

# AWS RDS Notes

## (Relational Database Service)

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

→ Amazon RDS is a fully managed cloud database service.

→ It allows you to create, operate & scale relational database easily without managing hardware, backups or patching.

### Steps to Create & Connect

#### RDS Instance (Step-1)

→ Create RDS MySQL instance

→ Else free tier / customize according to you.

→ Username will be 'admin' & you can set password (you can't use special characters)

→ Keep 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.

Step-2 done in two way for EC2 instance

ii) Using docker (docker run -it --rm mysql:8.0 mysql -h db.example.com -uadmin -p).

EC2 instance

- o Go to EC2 dashboard
- o Launch an instance
- o Connect & open terminal
- o sudo yum install -y docker
- o sudo service docker start
- o sudo usermod -aG docker ec2-user
- o sudo docker pull Docker image :02 (version / variant)
- o docker run -it -p 80:3000
  - e DB\_HOST = "your-db-hostname"
  - e DB\_USER = "your-db-password-username".
  - e DB\_PASSWORD = "your db password"

-d Docker image : version

ii) Simple without docker

EC2 instance

- o Launch an EC2 instance
- o Open Terminal
- o SSH into EC2

- ⇒ sudo apt update
  - ⇒ sudo apt install nodejs npm mysql-client -y
  - ⇒ node -v
  - ⇒ npm -v
- ⇒ deploy nodejs app that connect to oracle by host, username, password, and db name.

Then,

- ⇒ npm init -y
- ⇒ npm install express mysql 1.2
- ⇒ node app.js

# Snapshots ⇒ also make snapshots and keep data backups.

- also restore using snapshots
- By Take snapshot manually.
- By Take snapshot automatically.

### Key Features

1. managed Services :- AWS handles DB provisioning, backups, patching, scaling and failovers.
2. Automated Backup + Daily snapshots + point in time recovery (up to 35 days).

- Multi-AZ-deployment :- automatically replicates DB in another AZ for high availability.
- Read Replicas :- improve read performance by offloading traffic to replicas DBs.
- Monitoring :- Integrate with Amazon CloudWatch & Performance Insights.
- Security :- IAM, VPC, encryption at rest & in transit, security groups.

### Supported Database Engines

#### Engines

MySQL → open source, widely used.

PostgreSQL → advance SQL support, extensible.

MariaDB → MySQL-compatible fast.

Oracle → Enterprise-grade, license required

SQL Server → Microsoft ecosystem.

