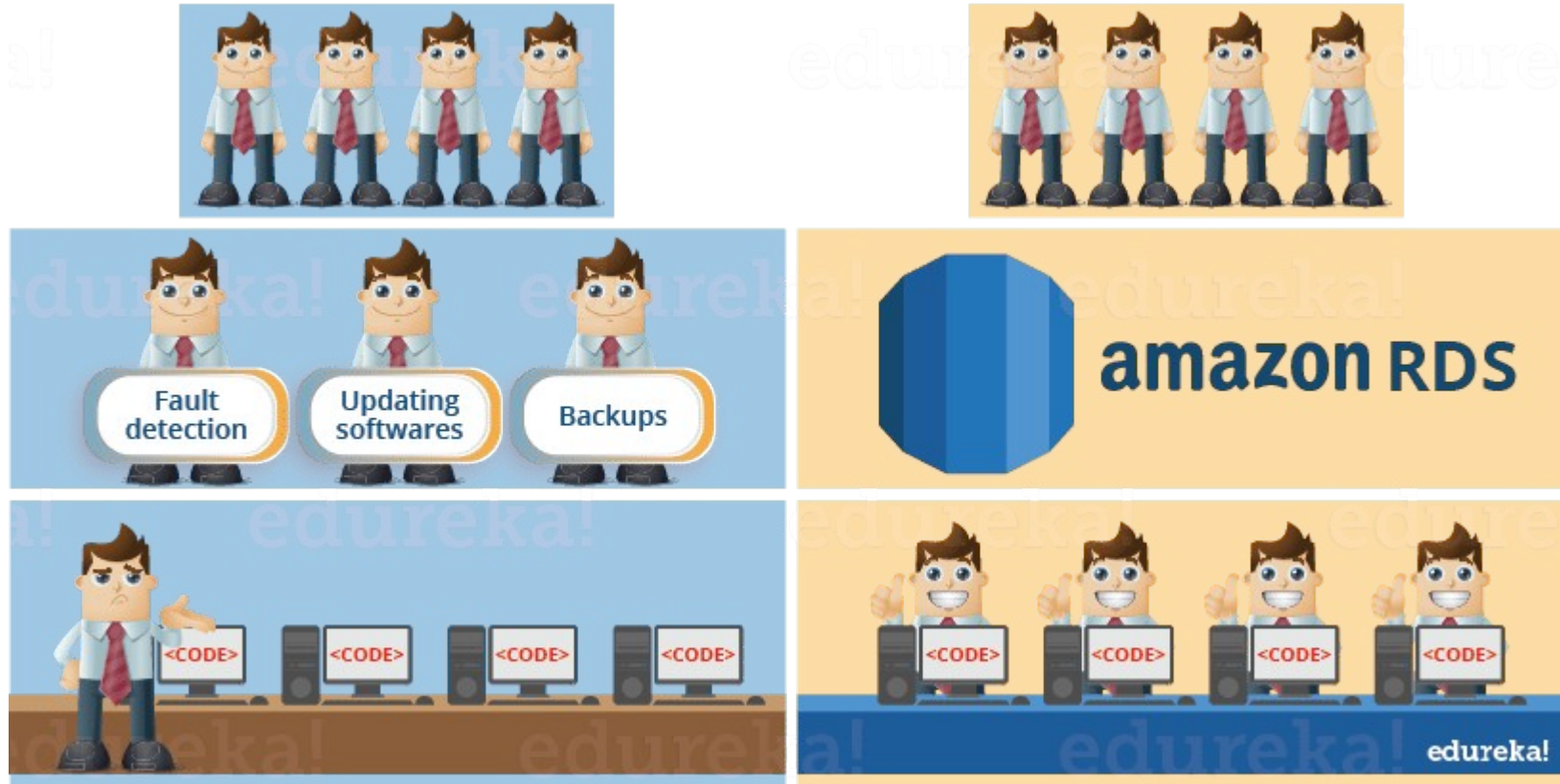


edureka!





