DATE : 04.02.2025

DT/NT : NT

LESSON : AWS

SUBJECT : AWS-RDS

BATCH : B 303

AWS-DEVOPS

TECHPRO EDUCATION

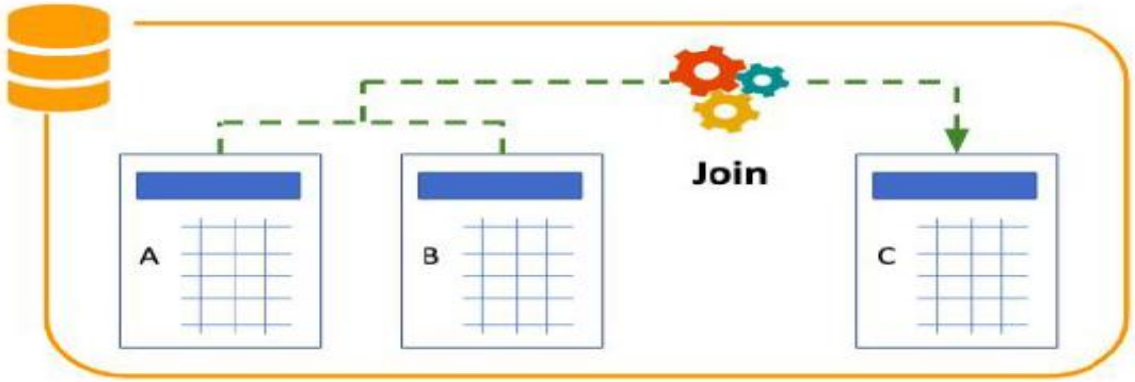
Introduction to Database

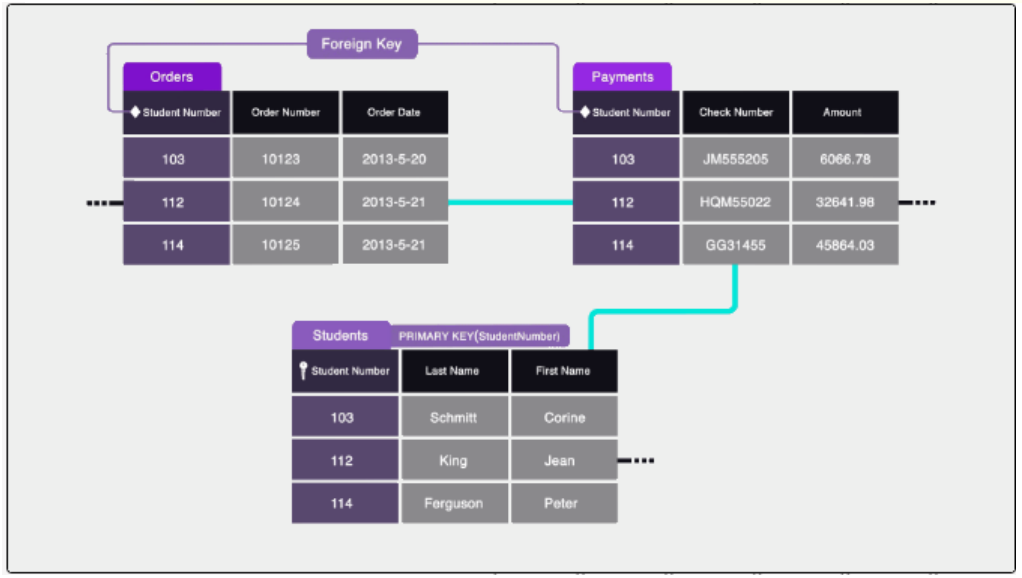
Introduction to Database

What is Database?

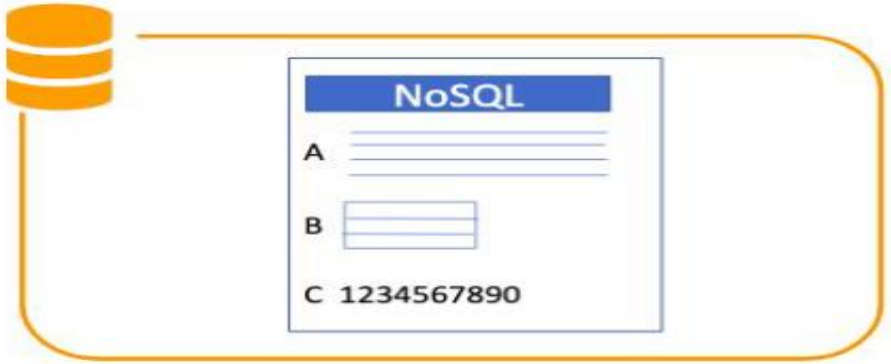
Types of Databases

Relational/SQL





Non-Relational/NoSQL



Document 1

```
{
  "id": "1",
  "name": "John Smith",
  "isActive": true,
  "dob": "1964-30-08"
}
```