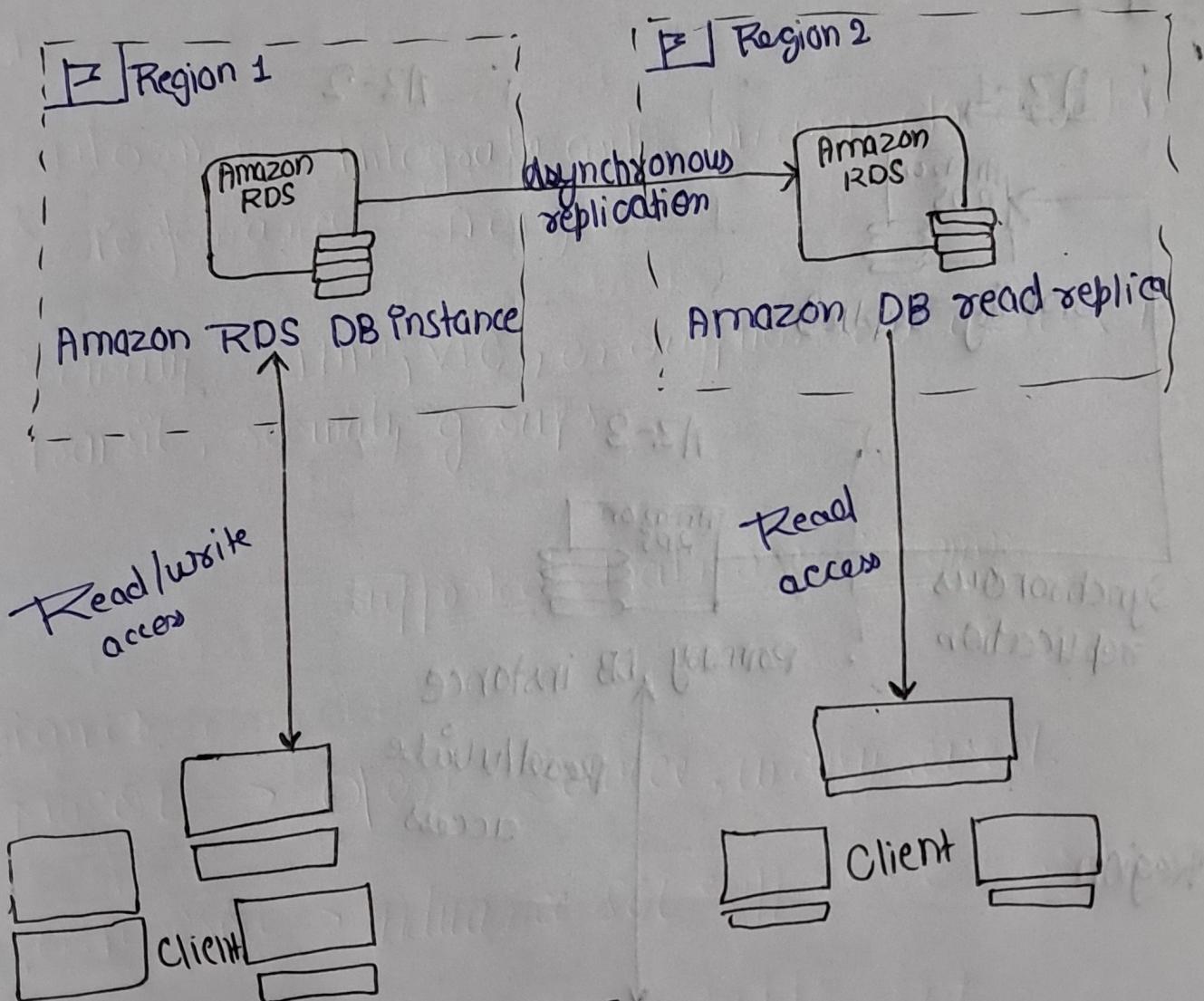
- ⇒ Amazon Aurora → it is Amazon-native engine
  - Aurora up to 5x the throughput of MySQL community edition & 3x of PostgreSQL.
  - Up to 128 TB of autoscaling SSD storage
  - Six way replication across three availability zones.
  - Up to 15 read replicas with replica lag under 10 ms
  - Automatic monitoring with CloudWatch Metrics

### Benefits of Using RDS

- ⇒ High availability & fault tolerance.
- ⇒ Vertical and Horizontal Scaling
- ⇒ Automated backups & recovery.
- ⇒ Read replicas for improved read performance.
- ⇒ multi AZ setup for Disaster Recovery.
- ⇒ Cost effectiveness.
- ⇒ Data security and access management using Encryption and IAM.

## RDS Read Replica - Multi Region

In RDS read replica is a read only copy of your primary database instance. It helps improve performance & scalability, especially for read-heavy applications.



