AIM : Connecting RDS (relational database services) with EC2
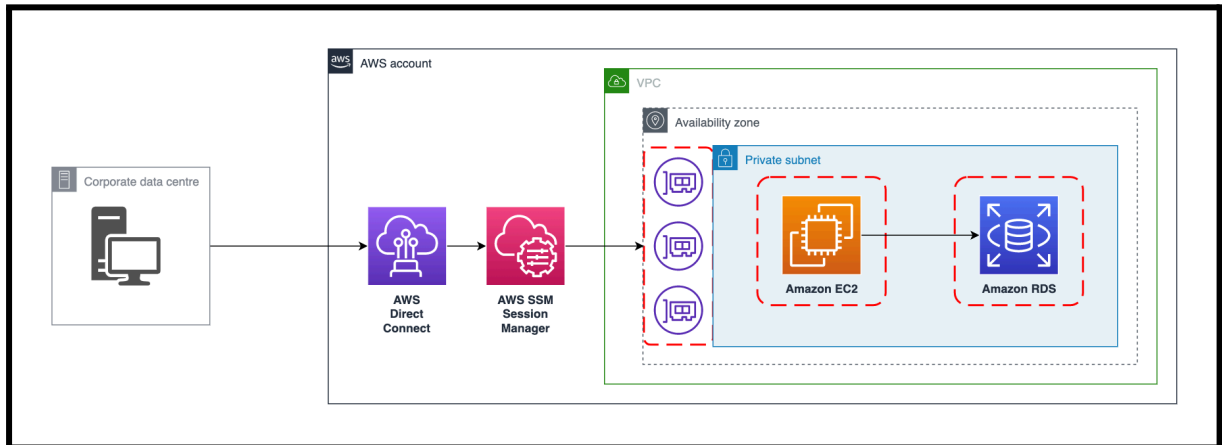
1. Create VPC

Your VPCs (2) Info					
Name	**VPC ID**	**State**	**IPv4 CIDR**	**IPv6 CID**
–	vpc-0129db4aa535d446a	⊘ Available	172.31.0.0/16	–
my-vpc	vpc-07bec28b60ac7a91e	⊘ Available	192.168.0.0/16	–

Master password | Info

•••••••••••••

Password strength [Strong]

Minimum constraints: At least 8 printable ASCII characters. Can't contain any of the following symbols: / ' " @

Confirm master password | Info

•••••••••••••

Give subnets

private-sub-2	subnet-...	⊘ Available.	vpc-07bec28b60ac7a91e	my-v...	192.168.2.0/24
public-subnet	subnet-...	⊘ Available.	vpc-07bec28b60ac7a91e	my-v...	192.168.0.0/24
–	subnet-...	⊘ Available.	vpc-0129db4aa535d446a		172.31.16.0/20
private-sub-1	subnet-...	⊘ Available.	vpc-07bec28b60ac7a91e	my-v...	192.168.1.0/24

Give subnet associations public-rt to public-subnet

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (1/3)

Filter subnet associations

‹ 1 › ⚙

	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
☐	private-sub-2	subnet-022e10dfeb995cad3	192.168.2.0/24	–	Main (rtb-09699f7e944676bb9
☑	public-subnet	subnet-0478c1239ceaf23ff	192.168.0.0/24	–	Main (rtb-09699f7e944676bb9
☐	private-sub-1	subnet-0626f982ff00fa018	192.168.1.0/24	–	Main (rtb-09699f7e944676bb9

Selected subnets

subnet-0478c1239ceaf23ff / public-subnet ✕

Cancel   **Save associations**

Give subnet associations private-rt to both private-subnet

Edit subnet associations

Change which subnets are associated with this route table.

Available subnets (2/3)

Filter subnet associations

‹ 1 › ⚙

	Name	Subnet ID	IPv4 CIDR	IPv6 CIDR	Route table ID
☑	private-sub-2	subnet-022e10dfeb995cad3	192.168.2.0/24	–	Main (rtb-09699f7e944676bb9
☐	public-subnet	subnet-0478c1239ceaf23ff	192.168.0.0/24	–	rtb-016aa4431e9640112 / pul
☑	private-sub-1	subnet-0626f982ff00fa018	192.168.1.0/24	–	Main (rtb-09699f7e944676bb9

Selected subnets

subnet-0626f982ff00fa018 / private-sub-1 ✕   subnet-022e10dfeb995cad3 / private-sub-2 ✕

Cancel   **Save associations**

Attach internet gateway to your VPC

VPC › Internet gateways › Attach to VPC (igw-0c94c983ae30372d1)

Attach to VPC (igw-0c94c983ae30372d1) Info

VPC

Attach an internet gateway to a VPC to enable the VPC to communicate with the internet. Specify the VPC to attach below.

