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EXPERIMENT- 09

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Branch: BE-CSE **Section/Group: KRG-1B**
Semester: 05 **Date of Performance: 04/11/25**
Subject Name:ADBMS **Subject Code: 23CSP-333**

1. Aim:
To create and connect a PostgreSQL database instance on **Amazon RDS (Relational Database Service)** and EC2.

2. Objective:

To understand the ACID property and the AWS completely.

3. Tools / Software

- AmazonWeb Services (AWS)
- PostgreSQL
- pgAdmin 4
- RDS (Relational Database Service)

4. Program:

1. Overview of Database: SQL & NOSQL

DATABASES ON EC2 INSTANCE

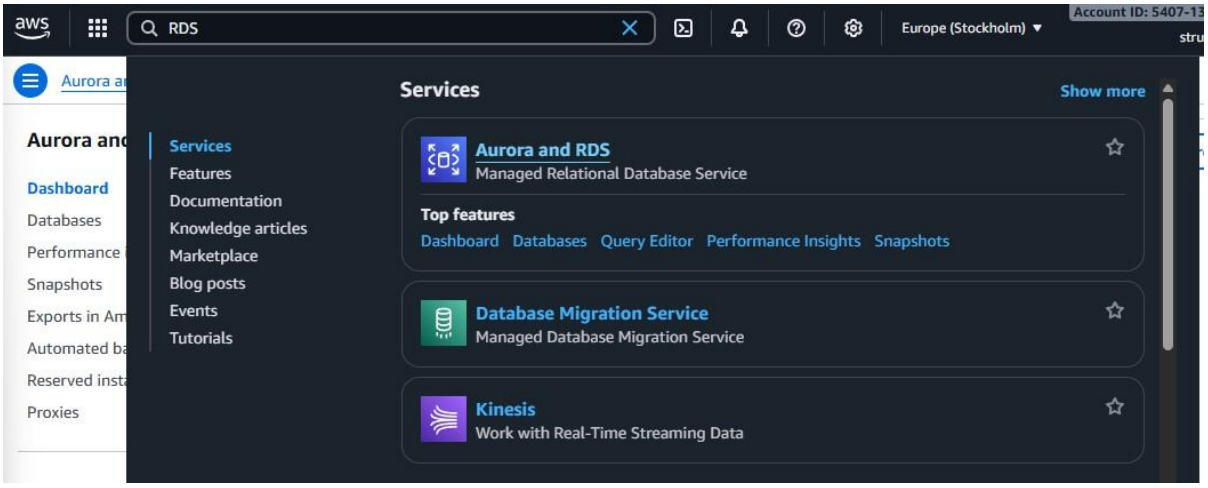
- **3-tier architecture**: where we can run all the 3 components in the same EC2 instance. **Not recommended**

- 2-tier architecture: Where application + webserver runs on one EC2 instance & Database runs on another EC2 instance & finally we can place both of these EC2 instances in one availability zone

