

# Creating an Amazon RDS Database Simulation

## Simulation overview

Traditionally, creating a database can be a complex process that requires either a database administrator or a system administrator. In the cloud, you can reduce the number of steps in the process by using Amazon Relational Database Service (Amazon RDS). In this simulation, you will learn how to use Amazon RDS to provision a MySQL database and perform a few basic administrative actions.

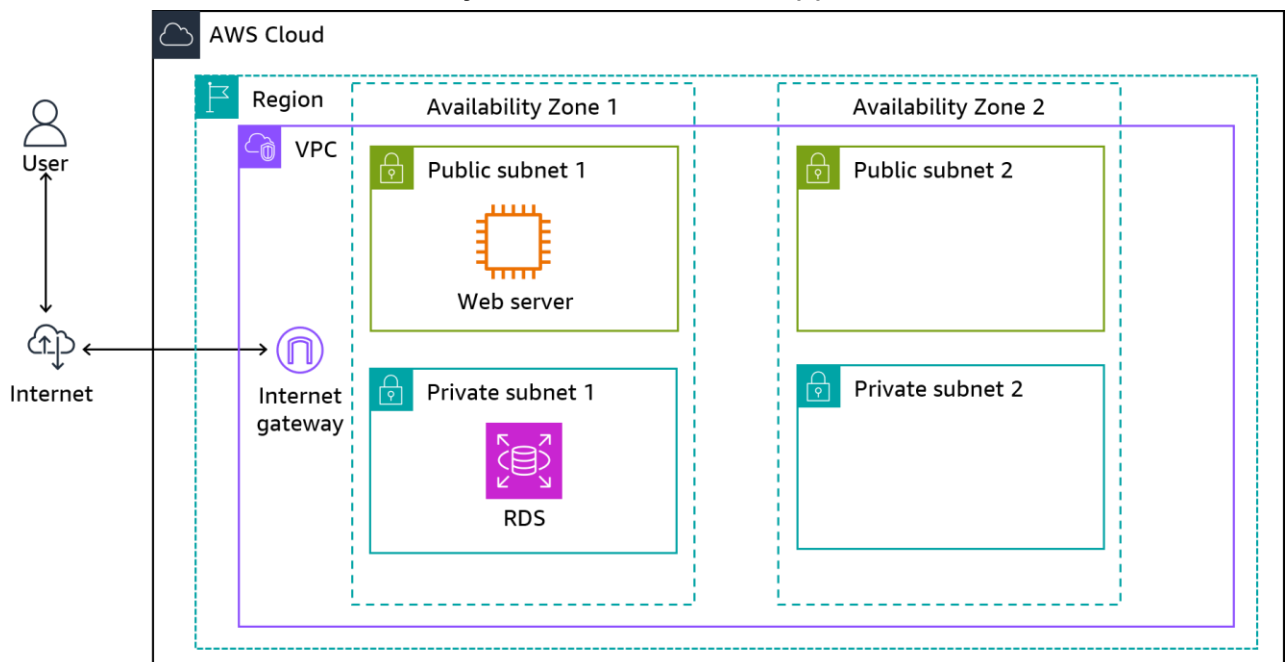
When you start the simulation, an Amazon Elastic Compute Cloud (Amazon EC2) instance with a running web application is provisioned in the simulated Amazon Web Services (AWS) environment.

## Objectives

After completing this simulation, you will be able to do the following:

- Launch a MySQL database using Amazon RDS.
- Configure a web application to connect to the Amazon Relational Database Service (Amazon RDS) for MySQL database instance.
- Perform operations (stop, start, and reboot) on the database instance.
- Perform basic database monitoring.

At the end of this simulation, your architecture will appear as follows:



## Prerequisites

This simulation requires that you first complete the Getting Started with Databases course.

## AWS service restrictions

In this simulation environment, access to AWS services and service actions might be restricted to only what you need to complete the simulation instructions. You might encounter errors if you attempt to access other services or perform actions beyond those provided in this simulation.

## Task 1: Create an Amazon RDS database

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In this task, you create a MySQL database in a virtual private cloud (VPC). MySQL is a common open source relational database management system (RDBMS), so there are no software licensing fees.

1. At the top of the **AWS Management Console**, enter **RDS** in the search bar.
  - **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
2. In the search results, choose **RDS**.
3. Choose **Create Database**.

For this simulation, for **Choose a database creation method**, keep the default, **Standard create**, to display the full set of features available.

### Engine options

4. Under **Engine options**, for **Engine type**, choose **MySQL**.
5. To scroll down, choose the scroll bar.

You can now configure the database, including the software version, instance class, storage, and login settings.

6. Choose the **Engine Version** menu, and then select **MySQL 8.0.32**.
7. In the **Templates** section, choose **Dev/Test**.
8. To scroll down, choose the scroll bar.

