



# DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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## Worksheet 9

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Section/Group: KRG 1-B

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Subject Name: ADBMS

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 RDS service dashboard. On the left, there's a sidebar with navigation links for Aurora and RDS, including Database, 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 area is titled "Databases (0)" and features a search bar and filters for DB identifier, Status, Role, Engine, Region, and Size. A large, friendly robot icon is centered above the message "No resources". At the bottom right of the main area is a prominent orange "Create database" button. The top right corner shows account information: Account ID: 3961-8352-6319, Europe (Stockholm) region, and user name Shivanshu Ranjan. The bottom of the screen includes standard AWS footer links: CloudShell, Feedback, © 2025, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, and Cookie preferences.

## 3. Amazon RDS Dashboard Overview

The screenshot shows the Amazon RDS Dashboard. The sidebar on the left is identical to the one in the previous screenshot. The main area is divided into several sections: "Resources" which displays usage details for DB Instances, Parameter groups, Option groups, Subnet groups, and Supported platforms; "Explore RDS" which encourages users to start a tutorial with a "Start tutorial" button; "Create a database" which provides instructions for setting up a new database and includes a "Create a database" button; and "Recommended services" which currently shows no recommendations. The top right corner shows account information: Account ID: 3961-8352-6319, Europe (Stockholm) region, and user name Shivanshu Ranjan. The bottom of the screen includes standard AWS footer links: CloudShell, Feedback, © 2025, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, and Cookie preferences.



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## 4. Creating a New Database Instance

The screenshot shows the 'Create database' step in the AWS RDS console. Under 'Choose a database creation method', 'Easy create' is selected. In the 'Configuration' section, 'PostgreSQL' is chosen from a list of engines: Aurora (MySQL Compatible), Aurora (PostgreSQL Compatible), MySQL, MariaDB, and Oracle. The PostgreSQL option is highlighted with a blue border. At the bottom, there are links for CloudShell, Feedback, and a copyright notice for 2025.

## 5. Selecting PostgreSQL as Database Engine

The screenshot shows the 'Create database' step in the AWS RDS console. It displays three configuration options: one with 4 VCPUs and 1.946 USD/hour, another with 2 VCPUs and 0.278 USD/hour, and a third with 2 VCPUs and 0.019 USD/hour. The second option is selected. Below these, the 'DB instance identifier' is set to 'shivanshu-DB'. The 'Master username' is 'postgres'. Under 'Credentials management', 'Self managed' is selected. The 'Master password' field contains '\*\*\*\*\*'. The 'Password strength' is 'Neutral'. Minimum password constraints are listed as: At least 8 printable ASCII characters. Can't contain any of the following symbols: / \ \* @. At the bottom, there are links for CloudShell, Feedback, and a copyright notice for 2025.



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## 6. Choosing Deployment Option and Template

The screenshot shows the 'Create database' configuration page for AWS Aurora and RDS. 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 for AWS Aurora and RDS. A success message at the top states: "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." The database list shows one entry:

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.