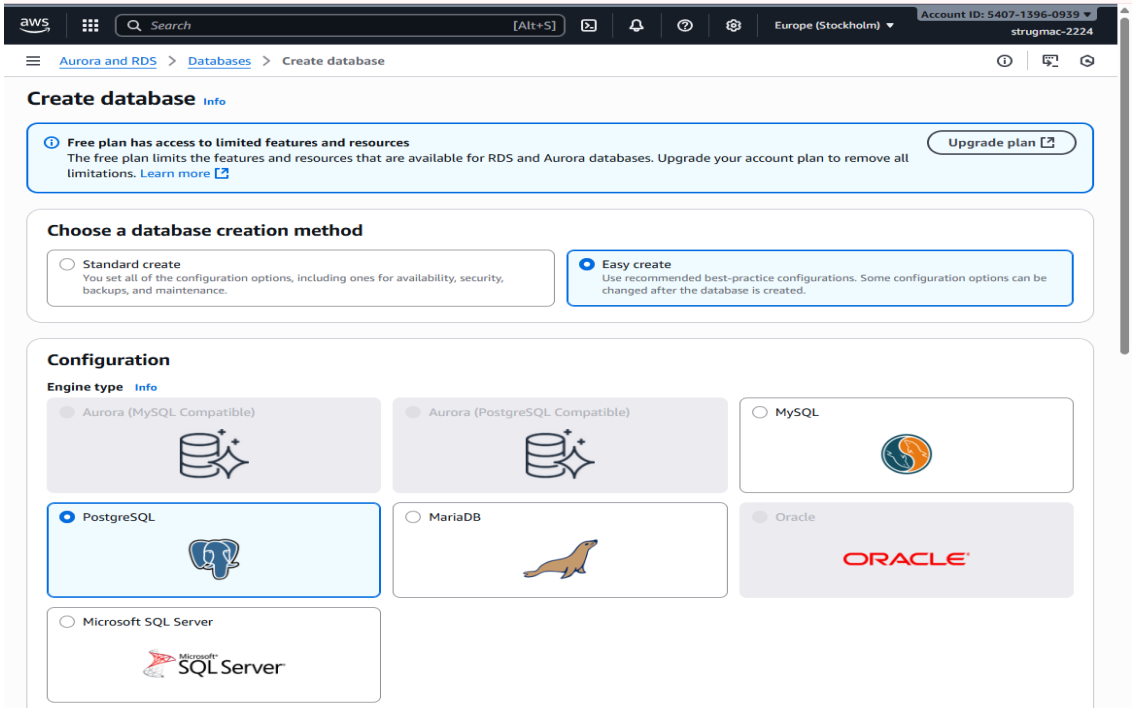
Feature	Description	Purpose
CloudWatch	Monitors RDS metrics, sends alarms, and stores logs	Performance & health monitoring
Automated Backups	Daily snapshots and transaction logs	Disaster recovery
Manual Snapshots	User-created backups	Long-term retention
Manual Snapshots	User-created backups	Long-term retention
Multi-AZ Deployment	Standby replica in another AZ	High availability
Read Replicas	Read-only copies	Load balancing
Security (IAM, KMS, SSL)	Data protection and access control	Compliance & safety
Performance Insights	SQL and load analysis tool	Performance tuning
Storage Auto Scaling	Grows storage automatically	Prevents space outages
Enhanced Monitoring	OS-level real-time metrics	Deep diagnostics
Cross-Region Replicas	Replication to other regions	Global availability
Parameter/Option Groups	DB configuration controls	Customization

