

Worksheet 9

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Semester: 5th

Subject Name: ADBMS

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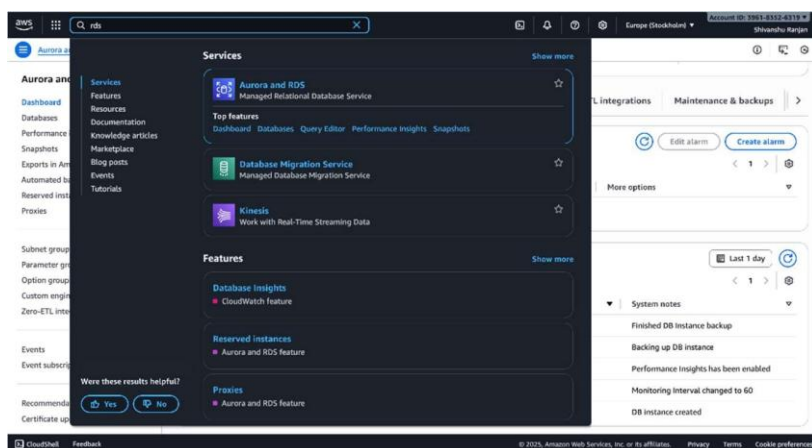
1. Aim: To understand and implement the setup of Amazon Relational Database Service (AWS RDS) by creating a database instance, configuring security groups, and establishing a secure connection between the local pgAdmin tool and the RDS instance hosted on the AWS Cloud.

2. Objective:

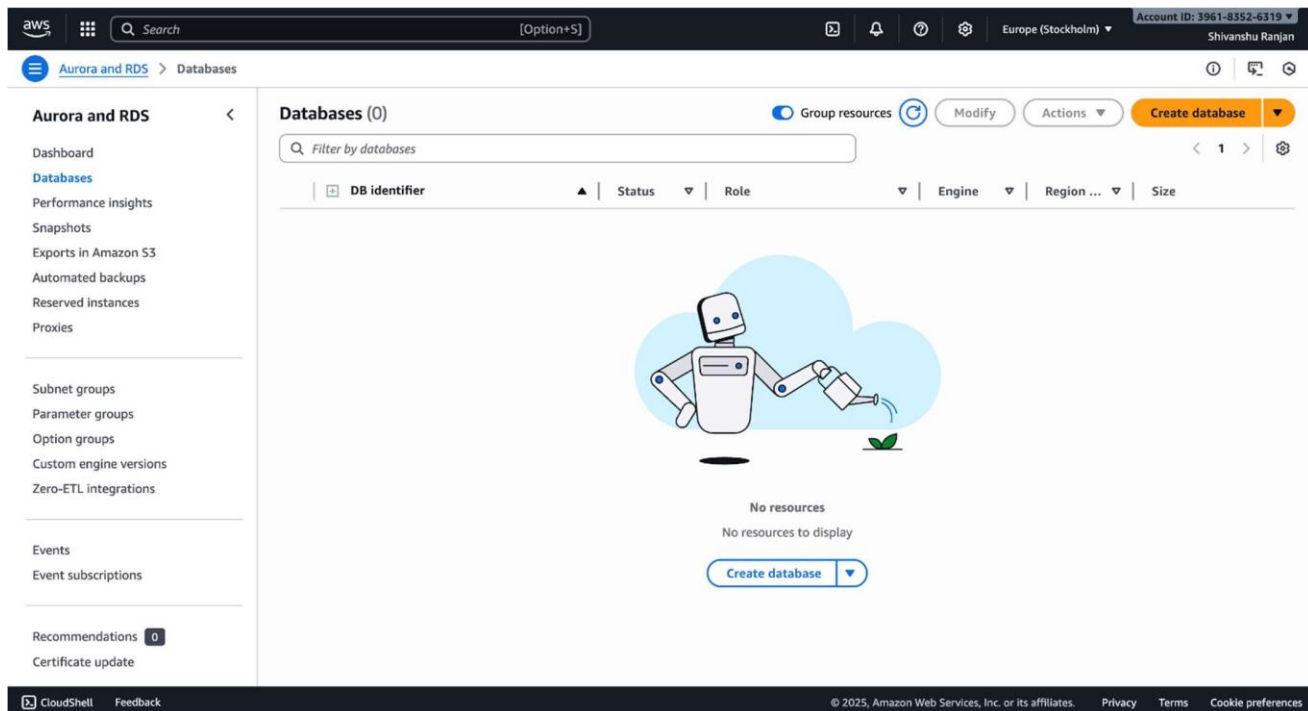
- To learn the basic concepts and features of Amazon Relational Database Service (AWS RDS).
- To create and configure a new RDS database instance on the AWS Management Console.
- To understand the role and configuration of security groups for controlling database access.
- To connect a local pgAdmin client to the AWS RDS instance securely using proper credentials and endpoint details.
- To verify successful database connectivity and perform basic operations through pgAdmin.

