Amazon Web Services

Database

ankitnarula1991@gmail.com

Database

- A database is an organized collection of data, so that it can be easily accessed and managed.

- Databases play a crucial role in the functioning of an application. Also, performance of an application is directly dependent on how the underlying database performs for the application. AWS Database Services is a set of databases offered by AWS on the cloud.

- There are numerous options we can find to run the managed relational data and also the managed NoSQL databases.

AWS Database - Advantages

- **Highly Scalable**: We can scale your database as our application grows without any downtime!

- **Fully Managed**: Everything, from maintenance to hardware upgrades, is managed by AWS.

- **Enterprise Class**: We get the same world-class infrastructure used by Amazon's giant ecommerce platform.

- **Workforce Reduction**: Since everything is managed by AWS, you don't need a Database Maintenance team in your organization.

AWS Database - Types

- Relational Database
- Key Value
- In Memory
- Document
- Wide Column
- Graph
- Time Series
- Ledger

AWS Database - Key Value

- A key-value database is a type of non-relational database that uses a simple key-value method to store data. A key-value database stores data as a collection of key-value pairs in which a key serves as a unique identifier. It is NoSQL Database.

- **Use Cases**: High-traffic web applications, ecommerce systems, gaming applications.

- **Types of AWS Services in Key Values**

- Amazon DynamoDB

AWS Database - In Memory

- An in-memory database keeps all its data in the random access memory (RAM) of a computer. Only the main memory is accessed when querying data. This allows for faster access of that data than a disk-based system. It is NoSQL Database.

- **User Cases**: Session management, gaming leaderboards, real time Bidding.

- **Types of AWS Services in In Memory**

- Amazon ElastiCache
- Amazon MemoryDB for Redis

AWS Database - Document

- Document databases store data in JSON or JSON-like documents. You can query data using the same document-model format used in programming applications.

- **User Cases:** Content management, catalogs, user profiles

- **Types of AWS Services in Document**

- Amazon DocumentDB (with MongoDB compatibility)

AWS Database - Wide Column

- In Wide Column data is stored and grouped into separately stored columns instead of rows. Queries for a particular value in a column are very fast, as the entire column can be loaded and searched quickly. Such databases organize information into columns that function similarly to tables in relational databases.

- **Use Cases**: High-scale industrial apps for equipment maintenance, fleet management, and route optimization

- **Types of AWS Services in Wide Column**

- Amazon Keyspaces

AWS Database - Graph

- This database type represents relationships directly. You can query data with specific graph languages. It storing billions of relationships and querying the graph with milliseconds latency.

- **Use Cases**: Fraud detection, social networking, and recommendation engines

- **Types of AWS Services in Graph**

- Amazon Neptune

AWS Database - Time Series

- Time-series databases store data in time-order and as append-only. We can query data over various time intervals. Time series data are simply measurements or events that are tracked, monitored, down sampled, and aggregated over time.

- **Use Cases:** Application performance monitoring**,** trades in a market, sensor data, DevOps, network data & many other types of analytics data.

- **Types of AWS Services in Time Series**

- Amazon Timestream

AWS Database - Ledger

- Ledger databases add a layer of digital signatures for each transaction so anyone can audit the list and see that it was constructed correctly. More importantly, no one has gone back to adjust a previous transaction to change history.

- **Use Cases:** Banking Transactions, supply chain, Crypto currency, Insurance claims & HR and payroll

- **Types of AWS Services in Ledger**

- Amazon Quantum Ledger Database

AWS Database - Relational Database

- A relational database is a collection of data items with pre-defined relationships between them. These items are organized as a set of tables with columns and rows. Tables are used to hold information about the objects to be represented in the database. Each column in a table holds a certain kind of data and a field stores the actual value of an attribute. The rows in the table represent a collection of related values of one object or entity. Each row in a table could be marked with a unique identifier called a primary key, and rows among multiple tables can be made related using foreign keys.

AWS Database - Relational Database

- **Use Cases**: Traditional applications, enterprise resource planning (ERP), customer relationship management (CRM), and ecommerce

- **Types of AWS Services in Relational Database**

- RDS (**Relational Database Service)**
- Amazon Redshift

AWS Database - Relational Database

- Amazon RDS supports six DB engine types:

- Amazon Aurora
- Oracle
- Microsoft SQL Server
- MySQL
- PostgreSQL
- MariaDB

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