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## Experiment 9

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**Subject Code:**23CSP-333

### Aim:

To understand and implement the creation and management of a relational database instance using **AWS RDS**, including setting up database connectivity (via pgAdmin or MySQL client), configuring security groups, and comparing RDS with EC2 database setups in terms of scalability, performance, and manageability.

### Objective:

- To study the concept and features of **Amazon Web Services (AWS) Relational Database Service (RDS)**.
- To understand the **advantages of using RDS** over EC2 and on-premise database setups.
- To learn how to **create a database instance** on AWS RDS.
- To configure and manage **security groups** for secure database access.
- To learn how to **connect AWS RDS to local pgAdmin or MySQL client**.
- To explore various **RDS features** such as automated backups, monitoring, and scaling.
- To understand **Multi-AZ deployment, read replicas, and cross-region replication** for high availability.
- To gain hands-on experience in **launching and managing cloud-based databases** using AWS.

## Theory:

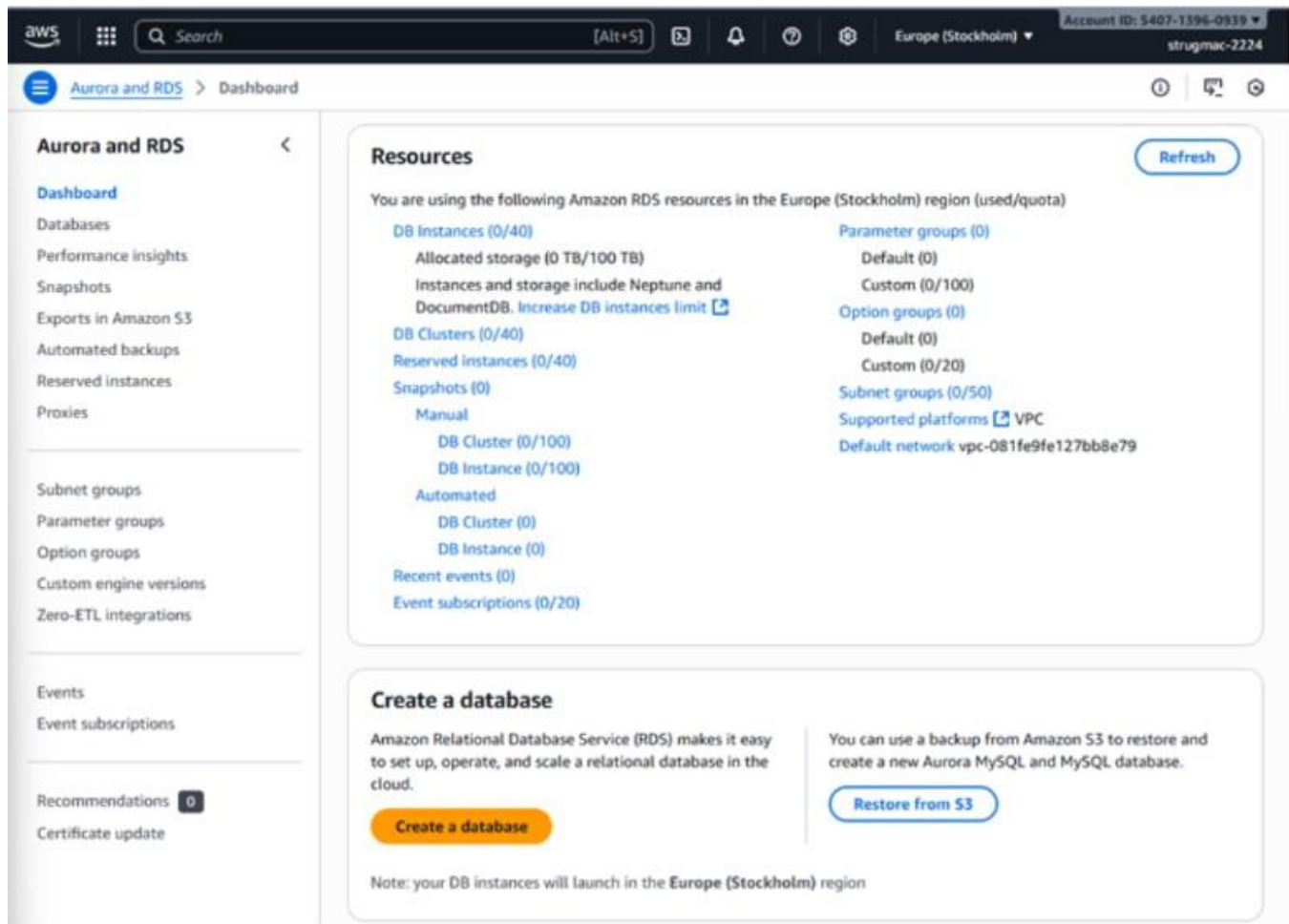
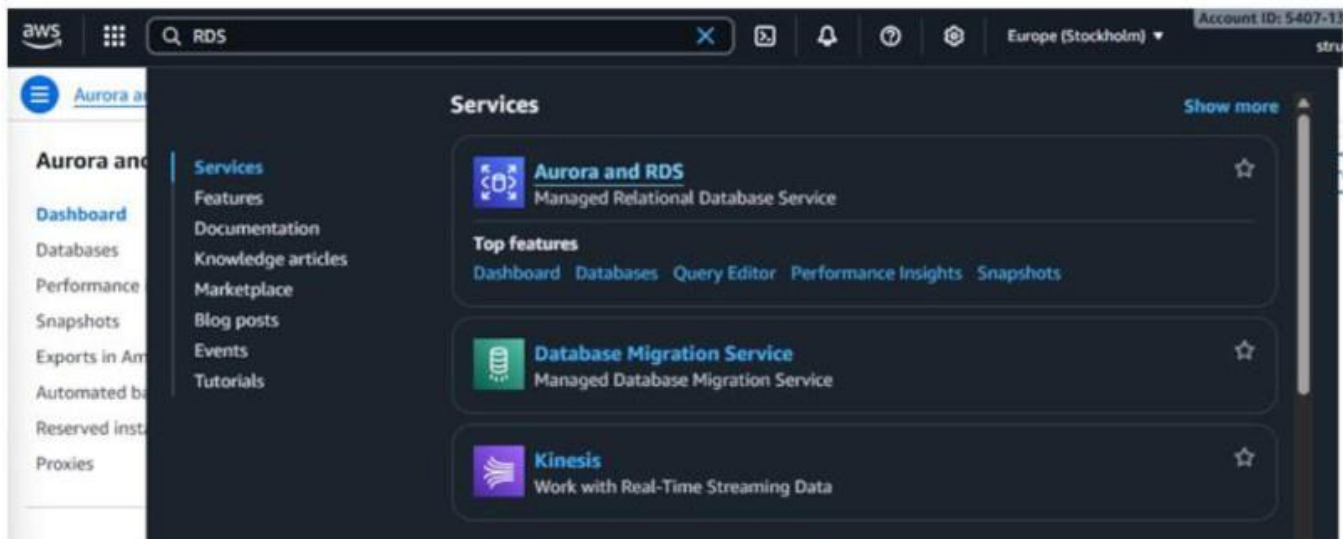
Amazon Web Services (AWS) Relational Database Service (RDS) is a **managed cloud database service** that simplifies the setup, operation, and scaling of relational databases. It automates key administrative tasks such as provisioning, patching, backups, and monitoring, allowing developers to focus on application logic rather than infrastructure management.

AWS RDS supports multiple database engines, including **MySQL, PostgreSQL, MariaDB, Oracle, and SQL Server**, and provides features like **automated backups, multi-AZ deployment**, and **read replicas** to ensure high availability and reliability. Security is managed through **IAM, KMS encryption**, and **VPC security groups**, which protect databases from unauthorized access.

Additionally, AWS RDS integrates with **CloudWatch** for performance monitoring and offers **storage auto-scaling** to handle growing data needs efficiently. Compared to running databases on EC2 instances, RDS provides greater scalability, reduced administrative overhead, and enhanced performance, making it a cost-effective and reliable choice for cloud-based database management.