3. Code & Output:

1. Sign-in

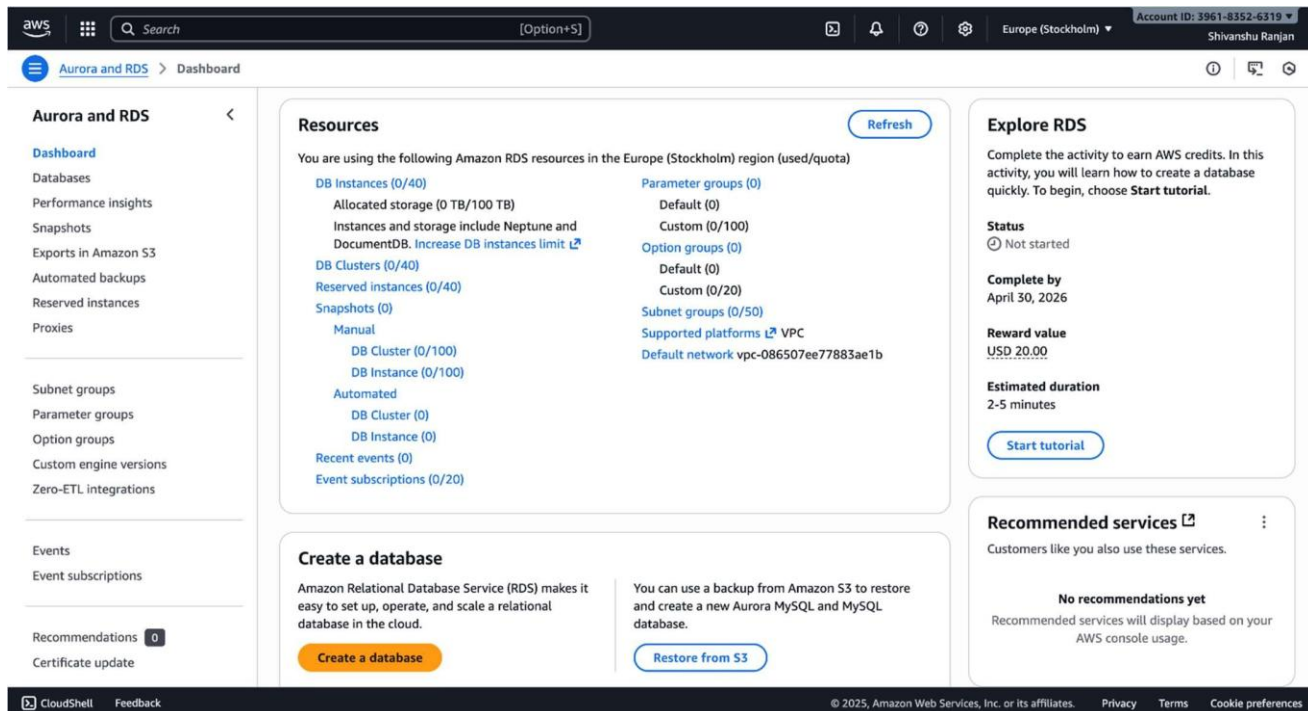


2. Navigating to RDS Service



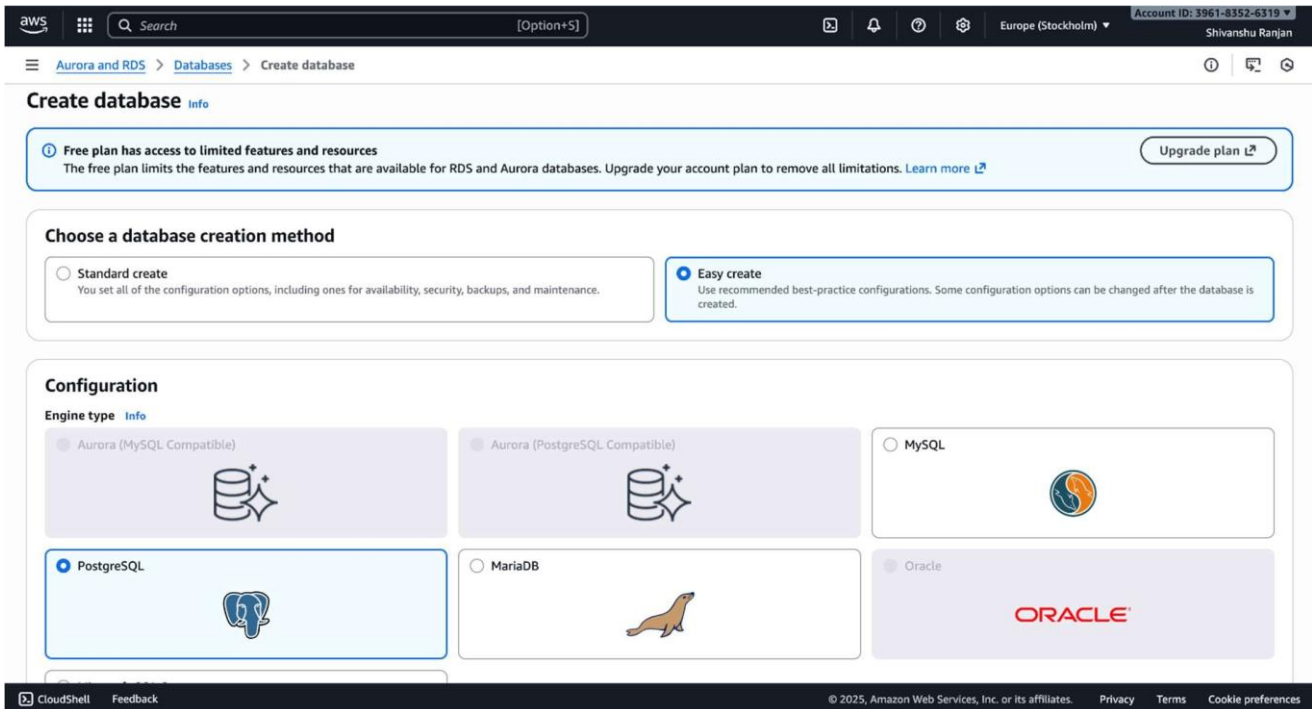
The screenshot shows the AWS Management Console interface for the Aurora and RDS service. The left sidebar contains a navigation menu with options like Dashboard, Databases, Performance insights, Snapshots, Exports in Amazon S3, Automated backups, Reserved instances, Proxies, Subnet groups, Parameter groups, Option groups, Custom engine versions, Zero-ETL integrations, Events, Event subscriptions, Recommendations, and Certificate update. The main content area is titled 'Databases (0)' and shows a 'No resources' message with a 'Create database' button. The top navigation bar includes the AWS logo, a search bar, and account information.