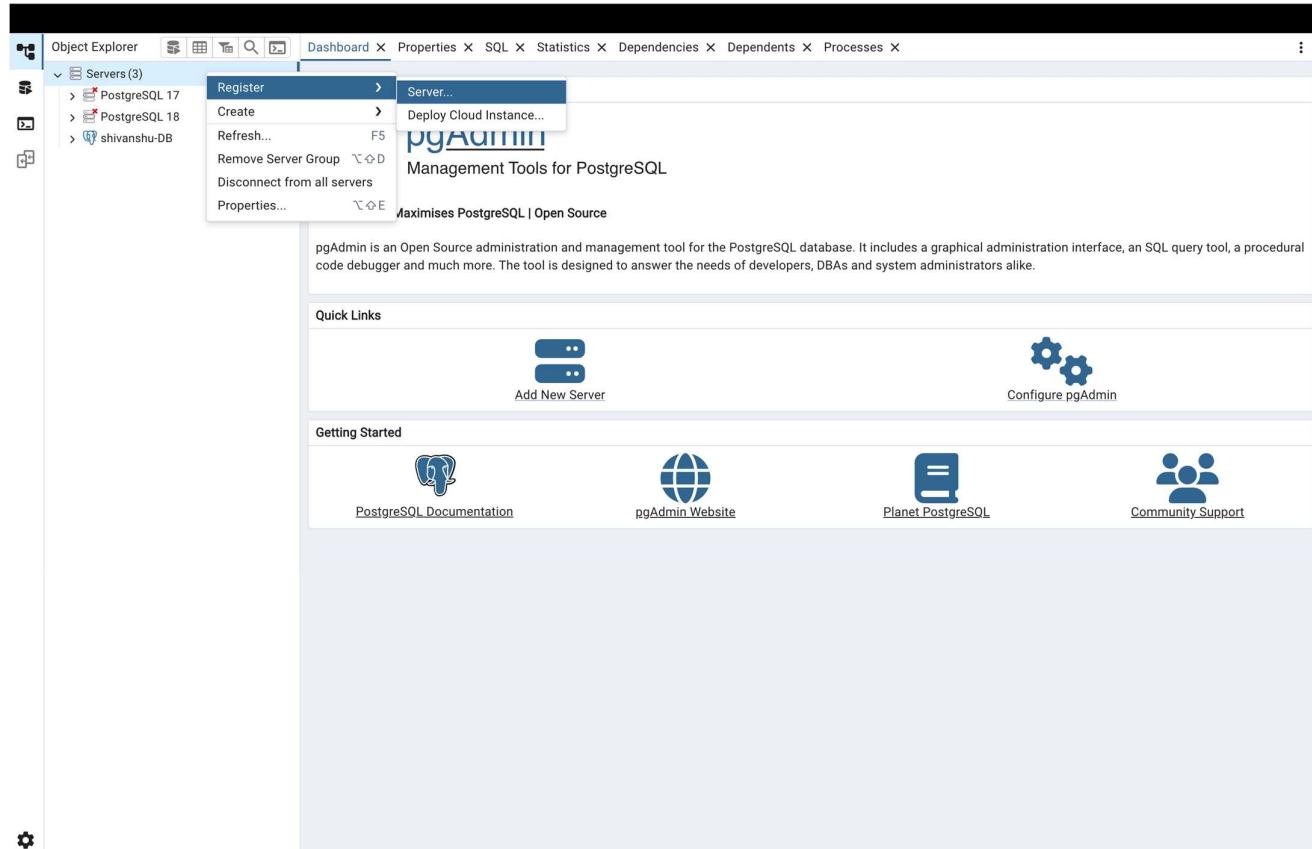
Footer links include CloudShell, Feedback, © 2025, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, and Cookie preferences.



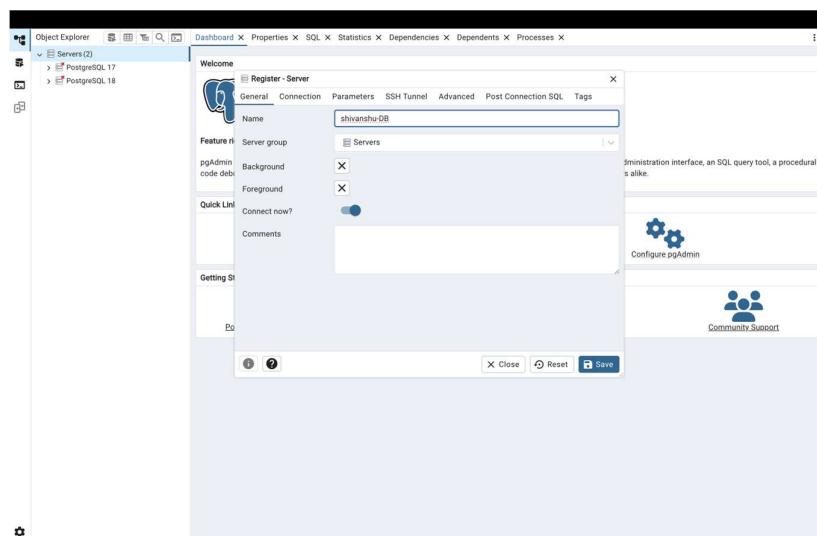
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## 8. Setting Up Instance Size and Storage



