

## Guided Lab: Integrating Amazon RDS to Amazon EC2 Instance

### Description

Welcome to the hands-on lab for integrating EC2 (Elastic Compute Cloud) and RDS (Relational Database Service) in AWS! This lab will guide you through the process of setting up an EC2 instance and an RDS database, and connecting the two. By the end of this lab, you'll have a basic understanding of how these core AWS services work together to create a scalable and secure environment for your applications.

### What is EC2?

Amazon EC2 is a web service that provides resizable compute capacity in the cloud. It allows you to launch virtual servers (instances) in minutes, enabling you to scale up or down as your computing needs change. EC2 is commonly used for hosting websites, running applications, performing data processing, and more.

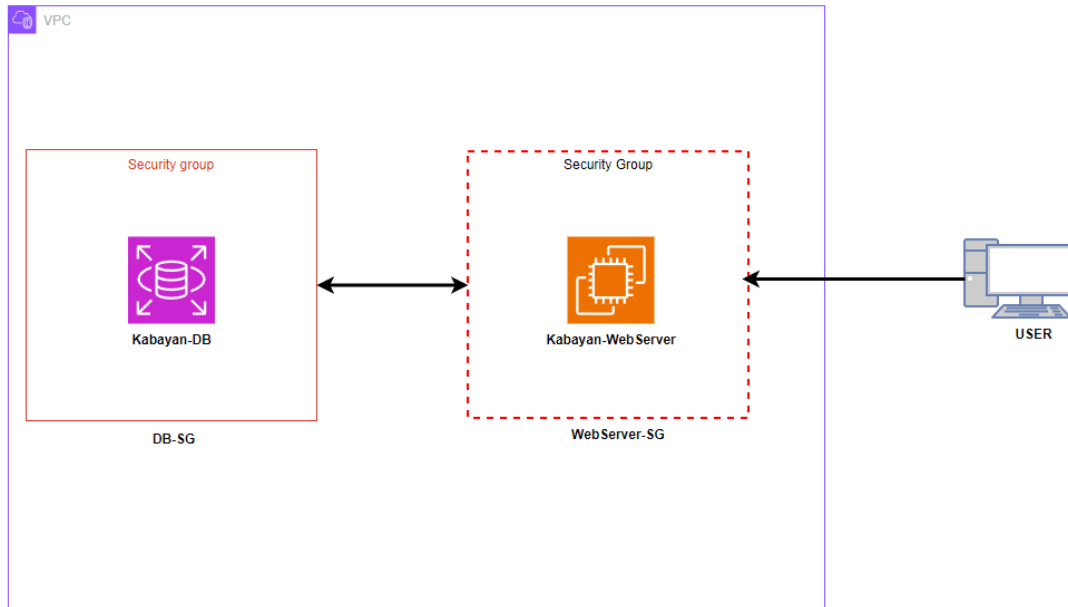
### What is RDS?

Amazon RDS is a managed relational database service that makes it easy to set up, operate, and scale a relational database in the cloud. RDS supports several popular database engines, including MySQL, PostgreSQL, MariaDB, Oracle, and Microsoft SQL Server. It automates time-consuming tasks such as hardware provisioning, database setup, patching, and backups.

### Why Integrate EC2 and RDS?

Integrating EC2 and RDS is a common architecture for many web applications. By separating the compute (EC2) and database (RDS) layers, you can achieve better performance, scalability, and security. Here are some benefits of this integration:

- **Performance:** Offload database management to RDS, allowing your EC2 instances to focus on application logic.
- **Scalability:** Scale your EC2 instances and RDS database independently to meet changing demands.
- **Security:** Isolate your database from the internet by placing it in a private subnet, accessible only from your EC2 instances.
- **Simplicity:** Simplify database management with RDS's automated backups, updates, and monitoring.



## Prerequisites

This lab assumes you have basic knowledge of creating an Amazon RDS database, an Amazon EC2 instance (Linux), and basic AWS networks.

If you find any gaps in your knowledge, consider taking the following lab:

- [Creating an Amazon RDS database](#)
- [Creating an Amazon EC2 instance \(Linux\)](#)
- [Security Group VS Network Access Control List](#)

## Objectives

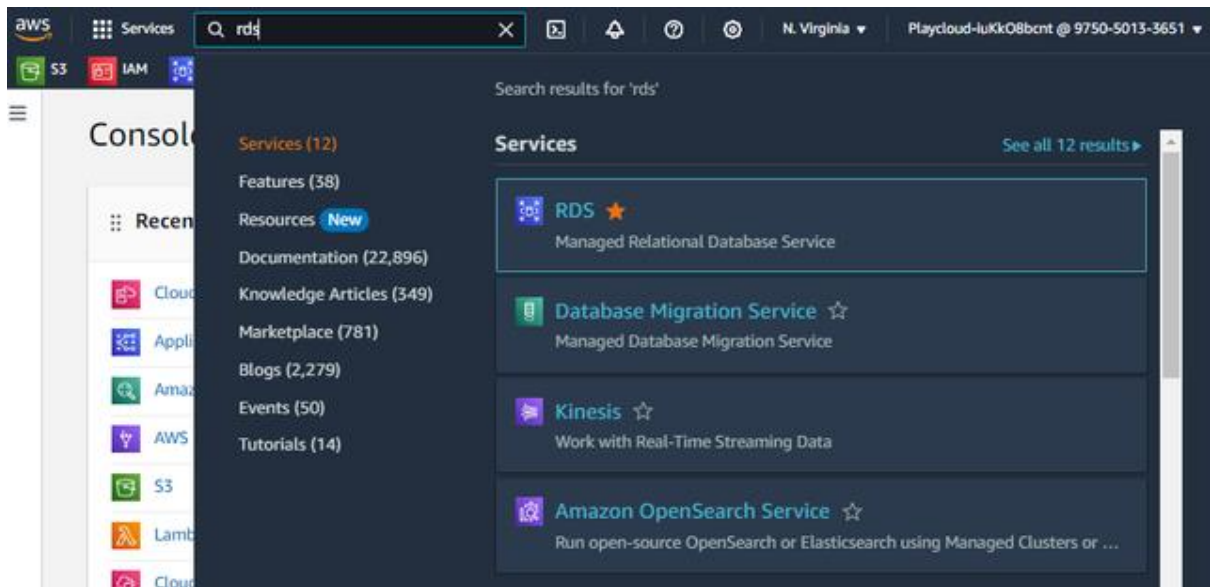
In this lab, you will:

- Learn how to set up an EC2 instance and RDS database and connect the EC2 instance to the RDS database.