3. Amazon RDS Dashboard Overview



The screenshot shows the AWS Management Console interface for the Amazon RDS service. The left sidebar contains a navigation menu with options like Dashboard, Databases, Performance insights, Snapshots, Exports in Amazon S3, Automated backups, Reserved instances, Proxies, Subnet groups, Parameter groups, Option groups, Custom engine versions, Zero-ETL integrations, Events, Event subscriptions, Recommendations, and Certificate update. The main content area is titled 'Resources' and displays a list of resources including DB Instances, Parameter groups, Option groups, DB Clusters, Reserved instances, Snapshots, Manual, Automated, Recent events, and Event subscriptions. There is a 'Create a database' button and a 'Start tutorial' button. The top navigation bar includes the AWS logo, a search bar, and account information.

4. Creating a New Database Instance



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

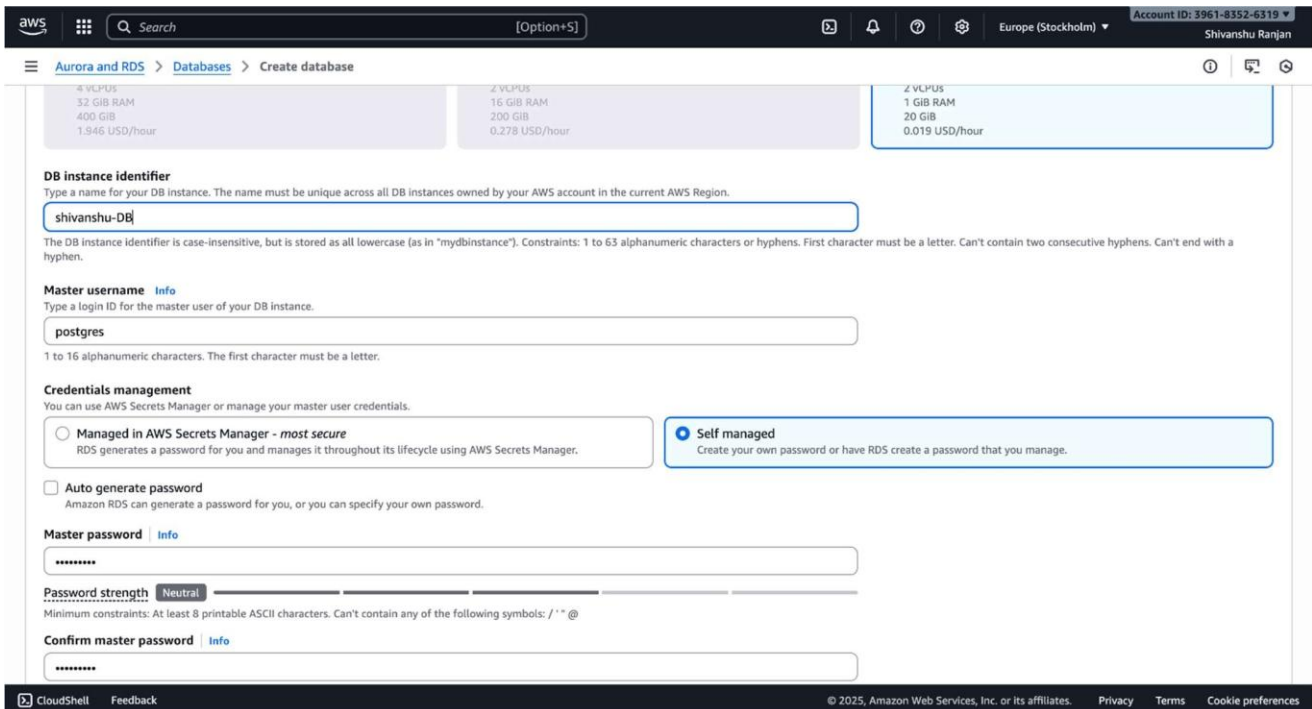
☒ **PostgreSQL**

☐ MariaDB

☐ Oracle

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5. Selecting PostgreSQL as Database Engine



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.

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.

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 [Neutral](#)
Minimum constraints: At least 8 printable ASCII characters. Can't contain any of the following symbols: / * @

Confirm master password [info](#)

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6. Choosing Deployment Option and Template

Configuration option	Value	Required
VPC security group	default	Yes
Publicly accessible	No	Yes
Database port	5432	Yes
DB instance identifier	shivanshu-DB	Yes
DB engine version	17.4	Yes
DB parameter group	default.postgres17	Yes
Monitoring type	Database Insights - Standard	Yes
Performance insights	Enabled	Yes
Monitoring	Enabled	Yes
Maintenance	Auto minor version upgrade enabled	Yes
Delete protection	Not enabled	Yes

You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services.

[Cancel](#) [Create database](#)

7. Configuring Database Settings (Name, Username, Password)

Aurora and RDS

Databases

Creating database shivanshu-db
Your database might take a few minutes to launch. You can use settings from shivanshu-db to simplify configuration of suggested database add-ons while we finish creating your DB for you.