Document 2

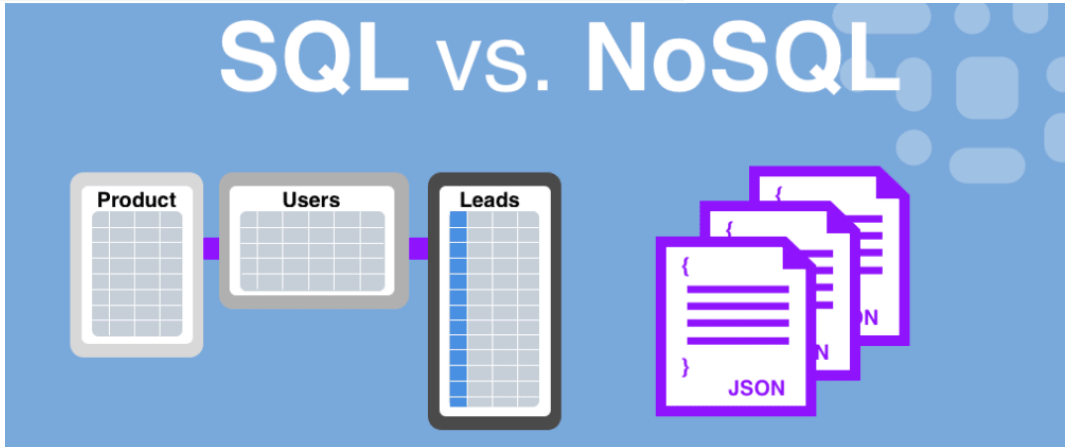
```
{
  "id": "2",
  "fullName": "Sarah Jones",
  "isActive": false,
  "dob": "2002-02-18"
}
```

Document 3

```
{
  "id": "3",
  "fullName":
  {
    "first": "Adam",
    "last": "Stark"
  },
  "isActive": true,
  "dob": "2015-04-19"
}
```

Types of Databases

SQL	NoSQL
Relational	Non-Relational
Table-based	Document-based, key-value pairs, graph databases or wide-column stores
Predefined Schema	Dynamic Schema
Uses SQL	As the name suggest, it doesn't use SQL
Used for complex queries	Used for simple queries
Available for **Join** function	Not available for **Join** function



What is AWS Database Services ?