## 9. Configuring Connectivity and VPC Settings

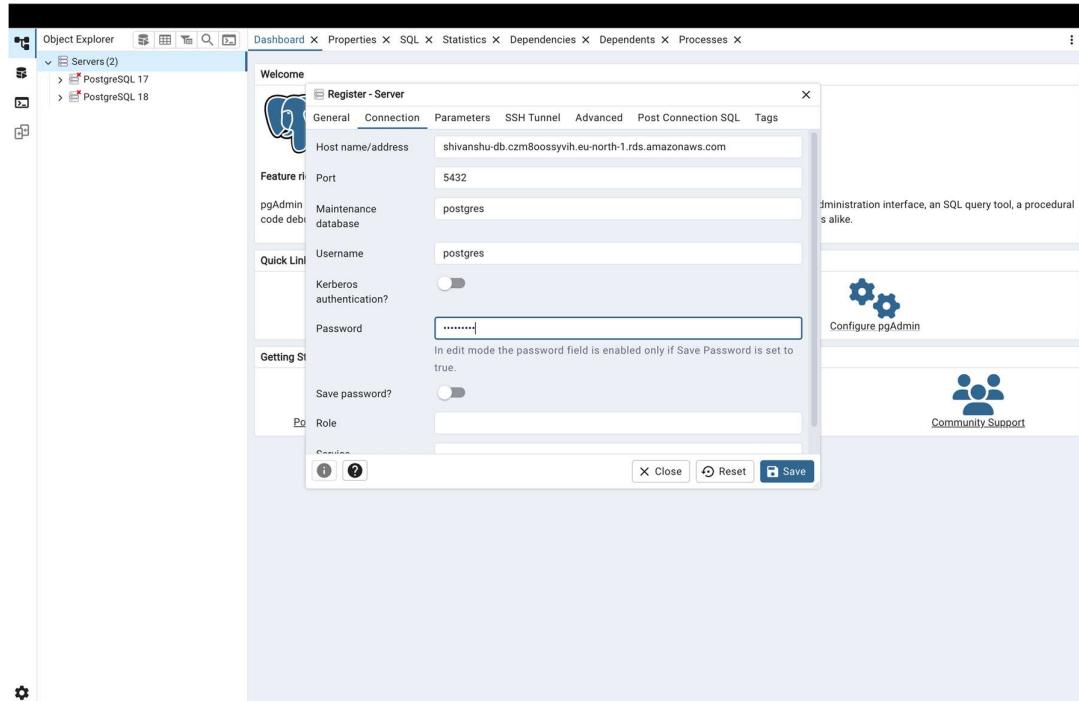




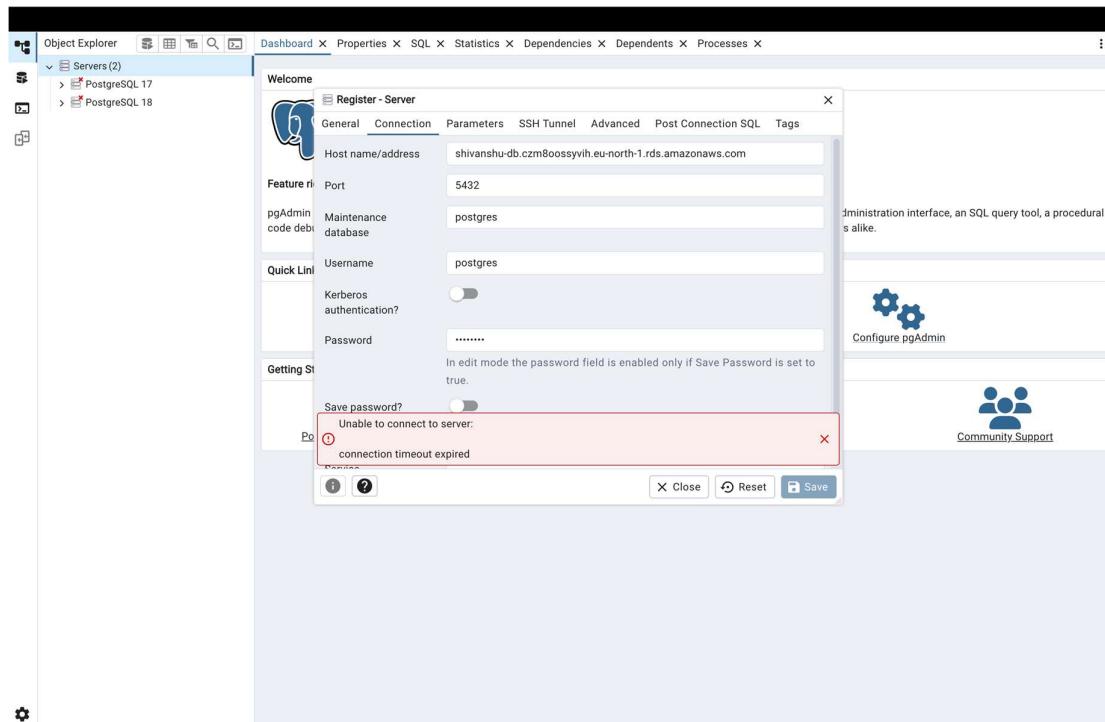
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## 10. GrSetting Up Security Groups for RDS Access



## 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 main summary panel displays the DB identifier (shivanshu-db), 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 selected, showing details like the endpoint (shivanshu-db.czmn8oossyvih.eu-north-1.rds.amazonaws.com), port (5432), VPC (vpc-086507ee77883ae1b), and subnet group (default-vpc-086507ee77883ae1b). It also lists subnets: subnet-0db6b45e321b700a, subnet-087377db566f545dc, and subnet-0bac42bdab1e990c5. The security section shows VPC security groups (default sg-0b4c8dc4647072099) and a certificate authority (rds-ca-rsa2048-g1).

## 13. RDS Instance Creation in Progress

The screenshot shows the AWS EC2 Security Groups console for the 'sg-0b4c8dc4647072099 - default' group. The 'Edit inbound rules' page is displayed, showing two existing rules. Rule 1 allows all traffic from the security group 'sg-0b4c8dc4647072099'. Rule 2 allows PostgreSQL traffic from 'My IP' (47.247.118.30/32). A new rule is being added, with 'Type' set to 'All traffic', 'Protocol' to 'TCP', 'Port range' to '5432', and 'Source' set to 'My IP'. The 'Add rule' button is visible at the bottom left, and 'Preview changes' and 'Save rules' buttons are at the bottom right.



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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](#)

