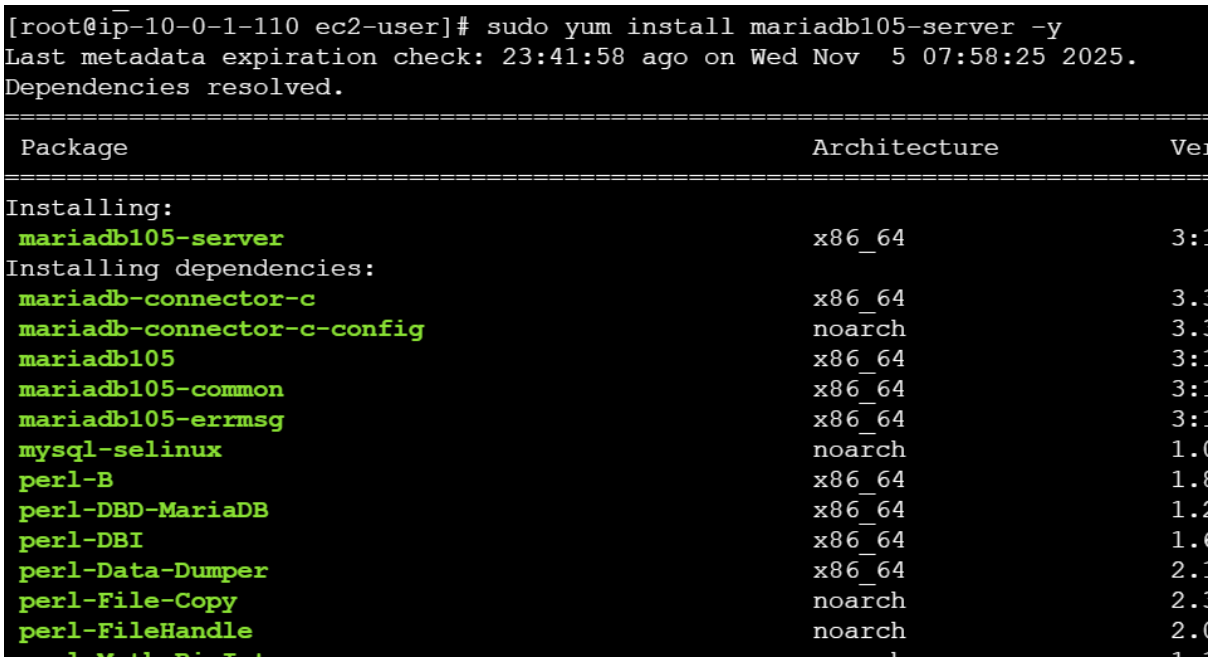
RDS – RELATIONAL DATABASE SYSTEM.

1. Create MariaDB DB on EC2.

- go ec2 and launch an instance
- connect to terminal
- install maria db as we are using amazon linux 2023
- use command – sudo yum install mariadb105-server -y



- sudo yum enable mariadb
- sudo yum start mariadb
- now log in to db with root
- mysql -u root -p
- now create a user
- CREATE USER 'KAMAL'@'%' INDENTIFIED BY 'kamal';
- GRANT ALL PRIVILEGES ON mydb.* TO 'KAMAL'@'%';
- FLUSH PRIVILEGES;
- User will ber created
- Now exit from root

```
MariaDB [(none)]> CREATE  USER 'KAMAL'@'%' IDENTIFIED BY 'kamal';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON mydb.* TO  'KAMAL'@'%';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 sec)
```

- Exit from root = EXIT;
- Now, login to user KAMAL
- Mysql -u KAMAL -P

```
[root@ip-10-0-1-110 ec2-user]# mysql -u KAMAL -P
mysql: option '-P' requires an argument
[root@ip-10-0-1-110 ec2-user]# mysql -u KAMAL -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 5
Server version: 10.5.29-MariaDB MariaDB Server
```

2. Insert some dummy data.
    - To insert some data as it is relational data
    - We need to create tables
    - Login to user, and create one personal db
    - CREATE DATABASE kamaldb;
    - Go to root and create create kamaldb and grant all privilges to KAMAL.
    - GRANT ALL PRIVILEGES ON *.* TO 'KAMAL'@'%' IDENTIFIED BY 'kamal' WITH GRANT OPTION;
    - FLUSH PRIVILEGES;
    - This command give permission to KAMAL user .

```
Your MariaDB connection id is 6
Server version: 10.5.29-MariaDB MariaDB Server

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

MariaDB [(none)]> GRANT ALL PRIVILEGES ON *.* TO 'KAMAL'@'%' IDENTIFIED BY 'kamal' WITH GR
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 sec)
```

