Module 7: Aurora Assignment

IntelliPaat

Problem Statement:

You work for XYZ Corporation. Their application requires a SQL service that can store data which can be retrieved if required. Implement a suitable RDS engine for the same.

While migrating, you are asked to perform the following tasks:

1. Create an AuroraDB Engine based RDS Database.
2. Create 2 Read Replicas in different availability zones for better infrastructure availability.

Solution:

1) <mark>Created aurora db (MySql compatible)</mark>

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)

Engine Version

Aurora MySQL 3.04.2 (compatible with MySQL 8.0.28) - default for major version 8.0 ▼

⚠ Parallel query is off by default. To enable it, use a DB instance parameter group with the aurora_parallel_query parameter enabled. Learn more ↗

Templates

Choose a sample template to meet your use case.

⦿ **Production**
Use defaults for high availability and fast, consistent performance.

◯ **Dev/Test**
This instance is intended for development use outside of a production environment.

Settings

DB cluster identifier Info

Enter a name for your DB cluster. The name must be unique across all DB clusters owned by your AWS account in the current AWS Region.

MyAurora-db

The DB cluster identifier is case-insensitive, but is stored as all lowercase (as in "mydbcluster"). 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.

admin

1 to 32 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.

⦿ **Self managed**
Create your own password or have RDS create a password that you manage.

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

Master password | Info

••••••••

Minimum constraints: At least 8 printable ASCII characters. Can't contain any of the following symbols: / ' " @

Confirm master password | Info

••••••••

Cluster storage configuration - *new* Info

Choose the storage configuration for the Aurora DB cluster that best fits your application's price predictability and price performance needs.

Configuration options

Database instance, storage, and I/O charges vary depending on the configuration. Learn more ↗

● Aurora Standard

- Cost-effective pricing for many applications with moderate I/O usage (I/O costs <25% of total database costs).
- Pay-per-request I/O charges apply. DB instance and storage prices don't include I/O usage.

○ Aurora I/O-Optimized

- Predictable pricing for all applications. Improved price performance for I/O-intensive applications (I/O costs >25% of total database costs).
- No additional charges for read/write I/O operations. DB instance and storage prices include I/O usage.

2. Make sure on here select burstable

Instance configuration

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

DB instance class Info

▼ Hide filters

◉ Include previous generation classes

○ Serverless v2
○ Memory optimized classes (includes r classes)
● Burstable classes (includes t classes)

db.t3.medium
2 vCPUs   4 GiB RAM   Network: 2,085 Mbps ▼

Availability & durability

Multi-AZ deployment Info

- ◉ Create an Aurora Replica or Reader node in a different AZ (recommended for scaled availability)
  Creates an Aurora Replica for fast failover and high availability.
- ○ Don't create an Aurora Replica

Connectivity Info

Compute resource

Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.

- ◉ Don't connect to an EC2 compute resource
  Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.

- ○ Connect to an EC2 compute resource
  Set up a connection to an EC2 compute resource for this database.

Network type Info

To use dual-stack mode, make sure that you associate an IPv6 CIDR block with a subnet in the VPC you specify.

- ◉ IPv4
  Your resources can communicate only over the IPv4 addressing protocol.

- ○ Dual-stack mode
  Your resources can communicate over IPv4, IPv6, or both.

Virtual private cloud (VPC) Info

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

```
Default VPC (vpc-0b30ac81932ad0441)
3 Subnets, 3 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 cluster can use in the VPC that you selected.