1. GO TO AWS HOMEPAGE -> CLICK ON SIGN IN-> ENTER USER NAME WITH EMAIL ADDRESS.

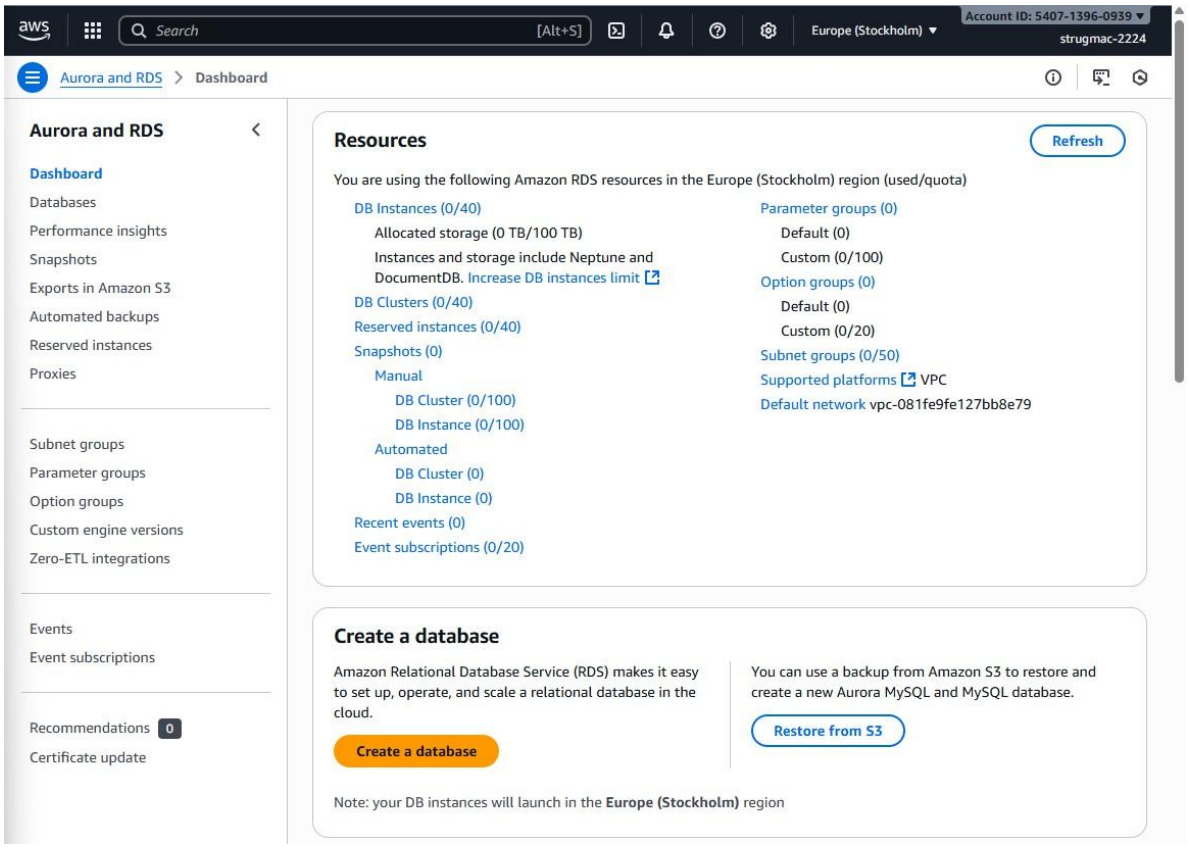
2. AFTER SIGN-IN -> GO TO SEARCH BAR -> SEARCH FOR RDS -> HIT ENTER



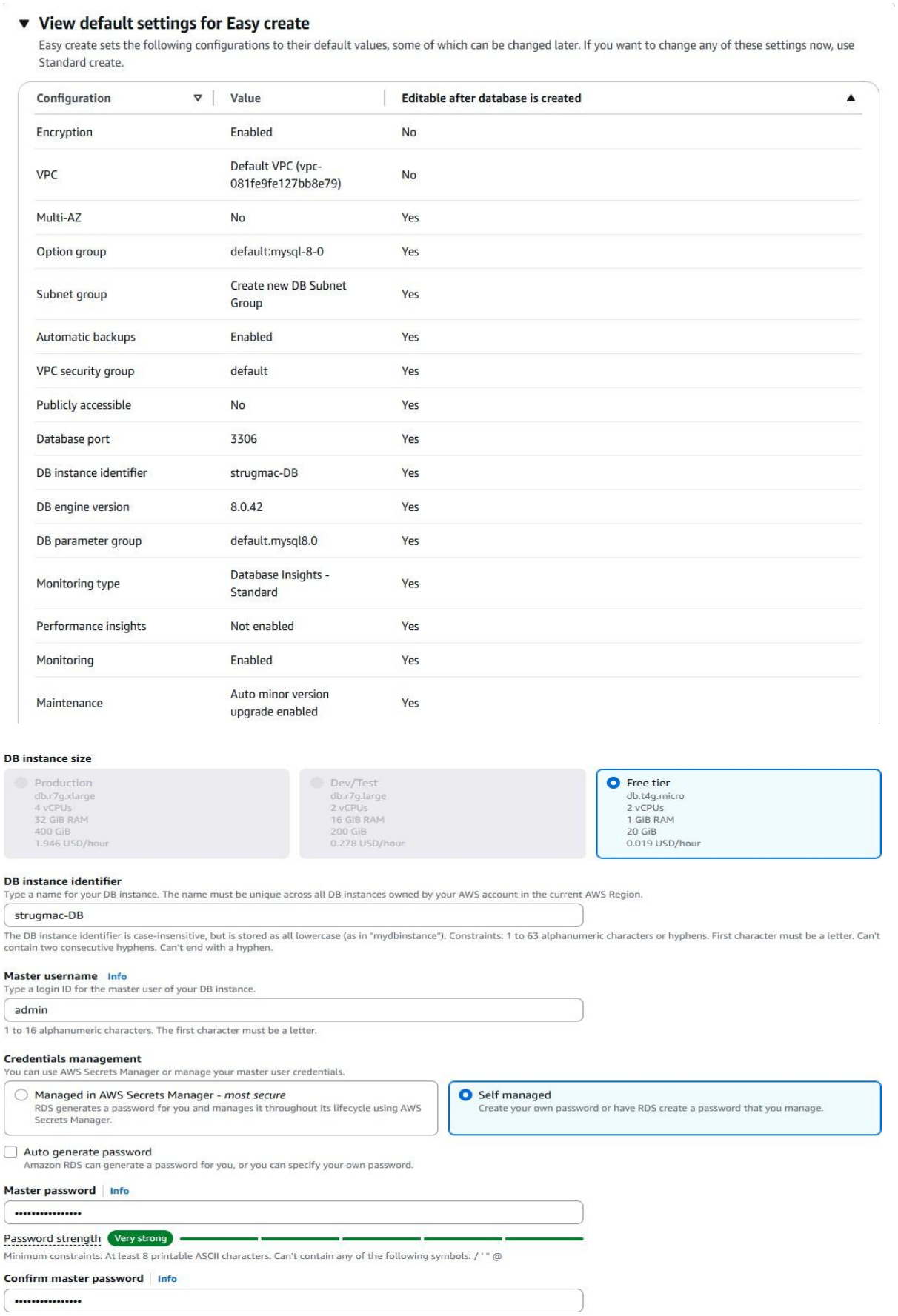
3. HOW TO CREATE MY SQL DATABASE INSTANCE ON AWS RDS?