[View connection details](#)

Databases (1)

☐ DB identifier ☐ Status ☐ Role ☐ Engine ☐ Region ... ☐ Size

DB identifier	Status	Role	Engine	Region ...	Size
shivanshu-db	Creating	Instance	PostgreSQL	-	db.t4g.micro

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Object Explorer

Servers (3)

PostgreSQL 17

PostgreSQL 18

shivanshu-DB

Register

Create

Refresh... F5

Remove Server Group

Disconnect from all servers

Properties...

Server...

Deploy Cloud Instance...

pgAdmin

Management Tools for PostgreSQL

Maximises PostgreSQL | Open Source

pgAdmin is an Open Source administration and management tool for the PostgreSQL database. It includes a graphical administration interface, an SQL query tool, a procedural code debugger and much more. The tool is designed to answer the needs of developers, DBAs and system administrators alike.

Quick Links

Add New Server

Configure pgAdmin

Getting Started

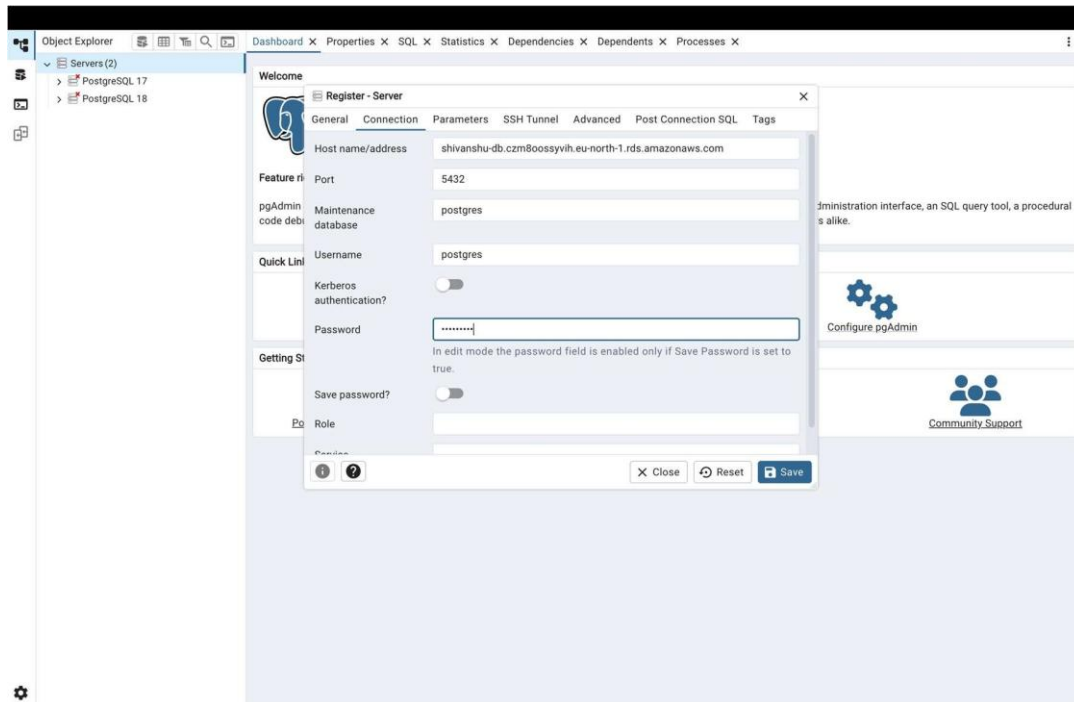
PostgreSQL Documentation

pgAdmin Website

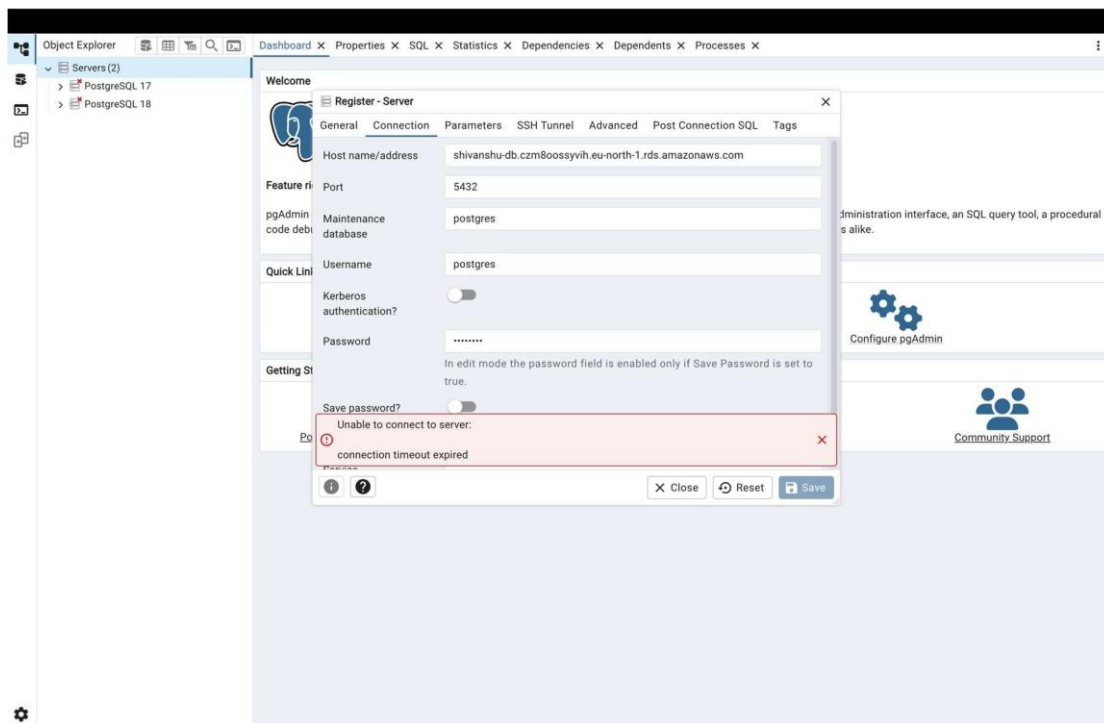
Planet PostgreSQL

Community Support

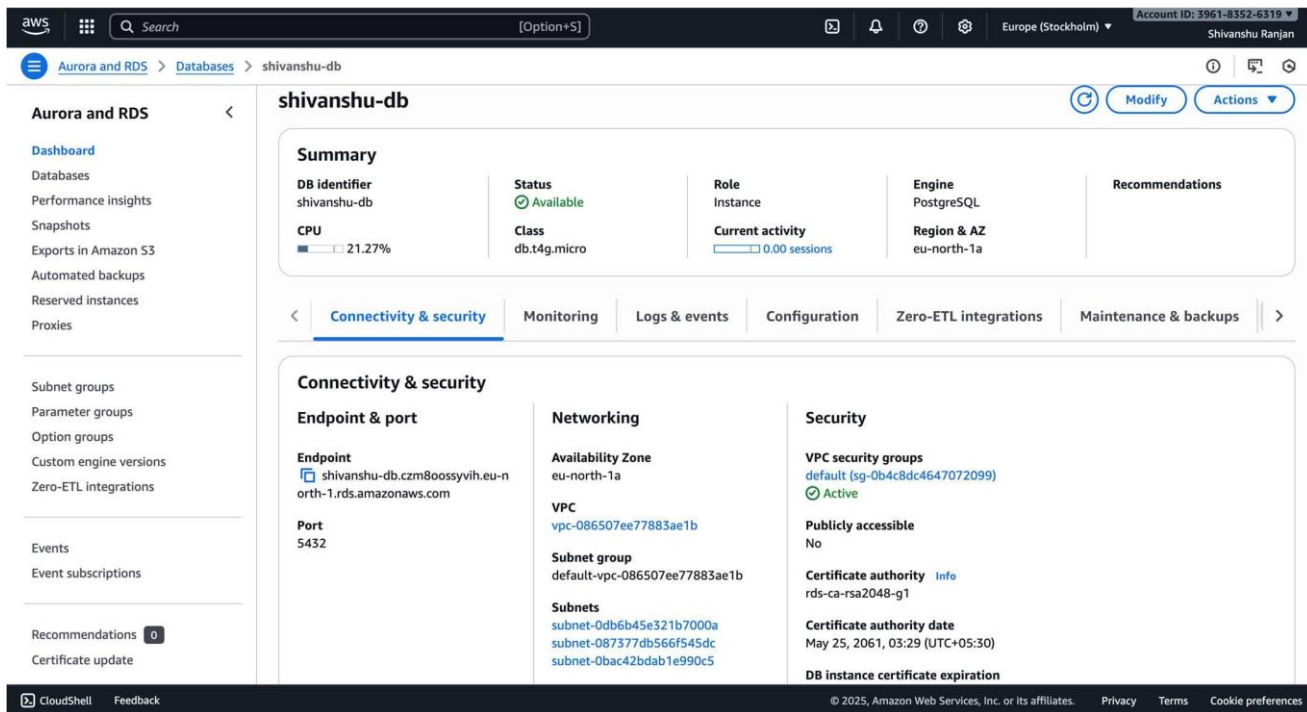
10. Gr Setting Up Security Groups for RDS Access



11. Additional Database Configuration Options



12. Reviewing and Creating the Database Instance



The screenshot shows the AWS Management Console interface for an Amazon RDS instance named 'shivanshu-db'. The console is in the 'Europe (Stockholm)' region, and the user is 'Shivanshu Ranjan' with account ID '3961-8352-6319'.

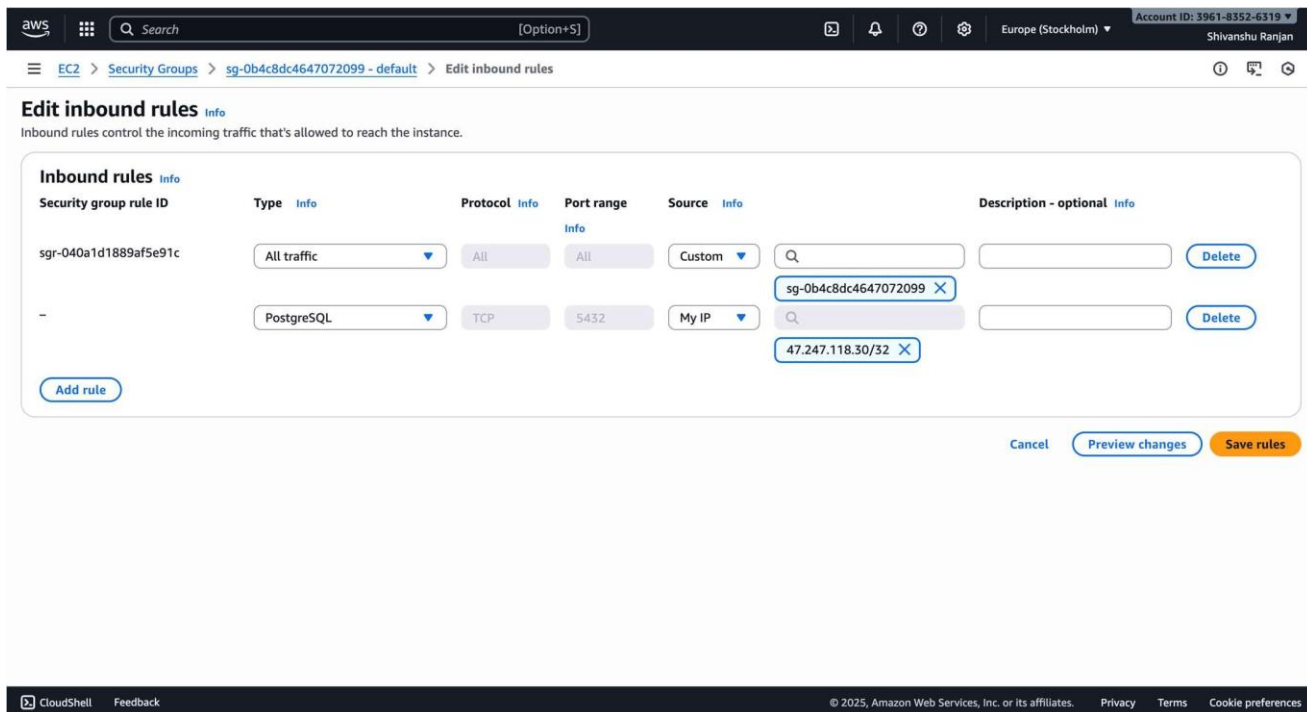
Summary:

