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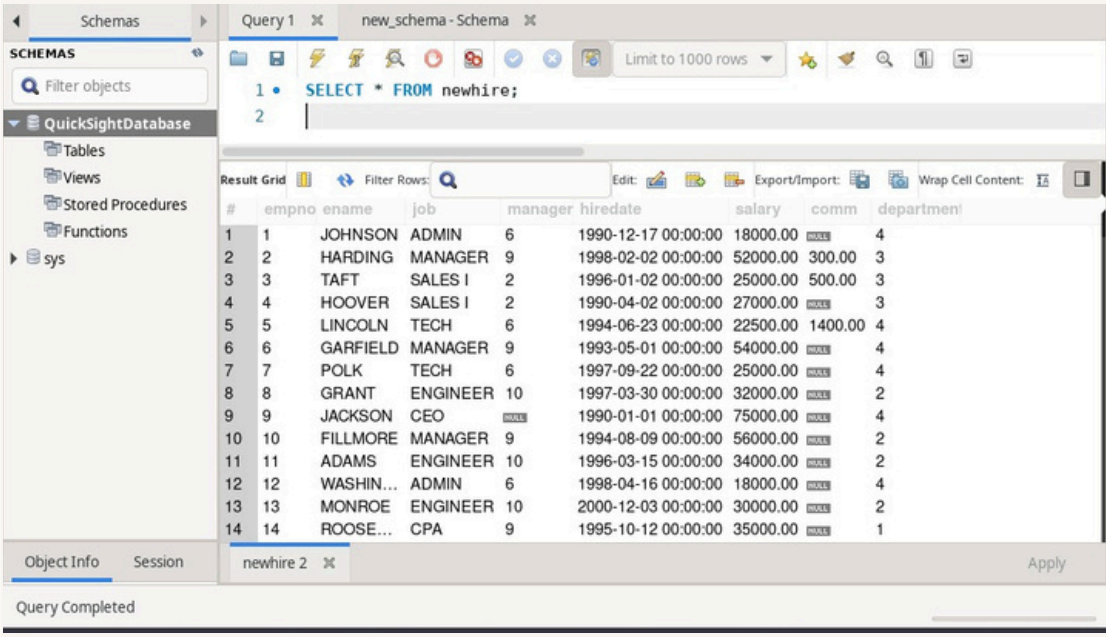
Visualize a Relational Database

Hassan Gachoka



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Introducing Today's Project!

What is Amazon RDS?

Amazon RDS is a managed database service that automates tasks like setup, scaling, and backups for databases like MySQL, PostgreSQL, and more. It's useful for reducing operational overhead and ensuring high availability, security, and performance.

How I used Amazon RDS in this project

In todays' project, I used Amazon RDS to create and manage a MySQL database. I connected it securely to QuickSight for data visualization, ensuring proper security groups and private access configurations.

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

One thing I didn't expect in this project was the complexity of securing connections between QuickSight and RDS, requiring precise security group configurations and IAM policies to ensure private and authorized access.

This project took me...

This project took me precisely 1 hour and 10 minutes to complete, covering all steps from setting up the RDS instance to securing connections and creating visualizations.

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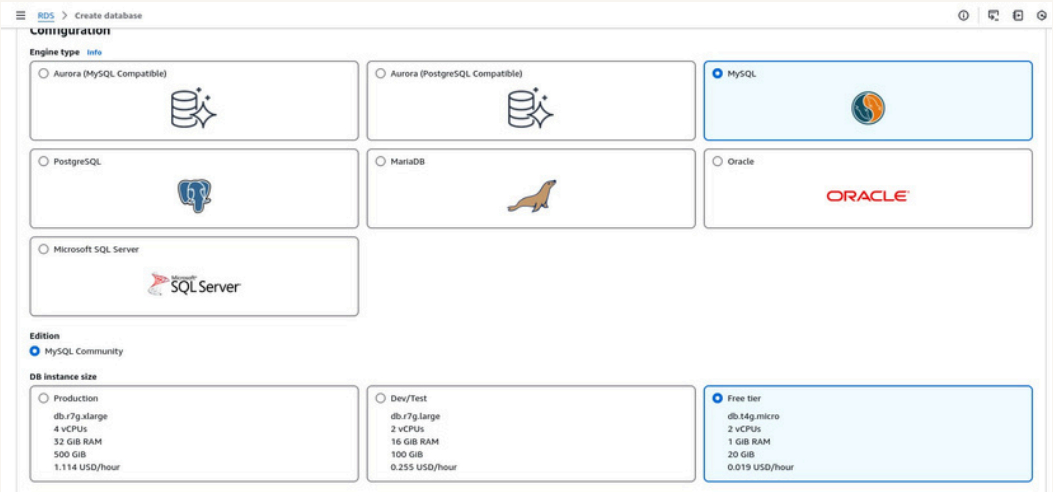
In the first part of my project...

