



Visualize a Relational Database

N No_need_to_give_my_name

Introducing Today's Project!

What is Amazon RDS?

Amazon RDS is a managed database service that automates tasks like provisioning, configuration, and backups. It simplifies database management and allows you to create databases quickly. RDS also offers flexibility for customization.

How I used Amazon RDS in this project

In this project, we used Amazon RDS to create a secure and scalable relational database. We populated the database with data using MySQL Workbench and then connected it to QuickSight for data visualization.

One thing I didn't expect in this project was...

One thing I didn't expect was the complexity involved in configuring security groups and managing access controls. While it's essential for protecting the database, it can be a bit challenging to get right, especially for beginners.

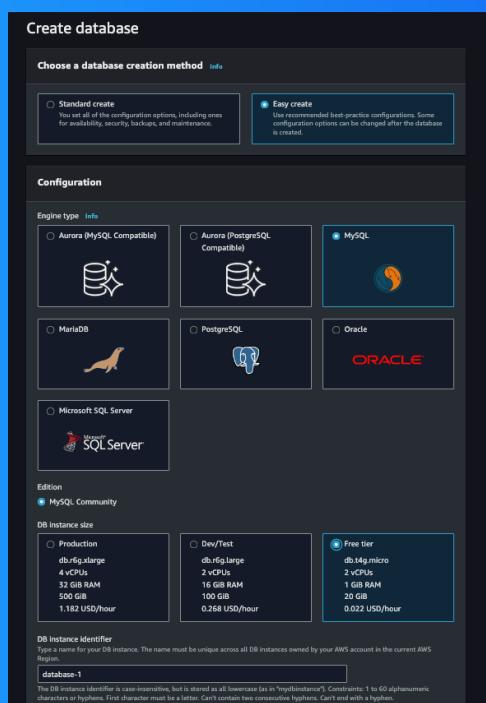
This project took me...

This project took me approximately 2 hour to complete, including the time spent creating the database, populating it with data, connecting it to QuickSight, and configuring security settings.

In the first part of my project...

Creating a Relational Database

I created a database in AWS using RDS. I configured settings like the engine type (MySQL), DB instance size (Free tier), DB instance identifier (QuickSightDatabase), username (admin), and a unique password, and then launched it.



Understanding Relational Databases

A relational database is a structured database that organizes data into tables, similar to spreadsheets. These tables have rows and columns, where each row represents a record and each column represents an attribute of that record.

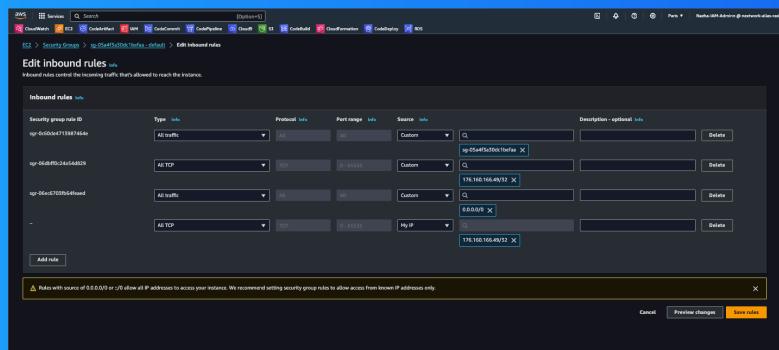
MySQL vs SQL

Several relational database management systems use SQL, including MySQL. MySQL is an open-source relational database management system, while SQL is the language you use to read, modify, and delete that data.

Populating my RDS instance

The first thing I did was make my RDS instance public because it's essential for allowing external connections, such as from MySQL Workbench, to access and interact with the database. This makes it easier to manage and modify the database directly.

I had to update the default security group for my RDS instance because it controls inbound and outbound traffic. By allowing traffic only from my specific IP address, I ensured that only my machine could connect to the database, enhancing its security.