4. CLICK ON CREATE DATABASE



IN THE STANDALONE CREATE, WE CAN SET EVERYTHING FOR OUR DATABASE, THE INCOMING TRAFFIC, IP ADDRESSES TO BE USED, BACKUP ETC.



▼ View default settings for Easy create

Easy create sets the following configurations to their default values, some of which can be changed later. If you want to change any of these settings now, use Standard create.

Configuration	Value	Editable after database is created
Encryption	Enabled	No
VPC	Default VPC (vpc-081fe9fe127bb8e79)	No
Multi-AZ	No	Yes
Option group	default:mysql-8-0	Yes
Subnet group	Create new DB Subnet Group	Yes
Automatic backups	Enabled	Yes
VPC security group	default	Yes
Publicly accessible	No	Yes
Database port	3306	Yes
DB instance identifier	strugmac-DB	Yes
DB engine version	8.0.42	Yes
DB parameter group	default.mysql8.0	Yes
Monitoring type	Database Insights - Standard	Yes
Performance insights	Not enabled	Yes
Monitoring	Enabled	Yes
Maintenance	Auto minor version upgrade enabled	Yes

DB instance size

Production
db.r7g.xlarge
4 vCPUs
32 GiB RAM
400 GiB
1.946 USD/hour

Dev/Test
db.r7g.large
2 vCPUs
16 GiB RAM
200 GiB
0.278 USD/hour

Free tier
db.t4g.micro
2 vCPUs
1 GiB RAM
20 GiB
0.019 USD/hour

DB instance identifier
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.

strugmac-DB

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 63 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

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.

