




## Database Project-2

 Project	 Description
MySQL / MariaDB Setup	 Install & configure MySQL or MariaDB, create database, manage users, and secure it (disable remote root access, strong passwords), automate regular backups using Shell Scripting & Crontab.

### Step 1 . Launch an EC2 Instance

- **AMI:** Ubuntu Server 22.04 or above
- **Type:** t2.micro or above
- **Storage:** 8–10 GB
- **Security Group (Inbound Rules):**
  - SSH → 22
  - *Optional* (only if needed): MySQL/MariaDB → 3306

Inbound rules							Outbound rules	Sharing - new	VPC associations - new	Tags
Inbound rules (2)										
<input type="text" value="Search"/>										
<input type="checkbox"/>	Name	▼	Security group rule ID	▼	IP version	▼	Type	▼	Protocol	
<input type="checkbox"/>	–		sgr-0b77b33d85ac0cf69		IPv4		SSH		TCP	
<input type="checkbox"/>	–		sgr-04780c90d0ab79034		IPv4		MYSQL/Aurora		TCP	

```
root@ip-172-31-46-45: ~  
root@ip-172-31-46-45:~# cat /etc/os-release  
PRETTY_NAME="Ubuntu 22.04.5 LTS"  
NAME="Ubuntu"  
VERSION_ID="22.04"  
VERSION="22.04.5 LTS (Jammy Jellyfish)"  
VERSION_CODENAME=jammy  
ID=ubuntu  
ID_LIKE=debian  
HOME_URL="https://www.ubuntu.com/"  
SUPPORT_URL="https://help.ubuntu.com/"  
BUG_REPORT_URL="https://bugs.launchpad.net/ubuntu/"  
PRIVACY_POLICY_URL="https://www.ubuntu.com/legal/terms-and-policies/privacy-policy"  
UBUNTU_CODENAME=jammy  
root@ip-172-31-46-45:~#
```

## Step 2 . Connect to Your EC2 Instance

```
ssh -i my-key.pem ubuntu@EC2_PUBLIC_IP
```

```
Command Prompt  
Microsoft Windows [Version 10.0.22631.6199]  
(c) Microsoft Corporation. All rights reserved.  
  
C:\Users\User>cd Downloads  
  
C:\Users\User\Downloads>ssh -i my-key.pem ubuntu@13.201.31.241
```

## Step 3 . Install MariaDB Server

```
apt update && sudo apt upgrade -y
```

```
sudo apt install mariadb-server -y
```

```
Check version: mariadb --version
```

```
root@ip-172-31-46-45: ~  
root@ip-172-31-46-45:~# mariadb --version  
mariadb Ver 15.1 Distrib 10.6.22-MariaDB, for debian-linux-gnu (x86_64) using EditLine wrapper  
root@ip-172-31-46-45:~#
```

## Step 4 . Start & Enable MariaDB

```
systemctl start mariadb
```

```
systemctl enable mariadb
```

```
systemctl status mariadb
```

```
root@ip-172-31-46-45: ~  
root@ip-172-31-46-45:~# systemctl restart mariadb  
root@ip-172-31-46-45:~# systemctl enable mariadb  
Synchronizing state of mariadb.service with SysV service script with /lib/systemd/systemd-sysv-install.  
Executing: /lib/systemd/systemd-sysv-install enable mariadb  
root@ip-172-31-46-45:~# systemctl status mariadb  
● mariadb.service - MariaDB 10.6.22 database server  
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)  
   Active: active (running) since Thu 2025-11-27 05:16:32 UTC; 8s ago  
     Docs: man:mariadb(8)  
           https://mariadb.com/kb/en/library/systemd/  
  Main PID: 13542 (mariabdd)  
    Status: "Taking your SQL requests now..."  
   Tasks: 12 (limit: 7425)  
  Memory: 61.3M  
    CPU: 345ms  
   CGroup: /system.slice/mariadb.service  
           └─13542 /usr/sbin/mariabdd  
  
Nov 27 05:16:32 ip-172-31-46-45 mariabdd[13542]: Version: '10.6.22-MariaDB-0ubuntu0.22.04.1' socket: '/run/mysqld/mysqld.sock' port: 3306  
Nov 27 05:16:32 ip-172-31-46-45 systemd[1]: Started MariaDB 10.6.22 database server.  
Nov 27 05:16:32 ip-172-31-46-45 /etc/mysql/debian-start[13557]: Upgrading MySQL tables if necessary.  
Nov 27 05:16:32 ip-172-31-46-45 /etc/mysql/debian-start[13560]: Looking for 'mariadb' as: /usr/bin/mariadb  
Nov 27 05:16:32 ip-172-31-46-45 /etc/mysql/debian-start[13560]: Looking for 'mariadb-check' as: /usr/bin/mariadb-check  
Nov 27 05:16:32 ip-172-31-46-45 /etc/mysql/debian-start[13560]: This installation of MariaDB is already upgraded to 10.6.22-MariaDB.  
Nov 27 05:16:32 ip-172-31-46-45 /etc/mysql/debian-start[13560]: There is no need to run mysql_upgrade again.  
Nov 27 05:16:32 ip-172-31-46-45 /etc/mysql/debian-start[13560]: You can use --force if you still want to run mysql_upgrade  
Nov 27 05:16:32 ip-172-31-46-45 /etc/mysql/debian-start[13568]: Checking for insecure root accounts.  
Nov 27 05:16:32 ip-172-31-46-45 /etc/mysql/debian-start[13572]: Triggering myisam-recover for all MyISAM tables and aria-recover for a  
lines 1-23/23 (END)
```