[Subscribe to access AWS PlayCloud Labs](#)

## Lab Steps

### Set Up an Amazon RDS Instance



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## 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



#### ☐ PostgreSQL



#### ☐ Oracle

ORACLE®

#### ☐ Microsoft SQL Server



#### ☐ IBM Db2

IBM Db2

### Edition

#### ☒ MySQL Community

### Engine version [Info](#)

View the engine versions that support the following database features.

#### ▼ Hide filters

#### ☒ Show versions that support the Multi-AZ DB cluster [Info](#)

Create a Multi-AZ DB cluster with one primary DB instance and two readable standby DB instances. Multi-AZ DB clusters provide up to 2x faster transaction commit latency and automatic failover in typically under 35 seconds.

#### ☒ 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

MySQL 8.0.35



#### ☐ Enable RDS Extended Support [Info](#)

Amazon RDS Extended Support is a paid offering [\[?\]](#). By selecting this option, you consent to being charged for this offering if you are running your database major version past the RDS end of standard support date for that version. Check the end of standard support date for your major version in the [RDS for MySQL documentation](#) [\[?\]](#).

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## 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.

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.

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.

☒ **Auto generate password**

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

**i** You can view your credentials after you create your database. Click the "View credential details" in the database creation banner to view the password.

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## Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class [Info](#)

### ▼ Hide filters

☒ Show instance classes that support Amazon RDS Optimized Writes [Info](#)  
Amazon RDS Optimized Writes improves write throughput by up to 2x at no additional cost.

☐ Include previous generation classes

- ☐ Standard classes (includes m classes)
- ☐ Memory optimized classes (includes r and x classes)
- ☒ 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

**i** After you modify the storage for a DB instance, the status of the DB instance will be in storage-optimization. Your instance will remain available as the storage-optimization operation completes. [Learn more](#)

### ► Storage autoscaling

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## 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.

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

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

vpc-092f3b7dd98fe3bee

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.

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.

### 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

DB-SG

### Availability Zone [Info](#)

us-east-1a



### RDS Proxy

RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and security.

☐ **Create an RDS Proxy [Info](#)**

RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see [Amazon RDS Proxy pricing](#).

### Certificate authority - optional [Info](#)

Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.

rds-ca-rsa2048-g1 (default)

Expiry: May 26, 2061



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☰

🔔 Successfully created database **kabayan-db**

View connection details ✕ 🔔

RDS has generated your database master password during the database creation and it will be displayed in the connection details. The only way to view your master password is to choose **View connection details** during database creation. You can modify your DB instance to create a new password at any time.

You can use settings from kabayan-db to simplify configuration of [suggested database add-ons](#) while we finish creating your DB for you.

RDS > Databases

Databases (1) ☒ Group resources

☐

DB identifier ▲

☐

Status ▼

Role ▼

Engine ▼

Region & AZ ▼

Size ▼

Recommendations ▼

○

[kabayan-db](#)

🟢 Available

Instance

MySQL Community

us-east-1a

db.t3.micro

Connection details to your database kabayan-db ✕

This is the only time you can view this password. Copy and save the password for your reference. If you lose the password, you must modify your database to change it. You can use a SQL client application or utility to connect to your database.

[Learn about connecting to your database](#) 🔗

Master username  
admin

Master password  
📋 J7YjEA vLY3224abq21lo

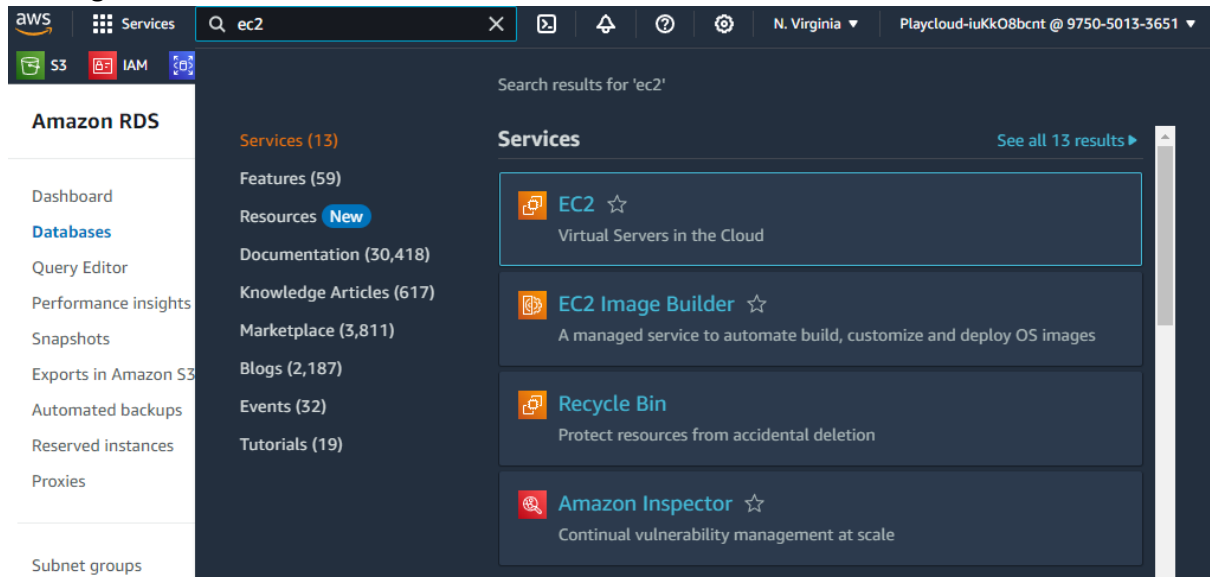
Endpoint  
📋 kabayan-db.chk2csmksvba.us-east-1.rds.amazonaws.com