Amazon RDS



Amazon RDS



- Amazon Relational Database Service (Amazon RDS) is a web service that makes it easier to set up, operate, and scale a relational database in the cloud. It provides cost-efficient, resizable capacity for an industry-standard relational database and manages common database administration tasks.
- So people often develop a misconception, when they confuse RDS with a database.
- RDS is not a database, it's a service that manages databases, having said that, let's discuss the databases that RDS can manage as of now

Amazon RDS DB Engines



Amazon RDS

Engine options

☒ Amazon Aurora

**Amazon
Aurora**

☐ MySQL



☐ MariaDB



☐ PostgreSQL



☐ Oracle

ORACLE®

☐ Microsoft SQL Server



Amazon RDS



Amazon RDS

- Amazon Aurora:

It is a relational database engine made by amazon which combines the speed and reliability of high-end commercial databases with the simplicity and cost-effectiveness of open source databases. Amazon claims that Aurora is 5x faster than RDS MySQL

- PostgreSQL:

PostgreSQL is yet another open source database management system which uses SQL to access the data

- Oracle:

It is object-relational database management system which was developed by Oracle Inc

- MySQL

It is an open source database management system which uses SQL (Structured Query Language) to access the data stored in its system

- SQL SERVER

SQL Server is a Relational Database Management System, which was developed by Microsoft in 2005 for the enterprise environment.

- Maria DB

MariaDB is a community developed fork of MySQL DBMS. The reason for its fork, was the concern over the acquisition of Oracle over MySQL

Overview of Amazon RDS



Why do you want a managed relational database service? Because Amazon RDS takes over many of the difficult or tedious management tasks of a relational database:

- When you buy a server, you get CPU, memory, storage, and IOPS, all bundled together. With Amazon RDS, these are split apart so that you can scale them independently. If you need more CPU, less IOPS, or more storage, you can easily allocate them.
- Amazon RDS manages backups, software patching, automatic failure detection, and recovery.
- To deliver a managed service experience, Amazon RDS doesn't provide shell access to DB instances, and it restricts access to certain system procedures and tables that require advanced privileges.
- You can have automated backups performed when you need them, or manually create your own backup snapshot. You can use these backups to restore a database. The Amazon RDS restore process works reliably and efficiently.
- You can get high availability with a primary instance and a synchronous secondary instance that you can fail over to when problems occur. You can also use MySQL, MariaDB, or PostgreSQL Read Replicas to increase read scaling.
- You can use the database products you are already familiar with: MySQL, MariaDB, PostgreSQL, Oracle, Microsoft SQL Server.
- In addition to the security in your database package, you can help control who can access your RDS databases by using AWS Identity and Access Management (IAM) to define users and permissions. You can also help protect your databases by putting them in a virtual private cloud.

RDS AWS Components

- DB Instances
- Regions and Availability Zones
- Security Groups
- DB Parameter Groups
- DB Option Groups

DB Instance

- They are the building blocks of RDS. It is an isolated database environment in the cloud, which can contain multiple user-created databases, and can be accessed using the same tools and applications that one uses with a stand-alone database instance.
- A DB Instance can be created using the AWS Management Console , the Amazon RDS API, or the AWS Command line Interface .
- The computation and memory capacity of a DB Instance depends on the DB Instance class. For each DB Instance you can select from 5GB to 6TB of associated storage capacity.
- The DB Instances are of the following types:
 - Standard Instances (m4,m3)
 - Memory Optimised (r3)
 - Micro Instances (t2)

Regions and Availability Zones

- The AWS resources are housed in highly available data centers, which are located in different areas of the world. This “area” is called a region.
- Each region has multiple Availability Zones (AZ), they are distinct locations which are engineered to be isolated from the failure of other AZs.
- You can deploy your DB Instance in multiple AZ, this ensures a failover i.e. in case one AZ goes down, there is a second to switch over to. The failover instance is called a standby, and the original instance is called the primary instance.

Security Groups

- A security group controls the access to a DB Instance. It does so by specifying a range of IP addresses or the EC2 instances that you want to give access.
- Amazon RDS uses 3 types of Security Groups:
- VPC Security Group
 - It controls the DB Instance that is inside a VPC.
- EC2 Security Group
 - It controls access to an EC2 Instance and can be used with a DB Instance.
- DB Security Group
 - It controls the DB Instance that is not in a VPC.