### # How to Create in AWS

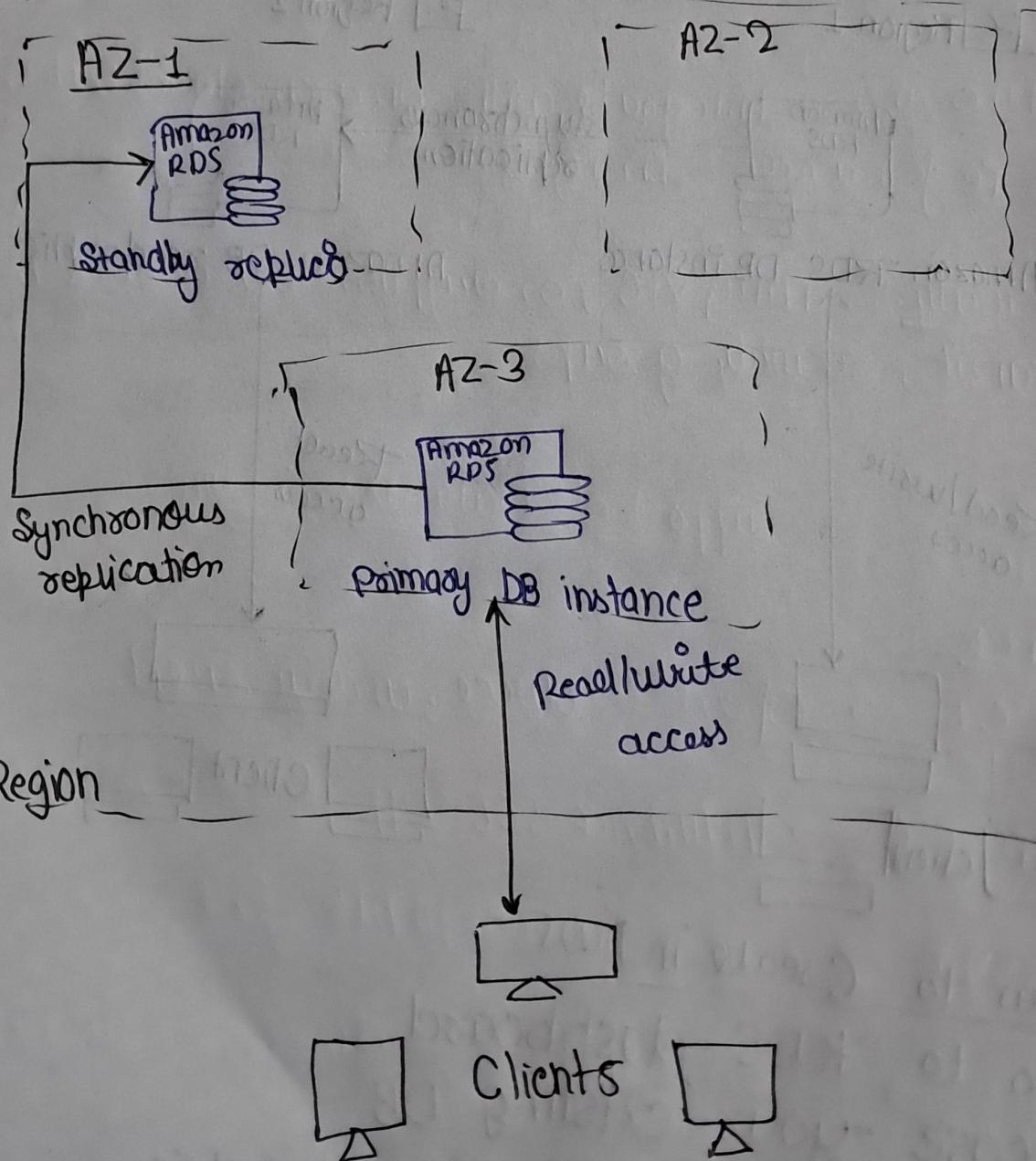
1. Go to RDS dashboard
2. Choose your existing DB
3. Click Actions → Create read replica.
4. Configure: Instance Size

