

## Module 7

### 1. MariaDB Assignment

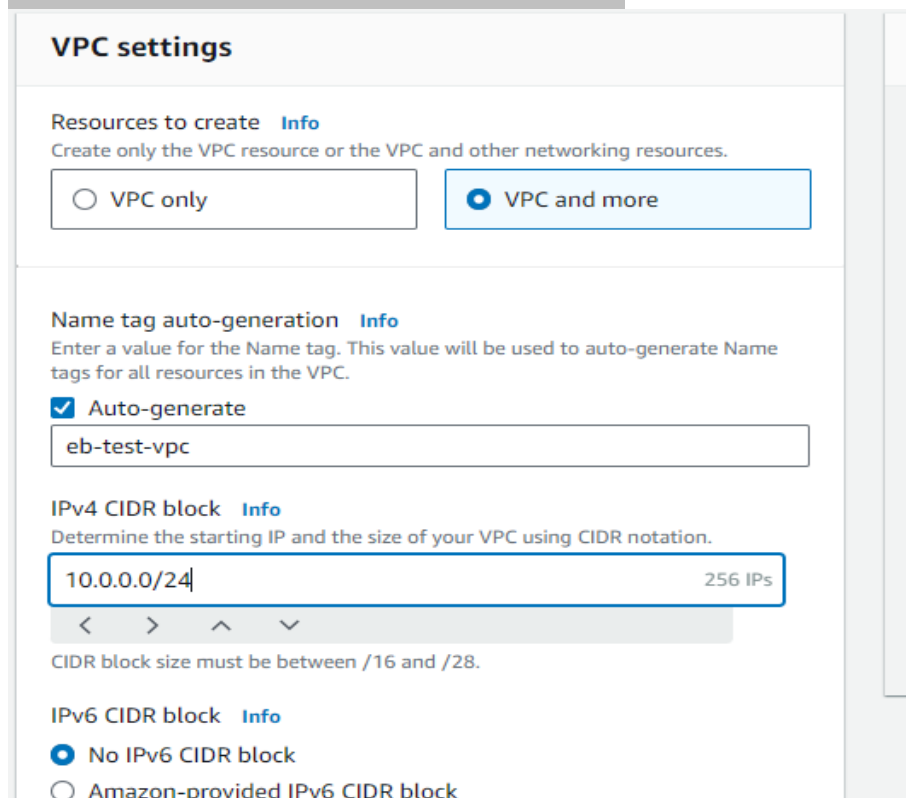
#### Problem Statement:

You work for XYZ Corporation. Their application requires a SQL service that can store data which can be retrieved if required. Implement a suitable RDS engine for the same. While migrating, you are asked to perform the following tasks:

1. Create a MariaDB Engine based RDS Database.
2. Connect to the DB using the following ways:
  - a. SQL Client for Windows
  - b. Linux based EC2 Instance

#### Solutions:

Create VPC with following configurations



The screenshot shows the 'VPC settings' configuration page in the AWS Management Console. It includes sections for 'Resources to create', 'Name tag auto-generation', 'IPv4 CIDR block', and 'IPv6 CIDR block'.

**VPC settings**

**Resources to create** [Info](#)  
Create only the VPC resource or the VPC and other networking resources.

☐ VPC only ☒ VPC and more

**Name tag auto-generation** [Info](#)  
Enter a value for the Name tag. This value will be used to auto-generate Name tags for all resources in the VPC.

☒ Auto-generate

eb-test-vpc

**IPv4 CIDR block** [Info](#)  
Determine the starting IP and the size of your VPC using CIDR notation.

10.0.0.0/24 256 IPs

< > ^ v

CIDR block size must be between /16 and /28.

**IPv6 CIDR block** [Info](#)

☒ No IPv6 CIDR block ☐ Amazon-provided IPv6 CIDR block

### Number of public subnets [Info](#)

The number of public subnets to add to your VPC. Use public subnets for web applications that need to be publicly accessible over the internet.

0	2
---	---

### Number of private subnets [Info](#)

The number of private subnets to add to your VPC. Use private subnets to secure backend resources that don't need public access.