Close

## Set Up an Amazon EC2 Instance



## 1. Navigate to EC2:



## 2. Launch an EC2 Instance with the following configuration:

- **Name:** Kabayan-WebServer
- **AMI:** Amazon Linux
- **Instance type:** t2.micro
- **Key pair:** (Please create a new one.)
  - **Key pair name:** kabayan-key-pair
  - **Key pair type:** RSA
  - **Private key file format:** .pem
- **Network settings:** (Click “Edit”)
  - Leave **VPC** and **Subnet** with the default
  - **Auto-assign public IP:** Select Enable
  - Firewall (security groups): tick on the **Create security group**
    - **Security group name – required:** WebServer-SG
    - **Description – required:** SG for Kabayan-WebServer

▼ Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

kabayan-key-pair ▼

Create new key pair

▼ Network settings Info

VPC - *required* Info

vpc-092f3b7dd98fe3bee

192.168.5.0/26

▼

Subnet Info

subnet-0a234fc2136c9af52

VPC: vpc-092f3b7dd98fe3bee   Owner: 975050133651   Availability Zone: us-east-1b  
IP addresses available: 11   CIDR: 192.168.5.16/28

▼

Create new subnet

Auto-assign public IP Info

Enable

▼

Additional charges apply when outside of free tier allowance

Firewall (security groups) Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☒ Create security group

☐ Select existing security group

Security group name - *required*

WebServer-SG

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and . \_ - / () # , @ [] + = & ; {} ! \$ \*

Description - *required* Info

SG for Kabayan-WebServer

- **Inbound Security Group Rules:** (add the following security group rule)
  - **Type:** ssh
    - **Source type:** My IP
  - **Type:** MYSQL/Aurora
    - **Source:** Select DB-SG that you created in the creation of your RDS instance earlier

---

*NOTE: This Inbound rules allows the Security Group for our Kabayan-WebServer(EC2 Instance) to connect with the Kabayan-DB's(RDS Instance) Security Group DB-SG. This is very important rule to let the communication between these Security Group secure and not let anyone connect to our RDS Except for our instance. We will also need to modify the Security Group Rule for the DB-SG later in the succeeding steps.*

### Inbound Security Group Rules

▼ Security group rule 1 (TCP, 22, 49.150.102.121/32)

Remove

Type

Info

ssh ▼

Protocol

Info

TCP

Port range

Info

22

Source type

Info

My IP ▼

Name

Info

Add CIDR, prefix list or security group

49.150.102.121/32 ✕

Description - optional

Info

e.g. SSH for admin desktop

▼ Security group rule 2 (TCP, 3306, sg-067329cd795cefb8)

Remove

Type

Info

MYSQL/Aurora ▼

Protocol

Info

TCP

Port range

Info

3306

Source type

Info

Custom ▼

Source

Info

Add CIDR, prefix list or security group

sg-067329cd795cefb8 ✕

Description - optional

Info

e.g. SSH for admin desktop

Add security group rule

▶ Advanced network configuration

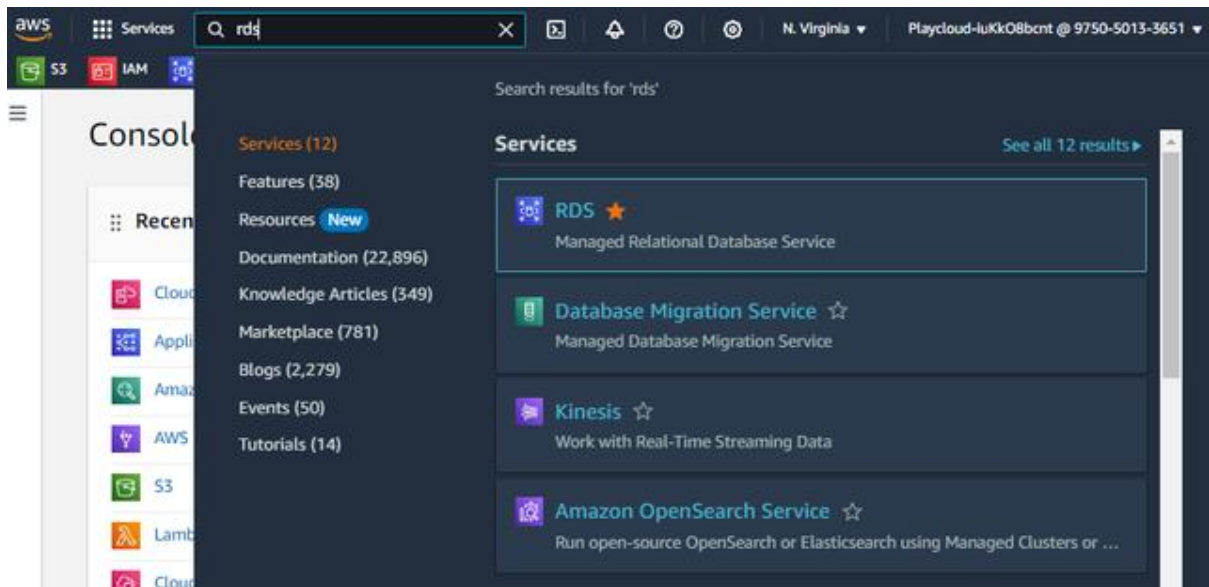
- 

- Click **Launch instance**

## Lab Steps

### Set Up an Amazon RDS Instance

1. Navigate to RDS:



2. Create a Database with the following configuration:

- **Choose a database creation method:** Standard create
- **Engine options:**
  - **Engine type:** MySQL
  - **Engine Version:** Leave it as default

## 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



#### ☐ PostgreSQL



#### ☐ Oracle

ORACLE®

#### ☐ Microsoft SQL Server



#### ☐ IBM Db2

IBM Db2

### Edition

#### ☒ MySQL Community

### Engine version [Info](#)

View the engine versions that support the following database features.

