



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Worksheet 9

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Semester: 5th
Subject Name: ADBMS

UID: 23BCS14195
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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

The screenshot shows the AWS Management Console search results for 'rds'. The search bar at the top contains 'rds'. The results are displayed in two main sections: 'Services' and 'Features'. Under 'Services', 'Aurora and RDS' is highlighted, described as a 'Managed Relational Database Service'. Other listed services include 'Database Migration Service' and 'Kinesis'. Under 'Features', 'Database Insights' and 'Reserved instances' are listed. On the right side of the screen, there's a sidebar with links for 'Services', 'Features', 'Resources', 'Documentation', 'Knowledge articles', 'Marketplace', 'Events', and 'Tutorials'. At the bottom left, there's a 'Feedback' section with 'Yes' and 'No' buttons. At the bottom right, there are links for 'CloudShell', 'Feedback', 'Privacy', 'Terms', and 'Cookie preferences'.



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2. Navigating to RDS Service

The screenshot shows the AWS Aurora and RDS service 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 area displays a heading "Databases (0)" with a search bar and filter options for DB identifier, Status, Role, Engine, Region, and Size. A central illustration of a robot watering a plant is present, with the text "No resources" and "No resources to display". A prominent orange "Create database" button is at the bottom. The top right corner shows account information (Account ID: 3961-8352-6319, Europe (Stockholm), Shivanshu Ranjan).

3. Amazon RDS Dashboard Overview

The screenshot shows the 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 area features a "Resources" section with a "Refresh" button, displaying usage statistics for DB Instances, Parameter groups, Option groups, Subnet groups, and Supported platforms. To the right, there's a "Explore RDS" section with a "Start tutorial" button, a "Status" section (Not started), a "Complete by" date (April 30, 2026), a "Reward value" (USD 20.00), and an "Estimated duration" (2-5 minutes). Below these are sections for "Recommended services" (with a note about no recommendations yet) and "Create a database" (with a "Create a database" button and a "Restore from S3" button). The top right corner shows account information (Account ID: 3961-8352-6319, Europe (Stockholm), Shivanshu Ranjan).



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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, 32 GB RAM, and 1.946 USD/hour; another with 2 VCPUs, 16 GB RAM, and 0.278 USD/hour; and a third with 2 VCPUs, 1 GB RAM, 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: / \ * @. The 'Confirm master password' field also contains '*****'. 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.

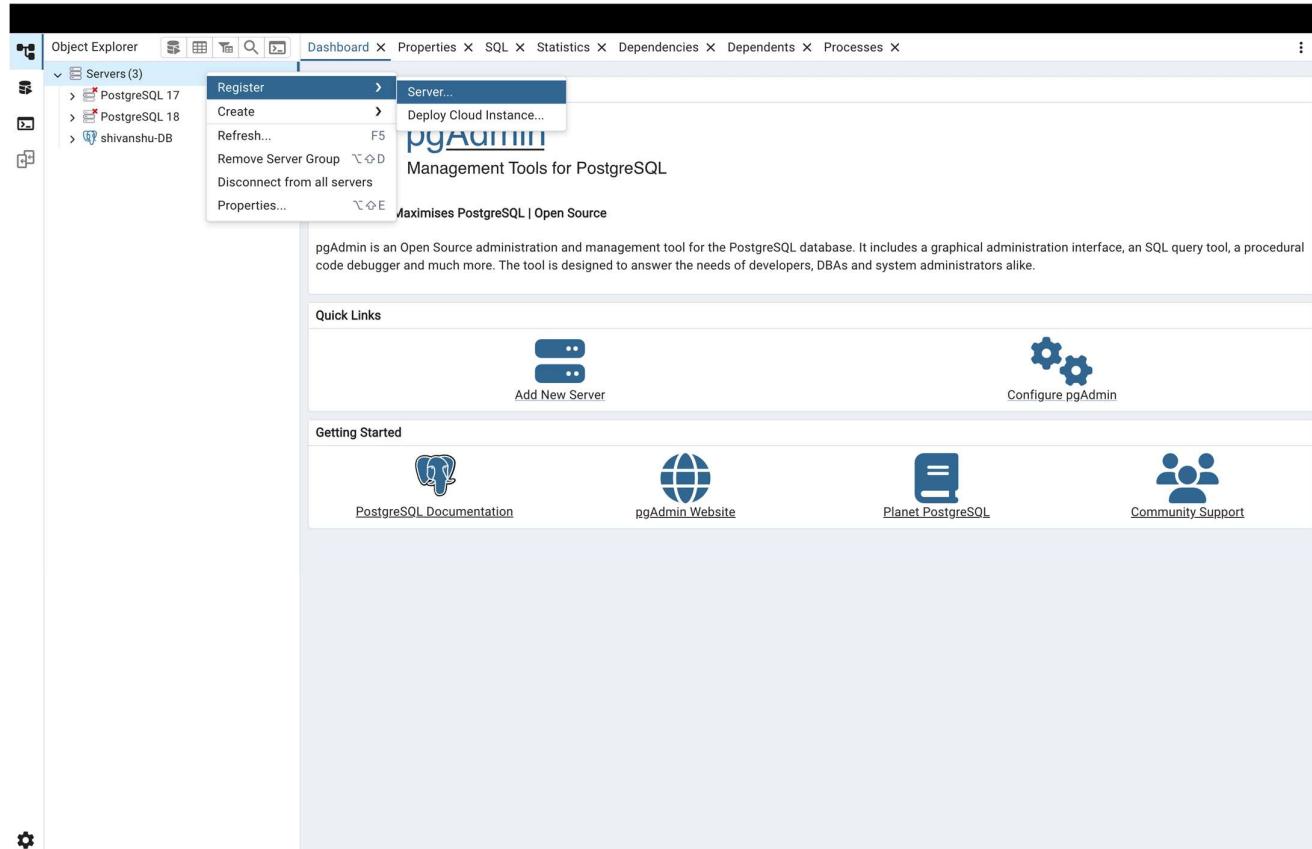
Footer links include CloudShell, Feedback, © 2025, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, and Cookie preferences.