- Now login to user= KAMAL
- Create database inside user by
- CREATE DATABASE kamaldb;
- CREATE TABLE user (user_id INT AUTO_INCREMENT PRIMARY KEY,
- name VARCHAR(100) NOT NULL,
- email VARCHAR(100) NOT NULL,
- phone VARCHAR(15),
- created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
-);

```
MariaDB [kamaldb]> CREATE TABLE  user ( user_id INT AUTO_INCREMENT PRIMARY KEY, name VARCHAR(100) NOT NULL, email VARCHAR(100) NOT NULL, phone VARCHAR(15
), created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP );
Query OK, 0 rows affected (0.008 sec)
```

```
CREATE TABLE users (
  user_id INT AUTO_INCREMENT PRIMARY KEY,
  name VARCHAR(100) NOT NULL,
  email VARCHAR(100) NOT NULL,
  phone VARCHAR(15),
  created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

```
MariaDB [kamaldb]> USE kamaldb;
Database changed
MariaDB [kamaldb]> CREATE TABLE users (
    ->   user_id INT AUTO_INCREMENT PRIMARY KEY,
    ->   name VARCHAR(100) NOT NULL,
    ->   email VARCHAR(100) NOT NULL,
    ->   phone VARCHAR(15),
    ->   created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
    -> );
Query OK, 0 rows affected (0.009 sec)
```

- To insert
- INSERT INTO users (name, email, phone) VALUES
- ('kamal', 'kamal@gmail.com', '1234567891'),
- ('bro', 'bro@gmail.com', '9876543211');

```
MariaDB [kamaldb]> INSERT INTO users (name, email, phone) VALUES
    -> ('kamal', 'kamal@gmail.com', '1234567891'),
    -> ('bro', 'bro@gmail.com', '9876543211');
Query OK, 2 rows affected (0.002 sec)
Records: 2  Duplicates: 0  Warnings: 0
```

- Check data
- SELECT * FROM users;

```
MariaDB [kamaldb]> SELECT * FROM users;
+---------+-------+-----------------+------------+---------------------+
| user_id | name  | email           | phone      | created_at          |
+---------+-------+-----------------+------------+---------------------+
|       1 | kamal | kamal@gmail.com | 1234567891 | 2025-11-06 12:23:50 |
|       2 | bro   | bro@gmail.com   | 9876543211 | 2025-11-06 12:23:50 |
+---------+-------+-----------------+------------+---------------------+
2 rows in set (0.000 sec)
```

3 . Take the backup of dummy data on EC2.

- Exit from db
- Go to linux terminal
- By command EXIT;
- mysqldump -u KAMAL -p kamaldb users > /home/ec2-user/users_table_backup.sql
- backup created now check,

- ls -l /home/ec2-user