RDS

- Manages relational database
- Handles structured & tabular data

Dynamo

- NoSQL database
- Document and key-value store
- Handles unstructured data

ElastiCache

- In-Memory Cache
- Improves the performance of any web application

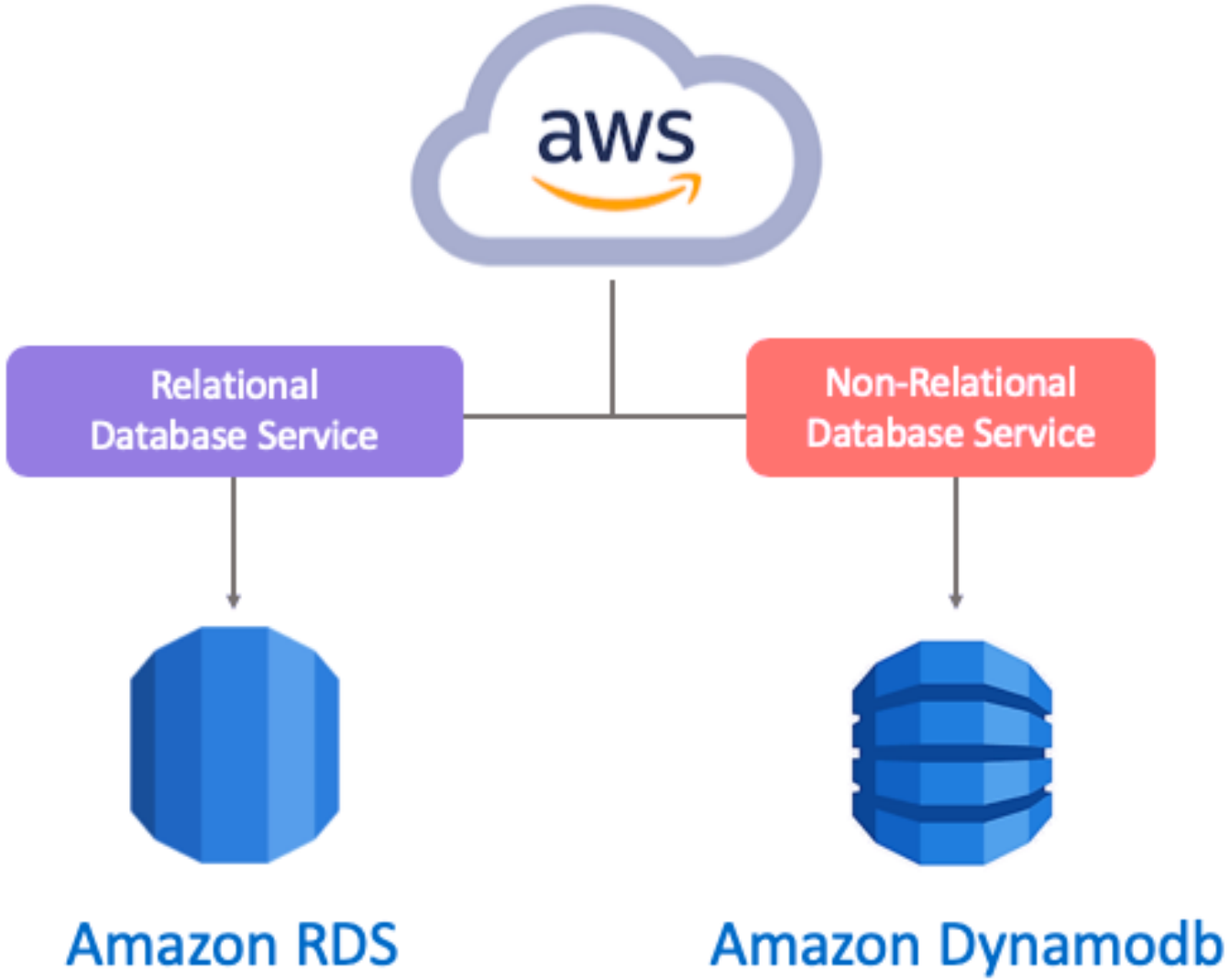
Redshift

- Data Warehouse
- It is used for data analysis and reporting

Aurora

- MySQL-compatible relational database with 5X performance

AWS Databases



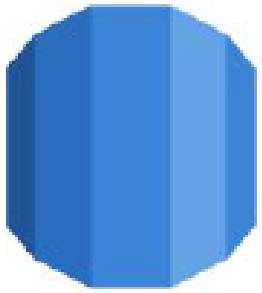
What is Amazon Relational Database (Amazon RDS)?

- **Relational databases** store data in a table form with rows and columns and use SQL query language to query the data. In these databases, columns represent attributes and rows represent records. Each field in the table represents a data value.
- **Amazon Relational Database Service (Amazon RDS)** makes it easy to spin up a database in the AWS cloud in just a few minutes. Amazon RDS is the most commonly used and a managed database service that automates all the time-consuming administration tasks such as provisioning, setup, patching, and backups.
- Amazon RDS provides seven different relational database options:

Self-managed Database vs. AWS-managed Database

Self-managed database	AWS-managed database
You have full responsibility for upgrades and backup	AWS provides upgrades, backup, and failover as a service
You have full responsibility for security	AWS provides high infrastructure security and certifications, and gives you tools to ensure DB security
Full control over parameters of server, OS, and database	Database is a managed appliance, so you can easily automate
Replication is expensive and complex and requires a lot of engineering	AWS provides failover as a packaged service

