

Module 7: Aurora Assignment

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Course Offered: -Advanced Cloud Computing and Devops

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Date Of Submission: -06/11/2024

Problem Statement:

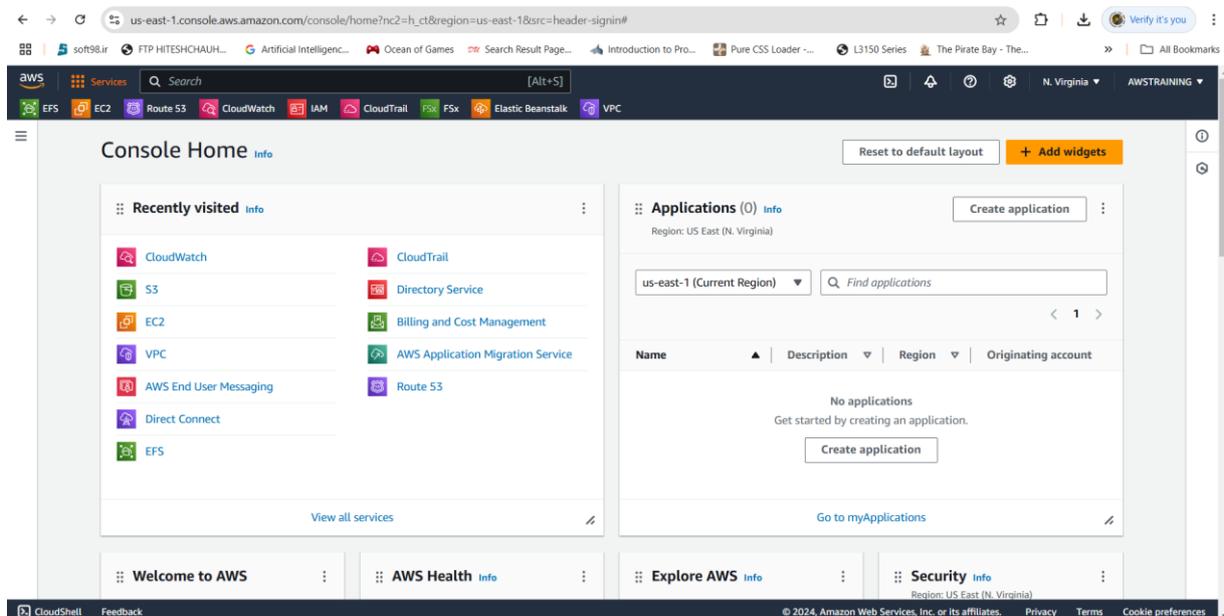
You work for XYZ Corporation. Their application requires a SQL service that can store data which can be retrieved if required. Implement a suitable RDS engine for the same.

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

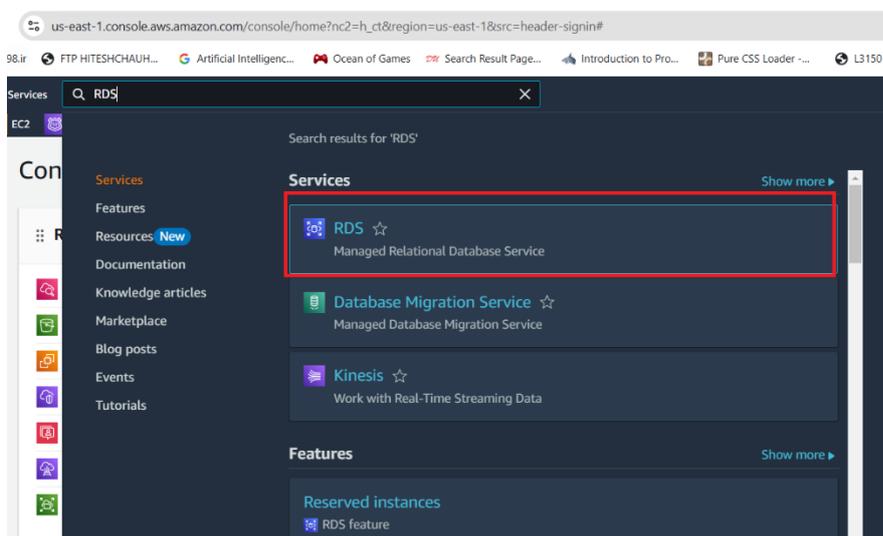
1. Create an AuroraDB Engine based RDS Database.
2. Create 2 Read Replicas in different availability zones for better infrastructure availability.