#### ▼ Hide filters

#### ☒ Show versions that support the Multi-AZ DB cluster [Info](#)

Create a Multi-AZ DB cluster with one primary DB instance and two readable standby DB instances. Multi-AZ DB clusters provide up to 2x faster transaction commit latency and automatic failover in typically under 35 seconds.

#### ☒ 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

MySQL 8.0.35



#### ☐ Enable RDS Extended Support [Info](#)

Amazon RDS Extended Support is a paid offering [\[?\]](#). By selecting this option, you consent to being charged for this offering if you are running your database major version past the RDS end of standard support date for that version. Check the end of standard support date for your major version in the [RDS for MySQL documentation](#) [\[?\]](#).

- **Templates:** Free tier
- **Settings:**
  - **DB instance identifier:** Kabayan-DB
  - **Master username:** admin (you can change this as you desire)
  - **Credentials management:** Self managed
  - For the simplicity of this lab we will tick the checkbox of **Auto generate password**.

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*But take note that in PRODUCTION, you need to create a strong password for better security of your Database*

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### 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.

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.

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***

☒ **Self managed**

RDS generates a password for you and manages it throughout its lifecycle using AWS Secrets Manager.

Create your own password or have RDS create a password that you manage.

☒ **Auto generate password**

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

**i** You can view your credentials after you create your database. Click the 'View credential details' in the database creation banner to view the password.

- **Instance configuration:**
  - **DB instance size:** db.t3.micro
- **Storage:**
  - **Storage type:** General Purpose SSD (gp2)

- **Allocated storage:** 20

### Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

DB instance class [Info](#)

▼ Hide filters

☐ Show instance classes that support Amazon RDS Optimized Writes [Info](#)  
Amazon RDS Optimized Writes improves write throughput by up to 2x at no additional cost.

☐ Include previous generation classes

☐ Standard classes (includes m classes)

☐ Memory optimized classes (includes r and x classes)

☒ 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

ⓘ After you modify the storage for a DB instance, the status of the DB instance will be in storage-optimization. Your instance will remain available as the storage-optimization operation completes. [Learn more](#)

► Storage autoscaling

- **Connectivity:**
  - **Compute resource:** Don't connect to an EC2 compute resource

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*Note that in this lab we will do this manually, so lets select Don't connect to an EC2 compute resource*

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- - **Virtual private cloud (VPC):** leave it as the default
  - **DB subnet group:** Create new DB Subnet Group
  - **Public access:** No

- **VPC security group (firewall):** Select Create new
  - *New VPC security group name:* DB-SG
  - *Availability Zone:* select whichever you prefer ( *e.g.* us-east-1a )
- Leave the rest as default



## 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.

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

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

vpc-092f3b7dd98fe3bee

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.

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.

### 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

DB-SG

### Availability Zone [Info](#)

us-east-1a

### RDS Proxy

RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and security.

☐ **Create an RDS Proxy** [Info](#)

RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see [Amazon RDS Proxy pricing](#).

### Certificate authority - optional [Info](#)

Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.

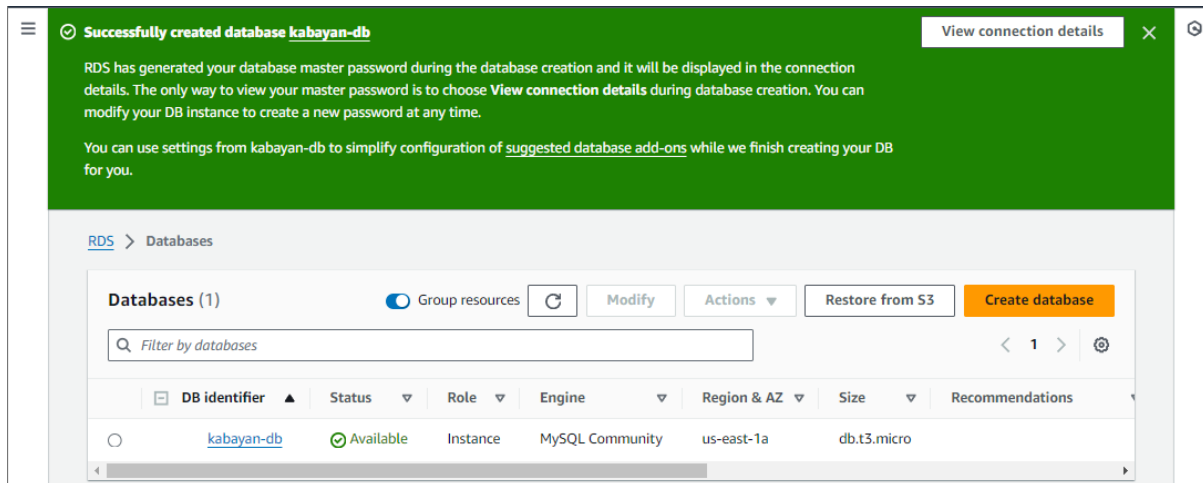
rds-ca-rsa2048-g1 (default)

Expiry: May 26, 2061

- ☐ Click **Create database**

Take note that this will take time, around 10-15 minutes to finished.