Components of Amazon RDS



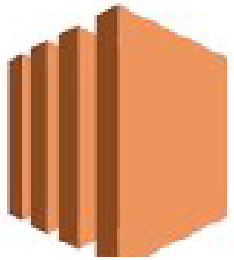
Amazon RDS

Database Engines

db.t2.micro

DB Instance

Storage Disk



EC2

AMI

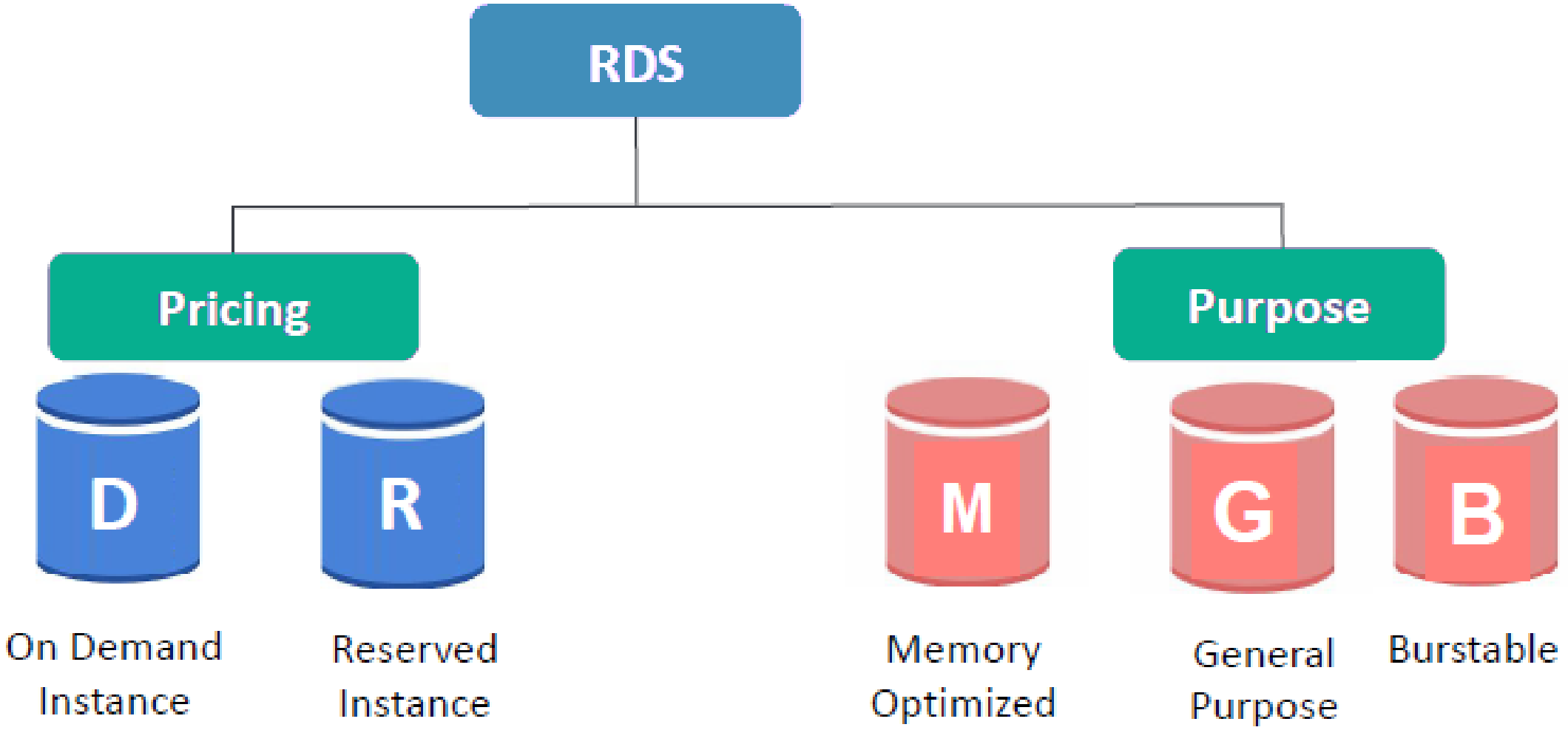
Instance Type

t2.micro

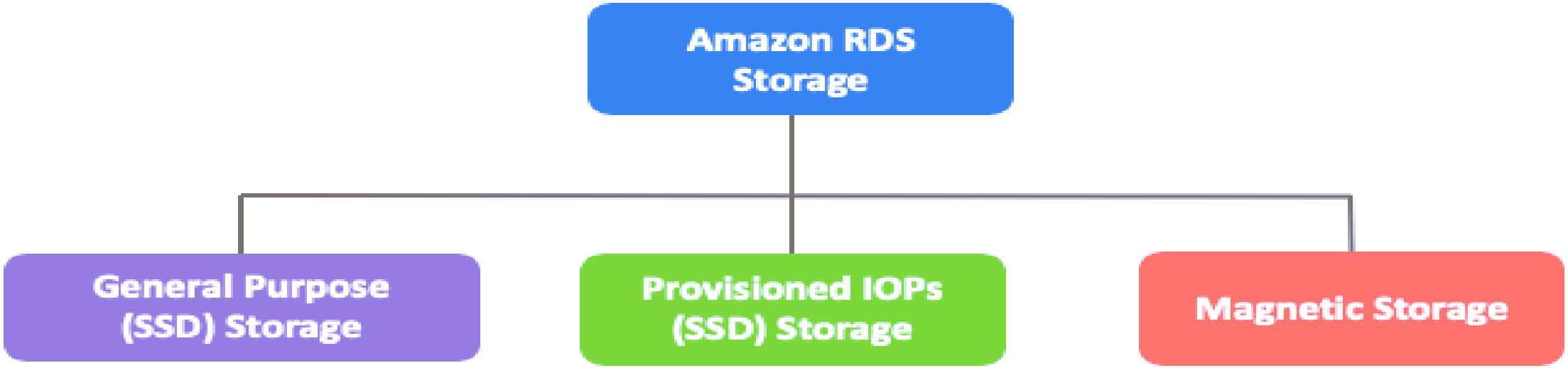
Storage Disk/
Root Volume

RDS - Database Engines

