



# DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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## Worksheet 9

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**Branch:** CSE

**Semester:** 5<sup>th</sup>

**Subject Name:** ADBMS

**UID:** 23BCS13877

**Section/Group:** KRG2-A

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**Subject Code:** 23CSP-333

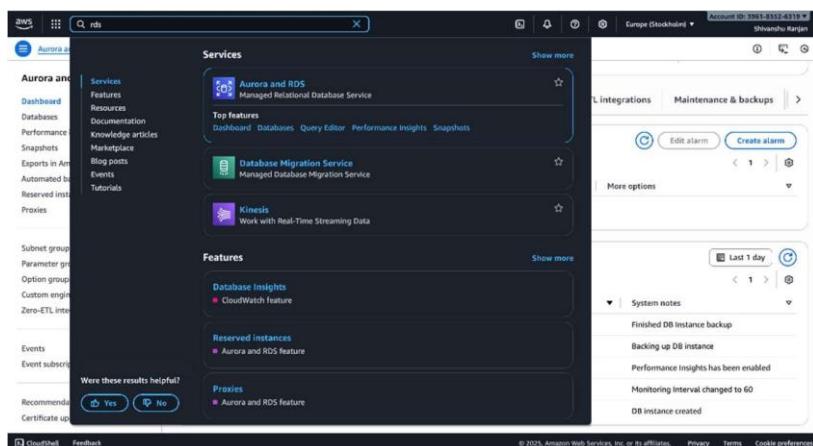
**1. Aim:** To understand and implement the setup of Amazon Relational Database Service (AWS RDS) by creating a database instance, configuring security groups, and establishing a secure connection between the local pgAdmin tool and the RDS instance hosted on the AWS Cloud.

### **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





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## 2. Navigating to RDS Service

The screenshot shows the AWS Aurora and RDS Databases page. The left sidebar includes links for 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 (0), and Certificate update. The main content area displays a message 'No resources' with 'No resources to display' below it. A large orange 'Create database' button is at the bottom. The top right shows account information: Account ID: 3961-8352-6319, Europe (Stockholm), and Shivanshu Ranjan.

## 3. Amazon RDS Dashboard Overview

The screenshot shows the AWS Amazon RDS Dashboard. The left sidebar includes links for 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 (0), and Certificate update. The main content area has a 'Resources' section with a 'Refresh' button. It lists DB Instances (0/40), DB Clusters (0/40), Reserved instances (0/40), Snapshots (0), and Automated. To the right is an 'Explore RDS' section with a 'Start tutorial' button, showing status (Not started), complete by (April 30, 2026), reward value (USD 20.00), and estimated duration (2-5 minutes). Below is a 'Recommended services' section with a 'Start tutorial' button, showing no recommendations yet. The bottom right shows copyright information: © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences.



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## 4. Creating a New Database Instance

The screenshot shows the 'Create database' page in the AWS RDS console. At the top, there's a note about a free plan having limited features. Below it, under 'Choose a database creation method', the 'Easy create' option is selected. In the 'Configuration' section, 'PostgreSQL' is chosen as the engine type. Other options like Aurora (MySQL Compatible), Aurora (PostgreSQL Compatible), MySQL, MariaDB, and Oracle are also listed with their respective icons. At the bottom, there are links for CloudShell, Feedback, and various AWS terms like Privacy, Terms, and Cookie preferences.

## 5. Selecting PostgreSQL as Database Engine

This screenshot continues from the previous one, showing the configuration for a PostgreSQL database instance. It lists three instance types: '4 vCPUs' (32 GB RAM, 400 GB, 1.946 USD/hour), '2 vCPUs' (16 GB RAM, 200 GB, 0.278 USD/hour), and '2 vCPUs' (2 GB RAM, 20 GB, 0.019 USD/hour). The '2 vCPUs' instance with 2 GB RAM is selected. In the 'DB instance identifier' field, 'shivanush-DB' is typed. Under 'Master username', 'postgres' is entered. For 'Credentials management', the 'Self managed' option is selected. A note says 'RDS generates a password for you and manages it throughout its lifecycle using AWS Secrets Manager.' There are also fields for 'Master password' and 'Confirm master password', both containing masked text. At the bottom, there are links for CloudShell, Feedback, and various AWS terms like Privacy, Terms, and Cookie preferences.