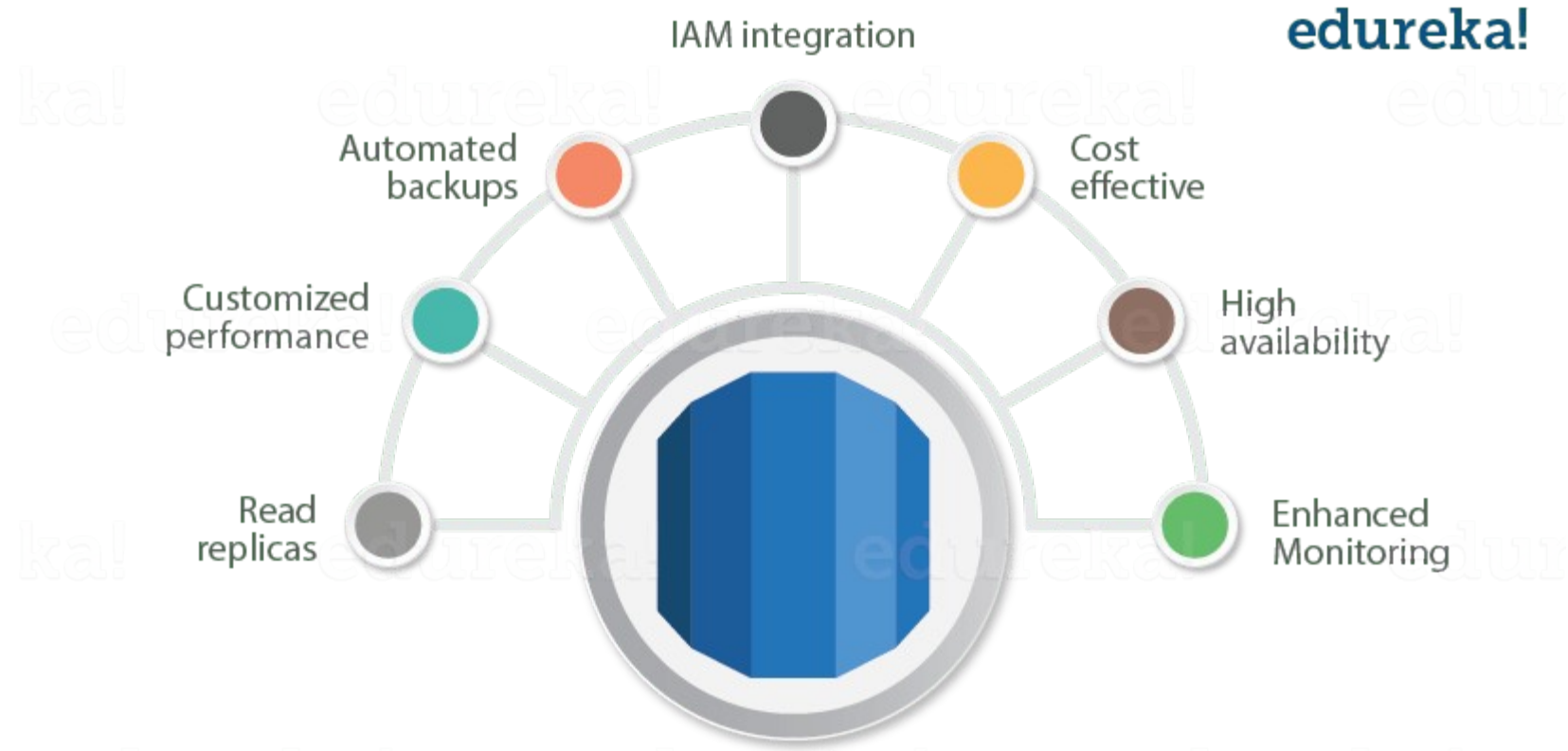
DB Parameter groups

- It contains the engine configuration values that can be applied to one or more DB Instances of the same instance type.
- If you don't apply a DB Parameter group to your instance, you are assigned a default Parameter group which has the default values.

DB Option groups

- Some DB engines offer tools that simplify managing your databases.
- RDS makes these tools available with the use of Option groups.

