STEMUP

AWS RDS

Relational Database Service

Firstname	Lastname	City	Contact
Paul	Philips	London	39899829
Raju	Sharma	Ranchi	90890288
Keto	Leri	Tokyo	50505005
Sham	Sha	Delhi	602020

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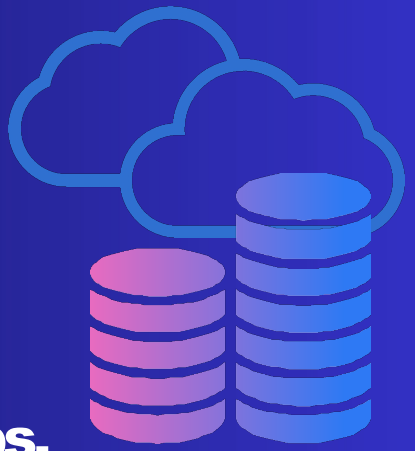
What is AWS RDS?



AWS RDS as a managed database service that simplifies database setup, operation, and scaling.

Purpose: handling administrative tasks like backups, patching, monitoring, and scaling.

Engine type Info

- ○ Aurora (MySQL Compatible)

- ◉ Aurora (PostgreSQL Compatible)

- ○ MySQL

- ○ MariaDB

- ○ PostgreSQL

- ○ Oracle

ORACLE

- ○ Microsoft SQL Server

Microsoft SQL Server

- ○ IBM Db2

IBM **Db2**

Practical

EC2

Docker

Node-App

RDS

MySQL

RDS Instance

- Create a RDS MySQL instance
  - Use Free Tier
  - Username will be 'admin' and you can set password (you can't use special character)
  - Keep the Public access to True to access it from Local or remote server
  - Create a security group (and allow 3306 from everywhere)
  - After creating, you can find Endpoint (hostname) to connect to this DB.

EC2 Instance

- sudo yum install -y docker
- sudo service docker start
- sudo usermod -aG docker ec2-user
- sudo docker pull philippaul/node-mysql-app:02

- docker run --rm -p 80:3000
-e DB_HOST="your-db-hostname"
-e DB_USER="your-db-username"
-e DB_PASSWORD="your-db-password"
-d philippaul/node-mysql-app:02

- docker run -it --rm mysql:8.0 mysql -h db.example.com -u admin -p

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Aurora offers:

- Up to 5x the throughput of MySQL Community Edition & 3x of PostGres
- Up to 128 TB of autoscaling SSD storage
- Six-way replication across three Availability Zones
- Up to 15 read replicas with replica lag under 10-ms
- Automatic monitoring with failover