## Step 5 . Secure the MariaDB Installation

mysql\_secure\_installation

## Step 6 . Login to MariaDB & Create Database & User (for portfolio)

```
mysql -u root -p
```

Inside MariaDB shell:

Create database

Show databases;

```
create database shabbir_db1;
```

```
root@ip-172-31-46-45: ~
MariaDB [(none)]> show databases;
+-----+
| Database           |
+-----+
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+-----+
4 rows in set (0.000 sec)

MariaDB [(none)]> create database shabbir_db1;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> show databases;
+-----+
| Database           |
+-----+
| information_schema |
| mysql              |
| performance_schema |
| shabbir_db1        |
| sys                |
+-----+
5 rows in set (0.000 sec)

MariaDB [(none)]>
```

## Create a user

```
create user shabbir@localhost identified by 'password@123';
```

```
root@ip-172-31-46-45: ~
MariaDB [(none)]> create user shabbir@localhost identified by 'password@123';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]>
```

## Grant permissions for Shabbir to shabbir\_db1

GRANT ALL PRIVILEGES ON shabbir\_db1.\* TO 'shabbir'@'localhost';

```
root@ip-172-31-46-45: ~  
MariaDB [(none)]> GRANT ALL PRIVILEGES ON shabbir_db1.* TO 'shabbir'@'localhost';  
Query OK, 0 rows affected (0.001 sec)  
  
MariaDB [(none)]>
```

EXIT;

Re-login with Shabbir user & Show database

```
root@ip-172-31-46-45: ~  
MariaDB [(none)]> GRANT ALL PRIVILEGES ON shabbir_db1.* TO 'shabbir'@'localhost';  
Query OK, 0 rows affected (0.001 sec)  
  
MariaDB [(none)]> exit ;  
Bye  
root@ip-172-31-46-45:~# mariadb -u shabbir -p  
Enter password:  
Welcome to the MariaDB monitor.  Commands end with ; or \g.  
Your MariaDB connection id is 38  
Server version: 10.6.22-MariaDB-0ubuntu0.22.04.1 Ubuntu 22.04  
  
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 |  
| shabbir_db1 |  
+-----+  
2 rows in set (0.000 sec)  
  
MariaDB [(none)]>
```

**Step 7 . Create New DB,use/go-inside new DB ,Create table,show tables,SELECT \* FROM employees;**

root@ip-172-31-46-45: ~

MariaDB [(none)]> show databases;

Database
information_schema
mysql
performance_schema
shabbir_db1
sys

5 rows in set (0.000 sec)

MariaDB [(none)]> create database shabbir\_db2;

Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> show databases;

Database
information_schema
mysql
performance_schema
shabbir_db1
shabbir_db2
sys

6 rows in set (0.000 sec)