0	2	4
---	---	---

### ► Customize subnets CIDR blocks

### NAT gateways (\$) [Info](#)

Choose the number of Availability Zones (AZs) in which to create NAT gateways. Note that there is a charge for each NAT gateway.

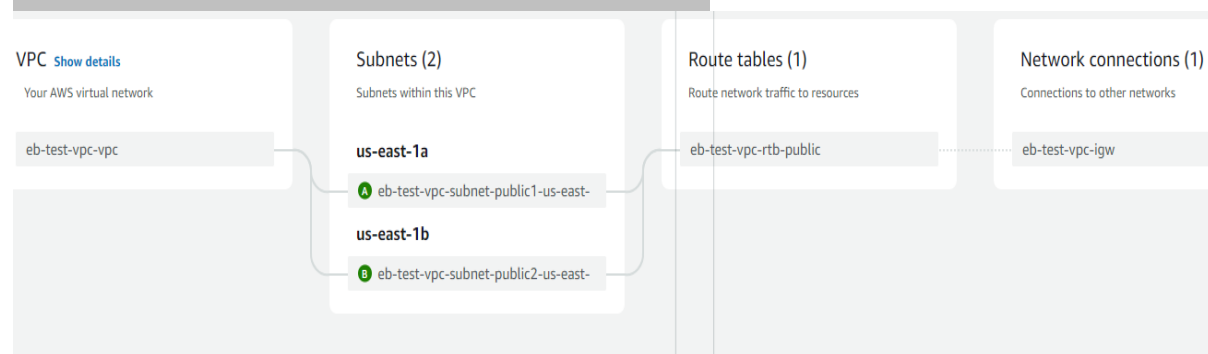
None	In 1 AZ	1 per AZ
------	---------	----------

### VPC endpoints [Info](#)

Endpoints can help reduce NAT gateway charges and improve security by accessing S3 directly from the VPC. By default, full access policy is used. You can customize this policy at any time.

None	S3 Gateway
------	------------

## VPC is created with 2 subnets, 1 RT and 1 IGW



## Creating RDS, first create Subnet group

[RDS](#) > [Subnet groups](#) > Create DB subnet group

### Create DB subnet group

To create a new subnet group, give it a name and a description, and choose an existing VPC. You will then be able to add subnets related to that VPC.

#### Subnet group details

##### Name

You won't be able to modify the name after your subnet group has been created.

Must contain from 1 to 255 characters. Alphanumeric characters, spaces, hyphens, underscores, and periods are allowed.

##### Description

##### VPC

Choose a VPC identifier that corresponds to the subnets you want to use for your DB subnet group. You won't be able to choose a different VPC identifier after your subnet group has been created.

## Add VPC and Subnets

### Add subnets

#### Availability Zones

Choose the Availability Zones that include the subnets you want to add.



#### Subnets

Choose the subnets that you want to add. The list includes the subnets in the selected Availability Zones.



For Multi-AZ DB clusters, you must select 3 subnets in 3 different Availability Zones.

Subnet group is created

RDS > Subnet groups

Subnet groups (1) Refresh Edit Delete Create DB subnet group

< 1 > Settings

<input type="checkbox"/>	Name	Description	Status	VPC
<input type="checkbox"/>	<a href="#">eb-test-subnet-group</a>	This will be used to deploy my RDS	<span>Complete</span>	vpc-0416f9456fa237aa6

Now create RDS > Data base > MariaDB > Standard Method > Free Tier

Give Name and password

#### DB instance identifier [Info](#)

Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current Region.

eb-test-mariaDB

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

#### ▼ Credentials Settings

##### Master username [Info](#)

Type a login ID for the master user of your DB instance.

admin

1 to 16 alphanumeric characters. The first character must be a letter.

##### Credentials management

You can use AWS Secrets Manager or manage your master user credentials.

☐ **Managed in AWS Secrets Manager - *most secure***  
RDS generates a password for you and manages it throughout its lifecycle using AWS Secrets Manager.

☒ **Self managed**  
Create your own password or have RDS create a that you manage.

☐ **Auto generate password**

Amazon RDS can generate a password for you, or you can specify your own password.

