

Lab 5: Build a Database server.

COS20019: Cloud computing architecture

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Task 1 : Create a security group for the RDS DB instance

1. Create security group and give access to the MYSQL

The screenshot shows the AWS Management Console interface for creating a new security group. The breadcrumb navigation indicates the path: VPC > Security Groups > Create security group. The main heading is 'Create security group' with an 'Info' link. Below this is a descriptive sentence: 'A security group acts as a virtual firewall for your instance to control inbound and outbound traffic. To create a new security group, complete the fields below.'

The 'Basic details' section contains three input fields:

- Security group name:** 'DB Security Group'. A note below states 'Name cannot be edited after creation.'
- Description:** 'Permit access from Web Security Group'.
- VPC:** 'vpc-0c4745bec67900c03'.

The 'Inbound rules' section is partially visible, showing a table with columns: Type, Protocol, Port range, Source, and Description - optional. A single rule is listed:

Type	Protocol	Port range	Source	Description - optional
MySQL/Aurora	TCP	3306	Custom	

Below the table, there is an 'Add rule' button. The 'Source' field for the rule is set to 'Custom' and has a search box with the text 'sg-0298e6884096942ae' entered.

Task 2: Create a DB Subnet Group

1. Follow the instruction of the lab to create the subnet group for the database

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RDS > Subnet groups > Create DB subnet group

Create DB subnet group

To create a new subnet group, give it a name and a description, and choose an existing VPC. You will then be able to add subnets related to that VPC.

Subnet group details

Name
You won't be able to modify the name after your subnet group has been created.

Must contain from 1 to 255 characters. Alphanumeric characters, spaces, hyphens, underscores, and periods are allowed.

Description

VPC
Choose a VPC identifier that corresponds to the subnets you want to use for your DB subnet group. You won't be able to choose a different VPC identifier after your subnet group has been created.

Add subnets

Availability Zones
Choose the Availability Zones that include the subnets you want to add.

Subnets
Choose the subnets that you want to add. The list includes the subnets in the selected Availability Zones.

ⓘ For Multi-AZ DB clusters, you must select 3 subnets in 3 different Availability Zones.

Task 3: Create an Amazon RDS DB instance

1. Using engine MySQL for the creating database

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RDS > Create database

Create database


Choose a database creation method [Info](#)


☒ 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.


Engine options


Engine type [Info](#)


☐ Aurora (MySQL Compatible)



☐ Aurora (PostgreSQL Compatible)


☒ MySQL


☐ MariaDB


☐ PostgreSQL


☐ Oracle


☐ Microsoft SQL Server


MySQL

MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

- Supports database size up to 64 TiB.
- Supports General Purpose, Memory Optimized, and Burstable Performance instance classes.
- Supports automated backup and point-in-time recovery.
- Supports up to 15 Read Replicas per instance, within a single Region or 5 read replicas cross-region.

2. Configure the credentials details for the database

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☐ Single DB instance
Creates a single DB instance with no standby DB instances.

Settings

DB instance identifier [Info](#)
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.

lab-db

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

▼ Credentials Settings

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

main

1 to 16 alphanumeric characters. First character must be a letter.

☐ Manage master credentials in AWS Secrets Manager
Manage master user credentials in Secrets Manager. RDS can generate a password for you and manage it throughout its lifecycle.

If you manage the master user credentials in Secrets Manager, some RDS features aren't supported. [Learn more](#)

☐ Auto generate a password
Amazon RDS can generate a password for you, or you can specify your own password.

Master password [Info](#)

Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), ' (single quote), " (double quote) and @ (at sign).

Confirm master password [Info](#)

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you

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3. Configure the instance and the storage for the database

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quote), "(double quote) and @ (at sign).
Confirm master password [Info](#)
.....

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.

 **Amazon RDS Optimized Writes - new** [Info](#)
☐ Show instance classes that support Amazon RDS Optimized Writes

DB instance class [Info](#)

☐ Standard classes (includes m classes)

☐ Memory optimized classes (includes r and x classes)

☒ Burstable classes (includes t classes)

db.t3.micro
2 vCPUs 1 GiB RAM Network: 2.085 Mbps▼

☐ Include previous generation classes

Storage

Storage type [Info](#)

General Purpose SSD (gp2)
Baseline performance determined by volume size▼

Allocated storage [Info](#)

20

GiB

The minimum value is 20 GiB and the maximum value is 6.144 GiB

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4. Configure the connectivity with the db subnet group has been created and the security group

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manually set up a connection to a compute resource later.