### 3. Wait for the RDS Instance to Be Available:



**Successfully created database kabayan-db** View connection details

RDS has generated your database master password during the database creation and it will be displayed in the connection details. The only way to view your master password is to choose **View connection details** during database creation. You can modify your DB instance to create a new password at any time.

You can use settings from kabayan-db to simplify configuration of [suggested database add-ons](#) while we finish creating your DB for you.

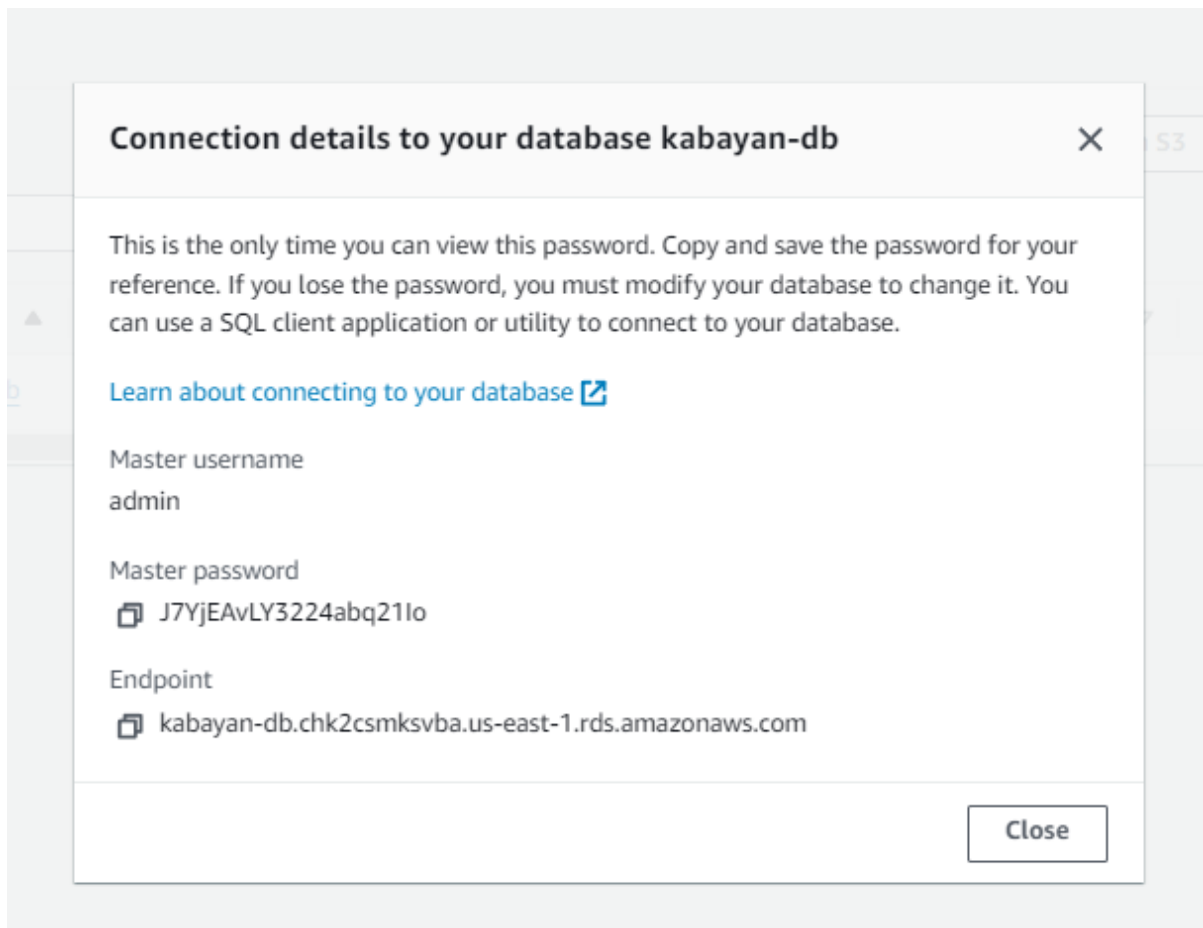
RDS > Databases

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

Filter by databases

DB identifier	Status	Role	Engine	Region & AZ	Size	Recommendations
<a href="#">kabayan-db</a>	Available	Instance	MySQL Community	us-east-1a	db.t3.micro	

### 4. Click **View connection details** and take note of the details



**Connection details to your database kabayan-db**

This is the only time you can view this password. Copy and save the password for your reference. If you lose the password, you must modify your database to change it. You can use a SQL client application or utility to connect to your database.

[Learn about connecting to your database](#)