- DB identifier:** shivanshu-db
- Status:** Available
- Role:** Instance
- Engine:** PostgreSQL
- Region & AZ:** eu-north-1a
- CPU:** 21.27%
- Class:** db.t4g.micro
- Current activity:** 0.00 sessions

Connectivity & security:

- Endpoint & port:**
 - Endpoint:** shivanshu-db.czm8oosyvih.eu-north-1.rds.amazonaws.com
 - Port:** 5432
- Networking:**
 - Availability Zone:** eu-north-1a
 - VPC:** vpc-086507ee77883ae1b
 - Subnet group:** default-vpc-086507ee77883ae1b
 - Subnets:**
 - subnet-0db6b45e321b7000a
 - subnet-087377db566f545dc
 - subnet-0bac42bdab1e990c5
- Security:**
 - VPC security groups:** default (sg-0b4c8dc4647072099) - Active
 - Publicly accessible:** No
 - Certificate authority:** rds-ca-rsa2048-g1
 - Certificate authority date:** May 25, 2061, 03:29 (UTC+05:30)
 - DB instance certificate expiration:**

13. RDS Instance Creation in Progress



The screenshot shows the 'Edit inbound rules' page for a Security Group in the AWS Management Console. The page is for the security group 'sg-0b4c8dc4647072099' in the 'Europe (Stockholm)' region, owned by 'Shivanshu Ranjan'.

Edit inbound rules

Inbound rules control the incoming traffic that's allowed to reach the instance.

Inbound rules:

Security group rule ID	Type	Protocol	Port range	Source	Description - optional	Actions
sgr-040a1d1889af5e91c	All traffic	All	All	Custom		Delete
-	PostgreSQL	TCP	5432	My IP	sg-0b4c8dc4647072099	Delete
				47.247.118.30/32		Delete

[Add rule](#) [Cancel](#) [Preview changes](#) [Save rules](#)



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14. Viewing Database Instance Details

▼ Additional configuration

Public access

☒ Publicly accessible

RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.

☐ Not publicly accessible

No IP address is assigned to the DB instance. EC2 instances and devices outside the VPC can't connect.

Database port

Specify the TCP/IP port that the DB instance will use for application connections. The application connection string must specify the port number. The DB security group and your firewall must allow connections to the port. [Learn more](#)

5432

15. Copying the RDS Endpoint for Connection

Connectivity & security

Endpoint & port

Endpoint

shivanshu-db.czm8oossyviu.eu-north-1.rds.amazonaws.com

Port

5432

Networking

Availability Zone

eu-north-1a

VPC

vpc-086507ee77883ae1b

Subnet group

default-vpc-086507ee77883ae1b

Subnets

subnet-0db6b45e321b7000a

subnet-087377db566f545dc

subnet-0bac42bdab1e990c5

Network type

IPv4

Security

VPC security groups

default (sg-0b4c8dc4647072099)

Active

Publicly accessible

Yes

Certificate authority

rds-ca-rsa2048-g1

Certificate authority date

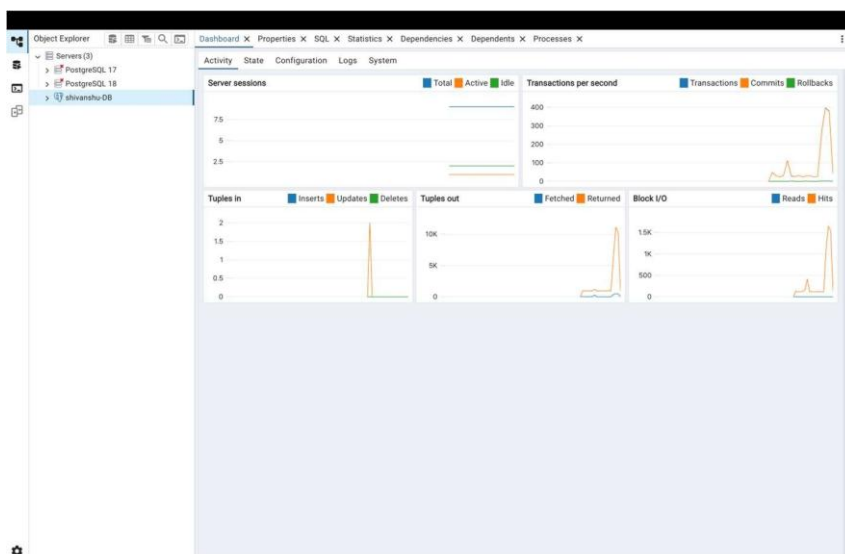
May 25, 2061, 03:29 (UTC+05:30)