```
default                                                       ▼
```

Public access Info

- ◉ Yes
  RDS assigns a public IP address to the cluster. Amazon EC2 instances and other resources outside of the VPC can connect to your cluster. Resources inside the VPC can also connect to the cluster. Choose one or more VPC security groups that specify which resources can connect to the cluster.

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

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 server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.

rds-ca-rsa2048-g1 (default)
Expiry: May 22, 2061 ▼

If you don't select a certificate authority, RDS chooses one for you.

▼ Additional configuration

Database options, encryption turned off, failover, backup turned on, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned off.

Database options

Initial database name Info

MyAurora_db

If you do not specify a database name, Amazon RDS does not create a database.

DB cluster parameter group Info

default.aurora-mysql8.0 ▼

DB parameter group Info

default.aurora-mysql8.0 ▼

Option group Info

default:aurora-mysql-8-0 ▼

Failover priority

No preference ▼

Backup

Backup retention period Info
The number of days (1-35) for which automatic backups are kept.

[1 ▼] day

☐ Copy tags to snapshots

Encryption

☐ Enable encryption
Choose to encrypt the given instance. Master key IDs and aliases appear in the list after they have been created using the AWS Key Management Service console. Info

Backtrack

Backtrack lets you quickly rewind the DB cluster to a specific point in time, without having to create another DB cluster. Info
☐ Enable Backtrack
Enabling Backtrack will charge you for storing the changes you make for backtracking.

Maintenance

Auto minor version upgrade Info
☑ Enable auto minor version upgrade
Enabling auto minor version upgrade will automatically upgrade to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the database.

Maintenance window Info
Select the period you want pending modifications or maintenance applied to the database by Amazon RDS.
○ Choose a window
● No preference

Deletion protection

☐ Enable deletion protection
Protects the database from being deleted accidentally. While this option is enabled, you can't delete the database.

Estimated Monthly costs

DB instance	91.98 USD
Total	**91.98 USD**

This billing estimate is based on on-demand usage as described in Amazon Aurora Pricing ↗. Estimate does not consider reserved instance benefits and costs for instance storage, IOs, or data transfer.
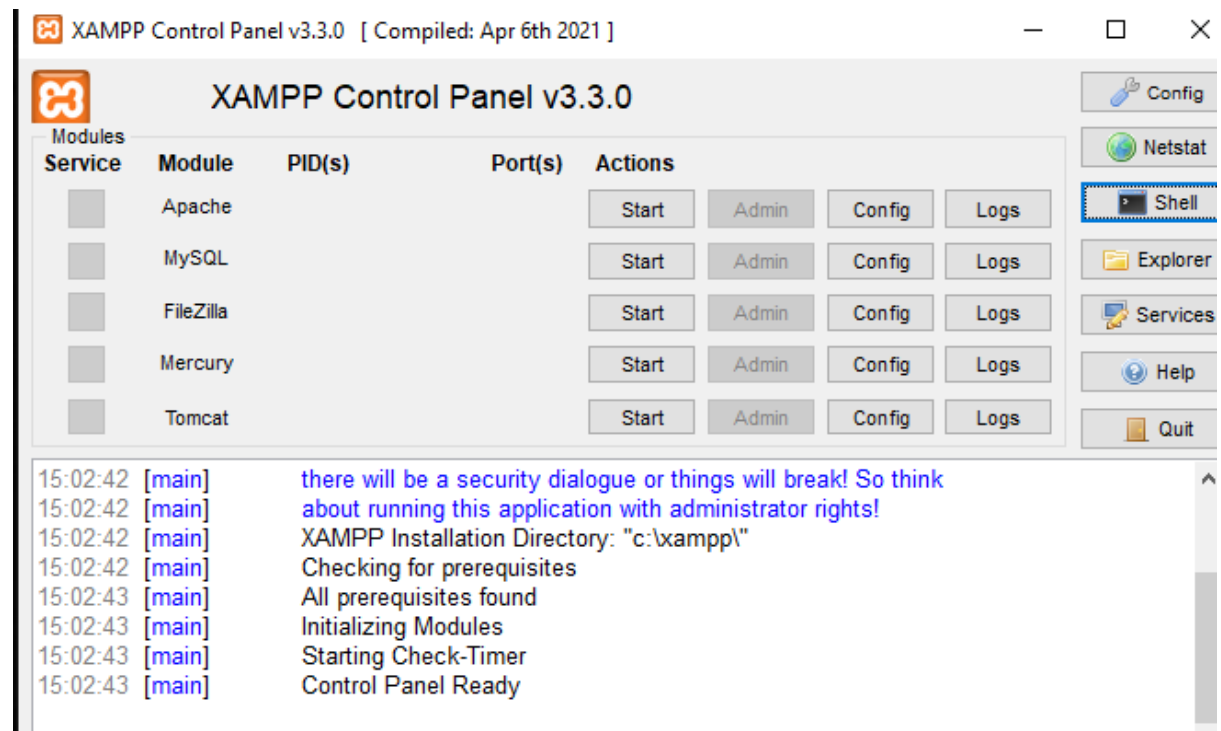
Estimate your monthly costs for the DB Instance using the AWS Simple Monthly Calculator ↗.

ⓘ 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.

Cancel   Create database

2) Download & install XAMPP from google & click on shell

3) Connect to the writer db

Run command: mysql -h endpoint -u admin -p

Enter Password: admin123

Run command : show databases;

Run command: use MyAurora_db;

Create Database id;