Creating a Relational Database

I created my relational database by using AWS RDS with the Easy Create option, selecting MySQL as the engine, choosing free tier settings, and configuring the database identifier, username, and password.



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Understanding Relational Databases

A relational database is a type of database that organizes data into tables with rows and columns, enabling relationships between data to be defined and queried using SQL.

MySQL vs SQL

The difference between MySQL and SQL is that SQL is a language for managing databases, while MySQL is an RDBMS that uses SQL to create, manage, and interact with relational databases.

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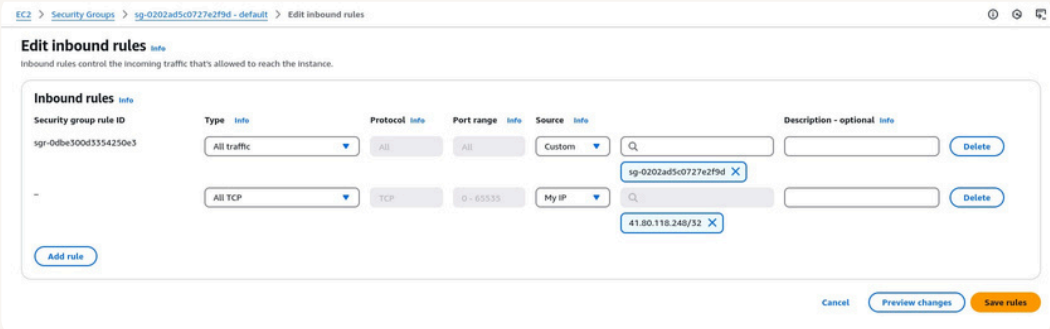
Populating my RDS instance

The first thing I did was make my RDS instance public because it allows my local machine to connect to the instance over the internet. Without making it public, the connection would be restricted to the local AWS network only.

I had to update the default security group for my RDS schema because it controls the inbound and outbound traffic. By adding a rule for my local machine's IP, I allowed MySQL Workbench to connect to the RDS instance.



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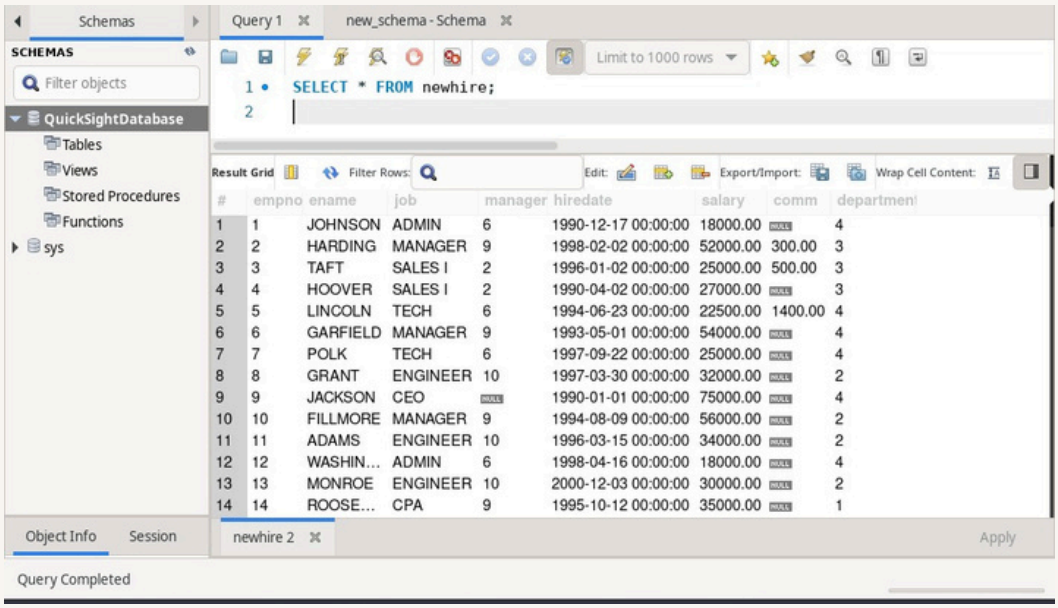
Using MySQL Workbench