##### Master password [Info](#)

.....

Provide Username and password


## Select Created VPC and Subnets

### Virtual private cloud (VPC) [Info](#)

Choose the VPC. The VPC defines the virtual networking environment for this DB instance.

eb-test-vpc-vpc (vpc-0416f9456fa237aa6)  
2 Subnets, 2 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

 After a database is created, you can't change its VPC.

### DB subnet group [Info](#)

Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.

eb-test-subnet-group  
2 Subnets, 2 Availability Zones

## Enable Public access and create new Security group

### Public access [Info](#)

☒ Yes

RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.

☐ No

RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

### VPC security group (firewall) [Info](#)

Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

☐ Choose existing  
Choose existing VPC security groups

☒ Create new  
Create new VPC security group

### New VPC security group name

eb-test-sg

### Availability Zone [Info](#)

No preference

## Give the Database Name

### ▼ Additional configuration

Database options, encryption turned off, backup turned off, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.

### Database options

Initial database name [Info](#)

If you do not specify a database name, Amazon RDS does not create a database.

DB parameter group [Info](#)

Option group [Info](#)

## Disable the Backup and Encryption

### Backup

☐ Enable automated backups

Creates a point-in-time snapshot of your database

### Encryption

☐ Enable encryption

Choose to encrypt the given instance. Master key IDs and aliases appear in the list after they have been created using the AWS Key Management Service console. [Info](#)

## Choose the following options

## Maintenance

Auto minor version upgrade [Info](#)

☒ **Enable auto minor version upgrade**

Enabling auto minor version upgrade will automatically upgrade to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the database.

Maintenance window [Info](#)

Select the period you want pending modifications or maintenance applied to the database by Amazon RDS.

☐ Choose a window


☒ No preference


## Deletion protection



☐ **Enable deletion protection**

Protects the database from being deleted accidentally. While this option is enabled, you can't delete the database.


## Create Database


**Databases (1)** ☒ Group resources  **Modify** **Actions** **Restore from S3** **Create database**



< 1 > 

 DB identifier	Status	Role	Engine	Region & AZ	Size	Recommendations
<input checked="" type="radio"/> <a href="#">eb-test-mariadb</a>	 Available	Instance	MariaDB	us-east-1a	db.t3.micro	

## Now Create EC2 instance with Ubuntu Machine

**Instances (1/1)** [Info](#)  **Connect** **Instance state** **Actions** **Launch instances**


**All states** < 1 > 

<input checked="" type="checkbox"/>	Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone
<input checked="" type="checkbox"/>	test-eb-instance	i-08e6c16dbbc2deb57	 Running	t2.micro	 Initializing	<a href="#">View alarms</a>	us-east-1b

## Security group Type- traffic and source- Anywhere

**Inbound rules** [Info](#)

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-015e48f2002b091f2	All traffic	All	All	Any...	



**Add rule**

## Connect the Instance to the Ubuntu Machine

```
Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

ubuntu@ip-10-0-0-30:~$
```

i-08e6c16dbbc2deb57 (test-eb-instance)

PublicIPs: 3.239.27.41 PrivateIPs: 10.0.0.30

## Update the Ubuntu Machine and Install Maria DB server

1. `sudo apt update -y`
2. `sudo apt install mariadb-server -y`

## Select the endpoint from RDS and run in the Machine

Connectivity & security		
Connectivity & security		
Endpoint & port	Networking	Security
Endpoint eb-test-mariadb.cpcsg4q8m3i9.us-east-1.rds.amazonaws.com	Availability Zone us-east-1a	VPC security groups eb-test-sg (sg-09d26440bf40199b6) ✔ Active
Port 3306	VPC eb-test-vpc-vpc (vpc-0416f9456fa237aa6)	Publicly accessible Yes
	Subnet group eb-test-subnet-group	Certificate authority <a href="#">Info</a>

```
mysql -h eb-test-mariadb.cpcsg4q8m3i9.us-east-1.rds.amazonaws.com -u  
admin -p
```

