



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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Worksheet 9

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Semester: 5th

Subject Name: ADBMS

UID: 23BCS10291

Section/Group: KRG 3-B

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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 left sidebar has 'Aurora and RDS' selected under 'Services'. The main search results pane shows 'Aurora and RDS Managed Relational Database Service' as the top feature. Other listed services include 'Database Migration Service Managed Database Migration Service' and 'Kinesis Work with Real-Time Streaming Data'. Below these, there are sections for 'Features' (Database Insights, CloudWatch feature), 'Reserved instances' (Aurora and RDS feature), and 'Proxies' (Aurora and RDS feature). On the right side, there is a 'System notes' panel showing recent events: 'Finished DB Instance backup', 'Backing up DB instance', 'Performance insights has been enabled', 'Monitoring Interval changed to 60', and 'DB instance created'. At the bottom, there are links for 'cloudshell', 'Feedback', and copyright information: '© 2025, Amazon Web Services, Inc. or its affiliates.' and 'Privacy Terms Cookie preferences'.



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2. Navigating to RDS Service

The screenshot shows the AWS RDS Dashboard. The left sidebar has sections for Aurora and RDS: Dashboard, Databases (selected), 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)' with a search bar and filters for DB identifier, Status, Role, Engine, Region, and Size. A large blue cloud icon with a white robot arm is centered. Below it, a message says 'No resources' and 'No resources to display'. A '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



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Aurora and RDS > Dashboard

Resources

You are using the following Amazon RDS resources in the Europe (Stockholm) region (used/quota)

DB Instances (0/40)	Parameter groups (0)
Allocated storage (0 TB/100 TB)	Default (0)
Instances and storage include Neptune and DocumentDB. Increase DB instances limit ↗	Custom (0/100)
DB Clusters (0/40)	Option groups (0)
Reserved instances (0/40)	Default (0)
Snapshots (0)	Custom (0/20)
Manual	Subnet groups (0/50)
DB Cluster (0/100)	Supported platforms ↗ VPC
DB Instance (0/100)	Default network vpc-086507ee77883ae1b
Automated	
DB Cluster (0)	
DB Instance (0)	
Recent events (0)	
Event subscriptions (0/20)	

Explore RDS

Complete the activity to earn AWS credits. In this activity, you will learn how to create a database quickly. To begin, choose Start tutorial.

Status: Not started

Complete by: April 30, 2026

Reward value: USD 20.00

Estimated duration: 2-5 minutes

Start tutorial

Create a database

Amazon Relational Database Service (RDS) makes it easy to set up, operate, and scale a relational database in the cloud.

Create a database

Restore from S3

CloudShell Feedback

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4. Creating a New Database Instance

Aurora and RDS > Databases > Create database

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: PostgreSQL

PostgreSQL

Aurora (MySQL Compatible)

Aurora (PostgreSQL Compatible)

MySQL

MariaDB

Oracle

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5. Selecting PostgreSQL as Database Engine

AWS CloudShell Feedback Account ID: 3961-8352-6319 Europe (Stockholm) Shivanshu Ranjan

Search [Option+5]

Aurora and RDS > Databases > Create database

DB Instance Identifier	Z VLATUS	Z VLATUS
shivanshu-DB	16 GB RAM 200 GB 0.278 USD/hour	1 GB RAM 20 GB 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.

Master username [Info](#)
Type a login ID for the master user of your DB instance.
postgres

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.

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](#)

6. Choosing Deployment Option and Template



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The screenshot shows the AWS RDS 'Create database' configuration page. At the top, there's a navigation bar with the AWS logo, search bar, and account information (Account ID: 3961-8352-6319, Europe (Stockholm), Shivanshu Ranjan). Below the navigation is a breadcrumb trail: Aurora and RDS > Databases > Create database. The main area contains a table with the following data:

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

At the bottom left, a note says: "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." On the right side, there are 'Cancel' and 'Create database' buttons.