To populate my database, I used SQL INSERT statements to add data into the two tables I created. This allowed me to input relevant information into the schema, making it ready for analysis and visualization in QuickSight.

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Connecting QuickSight and RDS

To connect my RDS instance to QuickSight, I adjusted the security group to allow inbound requests from any IP range, then added the RDS instance as a data source in QuickSight using the connection details for MySQL.

This solution is risky because our RDS instance is publicly accessible, which opens it up to potential unauthorized access. This makes it vulnerable to hacking attempts and exposes sensitive data to malicious actors.

A better strategy

First, I made a new security group so that I could securely allow QuickSight to access my RDS instance while keeping the database private. This ensures that only QuickSight has the required access, reducing the risk of unauthorized connections.

Next, I connected my new security group to QuickSight by adding an inline IAM policy to the aws-quicksight-service-role-v0 role, granting permissions to manage EC2 network interfaces, VPCs, and security groups for secure access to RDS.

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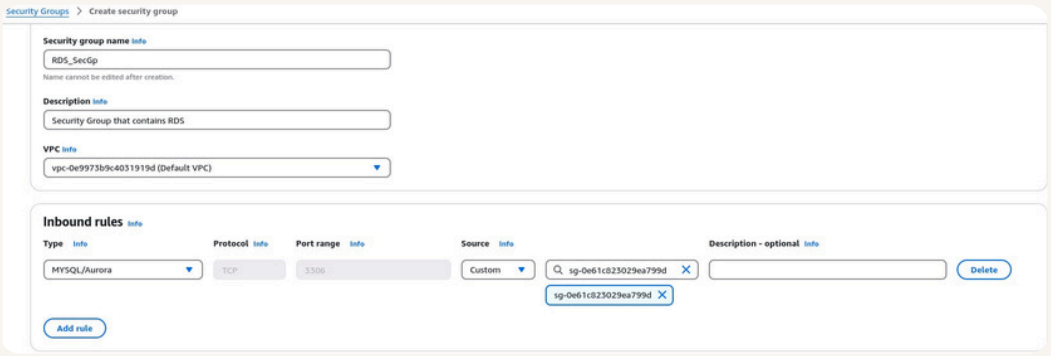
Now to secure my RDS instance

To make my RDS instance secure, I made it private by removing public access and created a new security group specifically for the RDS instance. I then allowed access between the RDS and QuickSight security groups to ensure secure communication.

I made sure that my RDS instance could be accessed from QuickSight by allowing my QuickSight security group to communicate with the RDS security group. This setup ensures that only QuickSight has access to the RDS instance.



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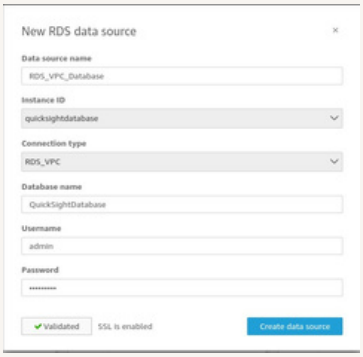
Adding RDS as a data source for QuickSight



This data source is different from my initial data source because it is now connected securely through a private RDS instance, using a specific security group for access, whereas the original connection was publicly accessible.