Type- Show databases; Now Connected to the DB using Linux based EC2 Instance



```
ubuntu@ip-10-0-0-30:~$ mysql -h eb-test-mariadb.cpcsg4q8m3i9.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 100
Server version: 10.11.6-MariaDB managed by https://aws.amazon.com/rds/

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 |
+-----+
| eb_test  |
| information_schema |
| innodb   |
| mysql    |
| performance_schema |
| sys      |
+-----+
6 rows in set (0.001 sec)

MariaDB [(none)]>
```

i-08e6c16dbbc2deb57 (test-eb-instance)

PublicIPs: 3.239.27.41 PrivateIPs: 10.0.0.30

## Connect to the DB using SQL Client for Windows

Install Dbeaver and connect to the RDS host, give the username and password

## Connection Settings

MariaDB connection settings



Main

Driver properties

SSH

SSL

+ Network configurations...

Server

Connect by: ☒ Host ☐ URL

URL:

Server Host:  Port:

Database:

Authentication (Database Native)

Username:

Password:  ☒ Save password

Advanced

Server Time Zone:

Local Client:

📘

You can use variables in connection parameters.

Connection details (name, type, ...)

Driver name: MariaDB

Driver Settings

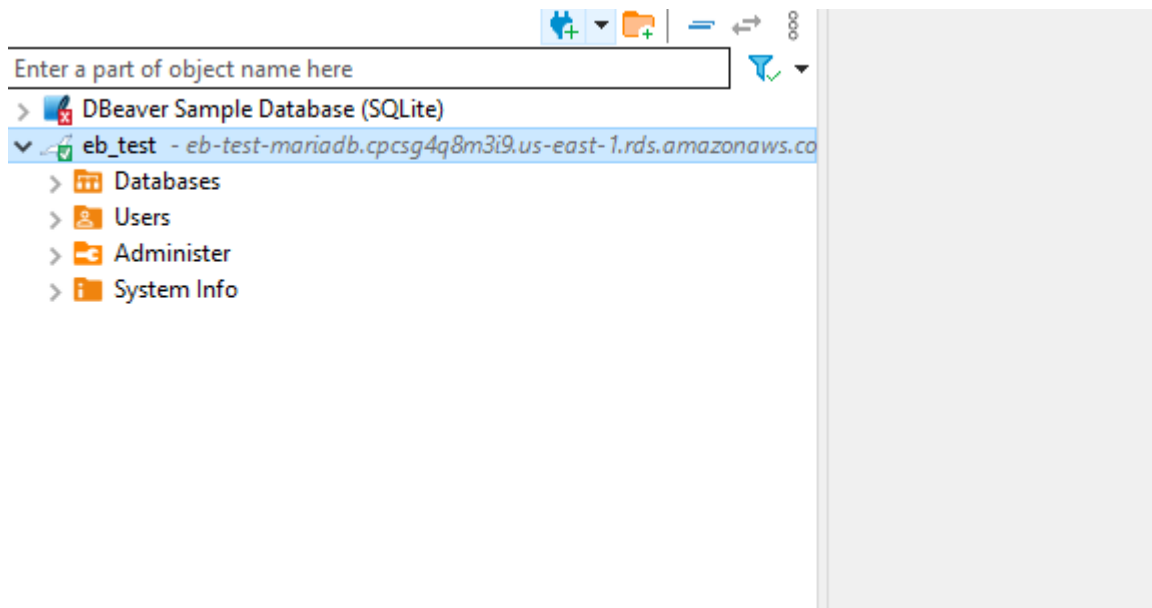
Test Connection ...

