Amazon Aurora

Amazon Aurora

- Amazon Aurora is a MySQL and PostgreSQL-compatible relational database built for the cloud, that combines the performance and availability of traditional enterprise databases with the simplicity and cost-effectiveness of open source databases.
- Amazon Aurora is up to five times faster than standard MySQL databases and three times faster than standard PostgreSQL databases. It provides the security, availability, and reliability of commercial databases at 1/10th the cost.
- Amazon Aurora is fully managed by Amazon Relational Database Service (RDS), which automates time-consuming administration tasks like hardware provisioning, database setup, patching, and backups.

Amazon Aurora

- Amazon Aurora features a distributed, fault-tolerant, self-healing storage system that auto-scales up to 64TB per database instance
- It delivers high performance and availability with up to 15 low-latency read replicas, point-in-time recovery, continuous backup to Amazon S3, and replication across three Availability Zones (AZs).

Features - MySQL

- Up to 5X Higher Throughput than MySQL
- Push-Button Compute Scaling – Compute and Memory
- Storage Auto-Scaling – Up to 64TB
- Low-Latency Read Replicas – Up to 15 read replicas
- Serverless Configuration
- Parallel Query – Provides faster analytical queries over your current data

Features - PostgreSQL

- Up to 3X Higher Throughput than PostgreSQL
- Push-button Compute Scaling
- Storage Auto-Scaling
- Low-Latency Read Replicas
- Serverless Configuration

Amazon Aurora – Global Database

- Amazon Aurora Global Database is designed for globally distributed applications, allowing a single Amazon Aurora database to span multiple AWS regions.
- It replicates your data with no impact on database performance, enables fast local reads with low latency in each region, and provides disaster recovery from region-wide outages.
- Global Database uses storage-based replication with typical latency of less than 1 second, using dedicated infrastructure that leaves your database fully available to serve application workloads. In the unlikely event of a regional degradation or outage, one of the secondary regions can be promoted to read and write capabilities in less than 1 minute.

Amazon Aurora – Global Database

- **Sub-Second Data Access** : Aurora Global Database lets you easily scale database reads across the world and place your applications close to your users. Your applications enjoy quick data access regardless of the number and location of secondary regions, with typical cross-region replication latencies below 1 second. You can achieve further scalability by creating up to 16 database instances in each region, which will all stay continuously up to date.

Amazon Aurora – Global Database

- **Cross Region DR** : If your primary region suffers a performance degradation or outage, you can promote one of the secondary regions to take read/write responsibilities. An Aurora cluster can recover in less than 1 minute even in the event of a complete regional outage. This provides your application with an effective Recovery Point Objective (RPO) of 1 second and a Recovery Time Objective (RTO) of less than 1 minute, providing a strong foundation for a global business continuity plan.

Amazon Aurora – Parallel Query

- Amazon Aurora Parallel Query is a feature of the Amazon Aurora database that provides faster analytical queries over your current data, without having to copy the data into a separate system. It can speed up queries by up to two orders of magnitude, while maintaining high throughput for your core transactional workload.
- Parallel Query takes advantage of Aurora's unique architecture to push down and parallelize query processing across thousands of CPUs in the Aurora storage layer. By offloading analytical query processing to the Aurora storage layer, Parallel Query reduces network, CPU, and buffer pool contention with the transactional workload.

Amazon Aurora – Performance Insights

- Amazon RDS Performance Insights is a database performance tuning and monitoring feature that helps you quickly assess the load on your database and determine when and where to take action.
  Performance Insights allows non-experts to detect performance problems with an easy-to-understand dashboard that visualizes database load.

Amazon Aurora – Performance Insights

- Performance Insights uses lightweight data collection methods that don’t impact the performance of your applications, and makes it easy to see which SQL statements are causing the load, and why. It requires no configuration or maintenance, and is currently available for Amazon Aurora (PostgreSQL- and MySQL-compatible editions), Amazon RDS for PostgreSQL, MySQL, MariaDB, SQL Server and Oracle.
- With seven days of free performance history retention, it's easy to track down and solve a wide variety of issues

Amazon Aurora - Serverless

- Amazon Aurora Serverless is an on-demand, auto-scaling configuration for Amazon Aurora (MySQL-compatible and PostgreSQL-compatible editions), where the database will automatically start up, shut down, and scale capacity up or down based on your application's needs. It enables you to run your database in the cloud without managing any database instances. It's a simple, cost-effective option for infrequent, intermittent, or unpredictable workloads.

Amazon Aurora - Serverless

- Manually managing database capacity can take up valuable time and can lead to inefficient use of database resources. With Aurora Serverless, you simply create a database endpoint, optionally specify the desired database capacity range, and connect your applications. You pay on a per-second basis for the database capacity you use when the database is active and migrate between standard and serverless configurations with a few clicks in the Amazon RDS Management Console.

Amazon Aurora – Serverless Use Cases

- Infrequently-Used Applications
- New Applications – Unsure about the size or capacity to provision.
- Variable Workloads
- Unpredictable Workloads
- Development and Test Databases
- Multitenant Applications – Database for each of your customers.