```
root@ip-10-0-1-110 ec2-user]# /home/ec2-user/
ash: /home/ec2-user/: Is a directory
root@ip-10-0-1-110 ec2-user]# ls -l /home/ec2-user
otal 4
rw-r--r--. 1 root root 2225 Nov  6 12:29 users_table_backup.sql
root@ip-10-0-1-110 ec2-user]#
```

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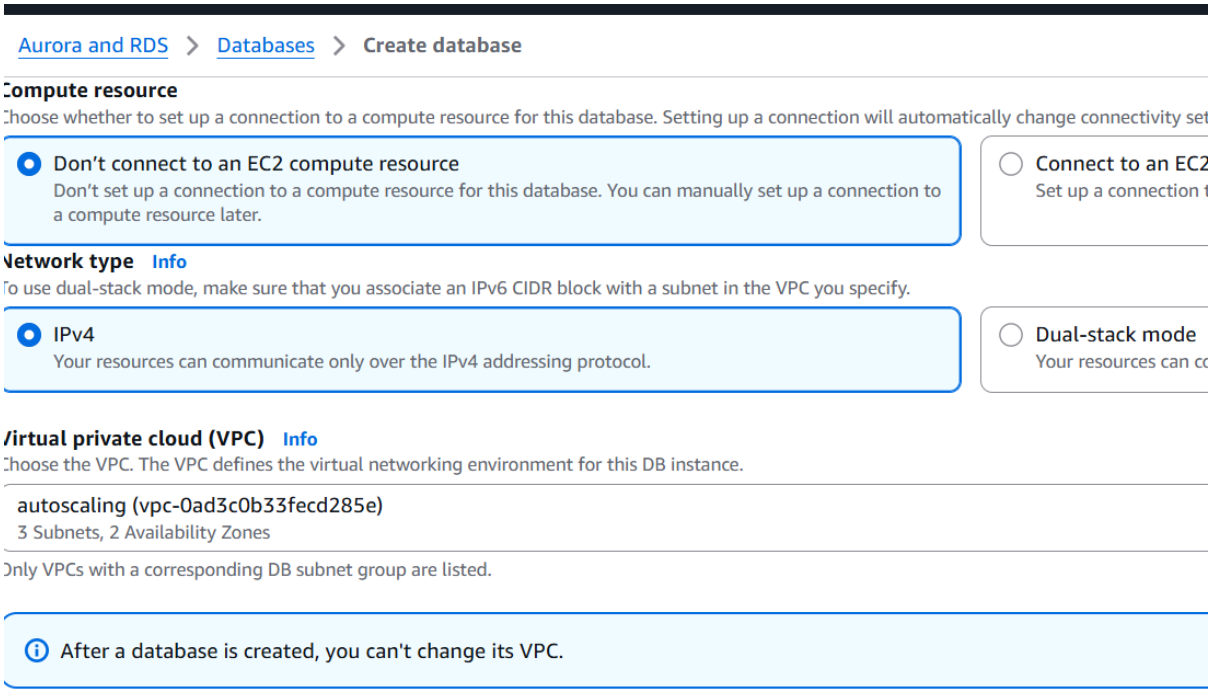
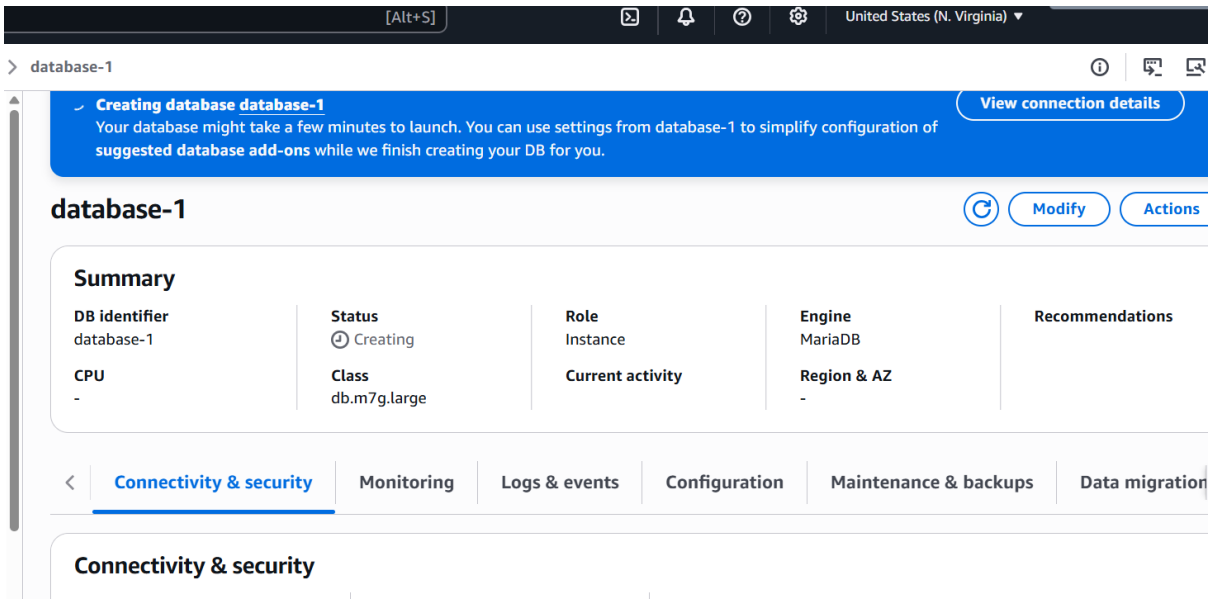
4 . Launch MariaDB RDS instance.

- Open aws console
- Navigate to RDS
- Create a database
- Given name
- Add standard
- Add vpc and existing subnets
- Add maira db

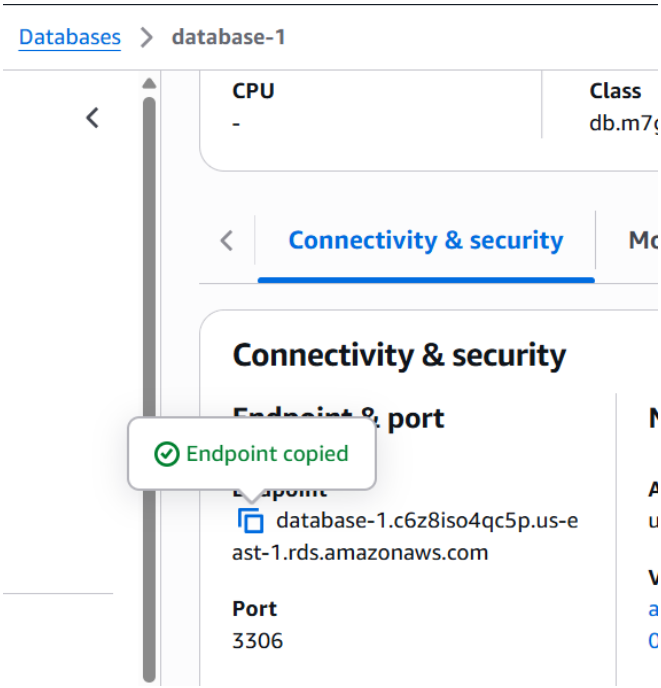