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## 6. Choosing Deployment Option and Template

The screenshot shows the 'Create database' wizard in the AWS RDS console. The configuration details are as follows:

Setting	Value	Status
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

A note at the bottom states: "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."

Buttons at the bottom right include 'Cancel' and 'Create database'.

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

The screenshot shows the 'Databases' page in the AWS RDS console. A blue banner indicates that the database 'shivanshu-db' is 'Creating'. The table lists the database details:

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

The left sidebar includes links for 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 (0), and Certificate update.

At the bottom, there are links for CloudShell, Feedback, and footer text: © 2025, Amazon Web Services, Inc. or its affiliates. Privacy Terms Cookie preferences.



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## 8. Setting Up Instance Size and Storage

The screenshot shows the pgAdmin 4 interface. In the top navigation bar, 'Dashboard' is selected. The left sidebar shows a tree view of 'Servers (3)': PostgreSQL 17, PostgreSQL 18, and shivanshu-DB. A context menu is open over the 'shivanshu-DB' entry, with 'Server...' highlighted. Below the menu, a tooltip for 'pyAUMITI Management Tools for PostgreSQL' is visible, stating: 'Maximises PostgreSQL | Open Source'. The main pane displays a brief introduction to pgAdmin: '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.' Under 'Quick Links', there are buttons for 'Add New Server' and 'Configure pgAdmin'. The 'Getting Started' section features links to 'PostgreSQL Documentation', 'pgAdmin Website', 'Planet PostgreSQL', and 'Community Support'.

## 9. Configuring Connectivity and VPC Settings

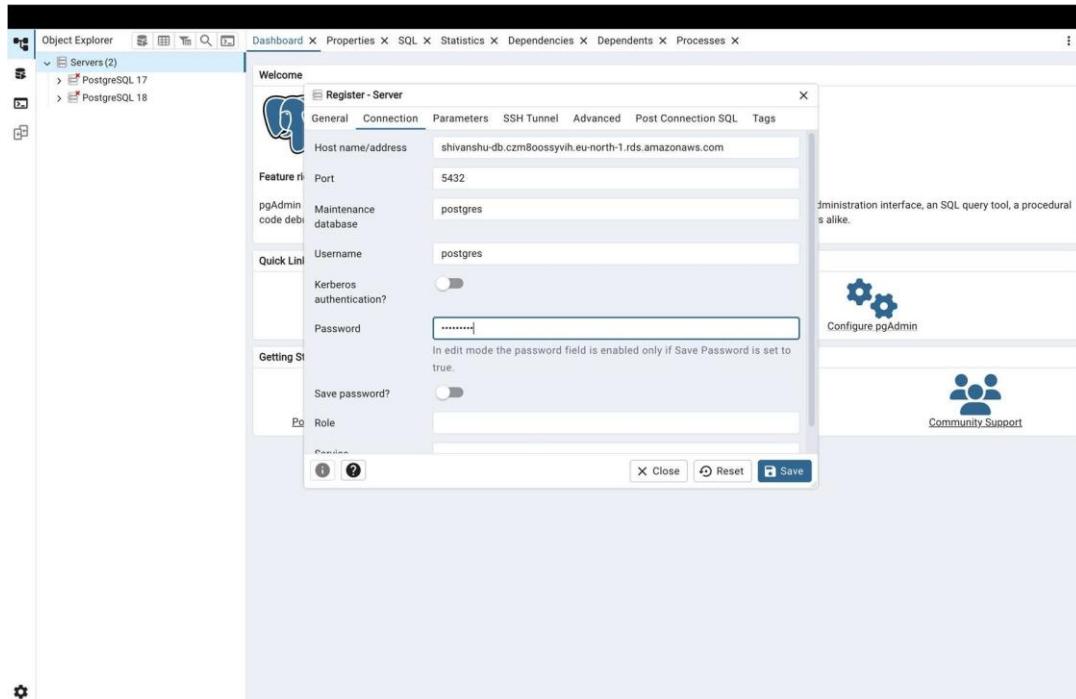
The screenshot shows the 'Register - Server' dialog box in pgAdmin 4. The 'General' tab is selected. The 'Name' field contains 'shivanshu-DB'. The 'Server group' dropdown is set to 'Servers'. The 'Background' and 'Foreground' checkboxes are unchecked. The 'Connect now?' checkbox is checked. The 'Comments' field is empty. At the bottom, there are 'Close', 'Reset', and 'Save' buttons. To the right of the dialog, a tooltip for 'Configure pgAdmin' is visible, and below it are 'Community Support' and 'Configure pgAdmin' links.