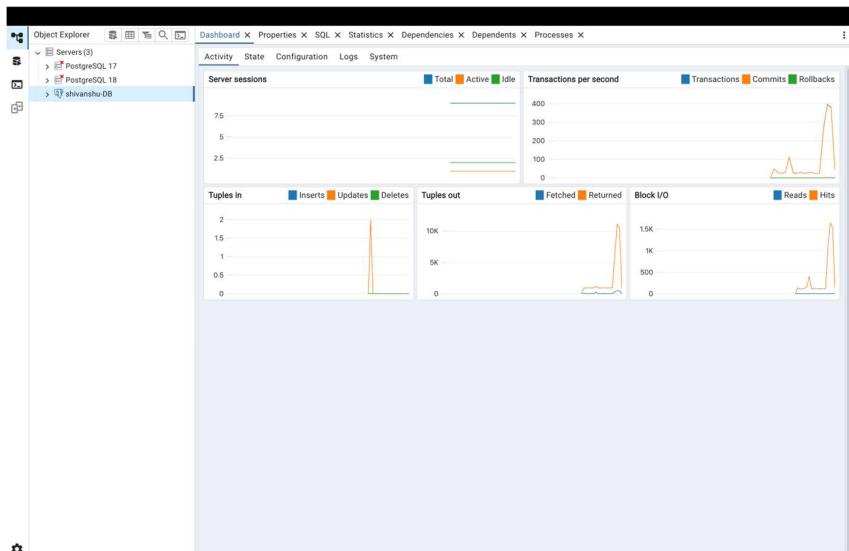
5432

## 15. Copying the RDS Endpoint for Connection

### Connectivity & security

Endpoint & port	Networking	Security
<b>Endpoint</b> <a href="#">shivanshu-db.cz8oossyvih.eu-north-1.rds.amazonaws.com</a>	<b>Availability Zone</b> eu-north-1a	<b>VPC security groups</b> <a href="#">default (sg-0b4c8dc4647072099)</a> Active
<b>Port</b> 5432	<b>VPC</b> <a href="#">vpc-086507ee77883ae1b</a>	<b>Publicly accessible</b> Yes
	<b>Subnet group</b> default-vpc-086507ee77883ae1b	<b>Certificate authority</b> <a href="#">Info</a> rds-ca-rsa2048-g1
	<b>Subnets</b> <a href="#">subnet-0db6b45e321b7000a</a> <a href="#">subnet-087377db566f545dc</a> <a href="#">subnet-0bac42bdab1e990c5</a>	<b>Certificate authority date</b> May 25, 2061, 03:29 (UTC+05:30)
	<b>Network type</b> IPv4	<b>DB instance certificate expiration date</b> October 30, 2026, 23:59 (UTC+05:30)