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

Master password Info

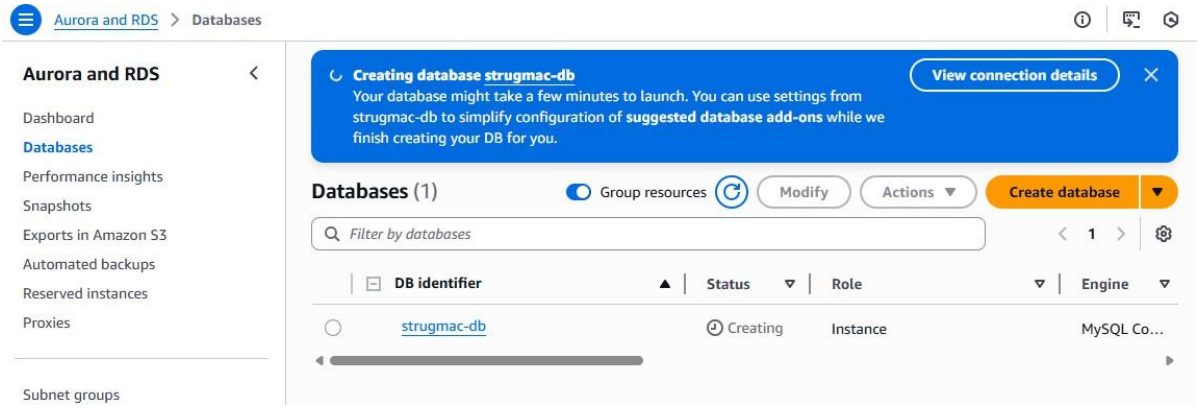
••••••••••••••••

Password strength Very strong

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

Confirm master password Info

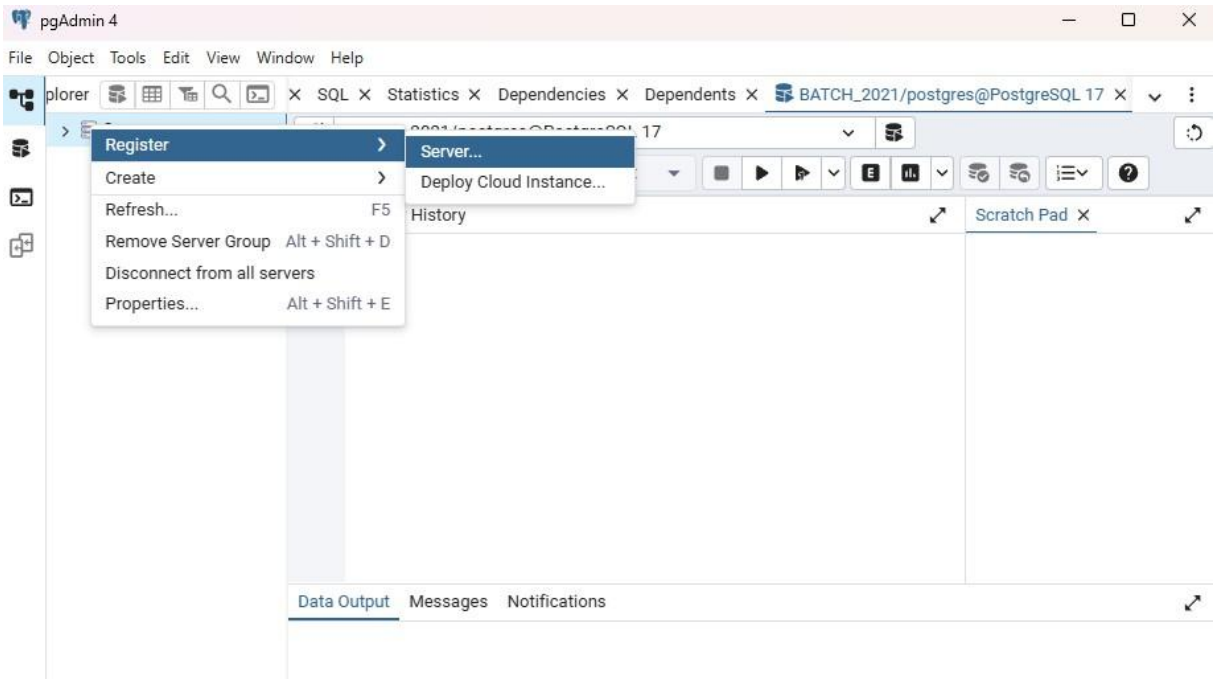
••••••••••••••••



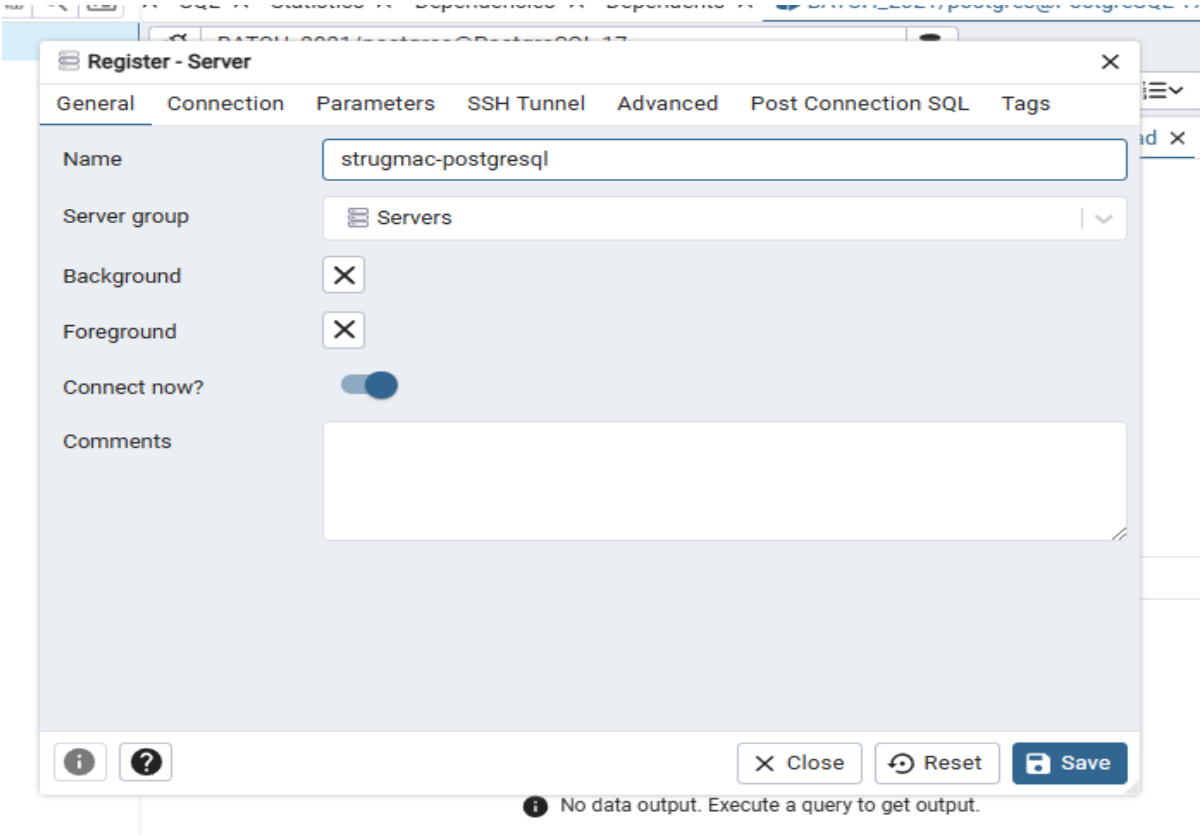
Now this will create a MySQL database to me, and we want to connect to RDS