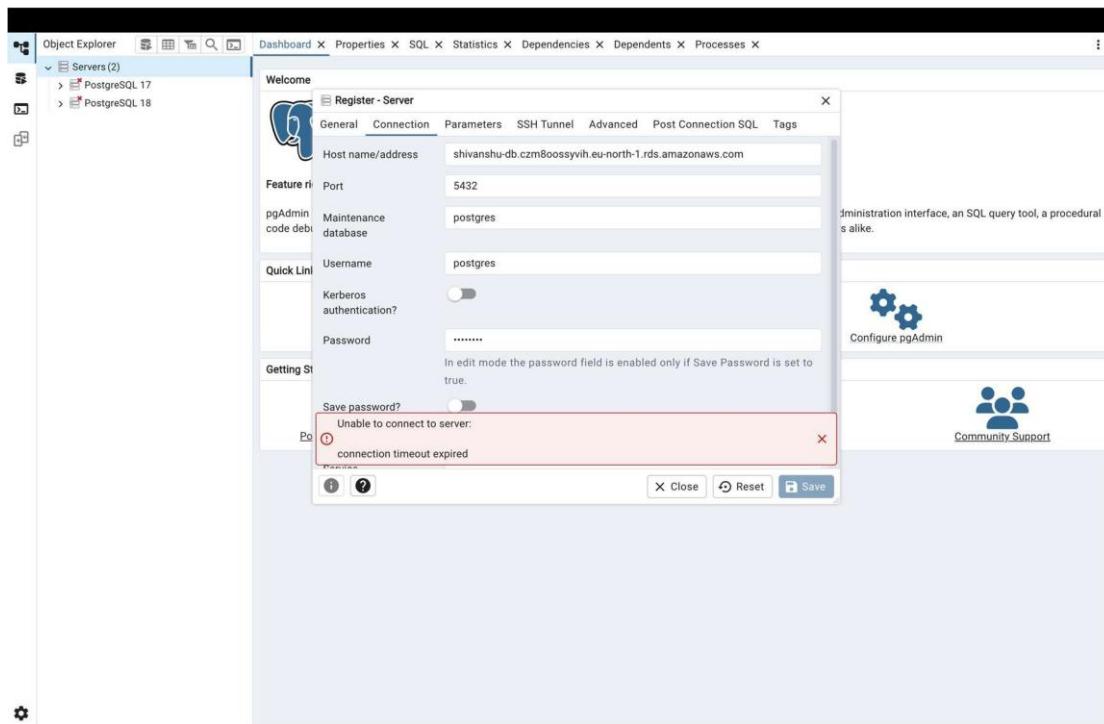
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## 10. Gr Setting Up Security Groups for RDS Access



## 11. Additional Database Configuration Options





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## 12. Reviewing and Creating the Database Instance

The screenshot shows the AWS RDS console for the 'shivanshu-db' database. The 'Summary' tab is selected, displaying basic information like DB identifier, status (Available), role (Instance), engine (PostgreSQL), and region (eu-north-1a). Below the summary, there are tabs for Connectivity & security, Monitoring, Logs & events, Configuration, Zero-ETL integrations, and Maintenance & backups. The 'Connectivity & security' tab is active, showing details such as endpoint, port, networking (availability zone eu-north-1a, VPC vpc-086507ee77883ae1b, subnet group default-vpc-086507ee77883ae1b, subnets subnet-0db6b45e321b7000a, subnet-087377db566f545dc, subnet-0bac42bdab1e990c5), and security (VPC security groups default sg-0b4c8dc4647072099, Active). The bottom of the page includes CloudShell, Feedback, and copyright information.