## Procedure:

- Log in to the AWS Management Console using your credentials.
- Search for and open the **RDS** service from the AWS dashboard.
- Click on **Create Database** to start a new RDS instance setup.
- Choose the **Standard Create** option for manual configuration.
- Select the required **database engine** (MySQL or PostgreSQL).
- Enter the **DB instance name**, **master username**, and **password**.
- Choose the **instance class** and configure **storage settings**.
- Enable **storage auto-scaling** if needed.
- Configure **VPC** and **security groups** for database connectivity.
- Set the database to be **publicly accessible** (if connecting locally).
- Enable **automated backups** and optional **Multi-AZ deployment**.
- Review all settings and click **Create Database**.
- Wait for the instance status to become **Available** in the RDS dashboard.
- Copy the **endpoint** (host name) of the created database.
- Open **pgAdmin** or **MySQL Workbench** on your local machine.
- Create a new connection using the endpoint, username, and password.
- If connection fails, modify **inbound rules** in the security group to allow your local IP.
- Test the connection and perform basic SQL operations to verify setup.



## Create database [Info](#)

### Free plan has access to limited features and resources

The free plan limits the features and resources that are available for RDS and Aurora databases. Upgrade your account plan to remove all limitations. [Learn more](#)

[Upgrade plan](#)

## Choose a database creation method

### ☐ 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.

## Configuration

### Engine type [Info](#)

☐ Aurora (MySQL Compatible)



☐ Aurora (PostgreSQL Compatible)



☐ MySQL



☒ PostgreSQL



☐ MariaDB



☐ Oracle

ORACLE

☐ Microsoft SQL Server



### 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](#)

\*\*\*\*\*

▼ 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

Aurora and RDS

Dashboard

Databases

Performance insights

Snapshots

Exports in Amazon S3

Automated backups

Reserved instances

Proxies

Subnet groups

Creating database strugmac-db

View connection details

Databases (1)

Group resources

Modify

Actions

Create database

Filter by databases

< 1 >

DB identifier	Status	Role	Engine
<a href="#">strugmac-db</a>	Creating	Instance	MySQL Co...



Console Home

makeplications

All services

All services

Services by category

Compute

EC2

Interml

Llvefulg

Buils

Enerat Benestalk

ARY Sghit Application Repository

ARB Durlenos

BDV Chdel Deliter

AP3 Tpuainization

AKA Sabtcaroe Measer

Vinural Jrintigating Service

Amivational View

Containers

Machine Learning

Amazon Supplition AI

Amazon Dsigization AI

Amazon Configcön

Amazon Services View

Amazon Developöriver

Amazon Manizeh

Amazon Cnual Detector

Amazon Fletildy

Amazon Foncevities

Amazon Engly

Amazon Transigation

Amazon Transide

Amazon Transpiree

Amazon Translors

EC2

Dashboard

AMB abunut View

Events

Instances

Instance

Instance Types

Launch Templates

Sych Resourcee

Savings State

Black laft Instances

Drellanine lxxelo

Creeting Reservations

Images

Benefits and features

EC2 offers ultimate scalability and control

Fully available comminceo plectly to support virtually any workload. This service is never ait the eltt

- Highest level of control of the entire technology stack, allowing full information in Jear:edlthe:rsomes
- Vualual with nuntth of conformation.
- Vidiata coicolutent of uperating systems to choose from including Unoer, Dovine ..:i and marcto
- Global availability

Find out more about EC2

Launch a virtual server

Launch Instance

View dashboard

deu search ruimrisutation

Get started ratorial

Additional actions

View execting stairjings

Migrate a server

EC2

Dashboard

AMB adunut View

Events

Instances rate

Connect

Instance state

Actions

Launch Instance

That travasare by attribube of mgl leantir sensodding

All defaus

Name of	Instance ID	Instance state	Instance type	Status check
No Instances				

### Application and OS Images (Amazon Machine Image)

An AMI contains operating systems, application servers, and applications that for your use instance. If you we're still, unit g or instance  
Browse more.