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



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The screenshot shows the AWS RDS (Aurora and RDS) console. On the left, there's a sidebar with navigation links 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 (0), and Certificate update. The main area is titled "Databases (1)" and shows a table with one row for "shivanshu-db". The table columns are DB identifier, Status, Role, Engine, Region ..., and Size. The database is currently "Creating" and is an "Instance" of PostgreSQL db.t4g.micro. A blue banner 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." There are buttons for "View connection details", "Modify", "Actions", and "Create database". The top right corner shows "Account ID: 3961-8352-6319", "Europe (Stockholm)", and the user "Shivanshu Ranjan". The bottom of the screen includes links for CloudShell, Feedback, and legal notices: © 2025, Amazon Web Services, Inc. or its affiliates., Privacy, Terms, and Cookie preferences.

8. Setting Up Instance Size and Storage



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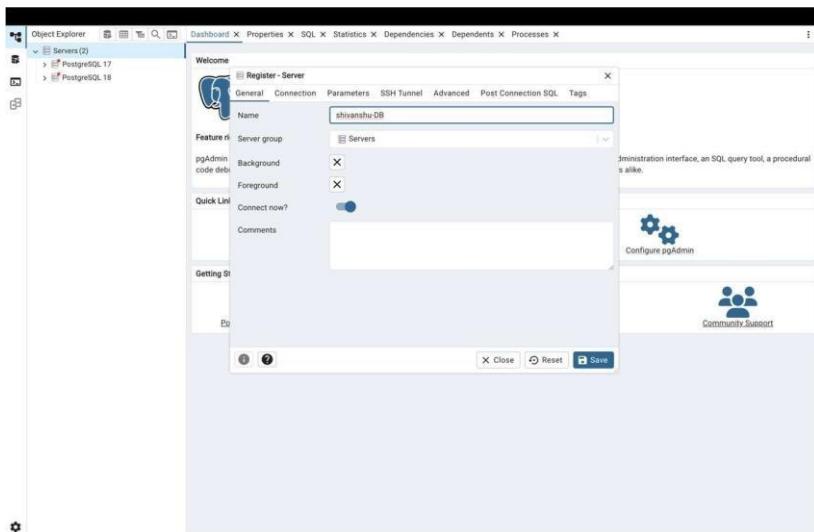
The screenshot shows the pgAdmin 4 application window. In the top navigation bar, the 'Servers' option is selected. A context menu is open over a server entry named 'shivanshu-DB'. The menu items include 'Register', 'Create', 'Refresh...', 'Remove Server Group', 'Disconnect from all servers', and 'Properties...'. The 'Server...' item is highlighted. Below the menu, the pgAdmin logo and the text 'Management Tools for PostgreSQL' are visible. A tooltip for 'Server...' states: 'Maximises PostgreSQL | Open Source'. The main pane displays 'Quick Links' for 'Add New Server' (with a plus icon) and 'Configure pgAdmin' (with a gear icon). At the bottom, there's a 'Getting Started' section with links to 'PostgreSQL Documentation' (with a PostgreSQL icon), 'pgAdmin Website' (with a globe icon), 'Planet PostgreSQL' (with a document icon), and 'Community Support' (with a people icon).