Master username  
admin

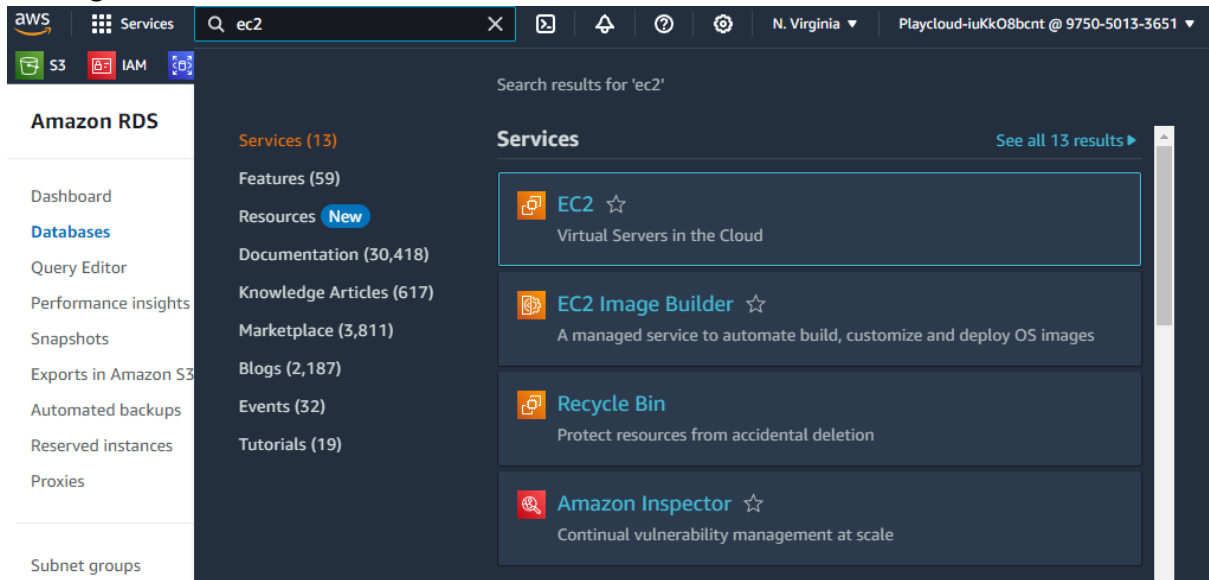
Master password  
J7YjEAvLY3224abq21lo

Endpoint  
kabayan-db.chk2csmksvba.us-east-1.rds.amazonaws.com

Close

## Set Up an Amazon EC2 Instance

### 1. Navigate to EC2:



### 2. Launch an EC2 Instance with the following configuration:

- **Name:** Kabayan-WebServer
- **AMI:** Amazon Linux
- **Instance type:** t2.micro
- **Key pair:** (Please create a new one.)
  - **Key pair name:** kabayan-key-pair
  - **Key pair type:** RSA
  - **Private key file format:** .pem
- **Network settings:** (Click "Edit")
  - Leave **VPC** and **Subnet** with the default
  - **Auto-assign public IP:** Select Enable
  - Firewall (security groups): tick on the **Create security group**
    - **Security group name – required:** WebServer-SG
    - **Description – required:** SG for Kabayan-WebServer

▼ Key pair (login) Info

You can use a key pair to securely connect to your instance. Ensure that you have access to the selected key pair before you launch the instance.

Key pair name - *required*

kabayan-key-pair ▼

Create new key pair

▼ Network settings Info

VPC - *required* Info

vpc-092f3b7dd98fe3bee

192.168.5.0/26

▼

Subnet Info

subnet-0a234fc2136c9af52

VPC: vpc-092f3b7dd98fe3bee   Owner: 975050133651   Availability Zone: us-east-1b  
IP addresses available: 11   CIDR: 192.168.5.16/28

▼

Create new subnet

Auto-assign public IP Info

Enable

▼

Additional charges apply when outside of free tier allowance

Firewall (security groups) Info

A security group is a set of firewall rules that control the traffic for your instance. Add rules to allow specific traffic to reach your instance.

☒ Create security group

☐ Select existing security group

Security group name - *required*

WebServer-SG

This security group will be added to all network interfaces. The name can't be edited after the security group is created. Max length is 255 characters. Valid characters: a-z, A-Z, 0-9, spaces, and \_-:/()#,@!+=&:~\*!

Description - *required* Info

SG for Kabayan-WebServer

- **Inbound Security Group Rules:** (add the following security group rule)
  - **Type:** ssh
    - **Source type:** My IP
  - **Type:** MYSQL/Aurora
    - **Source:** Select DB-SG that you created in the creation of your RDS instance earlier

---

*NOTE: This Inbound rules allows the Security Group for our Kabayan-WebServer(EC2 Instance) to connect with the Kabayan-DB's(RDS Instance) Security Group DB-SG. This is very important rule to let the communication between these Security Group secure and not let anyone connect to our RDS Except for our instance. We will also need to modify the Security Group Rule for the DB-SG later in the succeeding steps.*

### Inbound Security Group Rules

▼ Security group rule 1 (TCP, 22, 49.150.102.121/32)

Remove

Type [Info](#)

Protocol [Info](#)

Port range [Info](#)

ssh

TCP

22

Source type [Info](#)

Name [Info](#)

Description - optional [Info](#)

My IP

Q Add CIDR, prefix list or security group

49.150.102.121/32 X

e.g. SSH for admin desktop

▼ Security group rule 2 (TCP, 3306, sg-067329cd795ceffbe8)

Remove

Type [Info](#)

Protocol [Info](#)

Port range [Info](#)

MYSQL/Aurora

TCP

3306

Source type [Info](#)

Source [Info](#)

Description - optional [Info](#)

Custom

Q Add CIDR, prefix list or security group

sg-067329cd795ceffbe8 X

e.g. SSH for admin desktop

Add security group rule

► Advanced network configuration

- - Click **Launch instance**

## Integrating Amazon RDS to Amazon EC2 Instance

### 1.Connect to EC2 Instance:

- Open your SSH client. ( e.g. GitBash)
- Connect to the EC2 instance using the public DNS name and key pair:

*Do not forget to change the value of the placeholders in the following command*

```
ssh -i </path/to/your-key-pair.pem> ec2-user@<your-ec2-public-dns>
```

## Connect to instance Info

EC2 Instance Connect	Session Manager	SSH client	EC2 serial console
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 i-04ea8d66cfb6a64e9 (Kabayan-WebServer)

- ✔ Command copied

[illegible]

