Amazon Arora & RDS

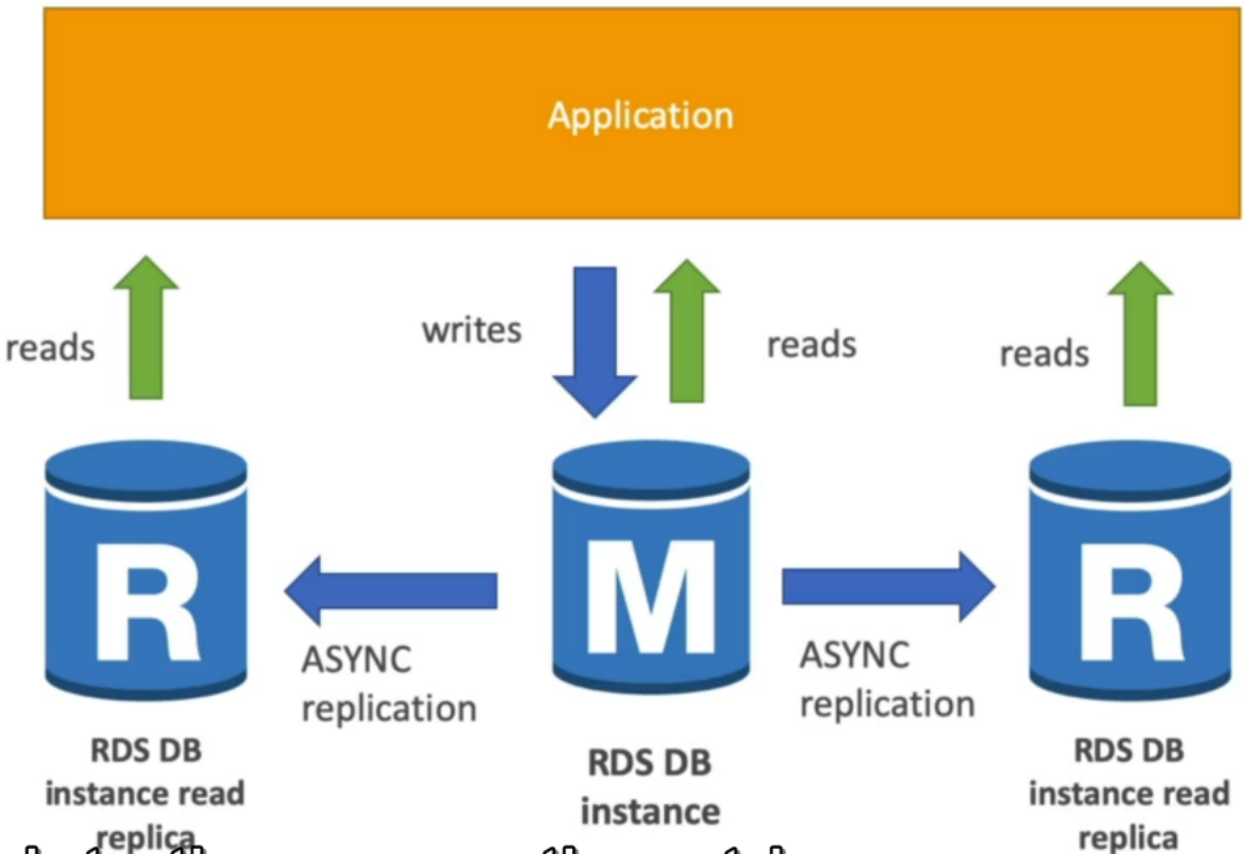
RDS

- You cannot SSH into an RDS DB instance.
- continuous backup and restore to specific timestamp (point of time of recover (PITR)).
- **Configure RDS to use SSL for data in transit**
  - You can use Secure Socket Layer / Transport Layer Security (SSL/TLS) connections to encrypt data in transit.
  - Amazon RDS creates an SSL certificate and installs the certificate on the DB instance when the instance is provisioned
  - For MySQL, you launch the MySQL client using the --ssl_ca parameter to reference the public key to encrypt connections
  - Using SSL, you can encrypt a PostgreSQL connection between your applications and your PostgreSQL DB instances.
  - You can also force all connections to your PostgreSQL DB instance to use SSL.
- IAM database authentication works with MySQL and PostgreSQL.
  - With this authentication method, you don't need to use a password when you connect to a DB instance. Instead, you use an authentication token.
  - AM authentication is just another way to authenticate the user's credentials while accessing the database.
  - It would not significantly enhance the security in a way that enabling SSL does by facilitating the in-transit encryption for the database.