Available VPCs

Attach the internet gateway to this VPC.

🔍 vpc-07bec28b60ac7a91e   ✕

▶ AWS Command Line Interface command

Cancel   **Attach internet gateway**

Edit routes in Public-rt

VPC > Route tables > rtb-016aa4431e9640112 > Edit routes

Edit routes

Destination	Target	Status	Propagated	
192.168.0.0/16	local ▾	⊘ Active	No	
	🔍 local ✕			
🔍 0.0.0.0/0 ✕	Internet Gateway ▾	–	No	Remove
	🔍 igw-0c94c983ae30372d1 ✕			

Add route

Cancel   Preview   **Save changes**

Create EC2 in Singapore Region

EC2 > Instances > Launch an instance

Launch an instance Info

Amazon EC2 allows you to create virtual machines, or instances, that run on the AWS Cloud. Quickly get started by following the simple steps below.

Name and tags Info

Name

Frontend   Add additional tags

▼ Network settings Info

VPC - *required*   Info

vpc-07bec28b60ac7a91e (my-vpc) ▾   ↻
192.168.0.0/16

Subnet   Info

subnet-0478c1239ceaf23ff   public-subnet
VPC: vpc-07bec28b60ac7a91e   Owner: 637423493890   ▾   ↻   Create new
Availability Zone: ap-southeast-1a   Zone type: Availability Zone   subnet ↗
IP addresses available: 251   CIDR: 192.168.0.0/24)

Auto-assign public IP   Info

Enable ▾

Additional charges apply when outside of free tier allowance

Go to > RDS > databases > create database

RDS > Create database

Create database

Choose a database creation method   Info

○ **Standard create**
You set all of the configuration options, including ones for availability, security, backups, and maintenance.

○ **Easy create**
Use recommended best-practice configurations. Some configuration options can be changed after the database is created.

Engine options

Engine type   Info

○ Aurora (MySQL Compatible)

○ Aurora (PostgreSQL Compatible)

○ MySQL

● MariaDB

▼ **Hide filters**

◯ Show versions that support the Amazon RDS Optimized Writes   Info
Amazon RDS Optimized Writes improves write throughput by up to 2x at no additional cost.

Engine Version

MariaDB 10.11.8   ▼

Templates

Choose a sample template to meet your use case.

○ **Production**
Use defaults for high availability and fast, consistent performance.

○ **Dev/Test**
This instance is intended for development use outside of a production environment.

● **Free tier**
Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS.
Info

Settings

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 AWS Region.

```
Pooja-database-1
```

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 password that you manage.

Password - Magicbus1234

● Burstable classes (includes t classes)

```
db.t3.micro
2 vCPUs    1 GiB RAM    Network: 2,085 Mbps       ▼
```

Storage

Storage type   Info

Provisioned IOPS SSD (io2) storage volumes are now available.

```
General Purpose SSD (gp2)
Baseline performance determined by volume size      ▼
```

Allocated storage   Info

```
20
```                                                    GiB

The minimum value is 20 GiB and the maximum value is 6,144 GiB

## Connectivity  Info

⟳

### Compute resource
Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.

**◉ Don't connect to an EC2 compute resource**
Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.

**○ Connect to an EC2 compute resource**
Set up a connection to an EC2 compute resource for this database.

### Network type  Info
To use dual-stack mode, make sure that you associate an IPv6 CIDR block with a subnet in the VPC you specify.

**◉ IPv4**
Your resources can communicate only over the IPv4 addressing protocol.

**○ Dual-stack mode**
Your resources can communicate over IPv4, IPv6, or both.

### 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.

| Create new DB Subnet 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.

**In RDS > create 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.

| rds-security-grp |
|---|

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

#### Description

| to assign security grp to rds |
|---|

#### 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.

| my-vpc (vpc-07bec28b60ac7a91e) ▼ |
|---|

## Add subnets

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

| Choose an availability zone ▼ |

ap-southeast-1b ✕   ap-southeast-1c ✕

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

| Select subnets ▼ |

subnet-0626f982ff00fa018 (192.168.1.0/24) ✕

subnet-022e10dfeb995cad3 (192.168.2.0/24) ✕

### Subnets selected (2)

| Availability zone | Subnet ID | CIDR block |
| --- | --- | --- |
| ap-southeast-1b | subnet-0626f982ff00fa018 | 192.168.1.0/24 |
| ap-southeast-1c | subnet-022e10dfeb995cad3 | 192.168.2.0/24 |