RDS - Database Instance



RDS - Instance Storage



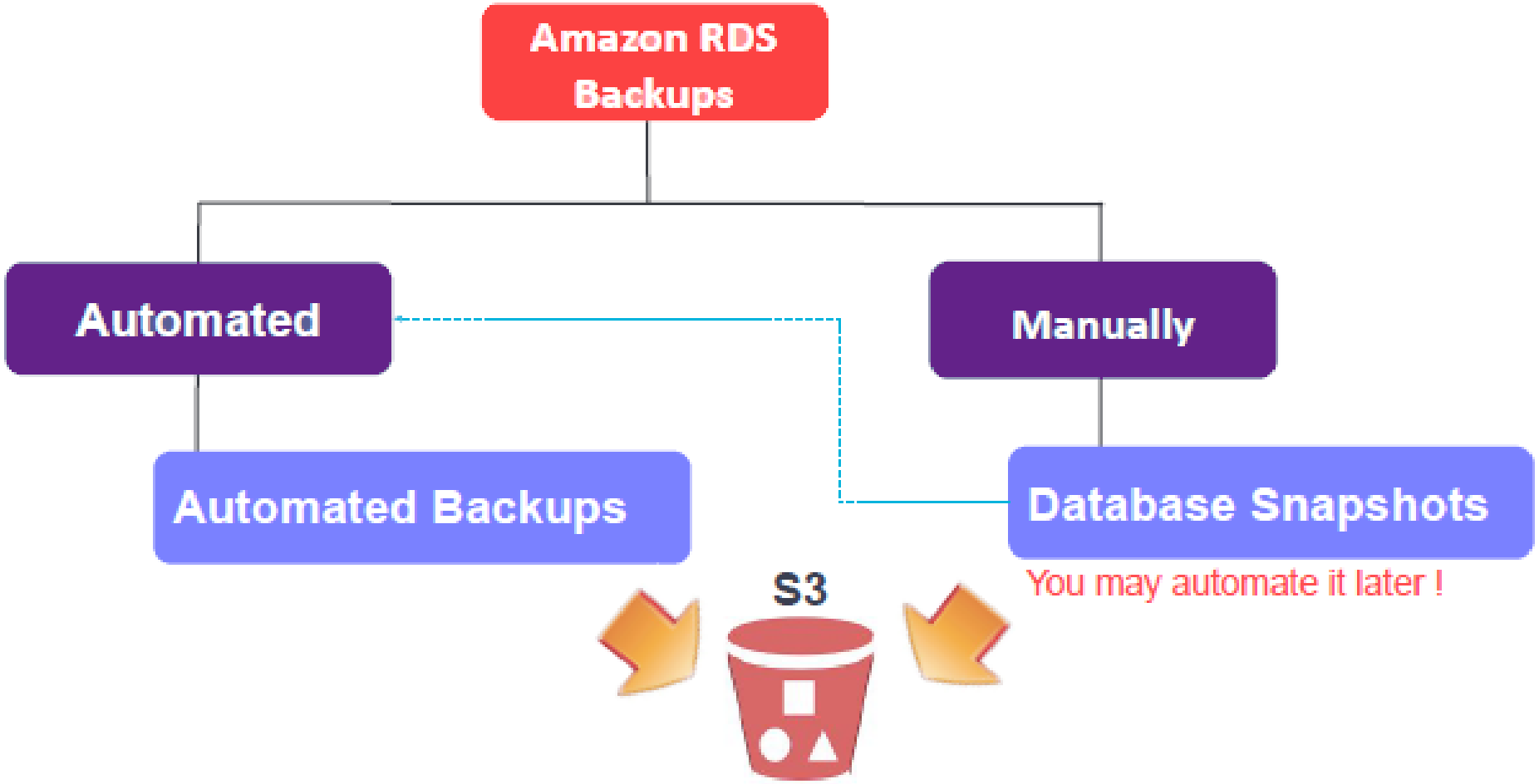
Cost-effective

Fast and consistent I/O

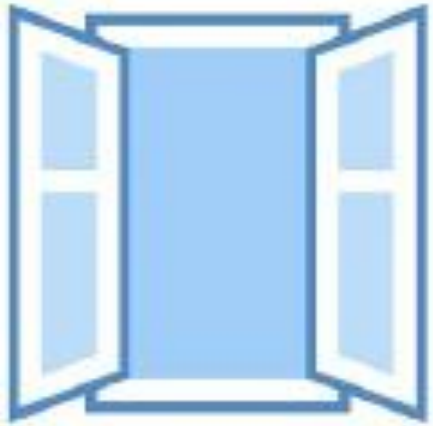
Not recommended

There is an important factor in the databases as much as CPU and RAM power, which is the value of IOPs of storage