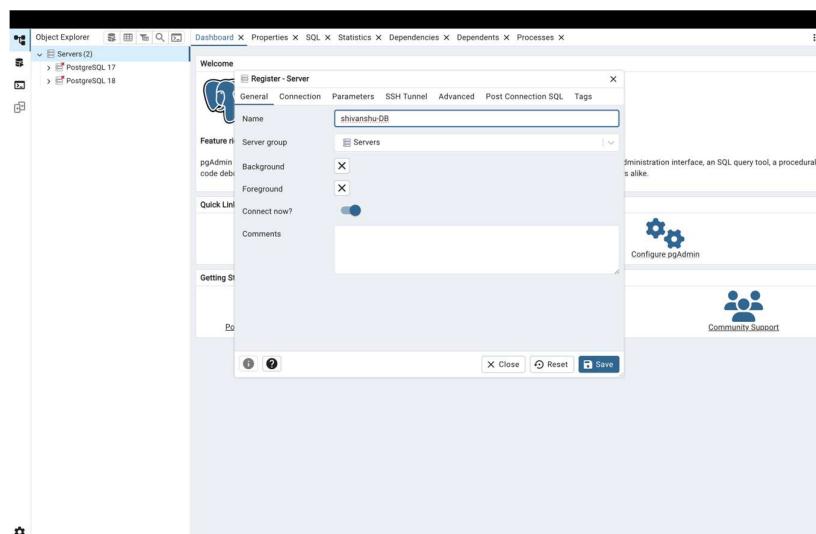
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8. Setting Up Instance Size and Storage