DB instance certificate expiration

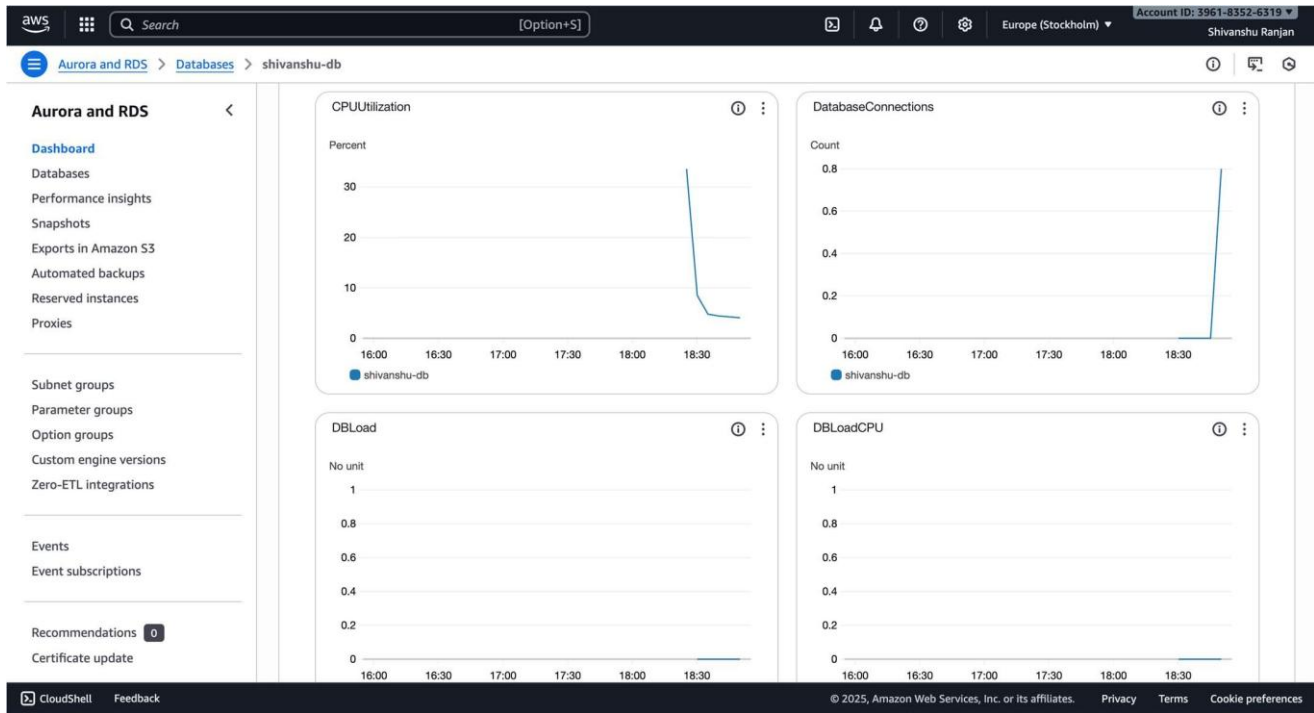
date

October 30, 2026, 23:59 (UTC+05:30)