RDS Advantages




Demo




Hands- ON

First select RDS Service from the AWS management console

rds|

 **Compute**

EC2

Lightsail 

ECR


ECS

EKS

Lambda

Batch

Elastic Beanstalk

 **Storage**


S3

EFS

FSx

S3 Glacier

Storage Gateway

 **Database**


RDS

DynamoDB

ElastiCache

Neptune

Amazon Redshift

 **Analytics**


Athena

EMR

CloudSearch

Elasticsearch Service


Kinesis

QuickSight 

Data Pipeline

AWS Glue

MSK

 **Security, Identity, & Compliance**

IAM


Resource Access Manager

Cognito

Secrets Manager

GuardDuty

Inspector

Amazon Macie 

AWS Organizations

AWS Single Sign-On

Certificate Manager

Key Management Service

CloudHSM

Directory Service

RDS Dashboard

Create Database

Amazon RDS



Dashboard

Databases

Performance Insights

Snapshots

Automated backups

Reserved instances

Security groups

Subnet groups

Parameter groups

Option groups

Events

Event subscriptions

Recommendations 9



Amazon Aurora

Amazon Aurora is a MySQL- and PostgreSQL-compatible enterprise-class database, starting at <\$1/day. Aurora supports up to 64TB of auto-scaling storage capacity, 6-way r more.

Create database

Or, [Restore Aurora DB cluster from S3](#)

Resources

Refresh

You are using the following Amazon RDS resources in the EU West (Ireland) region (used/quota)

[DB Instances \(4/40\)](#)

Allocated storage (320.00 GB/100.00 TB)

[Click here to increase DB instances limit](#)

[Reserved instances \(0/40\)](#)

[Snapshots \(98\)](#)

Manual (28/100)

Automated (33)

[Recent events \(12\)](#)

[Event subscriptions \(0/20\)](#)

[DB Security groups \(1/25\)](#)

[Parameter groups \(8\)](#)

Default (7)

Custom (1/100)

[Option groups \(6\)](#)

Default (6)

Custom (0/20)

[Subnet groups \(2/50\)](#)

[Supported platforms](#) EC2,VPC

[Default network](#) none

Create database

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

[Restore from S3](#)

Create database

Note: your DB instances will launch in the EU West (Ireland) region

Service health

[View service health dashboard](#)

Current status

Details

Select Engine

For Example, Select MySQL
Click Next

Select engine

Engine options

☐ Amazon Aurora



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

Use-Case

RDS > Create database

Choose use case

Use case
Do you plan to use this database for production purposes?

Use case

- ☐ **Production - Amazon Aurora** Recommended
MySQL-compatible, enterprise-class database at 1/10th the cost of commercial databases.
- ☐ **Production - MySQL**
Use [Multi-AZ Deployment](#) and [Provisioned IOPS Storage](#) as defaults for high availability and fast, consistent performance.
- ☐ **Dev/Test - MySQL**
This instance is intended for use outside of production or under the [RDS Free Usage Tier](#).

Billing is based on [RDS pricing](#).

Cancel Previous Next

Specify DB Details

RDS > Create database

Specify DB details

Instance specifications

Estimate your monthly costs for the DB Instance using the [AWS Simple Monthly Calculator](#) 

DB engine

MySQL Community Edition

License model [Info](#)


general-public-license ▼

DB engine version [Info](#)

MySQL 5.6.40 ▼



Known Issues/Limitations

Review the [Known Issues/Limitations](#)  to learn about potential compatibility issues with specific database versions.



Free tier

The Amazon RDS Free Tier provides a single db.t2.micro instance as well as up to 20 GiB of storage, allowing new AWS customers to gain hands-on experience with Amazon RDS. Learn more about the RDS Free Tier and the instance restrictions [here](#).

☐ Only enable options eligible for RDS Free Usage Tier [Info](#)

DB instance class [Info](#)

db.r4.xlarge — 4 vCPU, 30.5 GiB RAM ▼

Multi-AZ deployment [Info](#)

☐ Create replica in different zone

Creates a replica in a different Availability Zone (AZ) to provide data redundancy, eliminate I/O freezes, and minimize latency spikes during system backups.

☒ No

Storage Type, Size, DB Credentials

Storage type [Info](#)

General Purpose (SSD) ▼

Allocated storage

20

GiB

(Minimum: 20 GiB, Maximum: 32768 GiB) Higher allocated storage [may improve](#) IOPS performance.

ⓘ

Provisioning less than 100 GiB of General Purpose (SSD) storage for high throughput workloads could result in higher latencies upon exhaustion of the initial General Purpose (SSD) IO credit balance. [Click here](#) for more details.

Estimated monthly costs

DB Instance	386.90 USD
Storage	2.54 USD
Total	389.44 USD

Billing estimate is based on on-demand usage as described in [Amazon RDS Pricing](#) [🔗](#). Estimate does not include costs for backup storage, IOs (if applicable), or data transfer.