## 13. RDS Instance Creation in Progress

The screenshot shows the AWS EC2 Security Groups console for the security group 'sg-0b4c8dc4647072099 - default'. An inbound rule is being edited for a PostgreSQL instance. The rule configuration includes: Type: All traffic, Protocol: TCP, Port range: 5432, Source: My IP, and Description: optional. A new rule is being added with: Type: PostgreSQL, Protocol: TCP, Port range: 5432, Source: 47.247.118.30/32, and Description: optional. At the bottom, there are buttons for Add rule, Preview changes, and 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.czr8oossyvih.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**

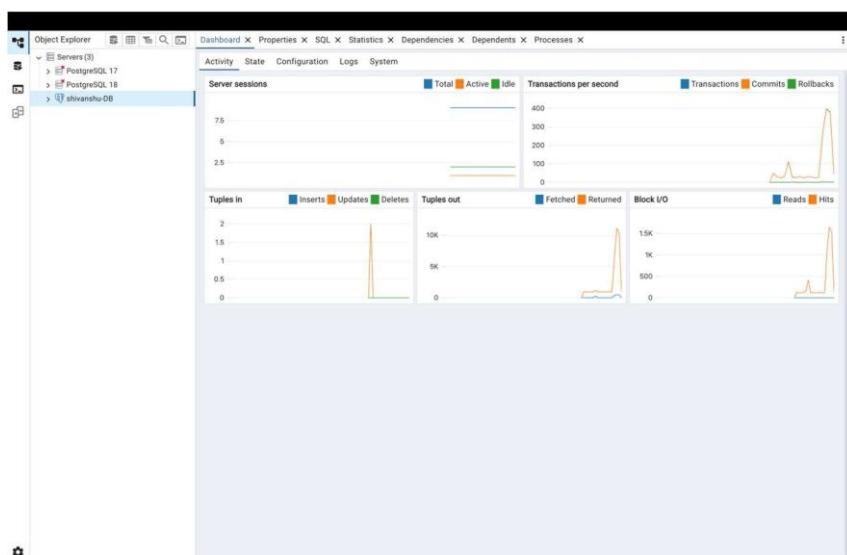
**Publicly accessible**  
Yes

**Certificate authority** [Info](#)  
[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

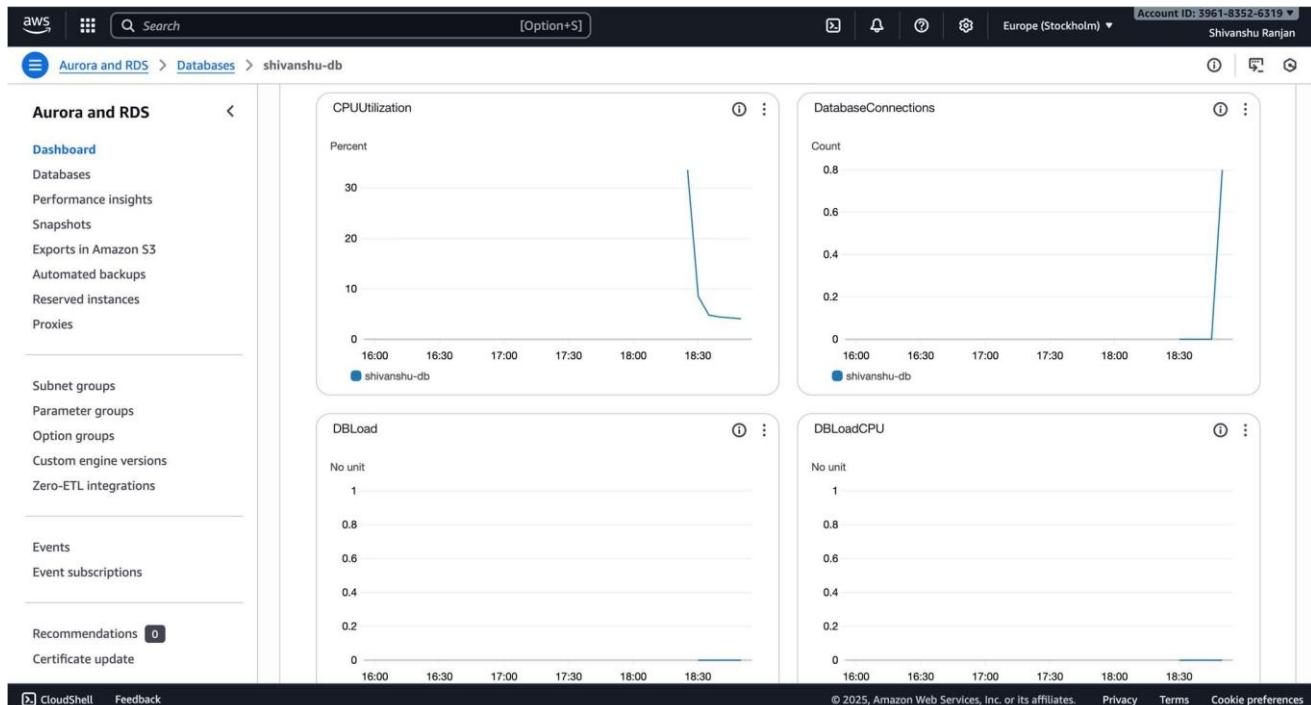




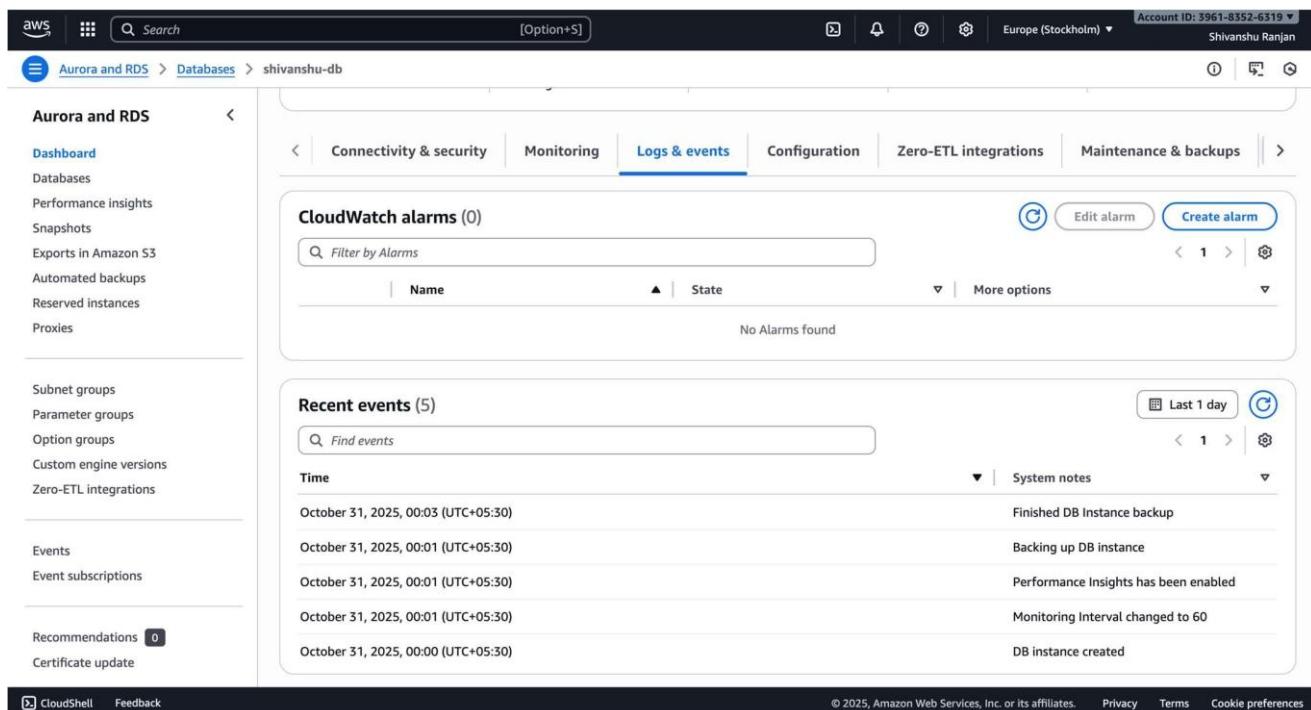
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## 17. Adding a New Server in pgAdmin



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





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## 19. Successful Connection to AWS RDS Database via pgAdmin

The screenshot shows the AWS RDS console interface. The top navigation bar includes the AWS logo, a search bar, and account information (Account ID: 3961-8352-6319, Europe (Stockholm), Shivanshu Ranjan). The left sidebar has a 'Databases' section selected, listing options like Dashboard, 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 (0), and Certificate update. The main content area is titled 'Deleting DB instance shivanshu-db' and shows a table of databases. The table has columns: DB identifier, Status, Role, Engine, Region ..., and Size. One row is selected, showing 'shivanshu-db' with a status of 'Deleting', engine 'PostgreSQL', region 'eu-north-1a', and size 'db.t4g.micro'. There are buttons for Group resources, Modify, Actions (with a dropdown arrow), and Create database.

## 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.