RDS - DB Instance Backups



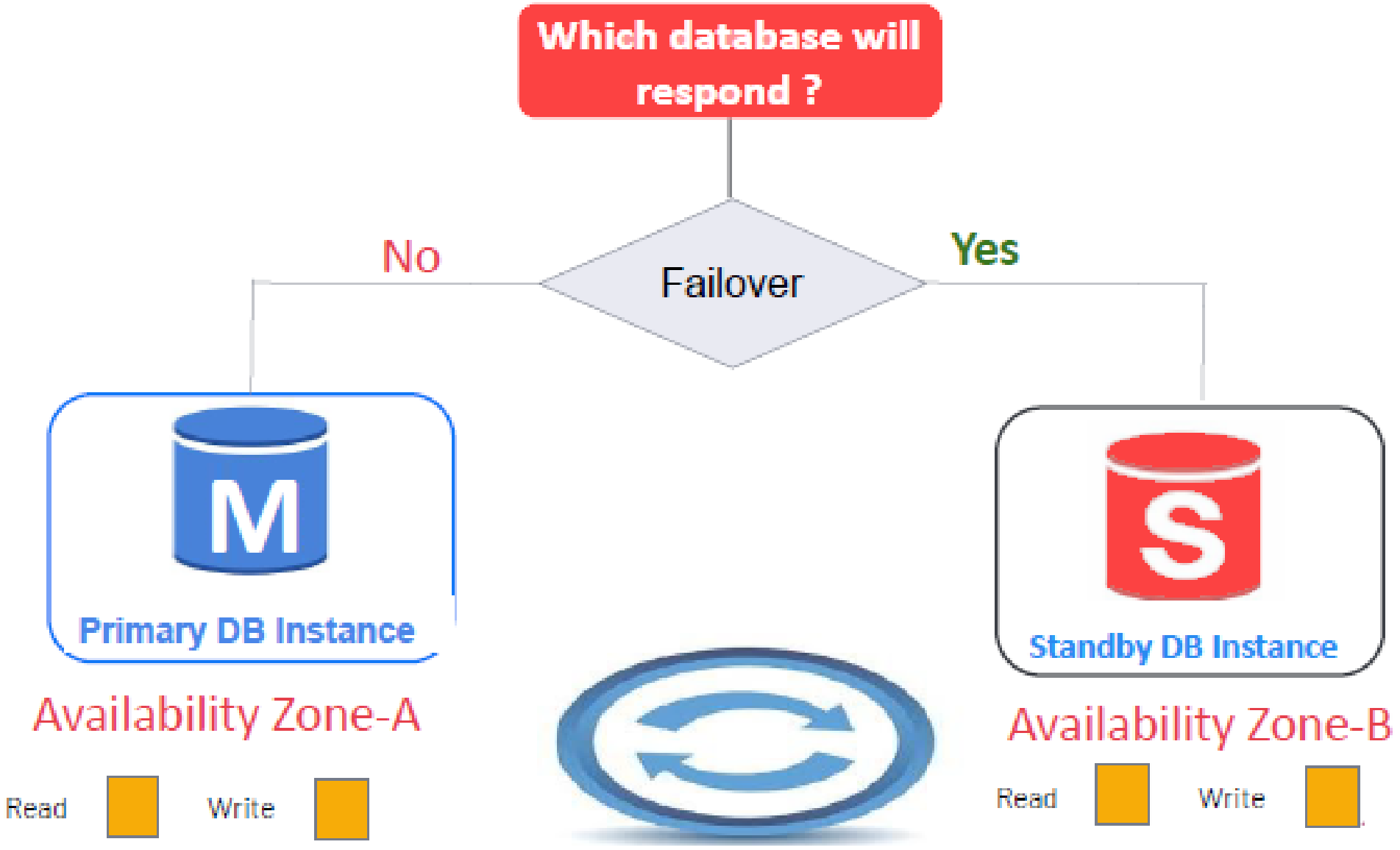
DB Instance Automated Backups



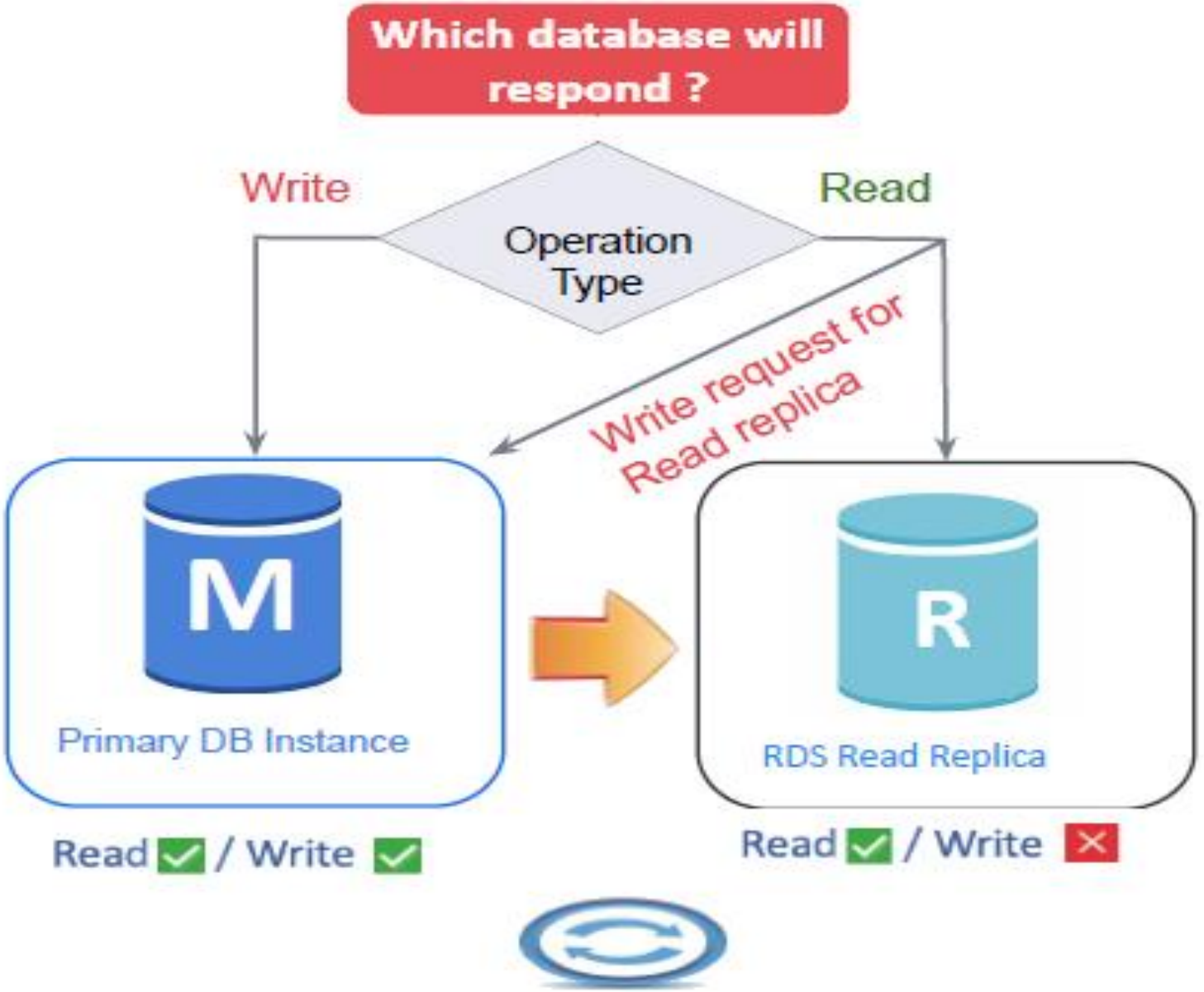
