AWS Relational Database Serivce

By The Tech Stuff

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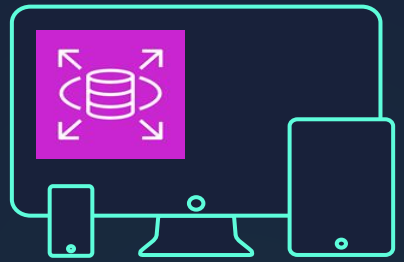
01

Introduction



Introduction

A managed relational database service provided by AWS. It simplifies the setup, operation, and scaling of a relational database in the cloud. With RDS, users can deploy databases in minutes with high availability, automated backups, and automated software patching, while only paying for the resources they use.

02

Key Features

Key Features

	Feature
01)	Automated Management
02)	High Availability & Scalability
03)	Security
04)	Backup & Recovery
05)	Monitoring & Metrics
06)	Performance
07)	Database Engines

Automated Management

Automated Backups

RDS provides automated backups, allowing point-in-time recovery for your databases. The automated backup feature enables recovery of your database to any point within the backup retention period.

Automated Patching

RDS performs automatic patching of the database engine and underlying hardware, ensuring that your database is always up-to-date with the latest security patches and features.

High Availability & Durability

Multi-AZ Deployment

For production workloads, RDS supports Multi-AZ deployments to enhance availability and durability. RDS automatically creates a primary database instance and synchronously replicates the data to a standby instance in a different Availability Zone (AZ).

Automated Failover

In the event of an infrastructure failure (e.g., an AZ outage), Amazon RDS automatically performs a failover to the standby instance without manual intervention.

Scalability

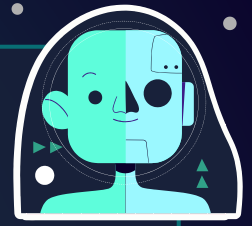
Vertical Scaling

Users can scale the compute and memory resources of their database instance by selecting a new instance type and applying the changes. This can be done with minimal downtime in many cases.

Storage Scaling

Storage can be scaled up without affecting database availability, providing flexibility to grow as your storage requirements increase.

Security



Network Isolation

ensures that your database instances are secure and accessible

Encryption

supports encryption at rest using AWS Key Management Service (KMS) and encryption in transit using SSL/TLS.

IAM Integration

Integrates with AWS (IAM) to control access to database instances.

Backup & Recovery

Manual Snapshots

In addition to automated backups, users can create manual snapshots of their database instances, which are retained until explicitly deleted.

Point-in-Time Recovery

RDS allows users to restore databases to a specific point in time within the backup retention period, providing protection against data loss or corruption.

Monitoring & Metrics

Amazon CloudWatch

RDS provides detailed monitoring metrics for the database instances. Users can monitor key metrics such as CPU, memory, storage, and I/O activity.

Enhanced Monitoring

Provides real-time metrics for the operating system that your DB instance runs on, providing more in-depth monitoring capabilities.

Performance

Read Replicas

supports read replicas for MySQL, PostgreSQL, MariaDB, and Aurora. Read replicas can be used to offload read traffic from the primary database instance, improving read performance and scalability.

Provisioned IOPS

RDS offers Provisioned IOPS (SSD) storage for applications with high I/O requirements, ensuring consistent performance.

Database Engines

- Amazon Aurora
- MySQL
- PostgreSQL
- MariaDB
- Oracle
- Microsoft SQL Server

03

Read Replicas

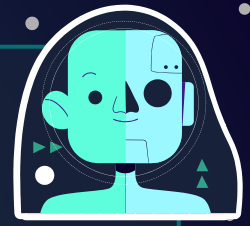
Definition and Purpose

Read Replicas in Amazon RDS are designed to support read-heavy database workloads and improve the performance and availability of your applications. They provide a mechanism for replicating data from a source DB instance to one or more read-only replicas.

Use Cases

Use Case	Description
Scaling Read Workloads	When an application experiences high read traffic, read replicas can distribute the load.
Backup and Recovery	can be used to perform DB backups and recovery operations without impacting the primary DB instance.
Disaster Recovery	Cross-region read replicas provide an effective disaster recovery solution.

Considerations



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Read replicas are read-only; write operations cannot be performed directly on them.

02

There is a replication lag, although usually minimal, that needs to be considered for applications requiring near real-time data consistency.

04

Multi AZ Disaster Recovery

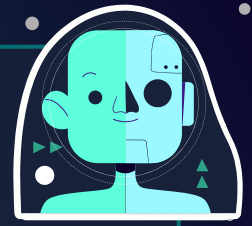
Definition and Purpose

Multi-AZ (Availability Zone) deployment in Amazon RDS ensures high availability and durability for your database instances. It automatically replicates the database across multiple Availability Zones within an AWS region.

Use Cases

Use Case	Description
Production Databases	Ensures high availability and fault tolerance for production databases.
Business Continuity	Ensures minimal downtime during maintenance or unexpected outages
Disaster Recovery	Provides an automated disaster recovery solution within a region.

Considerations



01

Multi-AZ deployment is primarily focused on high availability rather than read scaling. For read scaling, read replicas should be used.

02

There is a cost associated with Multi-AZ deployment due to the additional resources used for standby instances.

10 Minute Break

05

RDS Custom

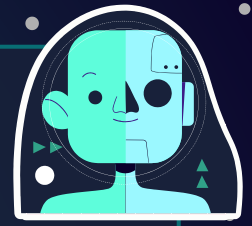
Definition and Purpose

RDS Custom is a managed database service that provides more customization and control over your database environment. It allows users to customize the underlying database infrastructure and software configurations to meet specific requirements that are not supported by the standard RDS configurations.

Use Cases

Use Case	Description
Legacy Applications:	Applications that require specific database configurations or customizations not supported by standard RDS.
High Customization Needs	Workloads that require custom scripts, software installations, or configurations.
Extended DB Functionality	When additional database functionalities, such as custom extensions or plugins, are needed.

Considerations



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RDS Custom provides more control but also requires more management compared to standard RDS instances.

02

Ensure that the additional control and customization capabilities are necessary for your use case to justify the increased management overhead.

06

Use Cases

Use Cases

- [x] Web App and mobiles
- [ ] E-commerce
- [ ] Content Management
- [x] Data Warehousing
- [ ] Development and Testing

07

Cost Management

Cost Management

On Demand

Pay for database instances by the hour with no long-term commitments.

Reserved

Savings over on-demand pricing for users who commit to using RDS for a 1- or 3-year term.

Aurora Serverless

Unpredictable workloads, where the database automatically starts up, shuts down, and scales capacity based on your needs.

08

Other DB Services

Other DB Services

- AWS Dynamodb
- AWS Redshift
- AWS DocumentDB
- AWS Neptune
- AWS Elasticache
- AWS Memory DB

THANKS!

Do you have any questions?
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