
1. Introduction
   1. A read replica is a copy of your main (or primary) database in Amazon RDS.
   2. It stays in sync with the primary database, constantly updating itself with any new data.
   3. But unlike the primary, a read replica is read-only, meaning it can only handle data reads, not changes like updates or deletions
2. Why Use a Read Replica?
   1. When your application has many users, the primary database can become slow due to too many requests.
   2. To solve this, read replicas are used to reduce the load on the primary database by handling all the "read" requests.
   3. This way, the primary database can focus on handling "write" requests (such as adding, deleting, or updating data), making the whole system faster and more efficient.
3. How Does It Work?
   1. Data Syncing
      1. The read replica automatically receives data updates from the primary database. This means any changes made to the primary database are reflected in the read replica
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   2. Read Traffic Distribution
      1. You can direct read requests from your application to the read replica instead of the primary database.
      2. By splitting these tasks, the primary database has less work to do, improving its performance for critical tasks
4. Benefits of Using Read Replicas
   1. Improved Performance
   2. High Scalability
   3. Reliability and Backup
   4. Special Note
      1. Read replicas cannot automatically take over as the primary database if the primary fails.
      2. Unlike Multi-AZ setups, which provide automatic failover, a read replica must be manually promoted to become the new primary if needed.
      3. This means that read replicas are not a substitute for Multi-AZ configurations when high availability and automatic failover are required
5. Same Region Vs Cross-Region Read Replicas
   1. Same-Region Read Replicas
      1. These replicas are created within the same AWS region as the primary database
      2. They’re useful for distributing read traffic locally and improving performance for users within the same region
      3. While same-region read replicas don’t automatically provide high availability (unlike Multi-AZ setups), choosing different AZs for your read replicas can provide better fault tolerance.
   2. Cross-Region Read Replicas
      1. These replicas are created in a different AWS region from the primary database
      2. Cross-region read replicas are ideal for
         1. Improving data access speed for global users by reducing latency
         2. Disaster recovery by keeping a copy of your database in another region, which can be promoted in case of a regional failure
         3. Data migration to another region by promoting the cross-region replica as the new primary