< Back

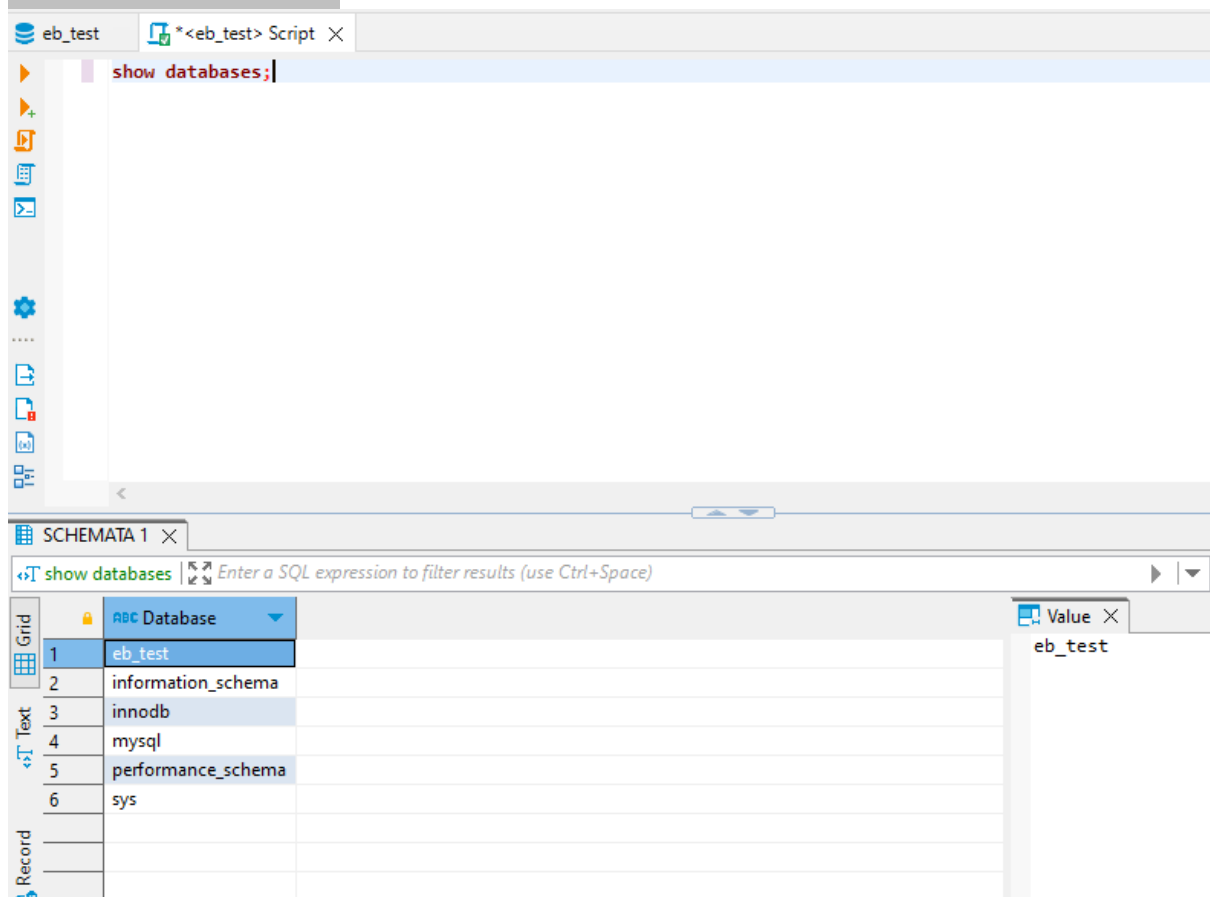
Next >

Finish

Cancel



Type show databases;



You can upload the file in Elastic Beanstalk and update the employee data,

## Upload Employee Data

Employee ID:

Name:

DOB:

Department:

The updated details can be seen in the Linux machine

```
Database changed
MariaDB [eb_test]> show tables;
+-----+
| Tables_in_eb_test |
+-----+
| employees          |
+-----+
1 row in set (0.001 sec)

MariaDB [eb_test]> select * from employees;
+-----+-----+-----+-----+-----+
| id | emp_id | name      | dob       | department |
+-----+-----+-----+-----+-----+
| 1  | 1      | Ruchitha  | 2024-04-10 | Engineering |
| 2  | 2      | Leela     | 2024-04-10 | health      |
+-----+-----+-----+-----+-----+
2 rows in set (0.001 sec)

MariaDB [eb_test]>
```

i-08e6c16dbbc2deb57 (test-eb-instance)

PublicIPs: 3.239.27.41 PrivateIPs: 10.0.0.30

Give following commands to switch and run the databases

Use eb\_test

Show tables;

Select \* from employees;

=====