**MySQL Client Applications:** This is a command-line tool or application that allows users to interact with the MySQL server. The client sends SQL queries to the MySQL server and retrieves the results. It is essentially a way for users to communicate with the MySQL server to perform database operations like querying, updating, and managing data.

```
sudo dnf install mariadb105
```

```
[ec2-user@ip-192-168-5-30 ~]$ sudo dnf install mariadb105
Last metadata expiration check: 0:14:36 ago on Wed Jul 24 09:43:40 2024.
Dependencies resolved.
=====
Package                                Arch      Version                                Repository    Size
=====
Installing:
mariadb105                             x86_64    3:10.5.23-1.amzn2023.0.1             amazonlinux   1.6 M
Installing dependencies:
mariadb-connector-c                     x86_64    3.1.13-1.amzn2023.0.3                amazonlinux   196 k
mariadb-connector-c-config              noarch    3.1.13-1.amzn2023.0.3                amazonlinux   9.2 k
mariadb105-common                       x86_64    3:10.5.23-1.amzn2023.0.1             amazonlinux   30 k
perl-Sys-Hostname                       x86_64    1.23-477.amzn2023.0.6                amazonlinux   18 k
=====
Transaction Summary
=====
Install 5 Packages

Total download size: 1.8 M
Installed size: 10 M
Is this ok [y/N]: y
Downloading Packages:
(1/5): mariadb-connector-c-3.1.13-1.amzn2023.0.3.x86_64.rpm    2.6 MB/s | 196 kB    00:00
(2/5): mariadb-connector-c-config-3.1.13-1.amzn2023.0.3.noarch. 122 kB/s | 9.2 kB    00:00
(3/5): mariadb105-common-3:10.5.23-1.amzn2023.0.1.x86_64.rpm  1.4 MB/s | 30 kB     00:00
(4/5): perl-Sys-Hostname-1.23-477.amzn2023.0.6.x86_64.rpm     725 kB/s | 18 kB     00:00
(5/5): mariadb105-3:10.5.23-1.amzn2023.0.1.x86_64.rpm        11 MB/s | 1.6 MB     00:00
-----
Total                                                                8.8 MB/s | 1.8 MB     00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      :                                1/1
  Installing     : mariadb-connector-c-config-3.1.13-1.amzn2023.0.3.noarch 1/5
  Installing     : mariadb-connector-c-3.1.13-1.amzn2023.0.3.x86_64      2/5
  Installing     : mariadb105-common-3:10.5.23-1.amzn2023.0.1.x86_64     3/5
  Installing     : perl-Sys-Hostname-1.23-477.amzn2023.0.6.x86_64        4/5
  Installing     : mariadb105-3:10.5.23-1.amzn2023.0.1.x86_64           5/5
  Running scriptlet: mariadb105-3:10.5.23-1.amzn2023.0.1.x86_64         5/5
  Verifying      : mariadb-connector-c-3.1.13-1.amzn2023.0.3.x86_64      1/5
  Verifying      : mariadb-connector-c-config-3.1.13-1.amzn2023.0.3.noarch 2/5
  Verifying      : mariadb105-3:10.5.23-1.amzn2023.0.1.x86_64          3/5
  Verifying      : mariadb105-common-3:10.5.23-1.amzn2023.0.1.x86_64    4/5
  Verifying      : perl-Sys-Hostname-1.23-477.amzn2023.0.6.x86_64       5/5

Installed:
mariadb-connector-c-3.1.13-1.amzn2023.0.3.x86_64
mariadb-connector-c-config-3.1.13-1.amzn2023.0.3.noarch
mariadb105-3:10.5.23-1.amzn2023.0.1.x86_64
mariadb105-common-3:10.5.23-1.amzn2023.0.1.x86_64
perl-Sys-Hostname-1.23-477.amzn2023.0.6.x86_64

Complete!
[ec2-user@ip-192-168-5-30 ~]$
```

3. Before we connect to the RDS Instance, as mentioned earlier, we need to ensure that our Security Groups Inbound Rules are configured correctly, as well as for DB-SG:

a. Navigate to the **EC2 Console > Security Groups > DB-SG**

The screenshot shows the AWS Management Console interface for Security Groups. On the left, the navigation menu is visible with categories like Instances, Images, Elastic Block Store, and Network & Security. The 'Security Groups' link under Network & Security is highlighted with a green box. A green arrow points from this link to the 'DB-SG' entry in the table. The table has columns for Name, Security group ID, Security group name, VPC ID, and Description. The 'DB-SG' entry is highlighted with a green box.

	Name	Security group ID	Security group name	VPC ID	Description
<input type="checkbox"/>	-	<a href="#">sg-021d4066c71a639ea</a>	DB-SG	<a href="#">vpc-092f3b7dd98fe3bee</a>	Created by RDS m
<input type="checkbox"/>	-	<a href="#">sg-0f298dbe89fd83620</a>	default	<a href="#">vpc-092f3b7dd98fe3bee</a>	default VPC secur
<input type="checkbox"/>	-	<a href="#">sg-01116e6c7f63a6328</a>	WebServer-SG	<a href="#">vpc-092f3b7dd98fe3bee</a>	SG for Kabayan-W

b. Edit the inbound rule, and add this rule: ( This is similar inbound rule we did in the WebServer-SG earlier)

- - **Inbound rule 1:**
    - **Type:** MYSQL/Aurora
    - **Source:** Select theWebServer-SG



EC2 > Security Groups > sg-021d4066c71a639ea - DB-SG > Edit inbound rules

## Edit inbound rules [Info](#)

Inbound rules control the incoming traffic that's allowed to reach the instance.