ANSWER:

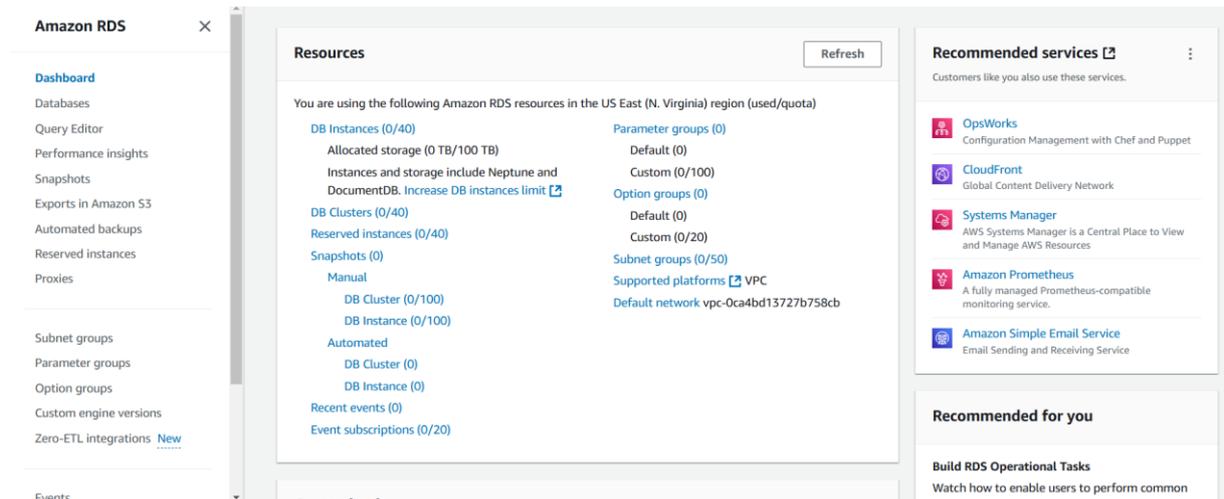
Login to AWS Management Console: -



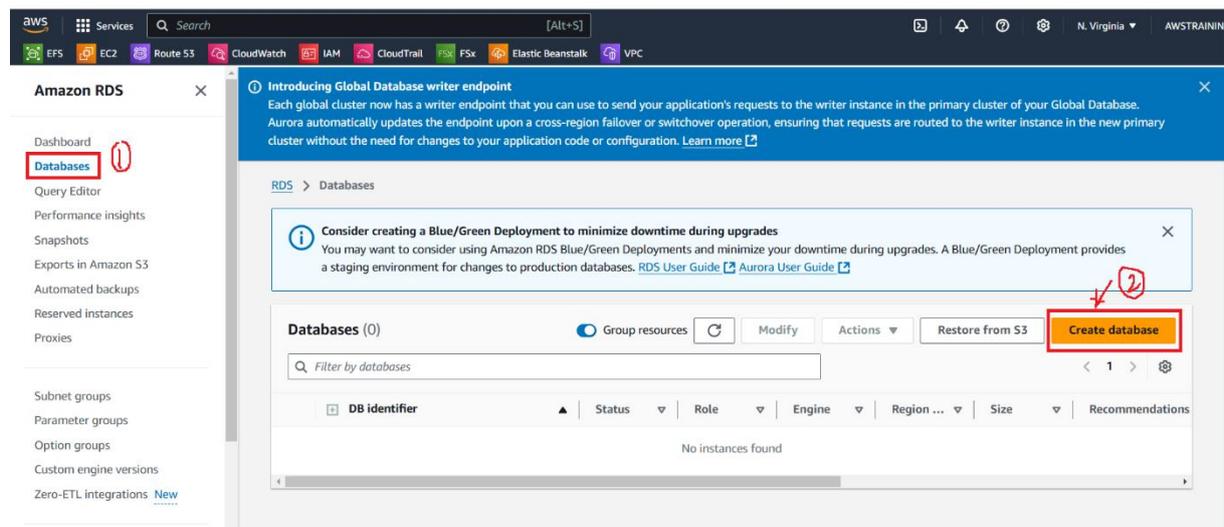
Then Search RDS



Then After click the rds will be open like this.



Then Go to Database and create database.



After Click the Create Database.

Then Choose a database creation method.

There is two options.

1.Standard Create

2.Easy Create

In my case I choose database creation method is **standard create**.

You will give you many options of database but right now I want to create engine option is aurora database.

Choose a database creation method ①

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 ②

Engine type [Info](#)

Aurora (MySQL Compatible)


Aurora (PostgreSQL Compatible)


Select Aurora

Then Select Templates of Dev/Test.

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.

Then Go to Settings And Assign the Name of DB Cluster Name.

In My Case My DB cluster identifier is myaurora

In Credential Settings

Master Username will be admin

In my case I assigned the name of master username is admin.