```
MySQL [(none)]> use MyAurora_db;
Database changed
MySQL [MyAurora_db]> create table data(eid int);
Query OK, 0 rows affected (0.164 sec)

MySQL [MyAurora_db]> show tables;
+----------------------+
| Tables_in_MyAurora_db |
+----------------------+
| data                 |
+----------------------+
1 row in set (0.122 sec)

MySQL [MyAurora_db]> create database id;
Query OK, 1 row affected (0.090 sec)

MySQL [MyAurora_db]>
```

==Its created id because it is regional cluster==

```
MySQL [MyAurora_db]> show databases;
+--------------------+
| Database           |
+--------------------+
| MyAurora_db        |
| id                 |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
6 rows in set (0.112 sec)
```

==Now go to reader and select endpoint and copy it==

DB identifier	Status	Role	Engine	Region & AZ	Size	Recommendations	CPU
myaurora-db	Available	Regional cluster	Aurora MySQL	ap-southeast-1	2 instances		-
myaurora-db-instance-1	Available	Writer instance	Aurora MySQL	ap-southeast-1a	db.t3.medium		15.4
myaurora-db-instance-1-ap-southeast-1b	Available	Reader instance	Aurora MySQL	ap-southeast-1b	db.t3.medium		-

Connectivity & security   Monitoring   Logs & events   Configuration   Maintenance & backups   Tags   Recommendations

Connectivity & security

Endpoint & port
Endpoint copied

myaurora-db-instance-1-ap-southeast-1b.cf
gaeosci3hq.ap-southeast-1.rds.amazonaws.com

Networking

Availability Zone
ap-southeast-1b

VPC

Security

VPC security groups
default (sg-0a6f01135d65a395e)
⊘ Active

Here we are unable to create because it is reader

```
Salman Farsi@DESKTOP-LN1OGKQ c:\xampp
# mysql -h myaurora-db-instance-1-ap-southeast-1b.cfgaeosci3hq.ap-southeast-1.rds.amazonaws.com -u admin -p
Enter password: ********
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 81
Server version: 8.0.28 Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| MyAurora_db        |
| id                 |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
6 rows in set (0.150 sec)

MySQL [(none)]> create database id;
ERROR 1836 (HY000): Running in read-only mode
MySQL [(none)]>
```

Add reader

Instance configuration

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

DB instance class Info

▼ Hide filters

🔘 Include previous generation classes

○ Serverless v2
○ Memory optimized classes (includes r classes)
🔘 Burstable classes (includes t classes)

```
db.t3.medium                                              ▼
2 vCPUs    4 GiB RAM    Network: 2,085 Mbps
```

AWS Region

Destination Region
The Region where the replica will be launched.

```
Asia Pacific (Singapore)                                 ▼
```

> ⓘ The replica database will be in the same Region as the source database.

Connectivity   ⟳

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.

Availability Zone Info
The EC2 Availability Zone that the database will be created in.