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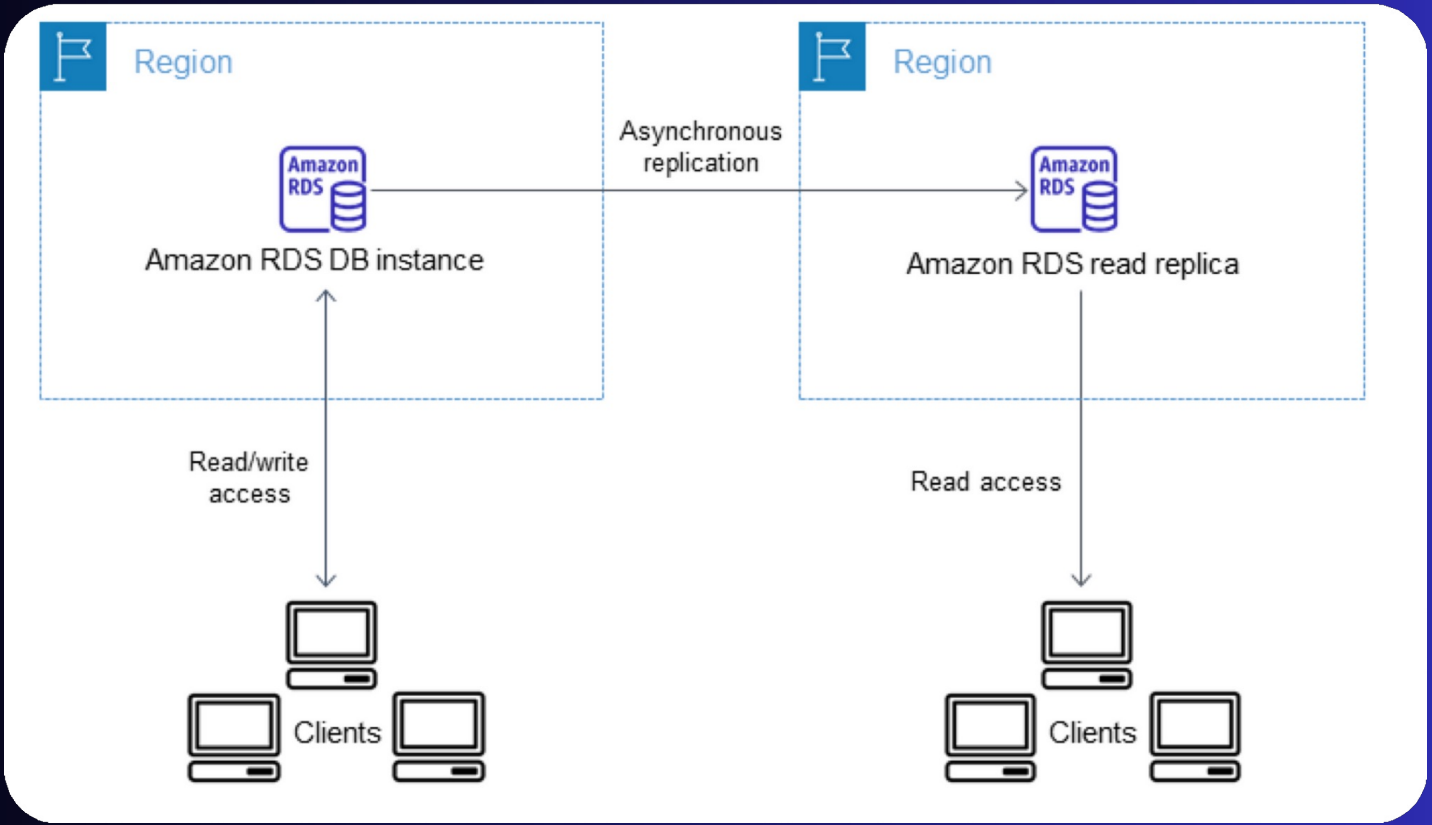
Benefits of Using RDS:

