Amazon Web Services

Relational Database Service

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Relational Database Service - RDS

- Amazon RDS supports an array of database engines to store and organize data. It also helps with relational database management tasks, such as data migration, backup, recovery and patching.

- **Advantage of RDS**

- Automatic Backups
- Multi Availability Zone
- Read Replica

RDS - Backup

- Backup refers to the copying of physical or databases to a secondary location for preservation in case of equipment failure.

- **Types of Backups**

- Automatic Backup
- Manual Backup

RDS – Backup

- Automatic backup is a type of data backup model that requires little or no human intervention in backing up and storing data from a local network/system to a backup facility.
- Automating the backup process saves time and complexity required to manually back up a computer, network or IT environment.
- Automatic backup allow us to recover our database to any point in time within a retention period. The retention period can be between 1 and 35 days.
- Default Retention Period is 7 Days
- Automatic backups will take a full daily snapshot and will also store transaction logs throughout the day. When we do a recovery, AWS will first choose the most recent daily backup, and then apply transaction logs relevant to that day.
- After they are deleted, the automated backups can't be recovered.
- Automatic backups are enabled by default

RDS – Backup

- **Automated backups rule:**

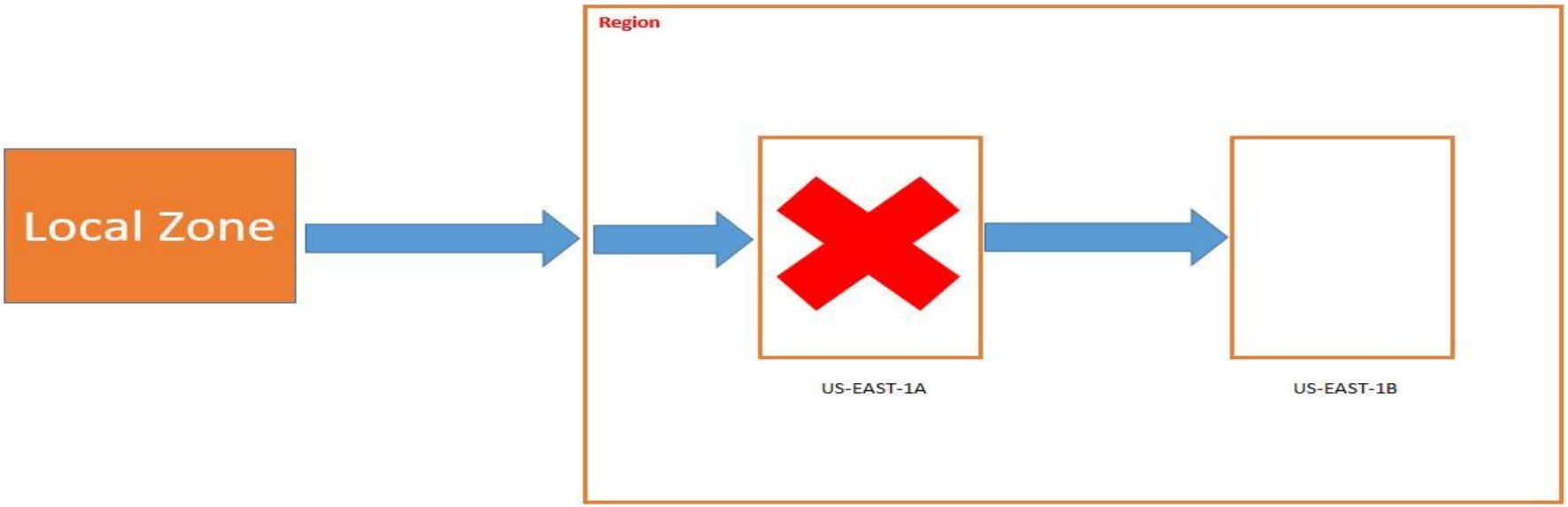
- Our DB instance must be in the AVAILABLE state for automated backups to occur. Automated backups don't occur while your DB instance is in a state other than AVAILABLE, for example STORAGE_FULL.

- **Manual Backup**

- Manual Backup are also called as Snapshot.
- Database Snapshot are done manually. They are stored even after we delete the original RDS instance, unlike automatically backups.
- We can have up to 100 manual snapshots per Region.