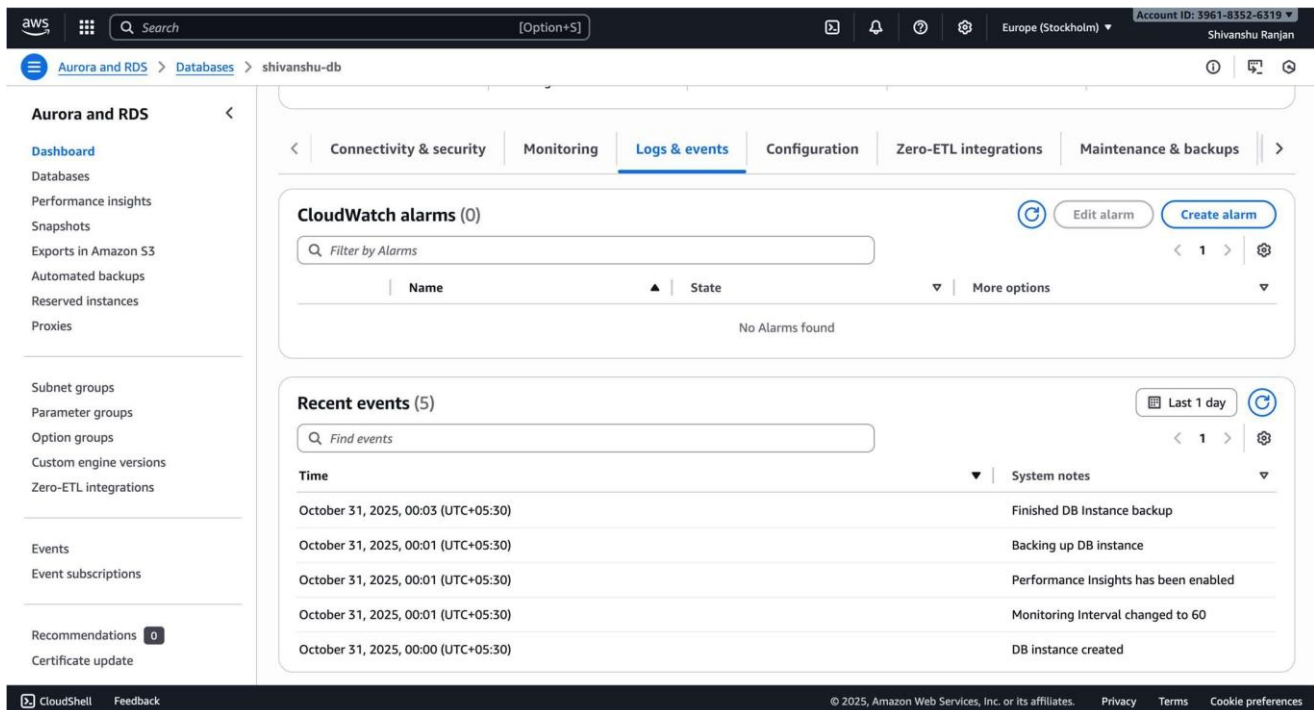
16. Launching pgAdmin on Local Machine



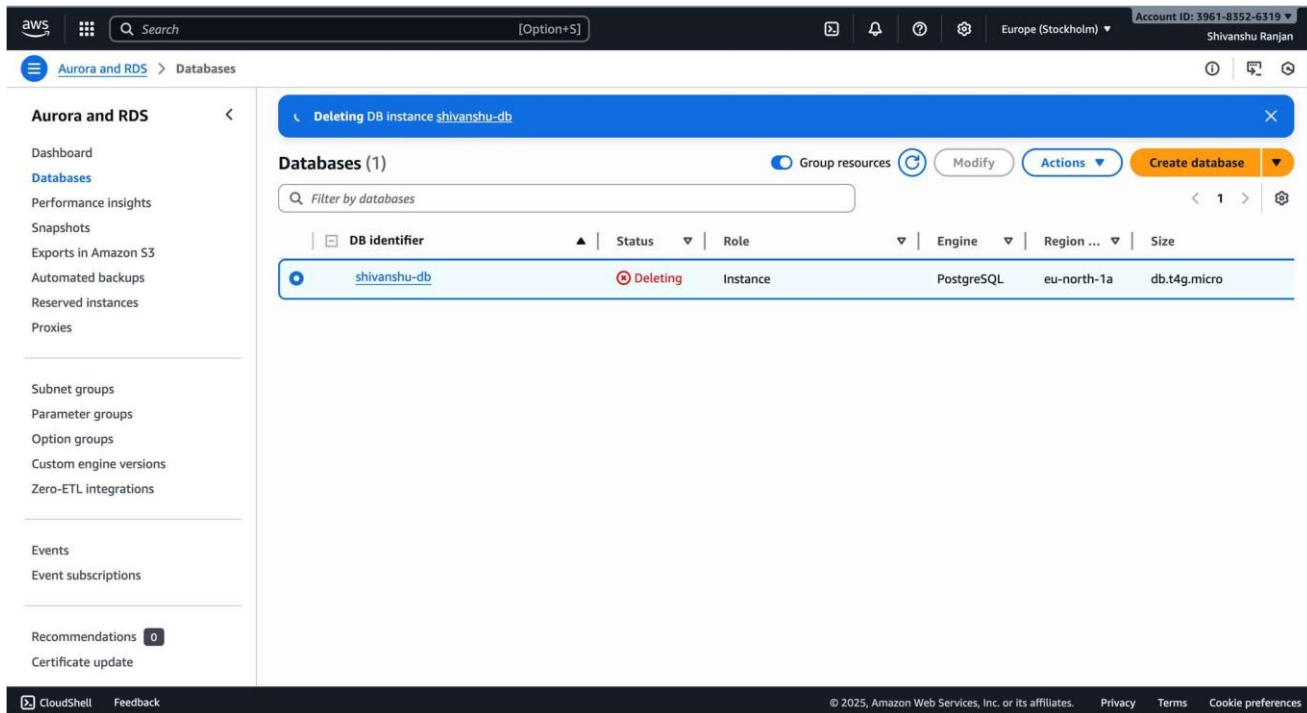
17. Adding a New Server in pgAdmin



18. Entering Connection Details (Endpoint, Username, Password)



19. Successful Connection to AWS RDS Database via pgAdmin



The screenshot displays the AWS Management Console interface. At the top, the AWS logo and account information (Account ID: 3961-8352-6319, Shivanshu Ranjan) are visible. The navigation pane on the left shows the 'Aurora and RDS' section expanded, with 'Databases' selected. The main content area shows a blue banner at the top indicating 'Deleting DB instance shivanshu-db'. Below this, the 'Databases (1)' section is active, displaying a table with one database instance. The table has columns for DB identifier, Status, Role, Engine, Region, and Size. The instance 'shivanshu-db' is shown with a status of 'Deleting', role of 'Instance', engine of 'PostgreSQL', region of 'eu-north-1a', and size of 'db.t4g.micro'.

DB identifier	Status	Role	Engine	Region	Size
shivanshu-db	Deleting	Instance	PostgreSQL	eu-north-1a	db.t4g.micro

4. Learning Outcomes:

- Understand the fundamental concepts and benefits of using Amazon RDS for relational database management in the cloud.
- Gain practical knowledge of creating and configuring an RDS database instance on AWS.
- Learn how to manage and secure database access using AWS security groups.
- Develop skills to connect a local pgAdmin client to a cloud-hosted RDS instance.
- Be able to monitor, manage, and test database connectivity and performance in a cloud environment.