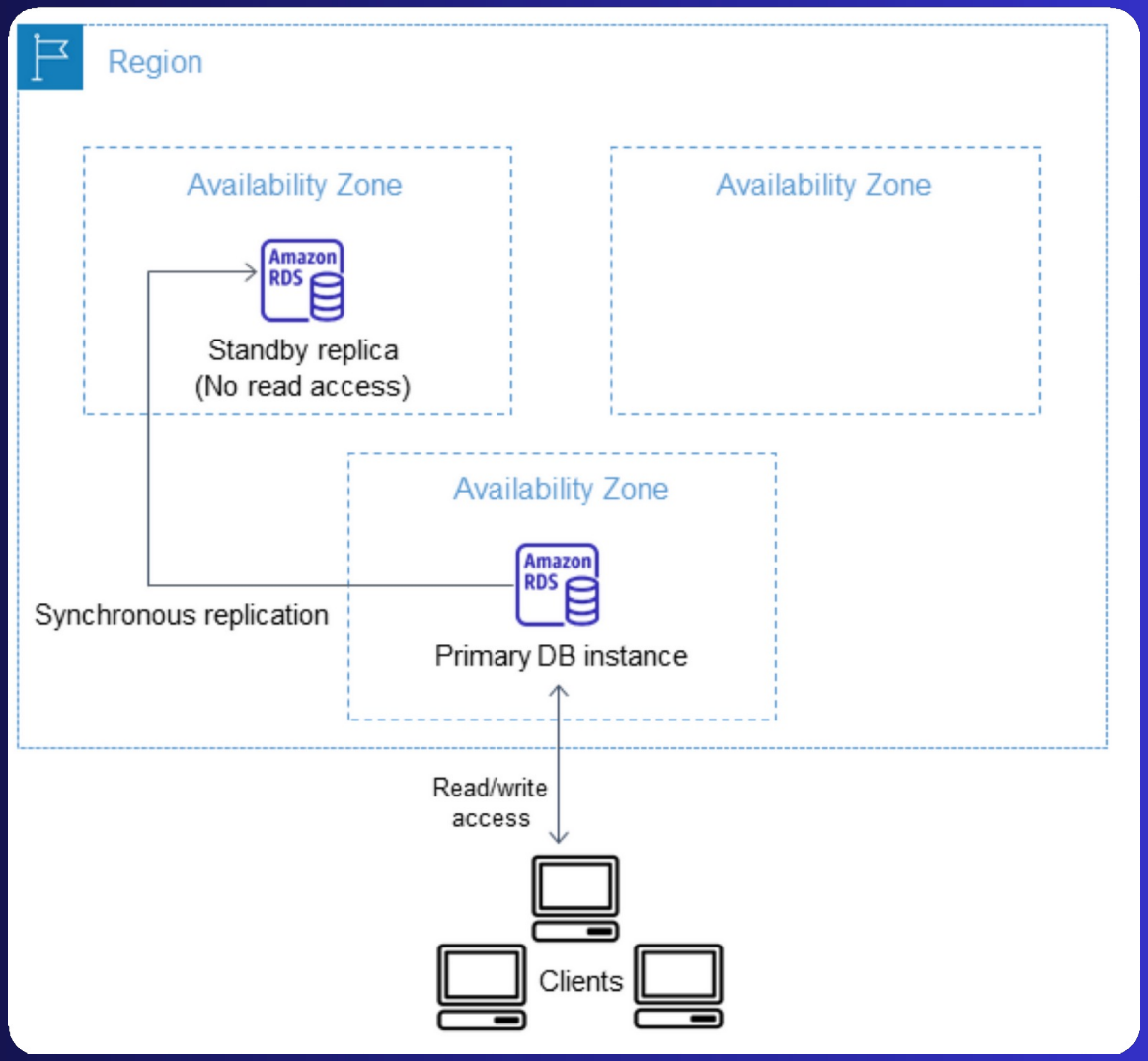
- High availability and fault tolerance.
- Vertical and Horizontal Scaling
- Automated backups and recovery.
- Read replicas for improved read performance
- Multi AZ setup for DR (Disaster Recovery)
- Cost-effectiveness.

Feature	How It Works	Purpose
Multi-AZ Deployment	Synchronous replication to standby in a different AZ with automatic failover.	High Availability and fault tolerance.
Read Replicas	Asynchronous replication to read-only instances, in the same or different regions.	Horizontal scaling for read-heavy workloads.
Automated Backups	Daily backups and transaction log storage for point-in-time recovery.	Data durability and recovery.
Manual Snapshots	User-initiated snapshots stored indefinitely.	Long-term storage and recovery options.
VPC and Security Groups	Network isolation and traffic control within a VPC.	Network security and restricted access.
CloudWatch, Enhanced Monitoring, Performance Insights	Real-time monitoring, OS-level metrics, and query analysis.	Performance optimization and troubleshooting.
Encryption and IAM	KMS-based encryption for storage, SSL/TLS for transit, IAM access control.	Data security and access management.