MariaDB [(none)]>

```

root@ip-172-31-46-45: ~
MariaDB [(none)]> use shabbir_db2
Database changed
MariaDB [shabbir_db2]> show tables;
Empty set (0.000 sec)

MariaDB [shabbir_db2]> CREATE TABLE employees (
->   id INT AUTO_INCREMENT PRIMARY KEY,
->   name VARCHAR(50) NOT NULL,
->   email VARCHAR(100) UNIQUE,
->   department VARCHAR(50),
->   salary DECIMAL(10,2),
->   created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
-> );
Query OK, 0 rows affected (0.012 sec)

MariaDB [shabbir_db2]> show tables;
+-----+
| Tables_in_shabbir_db2 |
+-----+
| employees              |
+-----+
1 row in set (0.000 sec)

MariaDB [shabbir_db2]> INSERT INTO employees(name, email, department, salary)
-> VALUES
-> ('Shabbir Ahmad','shabbir@example.com','IT',50000),
-> ('Rahul Kumar','rahul@gmail.com','DevOps',65000);
Query OK, 2 rows affected (0.002 sec)
Records: 2  Duplicates: 0  Warnings: 0

MariaDB [shabbir_db2]>

```

SELECT \* FROM employees;

```

MariaDB [shabbir_db2]> SELECT * FROM employees;
+-----+-----+-----+-----+-----+-----+
| id | name          | email                | department | salary  | created_at          |
+-----+-----+-----+-----+-----+-----+
| 1  | Shabbir Ahmad | shabbir@example.com  | IT         | 50000.00 | 2025-11-27 06:03:31 |
| 2  | Rahul Kumar   | rahul@gmail.com      | DevOps     | 65000.00 | 2025-11-27 06:03:31 |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.000 sec)

MariaDB [shabbir_db2]>

```

## Step 8. 📁 Automate Daily Backups (Shell Script + Cron)

A- First take Manual Backup/Dump

```

root@ip-172-31-46-45: ~
root@ip-172-31-46-45:~# mariadb-dump -u root -p=root@123 shabbir_db2 > /mnt/manual_dump
root@ip-172-31-46-45:~# ls /mnt/
manual_dump
root@ip-172-31-46-45:~#

```

```

root@ip-172-31-46-45: ~
MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| shabbir_db1 |
| shabbir_db2 |
| sys |
+-----+
6 rows in set (0.000 sec)

MariaDB [(none)]> drop database shabbir_db2;
Query OK, 1 row affected (0.014 sec)

MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| shabbir_db1 |
| sys |
+-----+
5 rows in set (0.000 sec)

MariaDB [(none)]>

```



### Restore Database (If Required)

```
mariadb -u root -p=root@123 shabbir_db1 < /mnt/manual-dump
```

```

root@ip-172-31-46-45: ~
root@ip-172-31-46-45:~# mariadb -u root -p=root@123 shabbir_db1 < /mnt/manual_dump

```

### B- Create backup script:

```
vim /root/auto-backup.sh
```

Add:

```
#!/bin/bash
```



```
mariadb-dump -u root -p=root@123 shabbir_db1 > /home/auto_backup
```

Make executable:

```
chmod 755 /root/auto_backup.sh
```

```
root@ip-172-31-46-45: ~
root@ip-172-31-46-45:~# cat auto_backup.sh
#!/bin/bash
mariadb-dump -u root -p=root@123 shabbir_db1 > /home/auto_backup
root@ip-172-31-46-45:~# ls /home/
auto_backup  ubuntu
root@ip-172-31-46-45:~#
```

## Step 9 . Schedule Automatic Backup (Crontab)

Open cron:

```
crontab -e
```

Add:

```
*/* * * * * /root/auto_backup.sh
```

## Step 10 . Allow Remote Access (Not recommended for production/ Optional)

Edit MariaDB config:

```
vim /etc/mysql/mariadb.conf.d/50-server.cnf
```

Change:

```
bind-address = 0.0.0.0
```

```
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
bind-address            = 0.0.0.0
```

Restart:

```
sudo systemctl restart mariadb
```

### **Update EC2 Inbound Rule:**

Port **3306**

Source: **My IP** (never 0.0.0.0/0)

```
# mariadb -h pub-IP -u root -p=root@123 Check-access from Remote
```

 **DONE – MariaDB Server on Ubuntu EC2 is Ready Thank you !!**