Cancel    **Create**

---

⊘ Successfully created rds-security-grp. View subnet group

RDS > Subnet groups

### Subnet groups (1)       ⟳   Edit   Delete   **Create DB subnet group**

🔍 Filter by subnet group                    ‹ 1 ›   ⚙

| ☐ | Name ▲ | Description ▽ | Status ▽ | VPC ▽ |
| --- | --- | --- | --- | --- |
| ☐ | rds-security-grp | to assign security grp to rds | ⊘ Complete | vpc-07bec28b60ac7a91e |

**In RDS >**

▼ **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

```
pooja-db
```

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

DB parameter group   Info

```
default.mariadb10.11                                    ▼
```

Option group   Info

```
default:mariadb-10-11                                   ▼
```

Assign security group

Virtual private cloud (VPC)   Info

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

```
my-vpc (vpc-07bec28b60ac7a91e)
3 Subnets, 3 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.

```
rds-security-grp
2 Subnets, 2 Availability Zones                         ▼
```

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

```
vpcsg
```

Availability Zone   Info

```
ap-southeast-1b                                         ▼
```

In additional configuration disable following options :

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**

Log exports

Select the log types to publish to Amazon CloudWatch Logs
☐ Audit log
☐ Error log
☐ General log
☐ Slow query log

IAM role
The following service-linked role is used for publishing logs to CloudWatch Logs.

RDS service-linked role

RDS Instance is created :

Inbound rules **Info**

Security group rule ID	Type **Info**	Protocol **Info**	Port range **Info**	Source **Info**		Description - optional **Info**	
sgr-0de6dcde92886b66b	MYSQL/Aurora ▼	TCP	3306	Cus... ▼	🔍		Delete
					120.138.99.31/32 ✕		
–	All traffic ▼	All	All	Cus... ▼	🔍 192.168.0.0/24 ✕	IP of Public Subnet	Delete
					192.168.0.0/24 ✕		

Add rule

Cancel   Preview changes   Save rules

Connectivity & security

Endpoint & port

Endpoint

📋 pooja-database-1.clku
u6206mc0.ap-southeast-1.
rds.amazonaws.com

Port
3306

Networking

Availability Zone
ap-southeast-1b

VPC
my-vpc (vpc-
07bec28b60ac7a91e)

Subnet group
rds-security-grp

Subnets
subnet-
022e10dfeb995cad3
subnet-0626f982ff00fa018

Security

VPC security groups
vpcsg (sg-
0be7f1dfb419e7e52)
⊘ Active

Publicly accessible
No

Certificate authority Info
rds-ca-rsa2048-g1

Certificate authority date
May 22, 2061, 04:09
(UTC+05:30)

Databases (1)

🔵 Group resources | ⟳ | Modify | Actions ▼ | Restore from S3 | **Create database**

🔍 Filter by databases   < 1 > ⚙

	DB identifier ▲	Status ▽	Role ▽	Engine ▽	Region & AZ ▽	Size ▽	R
○	pooja-database-1	⊘ Available	Instance	MariaDB	ap-southeast-1b	db.t3.micro	

RDS > Security group > inbound rules > edit

Security Groups (1/1) Info   ⟳ | Actions ▼ | Export security groups to CSV | ▼ | **Create security group**

🔍 Find resources by attribute or tag

sg-0be7f1dfb419e7e52 ✕ | **Clear filters**   < 1 >

☑	Name ▽	Security group ID ▽	Security group name ▽	VPC ID
☑	–	sg-0be7f1dfb419e7e52	vpcsg	vpc-07bec28b60

═

▭ ▣

Inbound rules (1)   ⟳ | Manage tags | **Edit inbound rules**

🔍 Search   < 1 > ⚙

Connect EC2 Instance :

| Instances (1/1) Info | | | Connect | Instance state ▼ | Actions ▲ | Launch instances ▼ |

Connect
View details
Manage instance state
Instance settings ▶
Networking ▶
Security ▶
Image and templates ▶
Monitor and troubleshoot ▶

| ☑ | Name ✎ | ▽ | Instance ID | Instance state | ▽ | Instance type |
| ☑ | Frontend | | i-07db71198f0b25dca | ⊘ Running ⊕ ⊖ | | t2.micro |

Attach network interface
Detach network interface
Connect RDS database
Disaster recovery for your instances ⧉

i-07db71198f0b25dca (Frontend)

Select the RDS database to connect to your EC2 instance.

Database role

○ **Cluster**
Apply security groups to all database instances within a cluster (Only regional clusters supported)

● **Instance**
Apply security groups to individual database instances that are not part of a cluster

RDS database
A security group is added to the EC2 instance. A security group is also added to the database with an inbound rule that allows the EC2 instance to access the database port.

pooja-database-1   vpc-07bec28b60ac7a91e ▼
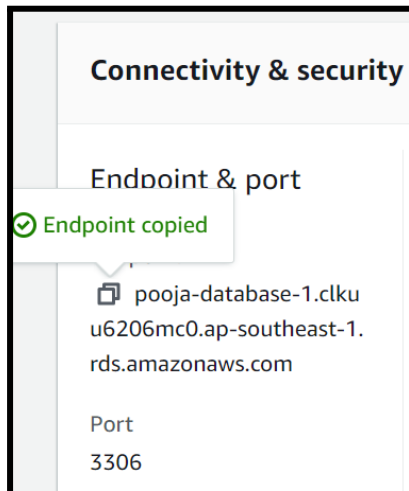Engine: MariaDB   Region and AZ: ap-southeast-1b

ⓘ Create RDS database ⧉

ⓘ You will incur data transfer fees because your EC2 instance and your RDS database are in different Availability Zones. To avoid incurring these charges, they must be in the same Availability Zone.

Cancel   **Connect**