9. Configuring Connectivity and VPC Settings

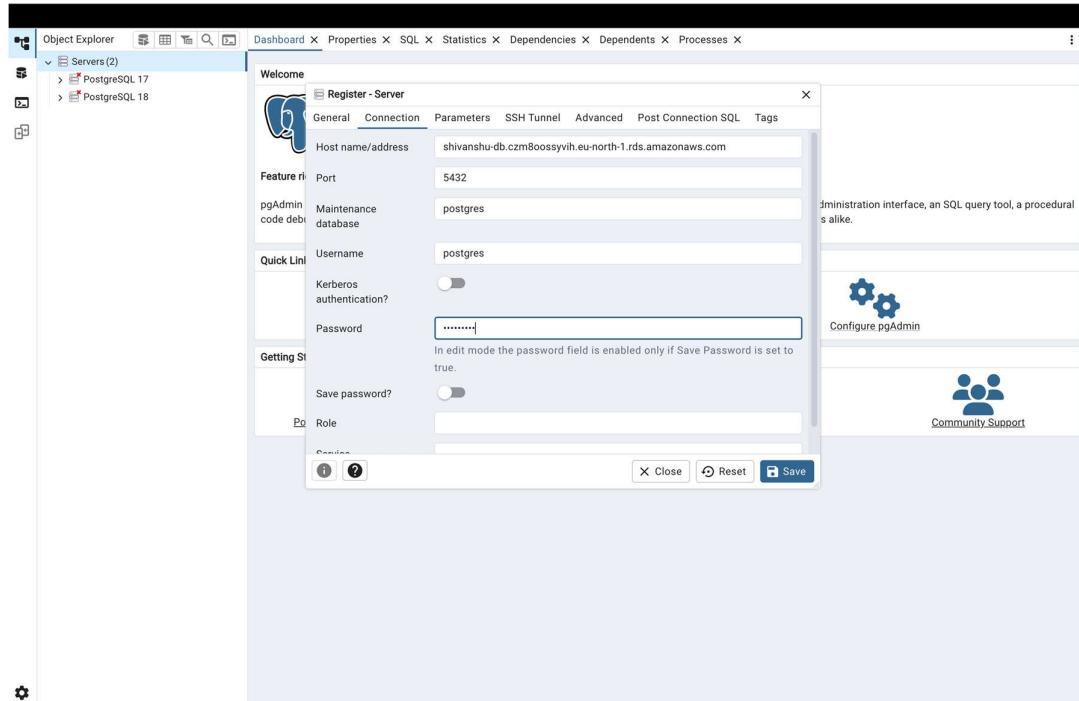




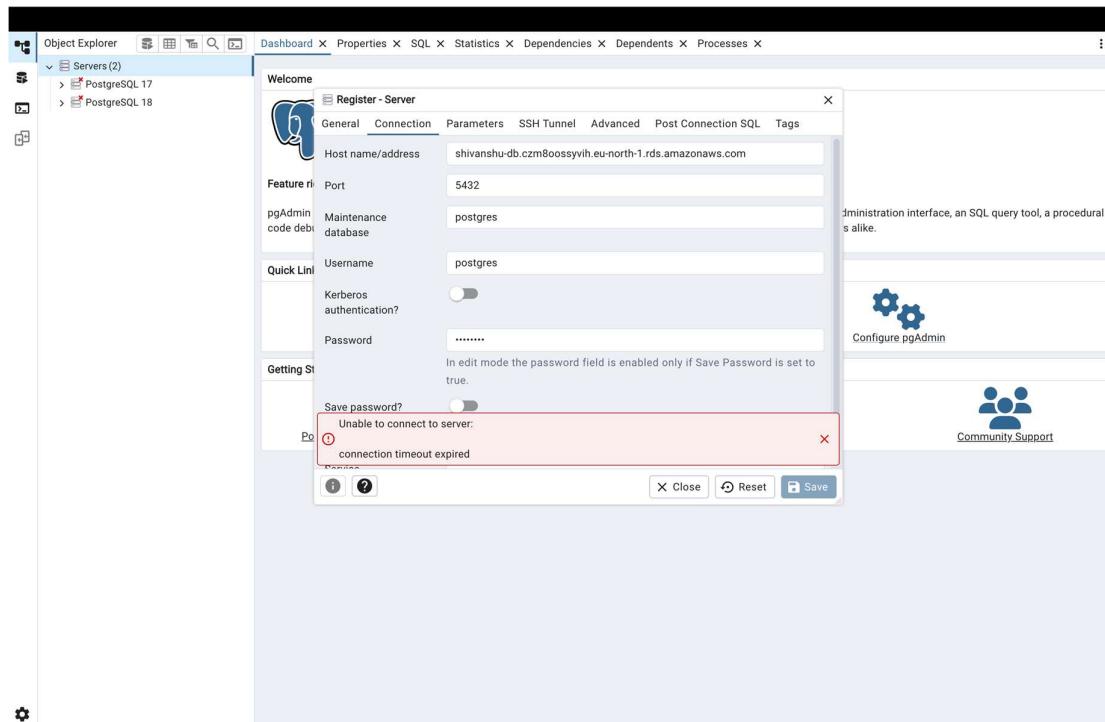
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10. GrSetting Up Security Groups for RDS Access