- Database created in rds



5. Migrate database from EC2 to RDS.

- Take backup first to migrate
- mysqldump -u KAMAL -p kamaldb > /home/ec2-user/kamaldb_backup.sql
- to migrate we need rds database – end point
- copy endpoint



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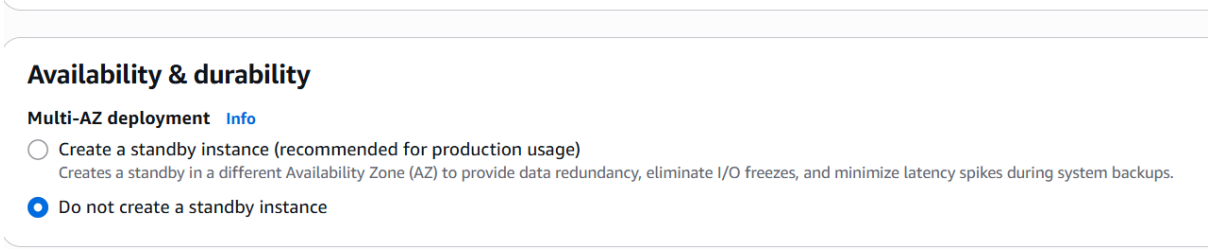
-
- **RDS → Create Database**

- Engine: **MariaDB**
- Set username & password
- Add manual password
- Enable **Public Access = Yes (for testing)**
- Add your **EC2 Security Group** to RDS Inbound Rules
- Create database instance



- Exit from database
-