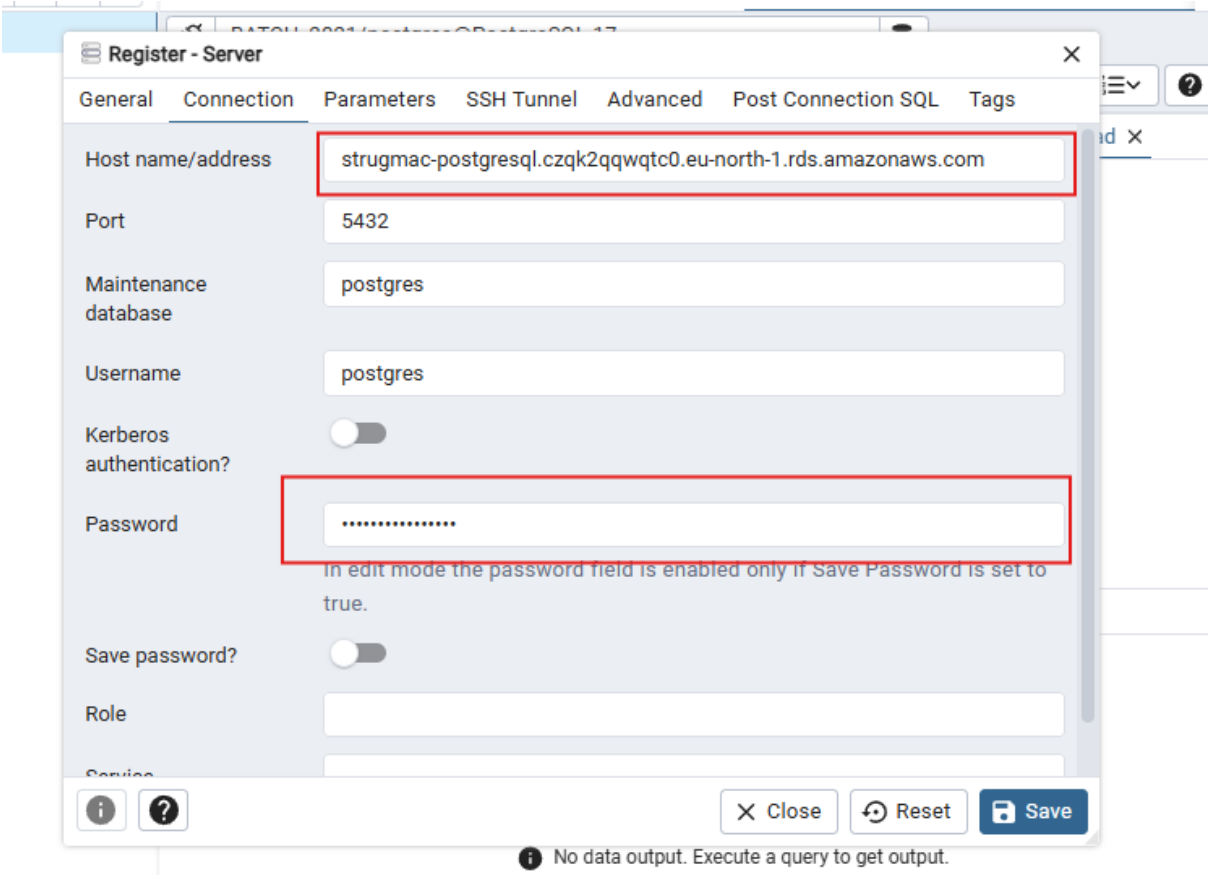
1. Create AWS RDS database for PostgresSQL