```
[ec2-user@ip-192-168-0-186 ~]$ sudo su
[root@ip-192-168-0-186 ec2-user]# yum update -y
Last metadata expiration check: 0:39:19 ago on Tue Aug 13 11:06:59 2024.
Dependencies resolved.
Nothing to do.
Complete!
[root@ip-192-168-0-186 ec2-user]# yum install mariadb* -y
Last metadata expiration check: 0:39:43 ago on Tue Aug 13 11:06:59 2024.
Dependencies resolved.
```

pooja-database-1.clkuu6206mc0.ap-southeast-1.rds.amazonaws.com


```
[root@ip-192-168-0-186 ec2-user]# mysql -u admin -p -h pooja-database-1.clkuu6206mc0.ap-southeast-1.rds.amazonaws.com
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 49
Server version: 10.11.8-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)]>
```

```
MariaDB [(none)]> create database pooja;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| innodb             |
| mysql              |
| performance_schema |
| pooja              |
| poojadb            |
| sys                |
+--------------------+
7 rows in set (0.001 sec)

MariaDB [(none)]> use database pooja
ERROR 1049 (42000): Unknown database 'database'
MariaDB [(none)]> use pooja
Database changed
```

Syntax for Creating a Table:

create table table1(id int,name varchar(30),salary int);

```
MariaDB [pooja]> create table table1(id int,name varchar(30),salary int);
Query OK, 0 rows affected (0.006 sec)
```

INSERT INTO table1 (id, name, salary) values (2,'Pooja Kharade', 90000), (3, 'Juli Chaurasiya', 55000), (4, 'Sonam Bharti', 60000);

```
MariaDB [pooja]> INSERT INTO table1 (id, name, salary) values (2,'Pooja Kharade', 90000), (3, 'Juli Chaurasiya', 55000), (4, 'Sonam Bharti', 60000);
Query OK, 3 rows affected (0.002 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

SELECT * FROM table1;

```
MariaDB [pooja]> SELECT * FROM table1;
+------+-----------------+--------+
| id   | name            | salary |
+------+-----------------+--------+
|    2 | Pooja Kharade   |  90000 |
|    3 | Juli Chaurasiya |  55000 |
|    4 | Sonam Bharti    |  60000 |
+------+-----------------+--------+
3 rows in set (0.001 sec)
```

UPDATE table1 SET salary = 62000 WHERE id = 2;

```
MariaDB [pooja]> UPDATE table1 SET salary = 62000 WHERE id = 2;
Query OK, 1 row affected (0.002 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
MariaDB [pooja]> SELECT * FROM table1;
+------+-----------------+--------+
| id   | name            | salary |
+------+-----------------+--------+
|    2 | Pooja Kharade   |  62000 |
|    3 | Juli Chaurasiya |  55000 |
|    4 | Sonam Bharti    |  60000 |
+------+-----------------+--------+
3 rows in set (0.001 sec)
```

DELETE FROM table1 WHERE id = 4;

```
MariaDB [pooja]> SELECT * FROM table1;
+------+-----------------+--------+
| id   | name            | salary |
+------+-----------------+--------+
|    2 | Pooja Kharade   |  62000 |
|    3 | Juli Chaurasiya |  55000 |
+------+-----------------+--------+
2 rows in set (0.001 sec)
```