```
[ec2-user@ip-10-0-1-110 ~]$ ls -l
total 8
-rw-r--r--. 1 root root 2960 Nov  6 12:37 kamaldb_backup.sql
-rw-r--r--. 1 root root 2225 Nov  6 12:29 users_table_backup.sql
[ec2-user@ip-10-0-1-110 ~]$
```

- Now loginto rds from ec2

```
[ec2-user@ip-10-0-1-110 ~]$ mysql -h database-1.c6z8iso4qc5p.us-east-1.rds.amazonaws.com -u adm
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 1846
Server version: 11.4.8-MariaDB-log managed by https://aws.amazon.com/rds/

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

MariaDB [(none)]> CREATE DATABASE kamaldb;
Query OK, 1 row affected (0.005 sec)
```

- Now send database from ec2 to rds

```
[ec2-user@ip-10-0-1-110 ~]$ mysql -h database-1.c6z8iso4qc5p.us-east-1.rds.amazonaws.com -u admin -p kamaldb < kamaldb_backup.sql
Enter password:
[ec2-user@ip-10-0-1-110 ~]$ mysql -h database-1.c6z8iso4qc5p.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 1849
Server version: 11.4.8-MariaDB-log managed by https://aws.amazon.com/rds/

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```

```
MariaDB [(none)]> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| innodb             |
| kamaldb            |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
6 rows in set (0.001 sec)
```

- Verified.