2. Connect from PgAdmin.

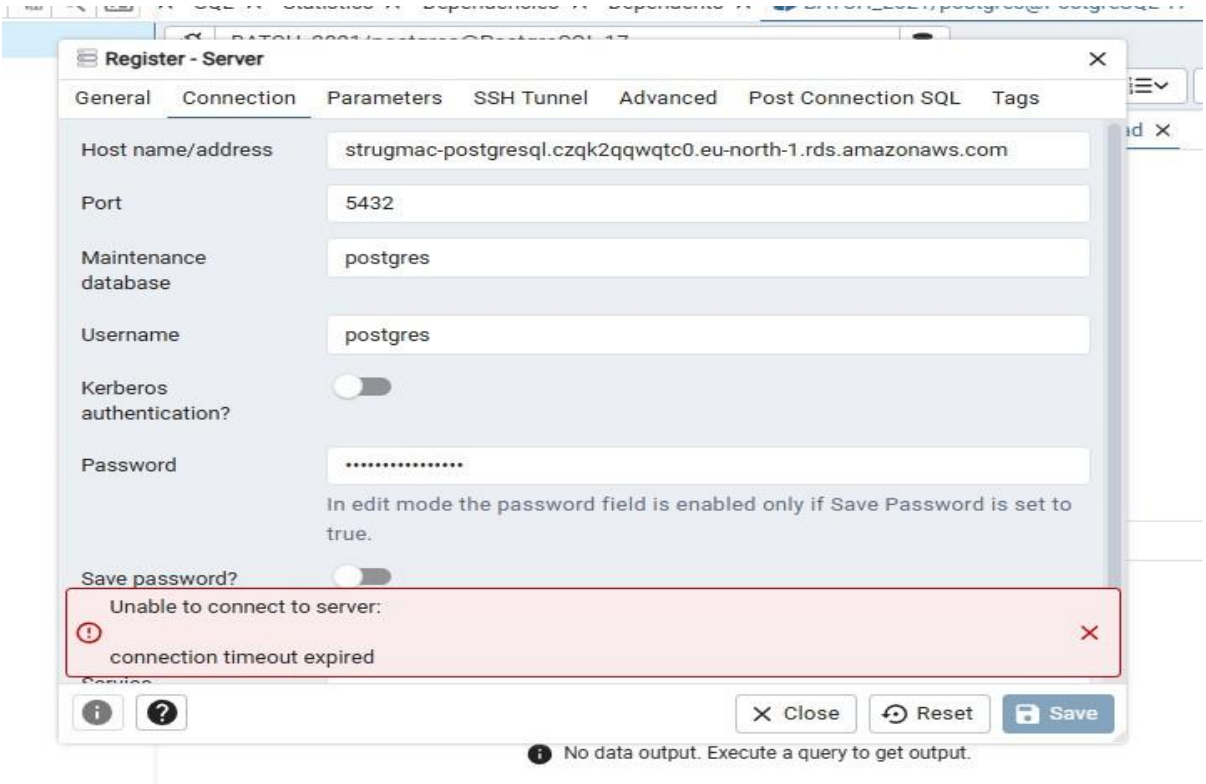


Copy the API Endpoints from the dashboard of AWS RDS Database instance.