- = Multi-AZ (optional)
- = Storage

5. Click Create Read Replica

# RDS Multi-AZ (Availability zone)

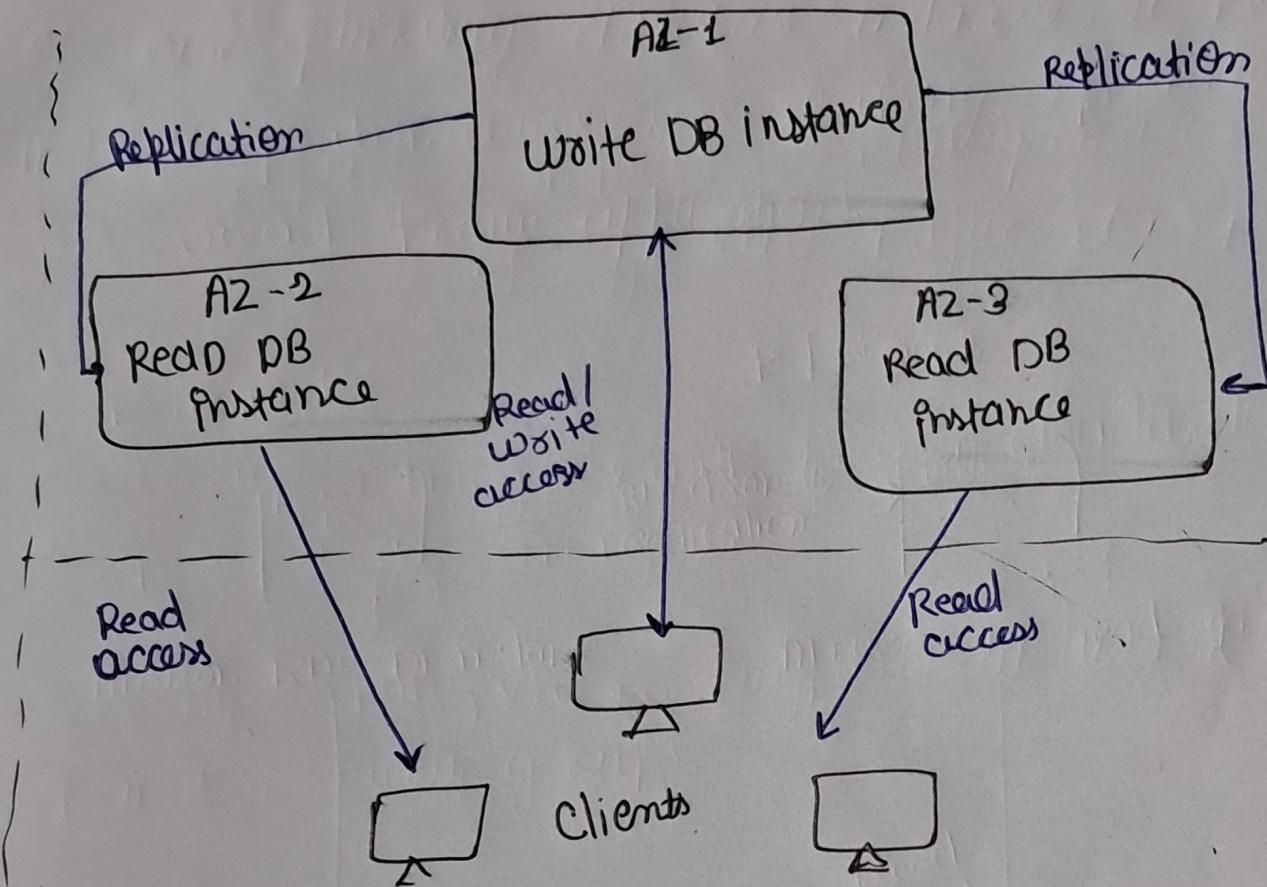
Setup 1



Region → AZ → System  
 AZ-1 become secondary source as come after AZ-3 base.

## RDS Multi-AZ - Setup - 2

Region



→ Read from all AZ  
→ But Write from main One.

# Common Use cases for RDS :-

= Web application :- Relational database are ideal for web apps requiring structured data.

= E-commerce :- For handling inventory, customers data, and order transaction.

= Business application :- ERP, CRM, and financial application with strong data integrity needs