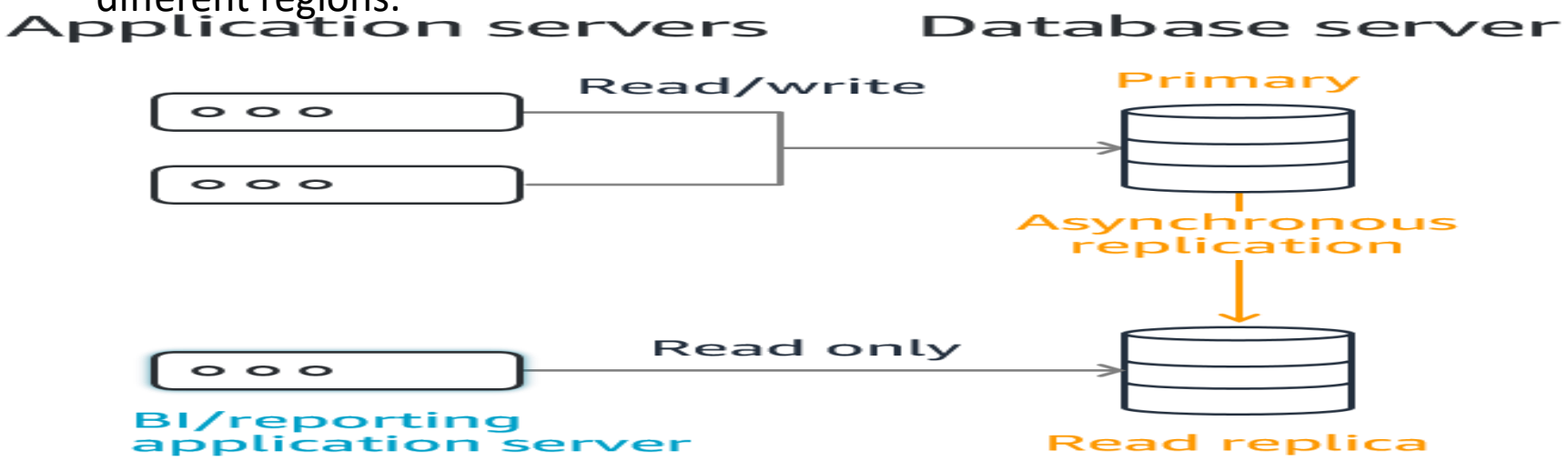
RDS – Multi Availability Zone

- Multi AZ allow us to have an exact copy of our production database in another AZ. AWS handles the replication for us. When our production database is written to, this write will automatically be synchronized to the stand by database.
- In the event of planned database maintenance, database instance failure or and Availability zone failure, Amazon RDS will automatically failover to the standby so that database operations can resume quickly without administrative intervention.
- Both Database Servers have same DNS endpoints



RDS – Read Replica

- Read replica allows us to have a read only copy of our production database.
- Amazon RDS Read Replicas provide enhanced performance and durability for RDS database (DB) instances.
- They make it easy to elastically scale out beyond the capacity constraints of a single DB instance for read-heavy database workloads.
- We can have up to 5 read replica copies of any database.
- We can have read replicas of read replicas (But Latency will be there)
- When we create a read replica, RDS gives us a read-only endpoint which is a DNS that resolves only to our read replica.
- A read replica and the master may be in different availability zones, and even in different regions.



RDS – Read Replica VS Multi AZ

Multi-AZ Deployments	Read Replicas
Synchronous replication – highly durable	Asynchronous replication – highly scalable
Only database engine on primary instance is active	All read replicas are accessible and can be used for read scaling
Automated backups are taken from standby	No backups configured by default
Always span two Availability Zones within a single Region	Can be within an Availability Zone, Cross-AZ, or Cross-Region
Database engine version upgrades happen on primary	Database engine version upgrade is independent from source instance
Automatic failover to standby when a problem is detected	Can be manually promoted to a standalone database instance

RDS

- Click on RDS
- Click on create database
- Select standard create as database creation method
- Select MySQL (It is open source database & it is given as free trail)
- Select free tier
- Enter the database name
- Enter Master password & confirm password

RDS

- Database instance class
- Go to Storage
- Go to Availability & Durability
- Go to Connectivity
- Select default VPC & Select default subnet group
- Select Yes for Public Access

RDS

- Select Create new for Security group & enter the name for security group
- Select availability Zone
- Click on Additional Configuration
- Automatic Backup
- Click on Create database

RDS – Connect with Workbench

- Download MYSQL Workbench: **Click Here**
- Click on Database identifier
- Note down the endpoint & port number
- Open MySQL Workbench
- Click on Database
- Click on Connect to database

RDS – Connect with Workbench

- Enter hostname
- Enter username (admin)
- Click on store in vault
- Enter password
- Click on ok
- SQL Query: **Click Here**

RDS – Create Read Replica

- Click on create read replica
- System will create

RDS – Manual Snapshot

- Click on take snapshot

- **Note: While practice don’t click on take snapshot otherwise we will start getting bill.**

RDS – Restore Snapshot

- **Restore Backup**

- Click on Automatic Backup

RDS – Enable Multi Availability Zone

- Select the instance
- Click on Modify
- Go to Availability & Durability
- Select create a standby instance

RDS – Delete the Database

- Select the Instance

- Uncheck create final snapshot
- Acknowledge the deletion
- Enter delete me
- Click on Delete

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