```
No preference                                            ▼
```

▶ Additional configuration

▶ **Additional configuration**

Database authentication Info

Password authentication is always active for your database engine. You can also turn on additional authentication methods for your database below.

- ☐ **IAM database authentication**
  Authenticates using IAM database authentication.
- ☐ **Kerberos authentication**
  Authenticates using Kerberos authentication through an AWS Directory Service for Microsoft Active Directory.

Tags

A tag consists of a case-sensitive key-value pair.

No tags associated with the resource.

Add new tag

You can add up to 50 more tags.

▼ **Additional configuration**
encryption turned off, failover, Enhanced Monitoring turned off, maintenance, CloudWatch Logs

▼ Additional configuration

encryption turned off, failover, Enhanced Monitoring turned off, maintenance, CloudWatch Logs

DB parameter group Info

default.aurora-mysql8.0 ▼

Failover priority

No preference ▼

Encryption

☐ **Enable encryption**
Choose to encrypt the given instance. Master key IDs and aliases appear in the list after they have been created using the AWS Key Management Service console. **Info**

Maintenance

Auto minor version upgrade **Info**

☑ **Enable auto minor version upgrade**
Enabling auto minor version upgrade will automatically upgrade to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the database.

Cancel   **Add reader**

Successfully added

	DB identifier	Status	Role	Engine	Region & AZ	Size	Recommendations
○	⊟ myaurora-db	⊘ Available	Regional cluster	Aurora MySQL	ap-southeast-1	3 instances	
○	├ myaurora-db-instance-1	⊘ Available	Writer instance	Aurora MySQL	ap-southeast-1a	db.t3.medium	
○	├ myaurora-db-instance-1-ap-southeast-1b	⊘ Available	Reader instance	Aurora MySQL	ap-southeast-1b	db.t3.medium	
●	└ myreader	⊘ Available	Reader instance	Aurora MySQL	ap-southeast-1c	db.t3.medium	

Connectivity & security   Monitoring   Logs & events   Configuration   Maintenance & backups   Tags   Recommendations

Connectivity & security

Endpoint & port

Endpoint
🗗 myreader.cfgaeosci3hq.ap-southeast-1.rds.a
mazonaws.com

Networking

Availability Zone
ap-southeast-1c

VPC

Security

VPC security groups
default (sg-0a6f01135d65a395e)
⊘ Active

```
Salman Farsi@DESKTOP-LN1OGKQ c:\xampp
# mysql -h myreader.cfgaeosci3hq.ap-southeast-1.rds.amazonaws.com -u admin -p
Enter password: ********
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 53
Server version: 8.0.28 Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| MyAurora_db        |
| id                 |
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
6 rows in set (0.130 sec)

MySQL [(none)]> create database name;
ERROR 1836 (HY000): Running in read-only mode
MySQL [(none)]>
```
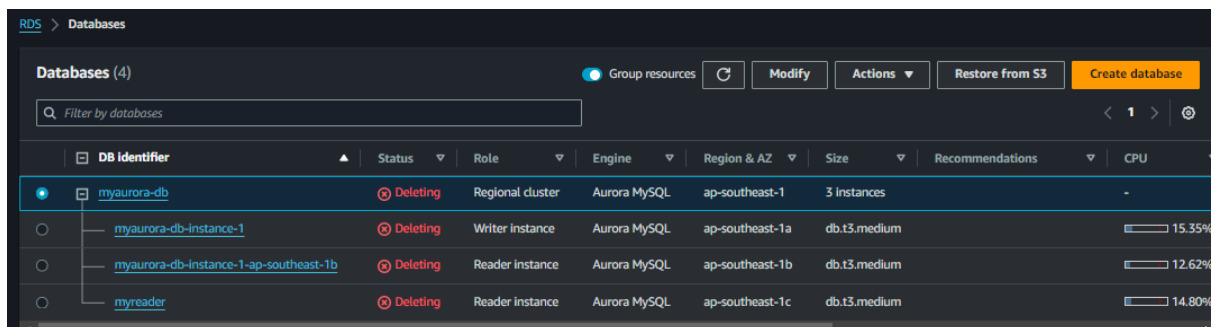
RDS > Databases

Databases (4)   Group resources | C | Modify | Actions ▾ | Restore from S3 | Create database

Q Filter by databases   < 1 > ⚙

	DB identifier	Status ▽	Role ▽	Engine ▽	Region & AZ ▽	Size ▽	Recommendations ▽	CPU
⦿	⊟ myaurora-db	⊗ Deleting	Regional cluster	Aurora MySQL	ap-southeast-1	3 instances	-	
○	└ myaurora-db-instance-1	⊗ Deleting	Writer instance	Aurora MySQL	ap-southeast-1a	db.t3.medium		▭ 15.35%
○	└ myaurora-db-instance-1-ap-southeast-1b	⊗ Deleting	Reader instance	Aurora MySQL	ap-southeast-1b	db.t3.medium		▭ 12.62%
○	└ myreader	⊗ Deleting	Reader instance	Aurora MySQL	ap-southeast-1c	db.t3.medium		▭ 14.80%