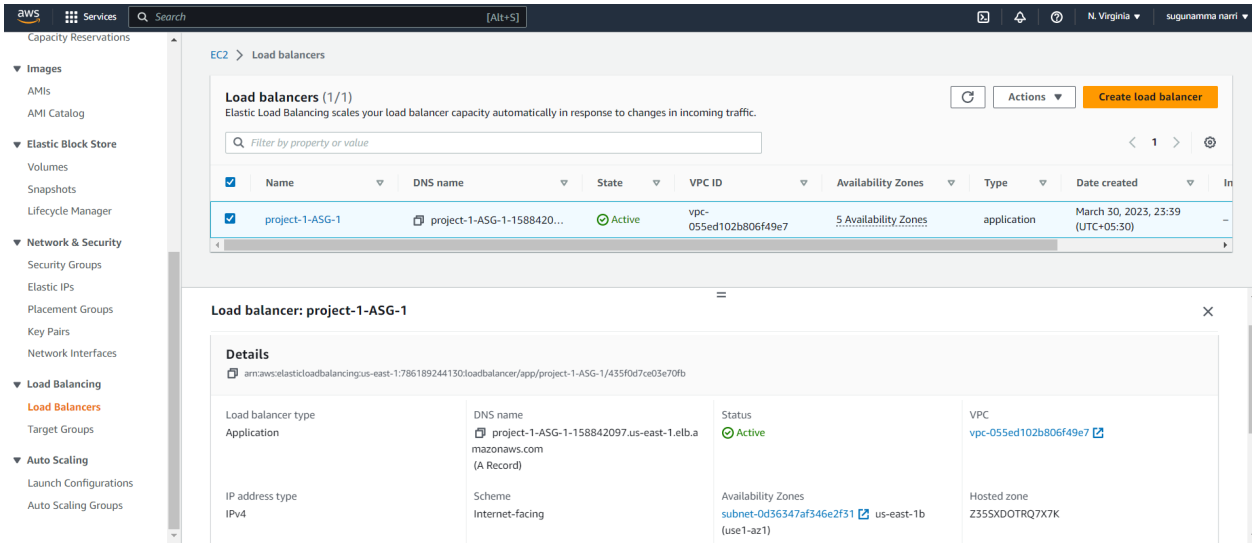
Launch configuration name: project-LC



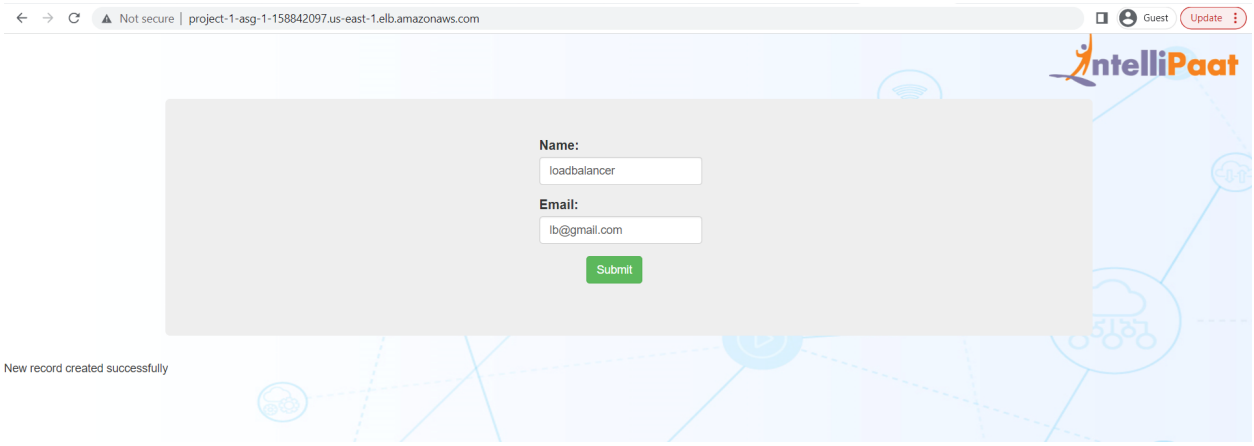
By using the above Launch Configuration,Created an Auto Scaling group with 2 minimum and 3 maximum instances.



Create an application load balancer.



Browse with the loadbalancer DNS endpoint to verify that app is accessible. To further verify that data is stored in the RDS, we have given the username and email with respect to loadbalancer things.



Now, switch to ec2 and login to rds database/table to confirm.