6 . Install MySQL DB on EC2

- Login too ec2,
- Install mysql
- sudo yum install mariadb105-server -y

```
[ec2-user@ip-10-0-1-110 ~]$ sudo yum install mariadb105-server -y
Last metadata expiration check: 0:44:07 ago on Fri Nov  7 09:20:42 2025.
Package mariadb105-server-3:10.5.29-1.amzn2023.0.1.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
[ec2-user@ip-10-0-1-110 ~]$
```

```
[ec2-user@ip-10-0-1-110 ~]$ sudo systemctl enable --now mariadb
[ec2-user@ip-10-0-1-110 ~]$ sudo systemctl start --now mariadb
[ec2-user@ip-10-0-1-110 ~]$ sudo systemctl status --now mariadb
● mariadb.service - MariaDB 10.5 database server
     Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; preset: disabled)
     Active: active (running) since Fri 2025-11-07 09:20:14 UTC; 47min ago
       Docs: man:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
   Main PID: 1507 (mariadbd)
     Status: "Taking your SQL requests now..."
      Tasks: 8 (limit: 1053)
     Memory: 85.5M
        CPU: 514ms
     CGroup: /system.slice/mariadb.service
             └─1507 /usr/libexec/mariadbd --basedir=/usr
```

7. Launch MySQL RDS image.