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Virtual private cloud (VPC)

Info

Choose the VPC. The VPC defines the virtual networking environment for this DB instance.

Lab VPC (vpc-0c4745bec67900c03)
4 Subnets, 2 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

After a database is created, you can't change its VPC.

DB subnet group

Info

Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.

db-subnet-group
2 Subnets, 2 Availability Zones

Public access

Info

☐ Yes
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.

☒ No
RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

VPC security group (firewall)

Info

Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

☒ Choose existing
Choose existing VPC security groups

☐ Create new
Create new VPC security group

Existing VPC security groups

Choose one or more options

default

RDS Proxy

RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and security.

☐ Create an RDS Proxy

Info

RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see [Amazon RDS Proxy pricing](#).

Certificate authority - optional

Info

Using a custom certificate provides an extra layer of security by validating that the connection is being

5. Take the endpoint value of the database

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Role Instance	Current activity 🔴 0 Connections	Engine MySQL Community	Region & AZ us-east-1a
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Connectivity & security | Monitoring | Logs & events | Configuration | Maintenance & backups | Tags

Connectivity & security

<div>Endpoint & port</div> <div>Endpoint lab-db.ceq1lkwuhtfq.us-east-1.rds.amazonaws.com</div> <div>Port 3306</div>	<div>Networking</div> <div>Availability Zone us-east-1a</div> <div>VPC Lab VPC (vpc-0c4745bec67900c03)</div> <div>Subnet group db-subnet-group</div> <div>Subnets subnet-02a78b03e8a8fc20c subnet-03ff3767f3a648528</div> <div>Network type IPv4</div>	<div>Security</div> <div>VPC security groups default (sg-0cd6fe16034e0b198) 🟢 Active</div> <div>Publicly accessible No</div> <div>Certificate authority Info rds-ca-2019</div> <div>Certificate authority date August 23, 2024, 00:08 (UTC+07:00)</div> <div>DB instance certificate expiration date August 23, 2024, 00:08 (UTC+07:00)</div>
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Task 4: Interact with your DB

1. Get the webserver IP

The screenshot shows a web application interface with a dark theme. At the top, there are buttons for 'Details', 'AWS', 'Start Lab', 'End Lab', '1:02', 'Instructions', and 'Actions'. Below these, a modal window displays session information:

- Remaining session time: 01:01:44 (62 minutes)
- Session started at: 2023-06-09T00:54:35-0700
- Session to end at: 2023-06-09T02:26:56-0700
- Accumulated lab time: 00:30:00 (30 minutes)

Below the session info, there are two IP addresses listed:

```
(1) ips -- public:3.86.113.100, private:10.0.2.189 (2) ips -- public:44.202.75.151, private:10.0.0.240
```

There are also buttons for 'SSH key' (Show, Download PEM, Download PPK) and 'AWS SSO' (Download URL).

SecretKey	ttX/EnnRtMoOsrKlyauAK7xge8J64ajxV0oU31xi
WebServer	3.86.113.100
BastionHost	44.202.75.151
Region	us-east-1
AccessKey	AKIAXJ6VQA3HQHKHME4Z

2. Info about ec2 is displayed

The screenshot shows a web browser window with the address bar displaying 'Không bảo mật | 3.86.113.100'. The browser tabs include 'Canvas SUT', 'Library', 'Dev', 'Major', 'LinkedIn Learning...', and 'AWS Academy Clou...'. The main content area shows the AWS logo and the text 'Load Test RDS'.

Meta-Data	Value
InstanceId	i-07a0685bd4931b1bc
Availability Zone	us-east-1b

Below the table, it says 'Current CPU Load: 0%'.

3. Enter details of database

← → ↻ ⚠ Không bảo mật | 3.86.113.100/rds.php

Canvas SUT IW Library Dev Major LinkedIn Learning:... AWS Academy Clou...

aws Load Test RDS

Endpoint

Database

Username

Password