

DYNAMO DB

- It is fast and flexible NOSQL DB service for all application that need consistent, single-digit **milliseconds latency** at any scale.
- It's a fully managed database and supports key-value data models.
- Stored on SSD storage
- You don't need to specify the full schema upfront when creating a table.
- You only need to declare the primary key for your table which uniquely identifies each record in your table.
- This reduces the upfront cost of designing your data model because you can easily modify your schema as your applications need change.

❖ **Database Types:**

- Generally, there are three types of data are available such as:

1. **Unstructured Data**
2. **Semi-structured Data**
3. **Structured Data**

1. **Unstructured Data:**

- It is the information that either doesn't have a predefined data model or it is not organized in a predefined manner.
- Unstructured information is text-heavy but may contains data such as dates, numbers and facts as well as examples include email messages, word processing documents, videos, photos, audio files, presentations webpages.

2. **Semi-structured Data:**

- Semi-structured data is information that doesn't reside in a relational database but that does have some organizational properties that make it easier to analyse.
- E.g.: XML, JSON

3. **Structured Data:**

- It refers to information with a high degree of organization, such that inclusion in a relational database is seamless and readily searchable by simple, straight forward search engine algorithms or other search operation.
- All data which can be stored in a database SQL in table with rows and columns. They have relational key and can be easily mapped into pre-defined fields.

❖ **DynamoDB Table:**

- A table is a collection of data items.
- Like all other DB, DynamoDB stores data in tables.

Table

- A collection of dynamo DB data records

Items:

- Each table contains multiple items.
- A single data record in a dynamo DB table
- An item is a group of attributes that is uniquely identifiable among all of the other items.
- An item consisting of a primary or composite key and a flexible number of attributes.
- Items in DynamoDB are similar into rows, records in other DB.

Attributes:

- Each item is composed one or more attributes.
- A single data element of an items.
- An attribute consists of the attribute name and a value or a set of values.
- An attribute is a fundamental data element, something that does not need to be broken down any further.

Note: aggregate size of an item cannot exceed 400kb including key and all attributes.

- DynamoDB allows low latency read/write access to items ranging from 1 byte to 400kb.
- DynamoDB can be used to store pointers to S3 stored objects, or items of sizes larger than 400kb too if needed.

Primary Key

- DynamoDB stores data indexed by a primary key, you can specify the primary key when you create the table.
- Each item in the table has a unique identifier. Or primary key, that distinguished the item from all of the others in the table.
- The primary key is the only required attributes for items in a table.
- DynamoDB tables are schema less, which means that neither the attributes nor their data types need to be defined before hand.
- Each item can have its own distinct attributes.

❖ **Eventually consistency Reads**

- Consistency across all copies of data is usually reached within a second, repeating a read after a short time (1 sec) should return the updates data (best read performance)

❖ **Strongly consistent Reads**

- A strongly consistency reads returns a result that reflects all writes that received a successful response prior to the read.

❖ **DynamoDB-Read Capacity Unit:**

- One read capacity unit represents one strongly consistent read per second, or two eventually consistent reads per seconds for an item up to 4kb in size.
- If you need to read an item that is larger than 4kb, DynamoDB will need to consume additional read capacity units.
- The total number of read capacity units required depends on the item size and whether you want an eventually consistent or strongly consistent read.

❖ DynamoDB-Write Capacity Unit:

- One writes capacity unit represents one write per second for an item up to 1kb in size.
- If you need to write an item that is larger than 1kb, DynamoDB will need to consume additional write capacity units.
- The total number of write capacity units required depends on the item size.

❖ DynamoDB- Pricing:

Reads are cheaper than writes when using DynamoDB. We are only pay for:

- Each table's provisioned read/write throughput (hourly rates).
- You are charged for provisioned throughput regardless whether you use it or not.
- Indexed data storage.
- Internet data transfer (if crosses a region).
- Free tier per account (access all tables) of 25 read capacity unit and 25 write capacity units per month.
- DynamoDB can do 10,000 writes capacity units or 10,000 read capacity units per second per table.

❖ DynamoDB Limits:

- 256 tables per account per region.
- No limits on the size of any table.

Amazon Database Services



Amazon RDS

- Managed commercial and open source databases
- Database engine options - Amazon Aurora, Oracle, Microsoft SQL Server, PostgreSQL, MySQL and MariaDB



Amazon Aurora

- MySQL and PostgreSQL compatible
- 5X the throughput of standard MySQL and 3X the throughput of standard PostgreSQL
- 1/10th the cost of commercial databases



Amazon DynamoDB

- DynamoDB is a fully managed, non-relational database service
- Delivers consistent, fast performance at any scale for all applications