RDS Backup

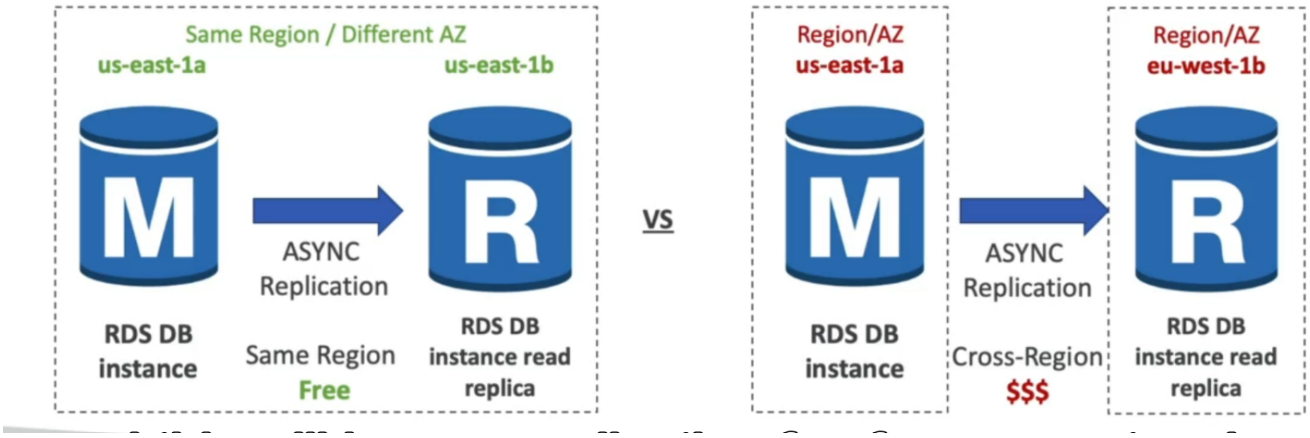
- After you create a DB instance, you can modify the backup retention period. You can set the backup retention period to between 0 and 35 days.
- Transaction log are backup by RDS every 5min
- Setting the backup retention period to 0 disables automated backups.
- Manual snapshot limits (100 per Region) do not apply to automated backups.
- Automated backups aren't created while a DB instance is stopped.
- Backups can be retained longer than the backup retention period if a DB instance has been stopped.
- RDS doesn't include time spent in the `stopped` state when the backup retention window is calculated.

RDS Read Replica



- Amazon RDS Read Replicas provide enhanced performance and durability for Amazon 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.
- You can create up to 5 read replica
- Replication is asynchronous so they are replicated consistent.
- Read replicas can also be promoted when needed to become standalone DB instances.
- Read replicas are available in Amazon RDS for MySQL, MariaDB, PostgreSQL, Oracle, and SQL Server as well as Amazon Aurora.
- use case : to run some analytics if you dont want to stress your primary instance

Read Replica Network cost



- If Read Replica are within same regin no network charge are applied but in case of cross region network charges are applied.

RDS Multi AZ

- In a Multi-AZ deployment, Amazon RDS automatically provisions and maintains a synchronous standby replica in a different Availability Zone.
- Failover in case of loss of AZ , loss of network,instance and storage failure.
- The primary DB instance is synchronously replicated across Availability Zones to a standby replica to provide data redundancy, eliminate I/O freezes, and minimize latency spikes during system backups.
- Running a DB instance with high availability can enhance availability during planned system maintenance and help protect your databases against DB instance failure and Availability Zone disruption.
- Deactivate automation mode to perform customization

RDS Custom

- Amazon RDS Custom is **a managed database service for applications that require customization of the underlying operating system and database environment**.
- You can also SSH into your instance
- Benefits of RDS automation with the access needed for legacy, packaged, and custom applications.

Amazon Arora

- Aurora features a distributed, fault-tolerant, and self-healing storage system that is decoupled from compute resources and auto-scales up to 128 TiB per database instance.
- **Set up database migration from RDS MySQL to Aurora MySQL. Swap out the MySQL read replicas with Aurora Replicas. Configure Aurora Auto Scaling**

- It delivers high performance and availability with up to 15 low-latency read replicas, point-in-time recovery, continuous backup to Amazon Simple Storage Service (Amazon S3), and replication across three Availability Zones (AZs).
- Since Amazon Aurora Replicas share the same data volume as the primary instance in the same AWS Region, there is virtually no replication lag.
- The replica lag times are in the 10s of milliseconds (compared to the replication lag of seconds in the case of MySQL read replicas).
- Database cloning is only available for Aurora and not for RDS.