Search our full catalog including 1000s of applications and OS images

Amazon  


Ubuntu  


Windows  


Red Hat  


Debian  


### Key pair (login) [info](#)

You can use a key pair to secure with to your instance. If that i have access to t the selected key pair you launch the instance.

#### Key pair recommended

Proceed without a key pair (Not recommended)

Default value ▶



## ▼ Network settings [info](#)

[Edit](#)

### Network [info](#)

vpc-65f01/eh72eb7hs

### Subnet [info](#)

No preference: (Default subnet in availability zone)

### Auto-assign public IP [info](#)

Enable

### Firewall (security groups) [info](#)

Amazon security groups have been created that control traffic to and from the instances. You must allow specific traffic to reach instances.

☐ Create security group

☒ Select existing security group

### Common security groups [info](#)

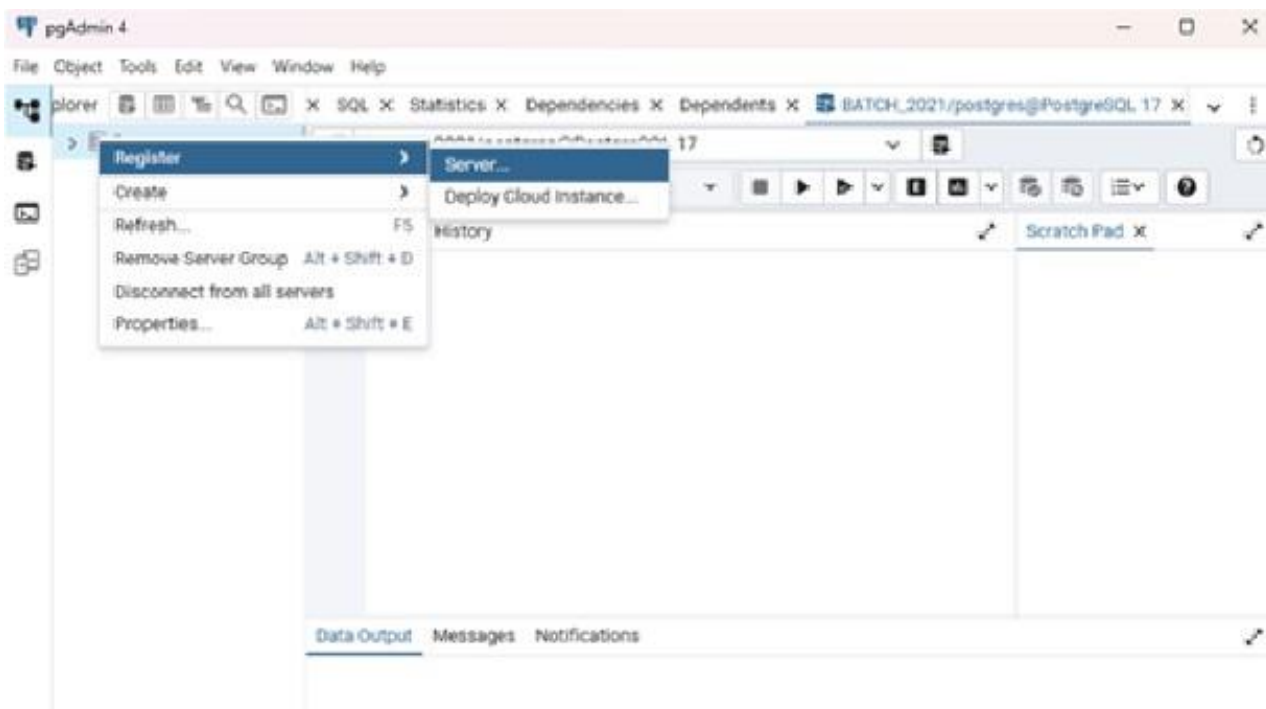
Select security groups

default - sg-0671ettb482425 ×  
default

Security groups that you add or remove from will be added or removed from all your network interfaces.

## ▼ Summary

Number of instances: 1

[Cancel](#)[Launch instance](#)

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

X

Foreground

X

Connect now?

Comments

X 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.am

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

Save password?

☐

Role

1

?

Close

Reset

Save

**i** No data output. Execute a query to get output.