- **Connect to RDS from your EC2 Instance**
- Run this command on your EC2 terminal:
- `mysql -h database-1.c6z8iso4qc5p.us-east-1.rds.amazonaws.com -u admin -p`
-

```
[ec2-user@ip-10-0-1-110 ~]$ mysql -h database-1.c6z8iso4qc5p.us-east-1.rds.amazonaws.com -u admin -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 1870
Server version: 11.4.8-MariaDB-log managed by https://aws.amazon.com/rds/

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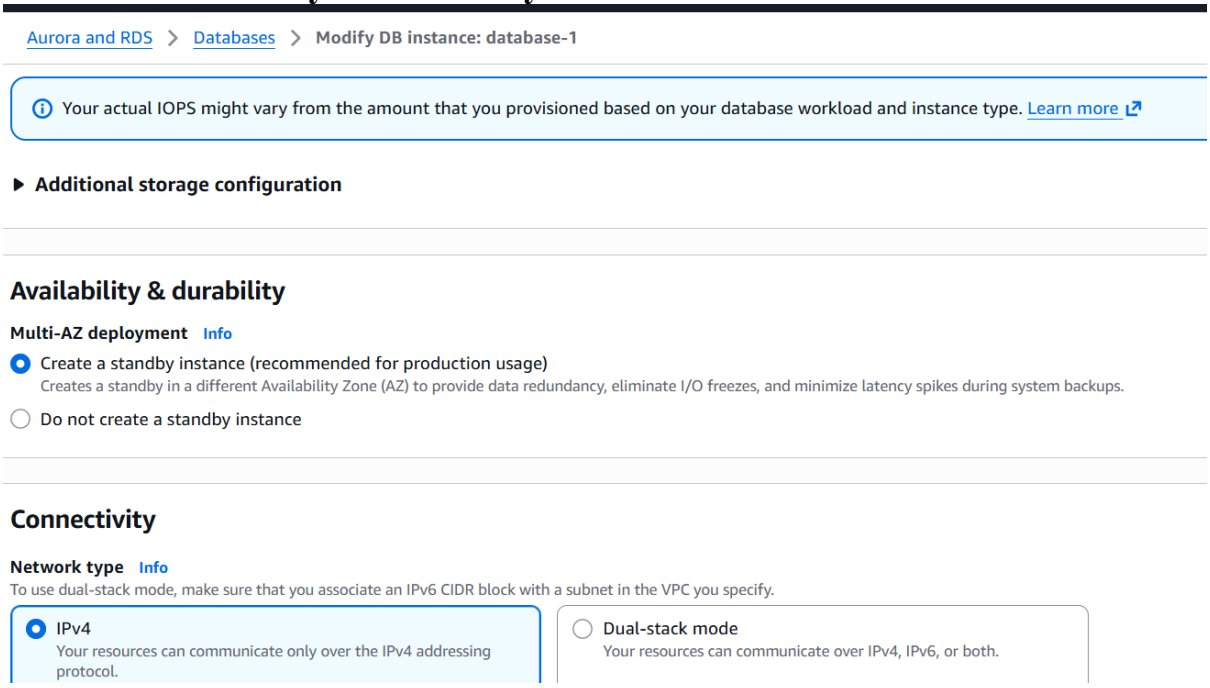
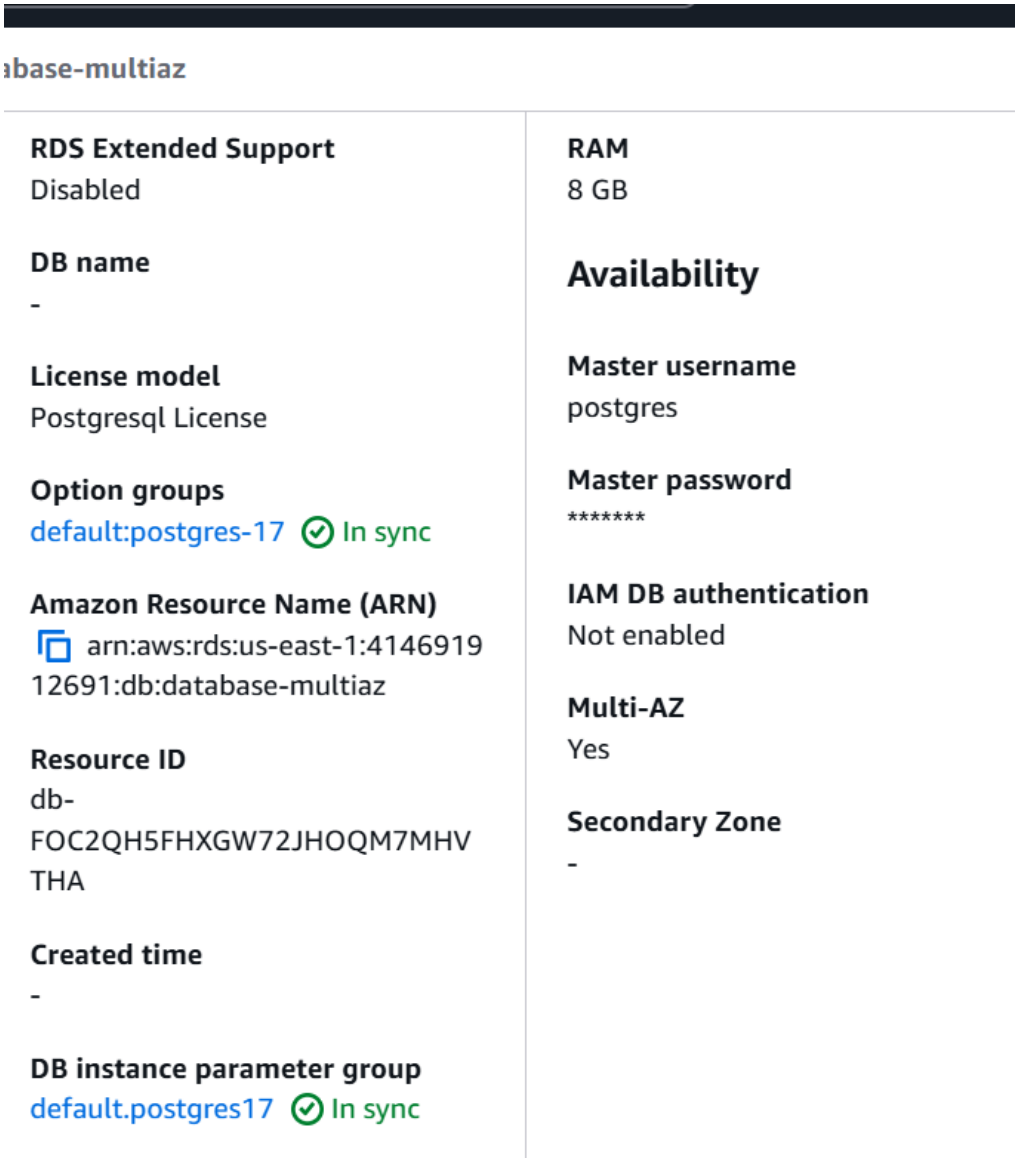

8. Configure Multi-AZ.

- Go to **RDS → Databases**
- Click your DB
- Click **Modify**
- Scroll to **Availability & Durability**
- 

"Create a standby instance"

- Scroll down
- → **Apply Immediately**
- → Click **Modify DB Instance**
- AWS will now create a standby copy in another

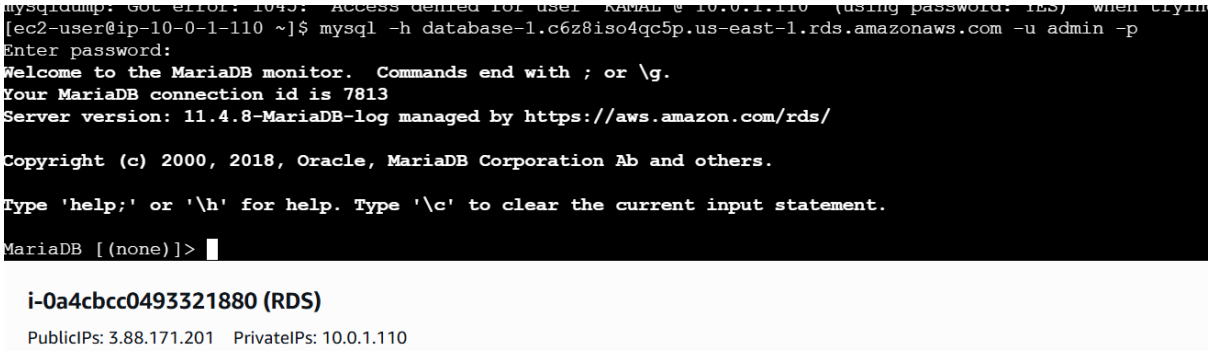


9. Take backup of DB and restore the DB.

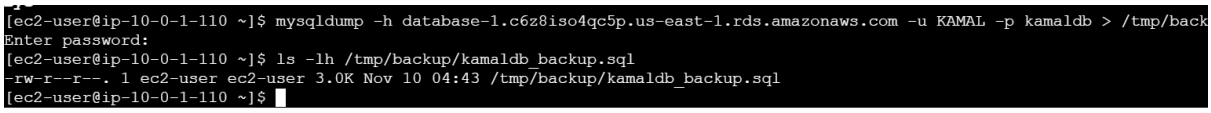
- Login into db
- mysql -u KAMAL -p
-

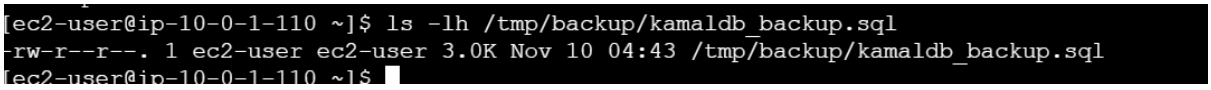
```
Your MariaDB connection id is 4
Server version: 10.5.29-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