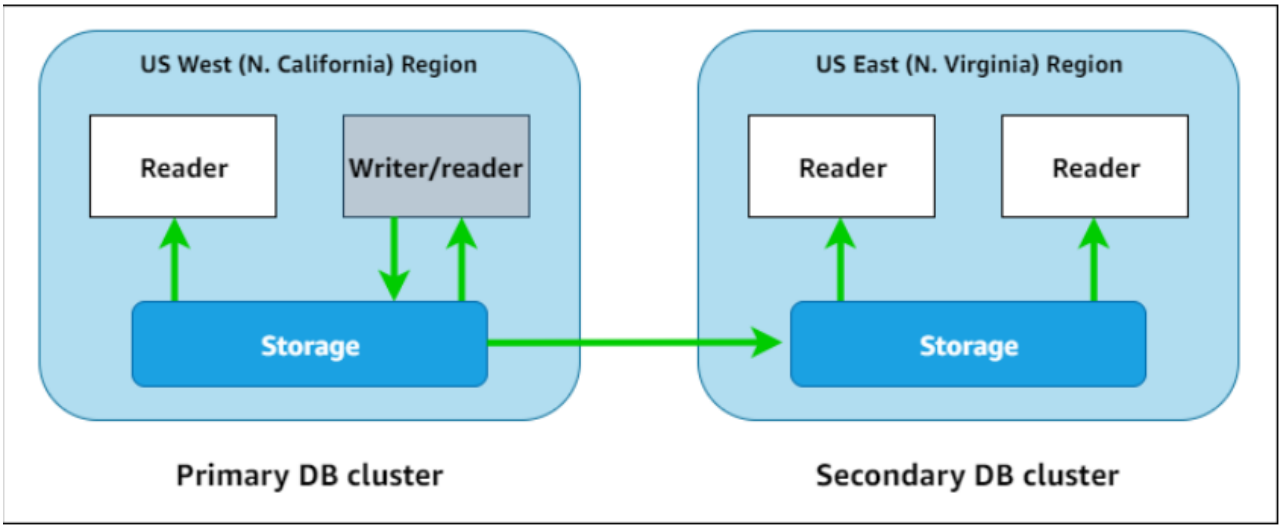
Arora Serverless

- Amazon Aurora Serverless is an on-demand, autoscaling configuration for Amazon Aurora.
- It automatically starts up, shuts down, and scales capacity up or down based on your application's needs.
- You can run your database on AWS without managing database capacity.
- Manually managing database capacity can take up valuable time and can lead to inefficient use of database resources.
- With Aurora Serverless, you create a database, specify the desired database capacity range, and connect your applications.
- You pay on a per-second basis for the database capacity that you use when the database is active, and migrate between standard and serverless configurations with a few steps in the Amazon Relational Database Service (Amazon RDS) console.

Arora Global

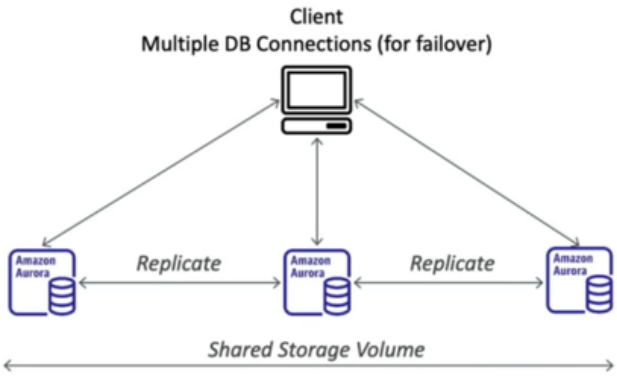
- Amazon Aurora global databases span multiple AWS Regions, enabling low latency global reads and providing fast recovery from the rare outage that might affect an entire AWS Region.
- An Aurora global database has a primary DB cluster in one Region, and up to five secondary DB clusters in different Regions.
- You issue write operations directly to the primary DB cluster in the primary AWS Region. Aurora replicates data to the secondary AWS Regions using dedicated infrastructure, with latency typically under a second.
- Upto 16 Read replica per secondary region
- Promoting another region has an RTO of <1 minute

- Typical cross region replication takes less than 1 second.



Arora MultiMaster

- In a multi-master cluster, all DB instances have read/write capability
- . Multi-master clusters have different availability characteristics, support for database features, and procedures for monitoring and troubleshooting than single-master clusters.



Arora Database Cloning

- By using Aurora cloning, you can create a new cluster that initially shares the same data pages as the original, but is a separate and independent volume.
- The process is designed to be fast and cost-effective. The new cluster with its associated data volume is known as a *clone*.
- Creating a clone is faster and more space-efficient than physically copying the data using other techniques, such as restoring a snapshot.
- Faster than snapshot and restore
- Useful to create a staging database without impacting the production database.

RDS Proxy

- Amazon RDS Proxy is a fully managed, highly available database proxy for Amazon Relational Database Service (RDS) that makes applications more scalable, more resilient to database failures, and more secure.
- RDS Proxy minimizes application disruption from outages affecting the availability of your database by automatically connecting to a new database instance while preserving application connections.
- When failovers occur, RDS Proxy routes requests directly to the new database instance.