35 days

5 minutes

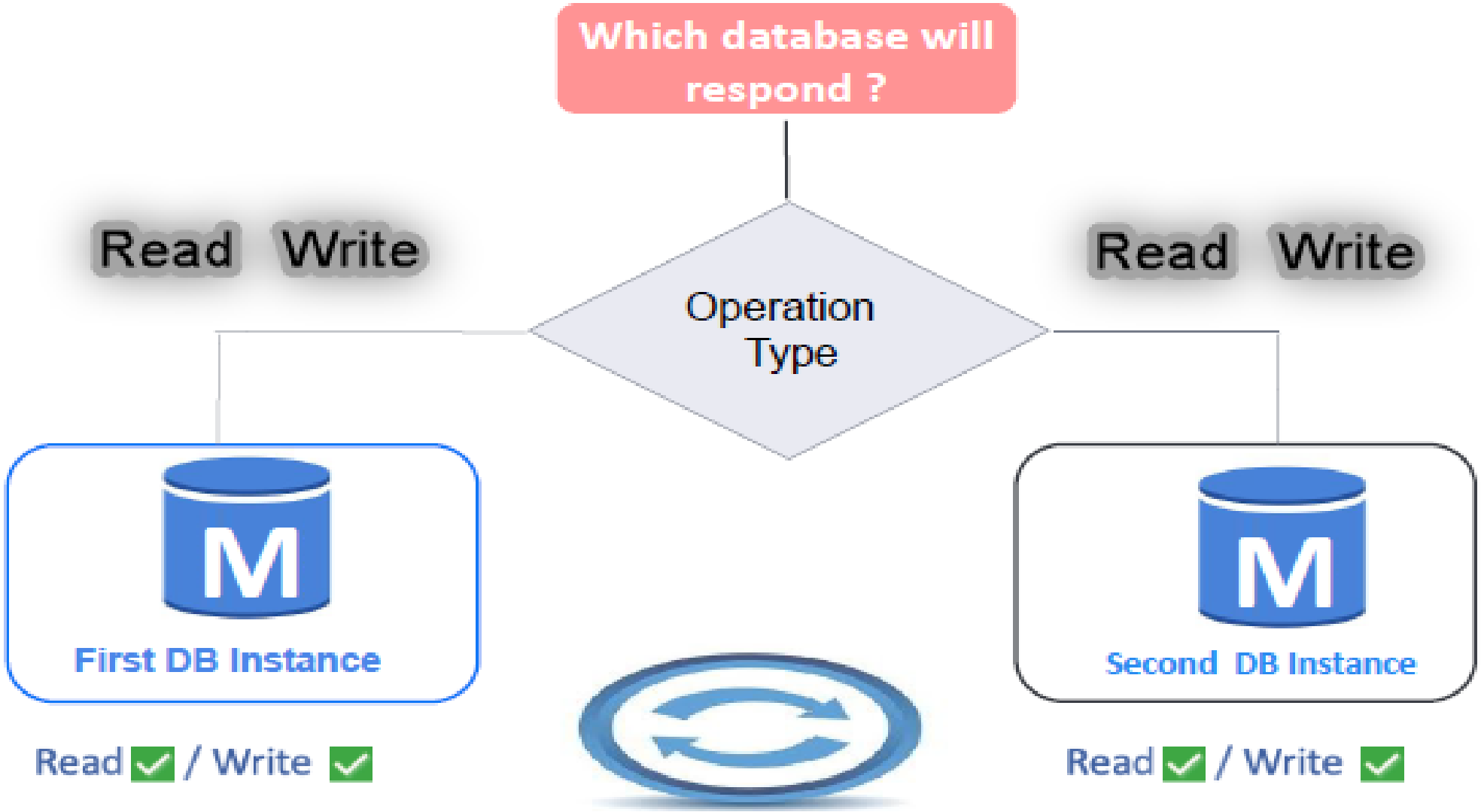
RDS Multi-AZ Deployment

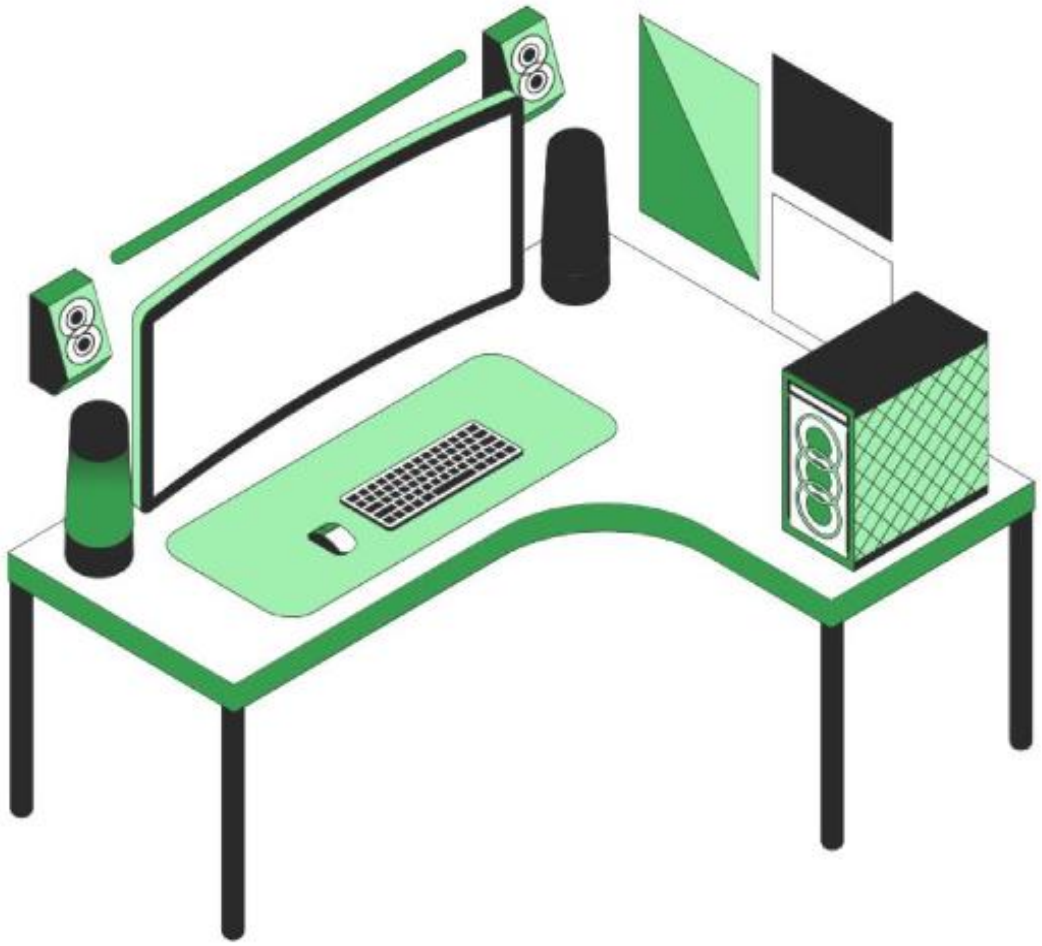


RDS Read Replicas



RDS - Aurora Multi-Master clusters





Do you have any questions?

Send it to us! We hope you learned something new.