MariaDB [(none)]> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| kamaldb            |
| mysql              |
| performance_schema |
+--------------------+
4 rows in set (0.002 sec)

MariaDB [(none)]>
```

- Exit from db
- Take backup from terminal
- Now create a directory and a file
- Loginto RDS using admin and master password
- mysql -h database-1.c6z8iso4qc5p.us-east-1.rds.amazonaws.com -u admin -p



- take backup
- mysqldump -h database-1.c6z8iso4qc5p.us-east-1.rds.amazonaws.com -u KAMAL -p kamaldb > /tmp/backup/kamaldb_backup.sql

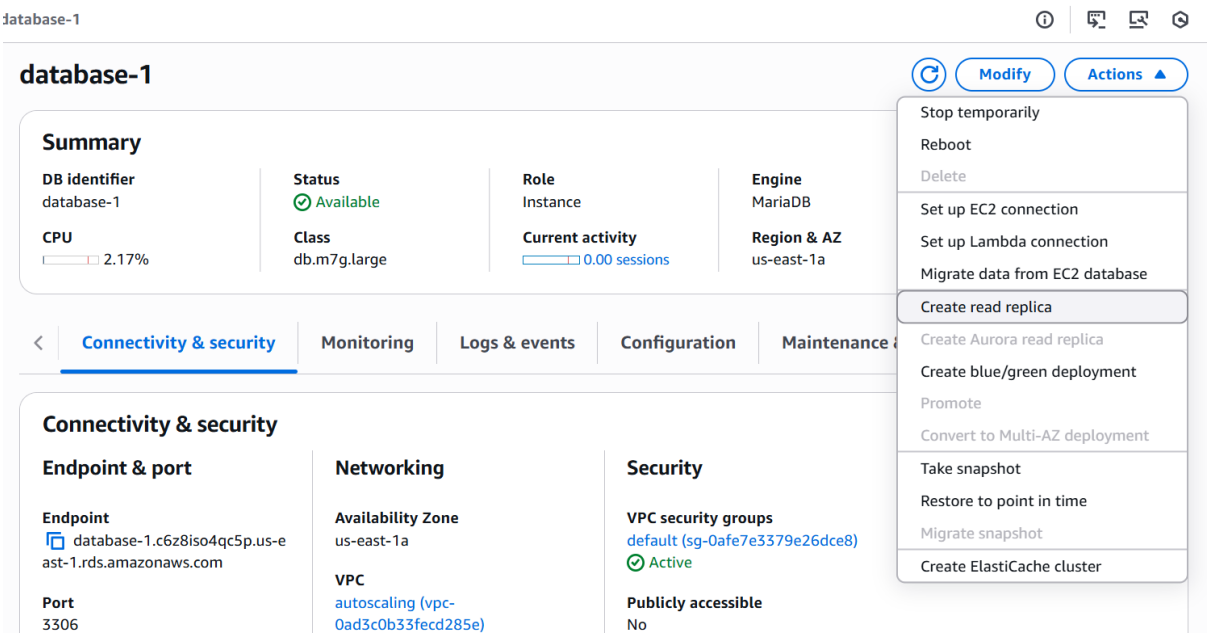


- ls -lh /tmp/backup/kamaldb_backup.sql
- 

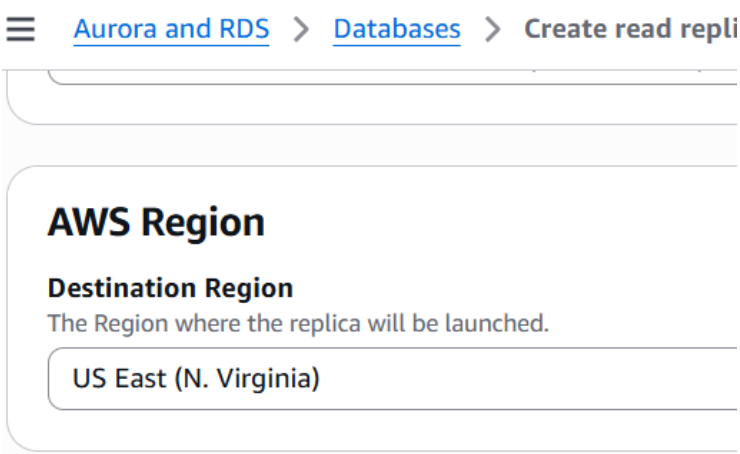
- Backup created

10 . create read replica

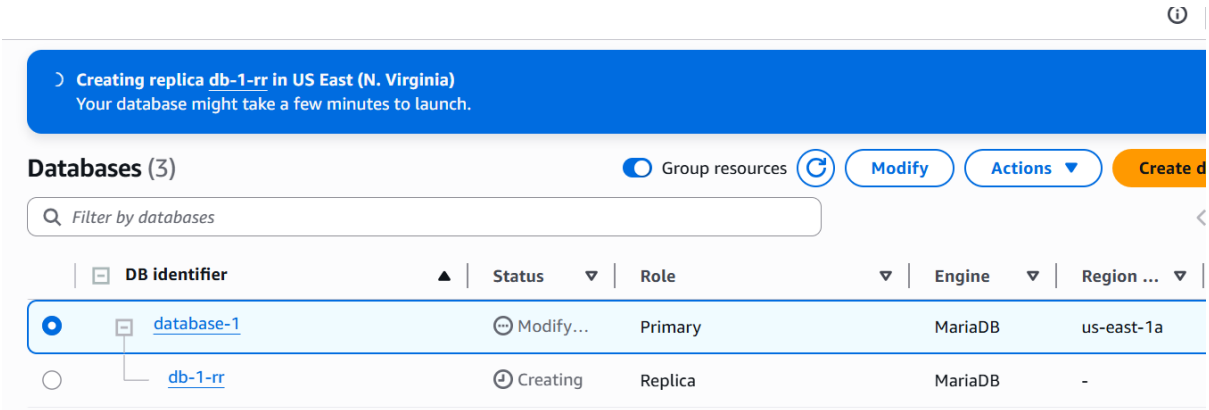
- Open aws console ,
- Navigate to rds
- Open data base



Same region



- Give a identifiet name as
- Db-1-rr



Main db replicationg new