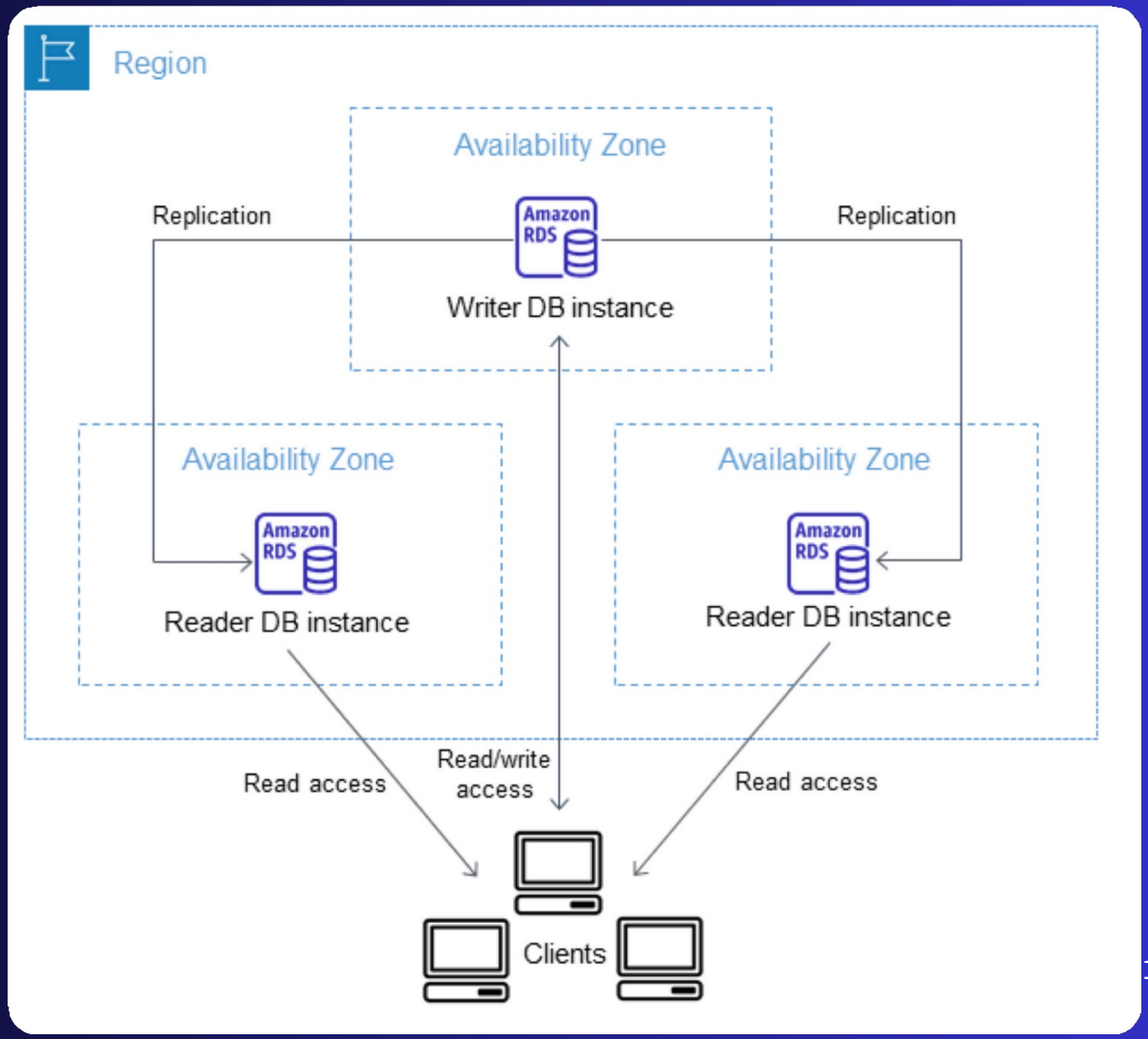
RDS Read Replica - Multi Region



RDS
Multi - AZ


Region
Availability Zone
Availability Zone
Amazon RDS
Standby replica
(No read access)
Availability Zone
Amazon RDS
Synchronous replication
Primary DB instance
Read/write access
Clients

RDS
Multi - AZ


Region
Availability Zone
Replication
Amazon RDS
Replication
Writer DB instance
Availability Zone
Availability Zone
Amazon RDS
Amazon RDS
Reader DB instance
Reader DB instance
Read access
Read/write access
Read access
Clients

Common Use Cases for RDS:

- Web Applications: Relational databases are ideal for web apps requiring structured data.
- E-commerce Platforms: For handling inventory, customer data, and order transactions.
- Business Applications: ERP, CRM, and financial applications with strong data integrity needs.