## 16. Launching pgAdmin on Local Machine

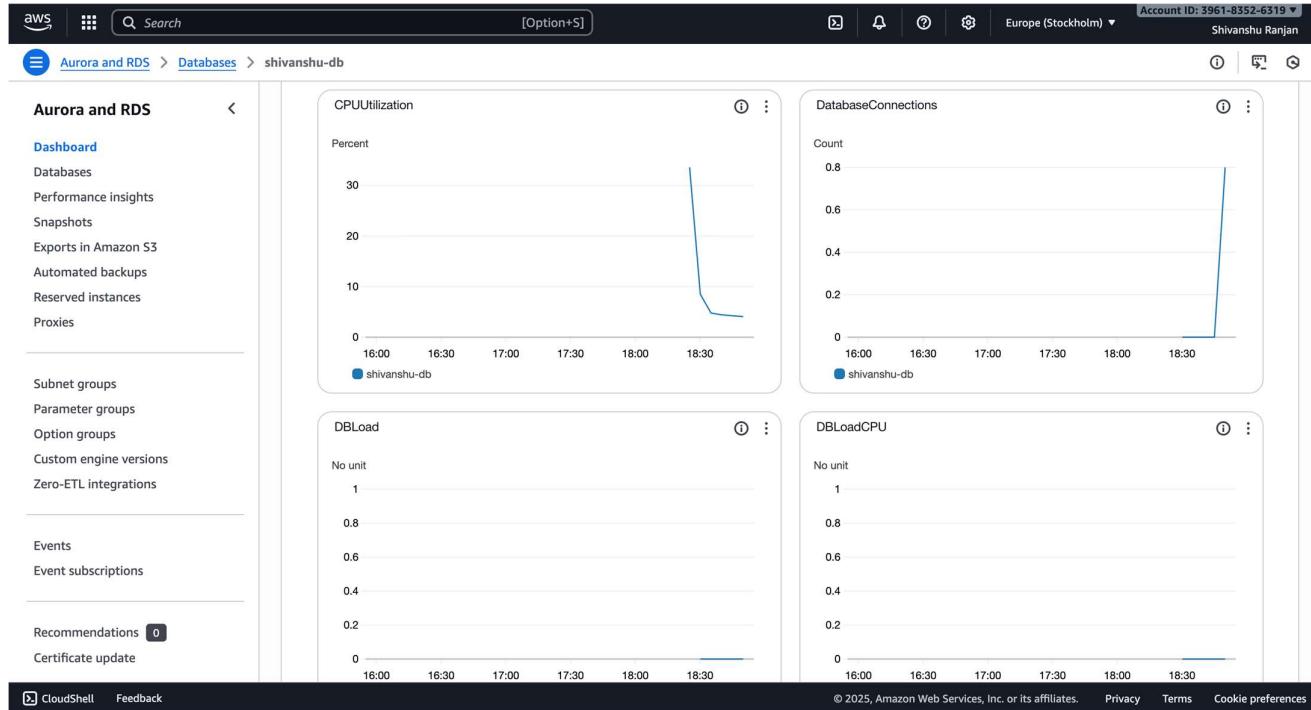




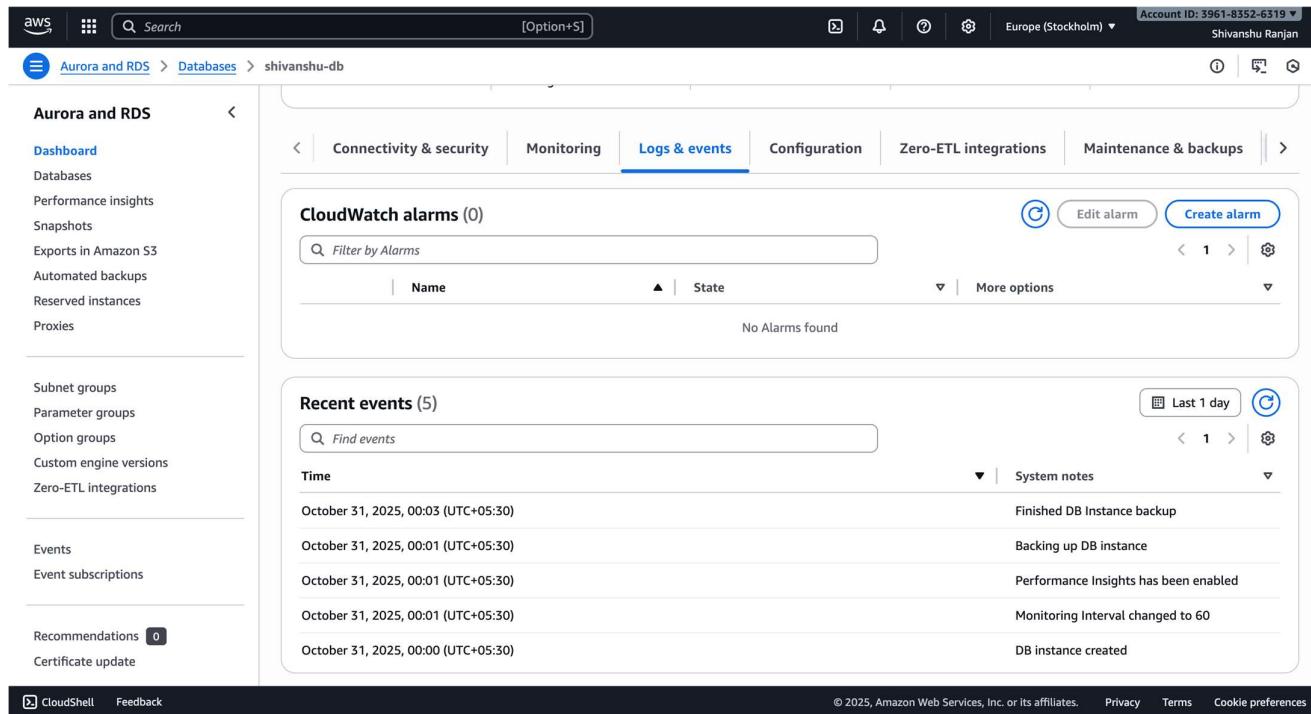
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## 17. Adding a New Server in pgAdmin



## 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 for 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'. The top right of the main area has buttons for Group resources, Modify, Actions (with a dropdown menu), Create database, and a dropdown for more actions.

## 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.