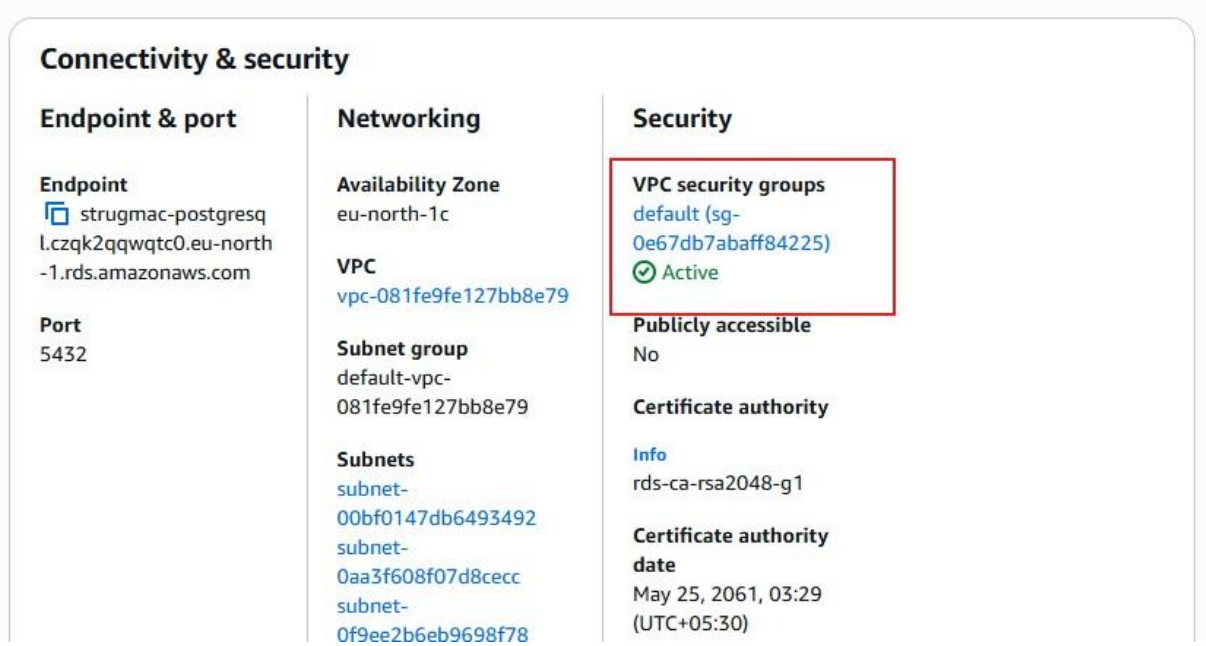

Register - Server
General
Connection
Parameters
SSH Tunnel
Advanced
Post Connection SQL
Tags
Name
strugmac-postgresql
Server group
Servers
Background
Foreground
Connect now?
Comments
Close
Reset
Save
No data output. Execute a query to get output.


Register - Server
General
Connection
Parameters
SSH Tunnel
Advanced
Post Connection SQL
Tags
Host name/address
strugmac-postgresql.czqk2qqwqtc0.eu-north-1.rds.amazonaws.com
Port
5432
Maintenance database
postgres
Username
postgres
Kerberos authentication?
Password
In edit mode the password field is enabled only if Save Password is set to true.
Save password?
Role
Close
Reset
Save
No data output. Execute a query to get output.

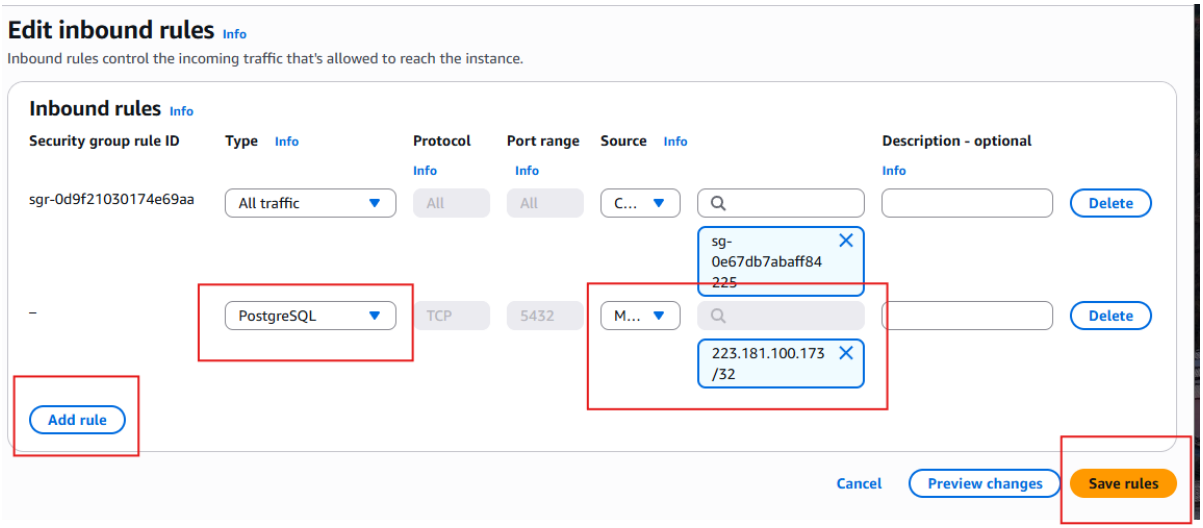
Click on Save



Might give this error as this DB instance is not available locally.
Change the INBOUND RULES of DB Instance from the A



WS Console


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 Info
Protocol Info
Port range Info
Source Info
Description - optional Info
sgr-0d9f21030174e69aa
All traffic
All
All
C...
sg-0e67db7abaff84225
Delete
–
PostgreSQL
TCP
5432
M...
223.181.100.173/32
Delete
Add rule
Cancel
Preview changes
Save rules