9. Configuring Connectivity and VPC Settings

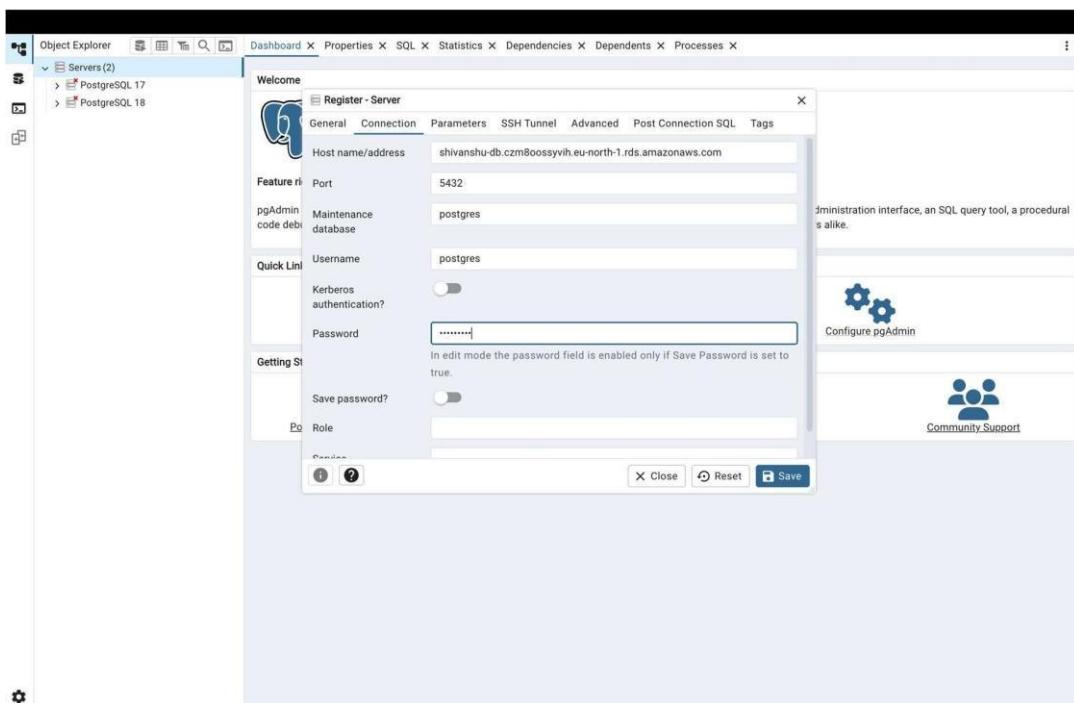


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10. Gr Setting Up Security Groups for RDS Access

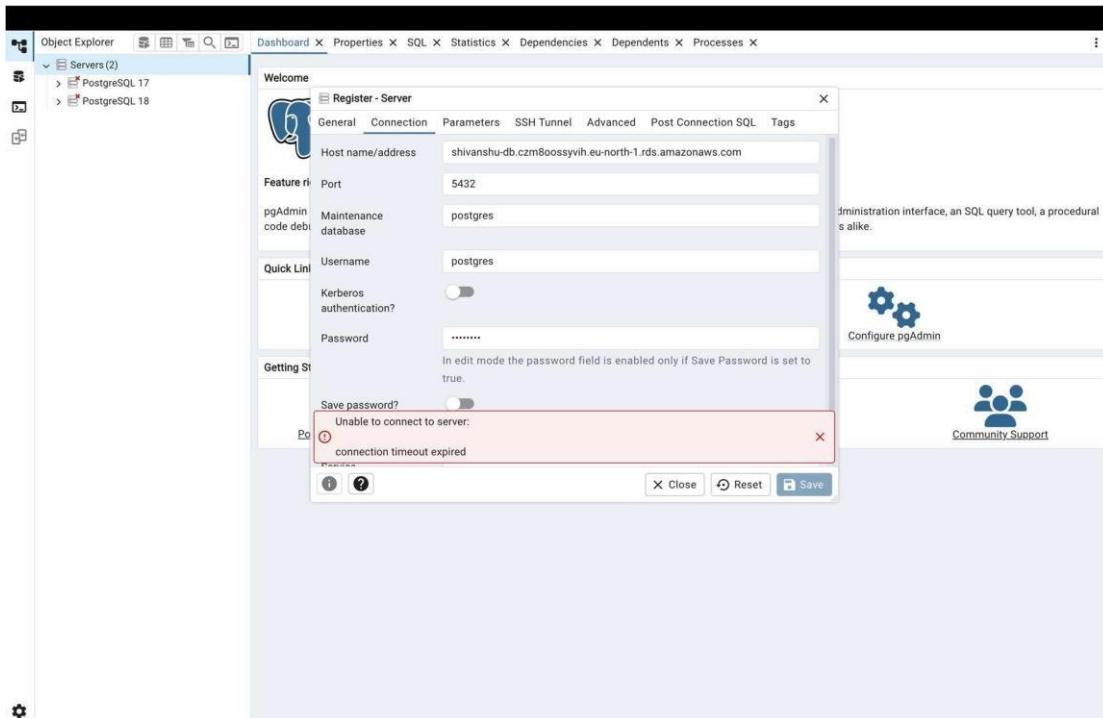


11. Additional Database Configuration Options



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12. Reviewing and Creating the Database Instance