### Inbound rules [Info](#)

Security group rule ID	Type <a href="#">Info</a>	Protocol <a href="#">Info</a>	Port range <a href="#">Info</a>	Source <a href="#">Info</a>	Description - optional <a href="#">Info</a>
sgr-0132c986c74b27f30	MySQL/Aurora ▼	TCP	3306	Cu... ▼	<input type="text" value="Q"/> <input type="text" value="49.150.111.121/32"/> <input type="button" value="Delete"/>
-	MySQL/Aurora ▼	TCP	3306	Cu... ▼	<input type="text" value="Q  "/> <input type="text" value="::/16"/> <input type="button" value="Delete"/>

Security Groups

DB-SG | sg-021d4066c71a639ea

default | sg-0f298dbe89fd83620

WebServer-SG | sg-01116e6cff63a6328

Prefix lists

com.amazonaws.us-east-1.dynamodb | pl-02cd2c6b

com.amazonaws.us-east-1.ipv6.route53-healthchecks | pl-05c0959a59362110e

com.amazonaws.us-east-1.route53-healthchecks | pl-062e1d6f8317caab5

com.amazonaws.us-east-1.ipv6.vpc-lattice | pl-073555187c4e6ccf2

com.amazonaws.us-east-1.vpc-lattice | pl-07cbd8b5e26960eac

This will allow connection between the DB-SG and WebServer-SG.

c. Click **Save rules**

EC2 > Security Groups > sg-067329cd795cefbe8 - DB-SG

## sg-067329cd795cefbe8 - DB-SG Actions ▾

### Details

Security group name DB-SG	Security group ID sg-067329cd795cefbe8	Description Created by RDS management console	VPC ID <a href="#">vpc-092f3b7dd98fe3bee</a>
Owner 975050133651	Inbound rules count 1 Permission entry	Outbound rules count 1 Permission entry	

Inbound rules | Outbound rules | Tags

### Inbound rules (1)

< 1 > ⚙

Type	Protocol	Port range	Source
MySQL/Aurora	TCP	3306	<a href="#">sg-0e6136795063a99ca / WebServer-SG</a>

#### 4. Connect to the RDS Instance from EC2:

- Use the MySQL client to connect to your RDS instance:

You gonna be needing the RDS endpoint you copied earlier, the username, the password and the port which is usually 3306.

Do not forget to change the value of the placeholders

```
mysql -h <your-rds-endpoint> -P 3306 -u <your-master-username> -p
```

```
ec2-user@ip-192-168-5-30:~  
[ec2-user@ip-192-168-5-30 ~]$ mysql -h kabayan-db.chk2csmksvba.us-east-1.rds.amazonaws.com -P 3306  
-u admin -p  
Enter password:
```

- Enter your master password when prompted.

Note you wont be able to see the password you type here. Just Type or paste it correctly and hit Enter

```
ec2-user@ip-192-168-5-30:~  
[ec2-user@ip-192-168-5-30 ~]$ mysql -h kabayan-db.chk2csmksvba.us-east-1.rds.amazonaws.com -P 3306  
-u admin -p  
Enter password:  
Welcome to the MariaDB monitor.  Commands end with ; or \g.  
Your MySQL connection id is 32  
Server version: 8.0.35 Source distribution  
  
Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
  
MySQL [(none)]> |
```

## 5. Verify Connection:

- Once connected, run some SQL commands to verify the connection:

SHOW DATABASES;

```
MySQL [(none)]> SHOW DATABASES;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.007 sec)

MySQL [(none)]>
```

## 6. Create a Database and Table:

a. You can now interact freely with your RDS Database like creating Database using the command:

Create DATABASE EmployeesDB;

```
MySQL [(none)]> Create DATABASE EmployeesDB;
Query OK, 1 row affected (0.007 sec)
```

You can check this by the same command

SHOW DATABASES;

```
MySQL [(none)]> SHOW DATABASES;
+-----+
| Database |
+-----+
| EmployeesDB |
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.005 sec)

MySQL [(none)]>
```

b. Choose the database that has been created.

USE EmployeesDB;

```
MySQL [(none)]> USE EmployeesDB;
Database changed
MySQL [EmployeesDB]> :
```

c. Creating a table.

CREATE TABLE Employees (

ID INT PRIMARY KEY,

Name VARCHAR(50),

Age INT,

Salary DECIMAL(10, 2)

);

```
MySQL [EmployeesDB]> CREATE TABLE Employees (  
-> ID INT PRIMARY KEY,  
-> Name VARCHAR(50),  
-> Age INT,  
-> Salary DECIMAL(10, 2)  
-> );  
Query OK, 0 rows affected (0.059 sec)
```

d. Describe the table.

DESCRIBE Employees;

```
MySQL [EmployeesDB]> DESCRIBE Employees;  
+-----+-----+-----+-----+-----+-----+  
| Field | Type          | Null | Key | Default | Extra |  
+-----+-----+-----+-----+-----+-----+  
| ID    | int           | NO   | PRI | NULL    |       |  
| Name  | varchar(50)   | YES  |     | NULL    |       |  
| Age   | int           | YES  |     | NULL    |       |  
| Salary | decimal(10,2) | YES  |     | NULL    |       |  
+-----+-----+-----+-----+-----+-----+  
4 rows in set (0.004 sec)
```

Congratulations on completing the lab! You've successfully set up an EC2 instance and an RDS database, and connected the two, leveraging the power of AWS to create a scalable, secure, and efficient architecture for your applications. This is just one of the many ways to securely connect your RDS database to your instance.

You've gained practical experience with AWS services, including creating and configuring EC2 and RDS instances, setting up security groups, and connecting to a database from a virtual server. These skills are fundamental for deploying and managing applications in the cloud like:

- **Web Applications:** Use EC2 for your web servers and RDS for your databases to build robust, scalable web applications.
- **Data Processing:** Leverage EC2 for processing tasks and RDS for storing processed data

By mastering the integration of EC2 and RDS, you've taken a significant step towards building modern, cloud-native applications. This foundational knowledge empowers you to explore more advanced AWS services and architectures, further enhancing your ability to design and deploy scalable, reliable, and secure applications in the cloud. Happy learning!