The Multi-AZ deployment option automatically creates a replica of the database in a second Availability Zone for high availability. You will not need a Multi-AZ deployment for this exercise.

9. In the **Availability and durability** section, choose **Single DB instance**.
10. To scroll down, choose the scroll bar.

## Settings

11. In the **Settings** section, for **DB instance identifier**, enter **inventory-db**.
  - **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
12. Under **Credentials Settings**, for **Master username**, keep the default value, **admin**.
13. Under **Credentials management**, choose **Self managed**.
14. To scroll down to the password fields, choose the scroll bar.
15. For **Master password**, enter **sim-password!** in lowercase letters.
  - **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
16. For **Confirm master password**, enter **sim-password!** in lowercase letters.
  - **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
17. To scroll down, choose the scroll bar.

## Instance configuration

18. In the **Instance configuration** section, choose **Burstable classes (includes t classes)**.
19. The instance type automatically changes to **db.t3.micro**. Keep this value.
20. To scroll down, choose the scroll bar.

## Storage

21. In the **Storage** section, choose the **Storage type** menu
22. Select **General Purpose SSD (gp2)**.
23. For **Allocated storage**, enter **20**.
  - **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
24. Choose **Storage autoscaling** to expand the section.
25. Clear the **Enable storage autoscaling** checkbox.
26. To scroll down, choose the scroll bar.

## Connectivity

27. In the **Connectivity** section, for **Compute resource**, keep default value, **Don't connect to an EC2 compute resource**. You will establish this manually at a later stage. Also, for **Network type**, keep the default value, **IPv4**.
28. Choose the **Virtual private cloud (VPC)** menu, and then select the option that starts with **Lab VPC**.
29. For the **DB subnet group**, keep the default value, **rds-lab-db-subnet-group**.
30. To scroll down, choose the scroll bar.
31. For **Public access**, keep the default value, **No**.
32. For **VPC security group (firewall)**, keep the default value, **Choose existing**.
33. For **Existing VPC security groups**, choose the **X** next to **default** to remove this security group.
34. Choose the **Existing VPC security groups** menu, and then select **DB-SG**. Choose any place outside the menu to close it.
35. For **Availability Zone**, keep the default value, **No preference**.
36. To scroll down, choose the scroll bar.

## Database authentication

37. For **Database authentication**, keep default value, **Password authentication**.

## Monitoring

38. In the **Monitoring** section, clear the **Enable Enhanced Monitoring** checkbox.

You will still have basic monitoring metrics available to review, which you will explore in Task 3 of this simulation.

## Additional configuration

39. Choose **Additional configuration** to expand the section.
40. Under **Database options**, for **Initial database name**, enter **inventory**.
  - **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.

This is the logical name of the database that the application will use.

41. To scroll down, choose the scroll bar.
42. For **Encryption**, choose the **Enable encryption** checkbox to clear it.
43. To scroll down, choose the scroll bar.

## Create the database

44. At the bottom of the page, choose **Create database**.

45. In the **Suggested add-ons for inventory-db** pop-up box, choose **Close**.

The following message appears at the top of the page: **“Creating database inventory-db”**.

Before you continue to the next task, the database instance **Status** must be *Available*. This process can take several minutes in a live environment.

46. Choose the refresh icon.

Notice that the database has been created, but the **Status** is *Backing-up*.

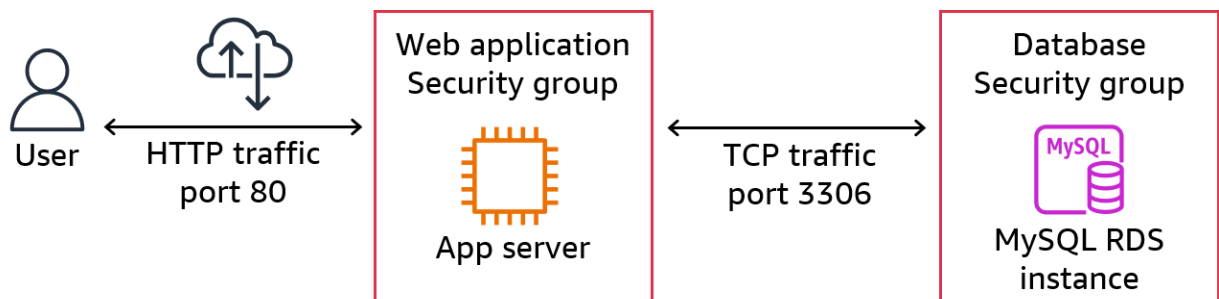
47. Choose the refresh icon again.

Notice that the database **Status** is now *Available*, and you can continue to the next task to connect to it.

## Task 2: Configure a web application communication with the database instance

This simulation automatically deployed an Amazon Elastic Compute Cloud (Amazon EC2) instance with a running web application. You must use the IP address of the instance to connect to the application.