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The screenshot shows the AWS RDS console for the 'shivanshu-db' database. The left sidebar includes links for Aurora and RDS, 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 the 'Summary' and 'Connectivity & security' tabs. Under 'Summary', details include DB identifier (shivanshu-db), Status (Available), Role (Instance), Engine (PostgreSQL), and Region & AZ (eu-north-1a). The 'Connectivity & security' tab is selected, showing information for the Endpoint (shivanshu-db.czmm8oosyyih.eu-north-1.rds.amazonaws.com) and Port (5432). It also lists the VPC (vpc-086507ee77883ae1b), Availability Zone (eu-north-1a), Subnet group (default-vpc-086507ee77883ae1b), and Subnets (subnet-0db6b45e321b7000a, subnet-087377db566f545dc, subnet-0bac42bdab1e990c5). The 'Networking' section shows the VPC (vpc-086507ee77883ae1b) and Subnet group (default-vpc-086507ee77883ae1b). The 'Security' section shows the VPC security groups (default sg-0b4c8dc4647072099), which is Active. It also indicates that the instance is Publicly accessible (No), has a Certificate authority (rds-ca-rsa2048-g1), and a Certificate authority date (May 25, 2061, 03:29 (UTC+05:30)). The DB instance certificate expiration is listed as May 25, 2061, 03:29 (UTC+05:30).

13. RDS Instance Creation in Progress



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Inbound rules Info

Security group rule ID Type Info Protocol Info Port range Info Source Info Description - optional Info