Then another important Setting is the Credential Management.in credential management there is two option first is Managed in AWS Secrets Manager-Most Secure and second one is Self-managed.

In my I choose to First Option is Managed in AWS Secrets Manager-Most Secure

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.

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.

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.

[i](#) If you manage the master user credentials in AWS Secrets Manager, additional charges apply. See [AWS Secrets Manager pricing](#). Additionally, some RDS features aren't supported. See [limitations here](#).

Next is Cluster Storage Configuration.

In Cluster storage option, there is two options.

1.Aurora I/O-Optimized.

2.Aurora Standard.

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 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.

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.

In My Case I Choose Aurora Standard.

Next, Instance Configuration Of Database there is three db. instance class

1.Serverless v2

2.Memory optimized classes (includes r classes) And

3.Burstable classes (includes t classes)

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.r7g.large

2 vCPUs 16 GiB RAM Network: Up to 10,000 Mbps

Note: This DB Instance classes will be used different use cases but we need to just for testing and development process I choose Memory optimized classes.

Next Is Availability and Durability.

in this scenario Db instance replicas will be create in different AZ.this configuration is very important for db instance. If in case one replicas will be crashed so this db instance will be use another replica for failover instance and recommended by aws for create replicas.

So I choose Create an aurora Replica or Reader node in a different AZ(recommended for scaled availability)

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

Next is very important Setting of Database Network Connectivity.

In Computer Resource I choose Don't connect to an EC2 compute resource because right now not require of connect to an ec2 compute resource and Then Network Type Will be IPV4 and Choose VPC.in my case I choose default vpc for Create Aurora Replica or Reader node in different AZ.

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-0ca4bd13727b758cb)
 6 Subnets, 6 Availability Zones

Only VPCs with a corresponding DB subnet group are listed.

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

Then Next Setting will be DB subnet group

There is default and public access I choose Yes because my db instance will be on public then other most important setting is VPC Security Group Firewall by default I choose existing created Security group by default so I created security group is cloudwatch agent.

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

cloudwatch agent X

Then Certificate Authority is select by default.

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 26, 2061

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

Then Read Replica I don't to Turn On then database authentication will be nothing.

Read replica write forwarding

Turn on local write forwarding [Info](#)
Issues write operations from reader DB instances within the same DB cluster.

Tags - optional
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.

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.

In monitoring Setting Retention period will be 7 days in free tier available in free tier account.

Monitoring

Turn on Performance Insights (cluster level)

Retention period for Performance Insights [Info](#)
7 days (free tier) ▼

Info Once you enable Performance insights on the cluster, you cannot manage this configuration, including retention periods, on individual instances. To opt-out of cluster level management, uncheck the box and modify each instance to configure Performance Insights. [Learn more](#) [↗](#)

AWS KMS key [Info](#)
(default) aws/rds ▼

Account
207567757353

KMS key ID
alias/aws/rds

Warning You can't change the KMS key after enabling Performance Insights.

Turn on DevOps Guru [Info](#)
DevOps Guru for RDS automatically detects performance anomalies for DB instances and provides recommendations.

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

Estimated monthly costs

DB instance	201.48 USD
Total	201.48 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](#).

i 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**

Create Database.

You will see The Replicas of myaurora db instance.

1 Creating database myaurora
 Your database might take a few minutes to launch. You can use settings from myaurora to simplify configuration of [suggested database add-ons](#) while we finish creating your DB for you. [View credential details](#)

Introducing Global Database writer endpoint
 Each global cluster now has a writer endpoint that you can use to send your application's requests to the writer instance in the primary cluster of your Global Database. Aurora automatically updates the endpoint upon a cross-region failover or switchover operation, ensuring that requests are routed to the writer instance in the new primary cluster without the need for changes to your application code or configuration. [Learn more](#)

RDS > Databases

i Consider creating a Blue/Green Deployment to minimize downtime during upgrades
 You may want to consider using Amazon RDS Blue/Green Deployments and minimize your downtime during upgrades. A Blue/Green Deployment provides a staging environment for changes to production databases. [RDS User Guide](#) [Aurora User Guide](#)

Databases (3) Group resources

Filter by databases

DB identifier	Status	Role	Engine	Region ...	Size	Recommendations	CPU
myaurora	Creating	Regional c...	Aurora My...	us-east-1	2 instances	-	-
myaurora-instance-1	Creating	Reader ins...	Aurora My...	us-east-1c	db.r7g.large	-	-
myaurora-instance-1-us-east-1a	Creating	Reader ins...	Aurora My...	us-east-1a	db.r7g.large	-	-

Read-replica also created.