Estimate your monthly costs for the DB Instance using the [AWS Simple Monthly Calculator](#) [🔗](#)

Settings

DB instance identifier [Info](#)

Specify a name that is unique for all DB instances owned by your AWS account in the current region.

mydbinstance

DB instance identifier is case insensitive, but stored as all lower-case, as in "mydbinstance". Must contain from 1 to 63 alphanumeric characters or hyphens (1 to 15 for SQL Server). First character must be a letter. Cannot end with a hyphen or contain two consecutive hyphens.

Master username [Info](#)

Specify an alphanumeric string that defines the login ID for the master user.

Master Username must start with a letter. Must contain 1 to 16 alphanumeric characters.

Master password [Info](#)

Confirm password [Info](#)

Advance Settings

Configure advanced settings

Network & Security

Virtual Private Cloud (VPC) [Info](#)

VPC defines the virtual networking environment for this DB instance.

EUROPE-VPC (vpc-a66651ce) ▼



Only VPCs with a corresponding DB subnet group are listed.

Subnet group [Info](#)

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

rds-db-net ▼

Public accessibility [Info](#)

☐ Yes

EC2 instances and devices outside of the VPC hosting the DB instance will connect to the DB instances. You must also select one or more VPC security groups that specify which EC2 instances and devices can connect to the DB instance.

☒ No

DB instance will not have a public IP address assigned. No EC2 instance or devices outside of the VPC will be able to connect.

Availability zone [Info](#)

No preference ▼

VPC security groups

Security groups have rules authorizing connections from all the EC2 instances and devices that need to access the DB instance.

☐ Create new VPC security group

☒ Choose existing VPC security groups

Choose VPC security groups ▼

default ✕

DB Options

Database options

Database name [Info](#)

dbname

Note: if no database name is specified then no initial MySQL database will be created on the DB Instance.

Port [Info](#)

TCP/IP port the DB instance will use for application connections.

3306

DB parameter group [Info](#)

default.mysql5.6

Option group [Info](#)

default:mysql-5-6

IAM DB authentication [Info](#)

☐ Enable IAM DB authentication

Manage your database user credentials through AWS IAM users and roles.

☒ Disable

Encryption

Encryption

☐ Enable encryption [Learn more](#)

Select to encrypt the given instance. Master key ids and aliases appear in the list after they have been created using the Key Management Service(KMS) console.

☒ Disable encryption



Backup



Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to detail [here](#).

Backup Monitoring

Backup

 Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to detail [here](#). 

Backup retention period [Info](#)

Select the number of days that Amazon RDS should retain automatic backups of this DB instance.

7 days ▼

Backup window [Info](#)

☐ Select window

☒ No preference

☒ Copy tags to snapshots

Monitoring

Enhanced monitoring

☐ Enable enhanced monitoring

Enhanced monitoring metrics are useful when you want to see how different processes or threads use the CPU.

☒ Disable enhanced monitoring

Log exports

Select the log types to publish to Amazon CloudWatch Logs

☐ Audit log

☐ Error log

☐ General log

☐ Slow query log

IAM role

The following service-linked role is used for publishing logs to CloudWatch Logs.

RDS Service Linked Role

Create Database

The screenshot shows the 'Create Database' configuration page in the AWS Management Console. It features two main sections: 'Maintenance' and 'Deletion protection'. The 'Maintenance' section has two sub-sections: 'Auto minor version upgrade' and 'Maintenance window'. Under 'Auto minor version upgrade', the 'Enable auto minor version upgrade' radio button is selected, with a description stating that it enables automatic upgrades to new minor versions as they are released during the maintenance window. The 'Disable auto minor version upgrade' option is also available. Under 'Maintenance window', the 'No preference' radio button is selected, with a description stating that it selects the period in which you want pending modifications or patches applied to the DB instance by Amazon RDS. The 'Deletion protection' section has a single checkbox labeled 'Enable deletion protection', which is currently unchecked, with a description stating that it protects the database from being deleted accidentally. At the bottom of the page, there are three buttons: 'Cancel', 'Previous', and 'Create database'.

Maintenance

Auto minor version upgrade [Info](#)

☒ Enable auto minor version upgrade
Enables automatic upgrades to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the DB instance.

☐ Disable auto minor version upgrade

Maintenance window [Info](#)
Select the period in which you want pending modifications or patches applied to the DB instance by Amazon RDS.

☐ Select 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.

Cancel Previous **Create database**

Connect using EndPoint

CO L !