Using MySQL Workbench

| empno | ename | job | manager | hiredate | salary | comm | deptno |
|-------|-----------|----------|---------|---------------------|----------|---------|--------|
| 1 | JOHNSON | ADMIN | 6 | 1990-12-17 00:00:00 | 18000.00 | NULL | 4 |
| 2 | HARDING | MANAGER | 9 | 1998-02-02 00:00:00 | 52000.00 | 300.00 | 3 |
| 3 | TAFT | SALES I | 2 | 1996-01-02 00:00:00 | 25000.00 | 500.00 | 3 |
| 4 | HOOVER | SALES I | 2 | 1990-04-02 00:00:00 | 27000.00 | NULL | 3 |
| 5 | LINCOLN | TECH | 6 | 1994-06-23 00:00:00 | 22500.00 | 1400.00 | 4 |
| 6 | GARFIELD | MANAGER | 9 | 1993-05-01 00:00:00 | 54000.00 | NULL | 4 |
| 7 | POLK | TECH | 6 | 1997-09-22 00:00:00 | 25000.00 | NULL | 4 |
| 8 | GRANT | ENGINEER | 10 | 1997-03-30 00:00:00 | 32000.00 | NULL | 2 |
| 9 | JACKSON | CEO | NULL | 1990-01-01 00:00:00 | 75000.00 | NULL | 4 |
| 10 | FILLMORE | MANAGER | 9 | 1994-08-09 00:00:00 | 56000.00 | NULL | 2 |
| 11 | ADAMS | ENGINEER | 10 | 1996-03-15 00:00:00 | 34000.00 | NULL | 2 |
| 12 | WASHIN... | ADMIN | 6 | 1998-04-16 00:00:00 | 18000.00 | NULL | 4 |
| 13 | MONROE | ENGINEER | 10 | 2000-12-03 00:00:00 | 30000.00 | NULL | 2 |
| 14 | ROOSEV... | CPA | 9 | 1995-10-12 00:00:00 | 35000.00 | NULL | 1 |
| NULL | NULL | NULL | NULL | NULL | NULL | NULL | NULL |

To populate my database, I used SQL queries within MySQL Workbench. I created two tables: "newhire" and "department." Then, I inserted data into these tables using the INSERT INTO statement, specifying the values for each column.

Connecting QuickSight and RDS

To connect my RDS instance to QuickSight, I adjusted its security group to allow inbound traffic from all sources. Then, I navigated to QuickSight and created a new dataset. I selected "RDS" as the data source and filled in the necessary details.

This solution is risky because our RDS instance is publicly accessible. This means anyone can access and exploit it, leading to data breaches and security vulnerabilities. To limit this risk, we need to restrict access to only QuickSight.

A better strategy

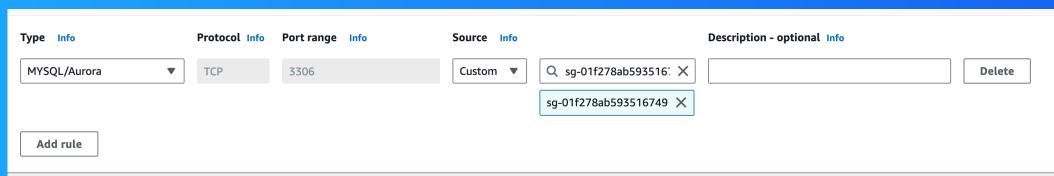
First, I made a new security group so that we can isolate QuickSight and restrict its access to only our RDS instance. This enhances security by preventing unauthorized access to our database.

I connected my new security group to QuickSight by updating the execution role "aws-quicksight-service-role-v0" with a new policy named "QuickSightAllowVPC." This policy granted the necessary permissions to attach the security group to QuickSight.

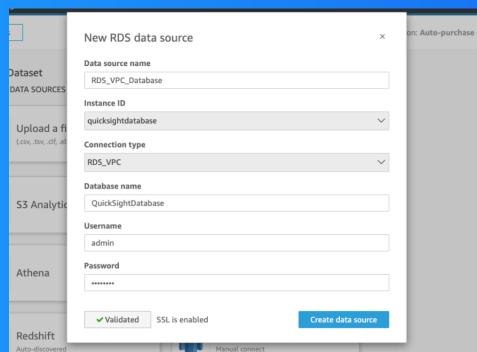
Now to secure my RDS instance

To make my RDS instance secure, I first made it private by removing public accessibility. Then, I created a new security group for RDS. Finally, I allowed inbound traffic from the QuickSight security group to my RDS security group.

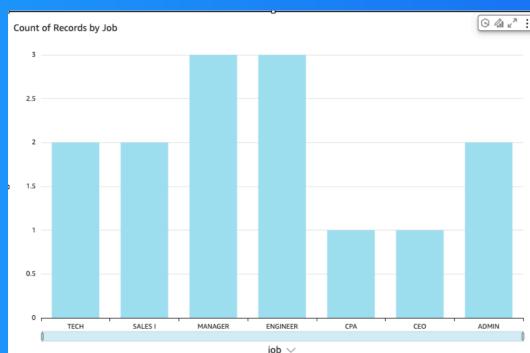
I made sure that my RDS instance could be accessed from QuickSight by creating a new security group for RDS and allowing inbound traffic from the QuickSight security group. This restricted access to only QuickSight, enhancing security.



Adding RDS as a data source for QuickSight



This data source is different from my initial data source because it's now securely connected through the new security group, preventing unauthorized access. Only QuickSight can query the data, enhancing the overall security of our system.





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