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

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



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Connectivity & security

Endpoint & port

Endpoint

shivanshu-db.czm8oossyvih.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

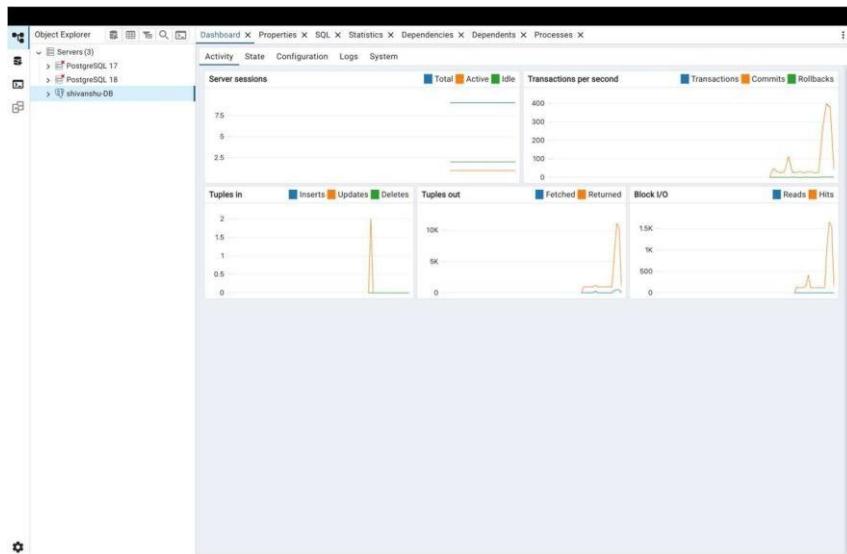
Certificate authority date

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

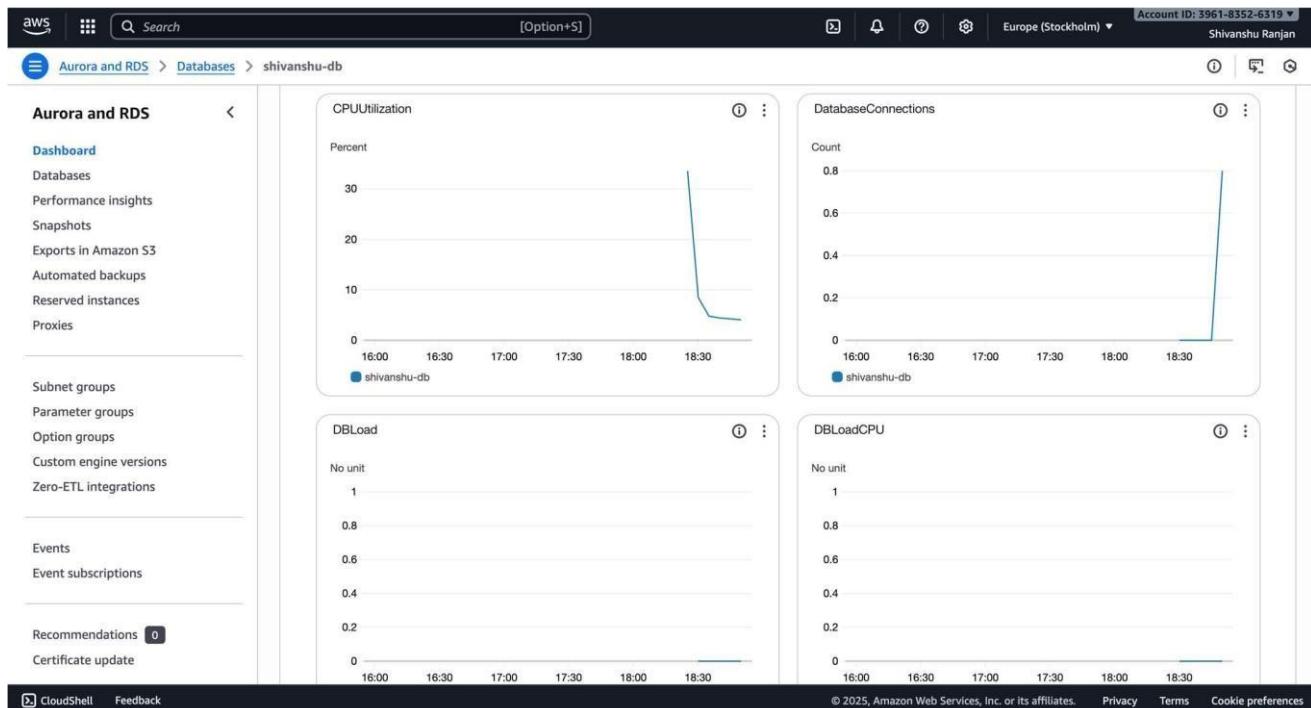


17. Adding a New Server in pgAdmin



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



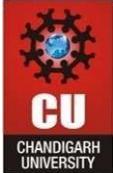
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The screenshot shows the AWS Aurora and RDS interface. On the left, there's a sidebar with various navigation options like Dashboard, Databases, and Recommendations. The main area is titled 'Logs & events' and displays two sections: 'CloudWatch alarms (0)' and 'Recent events (5)'. The 'Recent events' section lists five entries from October 31, 2025, such as 'DB instance created' and 'Monitoring Interval changed to 60'. At the bottom right of the main area, there are links for 'Last 1 day', 'System notes', and 'More options'.

19. Successful Connection to AWS RDS Database via pgAdmin

The screenshot shows the AWS Aurora and RDS interface. The main area is titled 'Deleting DB instance shivanshu-db' and displays a table of databases. One row for 'shivanshu-db' is selected and has a red 'Deleting' status indicator. The table includes columns for DB identifier, Status, Role, Engine, Region, and Size. The sidebar on the left is identical to the one in the previous screenshot, showing various management options for the database.



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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.