In this task, you will use the application to configure connection settings, which will be stored in AWS Secrets Manager for future use.



## Open the web application

48. Choose the recently visited services icon next to the search bar. It is the icon with nine white squares in three rows of three.
49. Choose **EC2**.
50. In the left navigation pane, choose **Instances**.

Notice that there is a running instance named **App Server**.

51. Select the **App Server** instance.
52. In the **Details** tab, choose the copy icon under **Public IPv4 address**.
53. To open a new tab, choose the plus sign (+) on your browser.
54. In the browser tab, choose the URL field, and then press Ctrl+V on your keyboard to paste the IP address into the address bar.
  - **Note:** If you are a Mac user, you will also press Ctrl+V on your keyboard. In this simulation, you will use your keyboard as a Windows keyboard.
55. To load the page, press Enter on your keyboard.

The web application opens. It does not display much information because the application is not yet connected to the database.

56. Choose **Settings**.

You can now configure the application to use the Amazon RDS database instance you created earlier. First, you need to retrieve the database endpoint so the application knows how to connect to a database.

## Connect the web application to the database

57. Choose the **Instances** browser tab, but do not close the **Inventory System** tab. You will return to it soon.
58. Choose the recently visited services icon next to the search bar.
59. Choose **RDS**.
60. In the left navigation pane, choose **Databases**.
61. Under **DB identifier**, choose the link for **inventory-db**.
62. In the **Connectivity & security** section, find the endpoint. It should be similar to this example: **inventory-db.c7bo7sqp7mwn.us-east-1.rds.amazonaws.com**. Then, choose the copy icon under **Endpoint**.
63. Choose the **Inventory System** browser tab.
64. Choose the **Endpoint** field, and then press Ctrl+V on your keyboard to paste in the database endpoint you just copied.

- **Note:** If you are a Mac user, you will also press Ctrl+V on your keyboard. In this simulation, you will use your keyboard as a Windows keyboard.
65. For **Database**, enter **inventory**.
- **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
66. For **Username**, enter **admin**.
- **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
67. For **Password**, enter **sim-password!** in lowercase letters.
- **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
68. Choose **Save**.

The application will save this information to Secrets Manager. It will connect to the database, load some initial data, and display information.

You can now use the web application to add, edit, and delete inventory information.

The inventory information is stored in the Amazon RDS for MySQL database you created earlier in the simulation. A failure in the application server will *not* lead to a loss of data, and multiple application servers can access the same data.

## Modifying the database entries

69. To insert new records into the table, choose **+Add Inventory**.
70. For **Store**, enter **Atlanta**.
- **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
71. For **Item**, enter **Amazon Alexa**.
- **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
72. For **Quantity**, enter **7**.
- **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.
73. Choose **Submit**.

You can also edit existing entries.

74. Choose the edit icon next to **Puerto Rico** in the top row of the table.
75. For **Quantity**, clear **12**, and then enter **5**.
- **Note:** To record your entry, press Enter on your keyboard or choose any place outside the entry field.

76. Choose **Submit**.

77. Choose the **X** on the **Inventory System** browser tab to close it.

You successfully launched the application and connected it to the database.

## Task 3: Monitor the database instance

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Monitoring is an important part of maintaining the reliability, availability, and performance of any database. Amazon RDS provides many useful metrics to monitor the health of your database instance. In this task, you will explore some of the metrics for the database instance you created.

78. On the **inventory-db** page, choose the **Monitoring** tab.

79. To scroll down, choose the scroll bar.

80. Observe the Amazon CloudWatch metrics indicating the respective database instance parameters.

81. Continue to scroll down until you have reviewed all available metrics.

## Task 4: Perform operations on the database

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In this task, you learn about a few of the administrative tasks that can be performed on the database in Amazon RDS.

82. In the left navigation pane, choose **Databases**.

83. Choose the **inventory-db** database.

84. Choose the **Actions** menu.

The **Actions** menu displays various operations, such as **Stop temporarily**, **Reboot**, and so on.

85. To stop the instance temporarily, choose **Stop temporarily**. The database will automatically restart after 7 days.

86. In the **Stop DB instance temporarily** pop-up box, select the checkbox under **Acknowledgement**.

87. Choose **Stop temporarily**.



**Note:** Stopping the instance also stops the billing charges associated with running the instance. Databases will continue to occupy storage space and incur billing charges.

## Simulation complete

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Congratulations! You have completed the simulation.

In this simulation, you configured and launched an Amazon RDS for MySQL database instance. You connected an existing web application to the database. Then, you interacted with the database instance by performing basic tasks, such as adding and updating records. You reviewed the various metrics available to monitor the database and gain insights into the health of the database. Finally, you performed basic database administrative operations by temporarily stopping the database.

*Your feedback is welcome and appreciated.*

To provide suggestions or corrections, see [Contact AWS Training and Certification](#).

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