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](#)

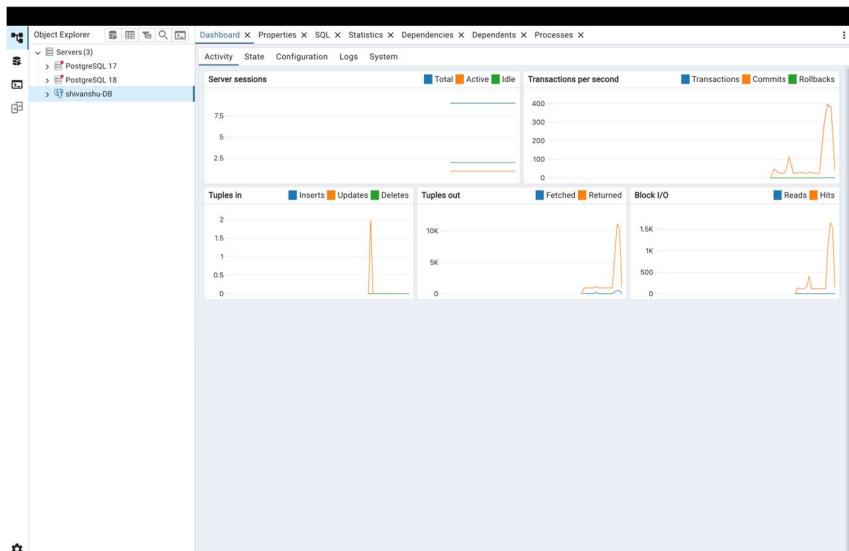
5432

15. Copying the RDS Endpoint for Connection

Connectivity & security

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

16. Launching pgAdmin on Local Machine

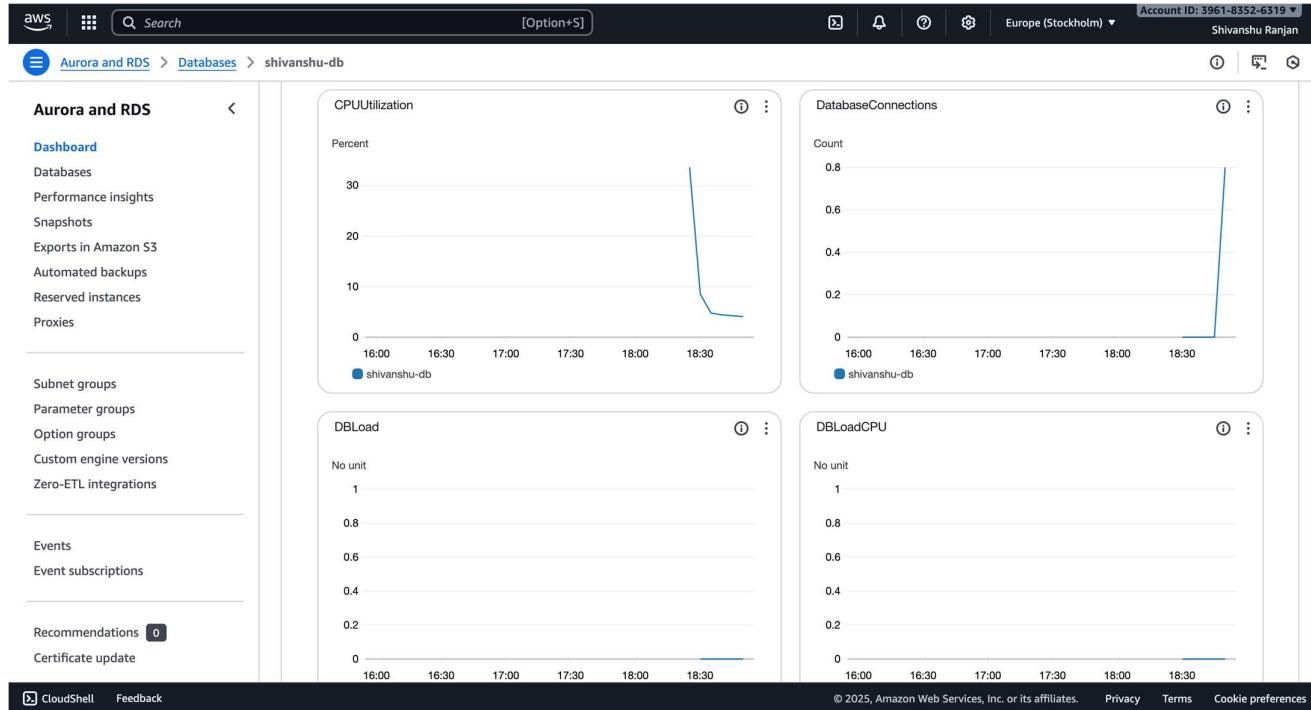




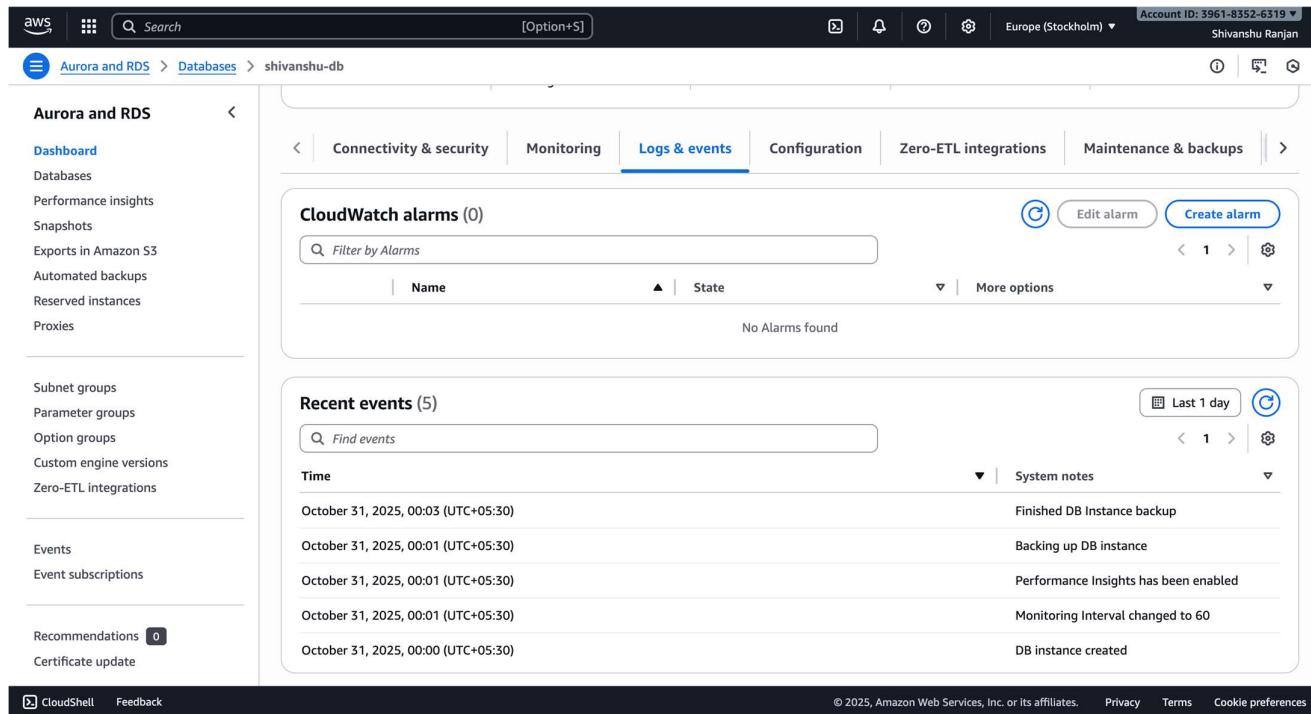
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17. Adding a New Server in pgAdmin



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'. It shows a table with one row for 'shivanshu-db', which is marked as 'Deleting'. The table columns are DB identifier, Status, Role, Engine, Region ..., and Size. The status column shows a red 'Deleting' icon. The bottom right of the main area contains copyright information (© 2025, Amazon Web Services, Inc. or its affiliates.) and links for Privacy, Terms, and Cookie preferences.

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.