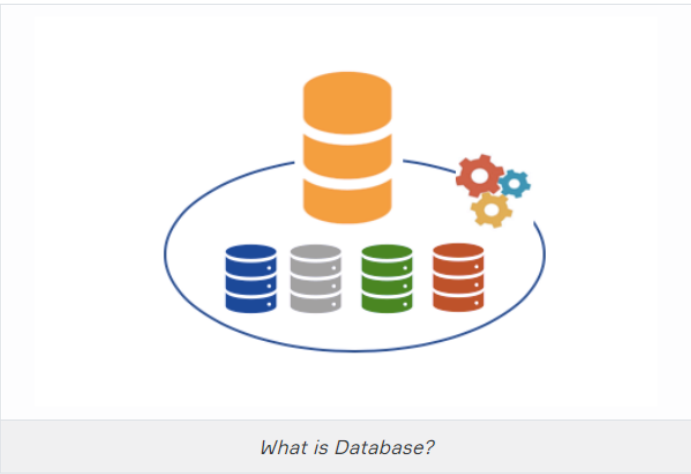


Introduction to AWS Database

What is Database?

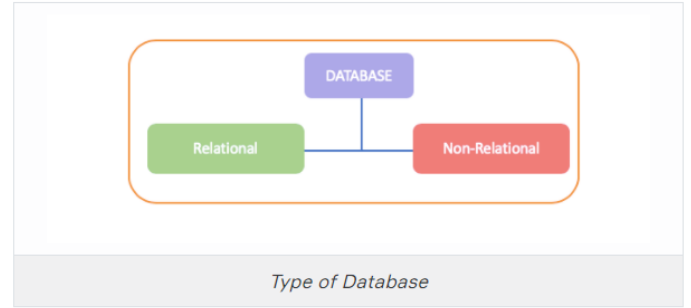


We all know that the computer is a tool that processes the existing information and stores this information in disks. But the information located in the disk is like a data bulk. It is not available for sorting or query. Here we need databases to make this information meaningful and to get the ones we need.

A system in which we can access the structured data is called a database. In other words, a database is an organized collection of data in which we can fetch the information based on the desired format and queries.

It is used to store data in a specific format to create conclusions from this stored data with queries made in its own language.(e.g. SQL)

Type of Database



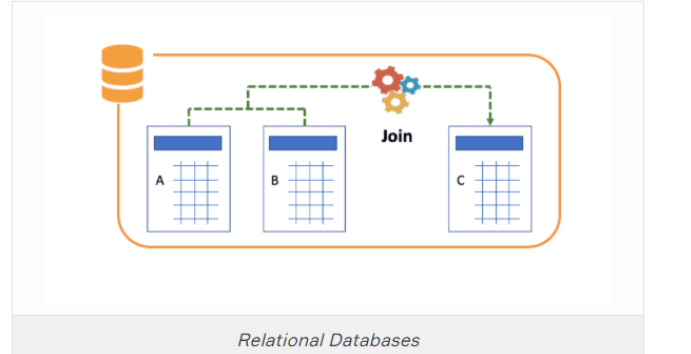
In the database environment, there are two leading types of Database storage:

- **Relational Database -SQL**
- **Non-Relational Database-NoSQL**

We call them SQL and NoSQL, referring to whether or not they're written solely in structured query language SQL.

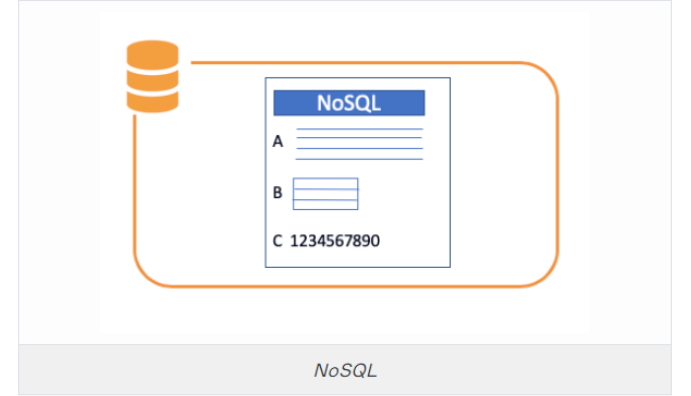
SQL stands for **Structured Query Language** and it is a standard language for dealing with Relational Databases. So we usually prefer to call Relational Database as SQL and Non-Relational Database as NoSQL.

What is SQL?



- **Relational Databases:**
- Relational databases are the oldest and currently the most widely used database type. Relational databases store data as rows and columns, just like in a Microsoft Excel Sheet.
- Tables in SQL are pre-determined and created as a schema. The user can store the data in this database by adhering to these schemes. Thanks to SQL (Structured Query Language), which is the basic language of relational databases, data can be imported into these tables, read or updated, etc.
- The main reason why this type of database is called relational is that it concludes by using separate tables as you see in the picture above.
- These processes are called **Join** in the database environment and the main power of relational databases is due to this **Join** process.
- Almost 90% of the database environment consists of these relational databases.
- But they have some disadvantages:
 - First of all, we have to update/add data into the database according to a determined scheme. Therefore, the requests must be determined correctly in advance. This causes low flexibility.
 - Besides, it requires strict coordination with database developers.
- Therefore, SQL presents a huge challenge in dynamic and constantly renewed workspaces.

What is NoSQL?



As the name suggests, Non-Relational(NoSQL) database is a type of database that is not based on SQL. The Non-Relational database is a new database model that is getting popular in recent years. It is designed to solve the problems caused by the relational databases depend on predetermined schemes and it has been improved and is becoming increasingly common.

The Non-Relational database keeps data as key data mappings in documents rather than tables. So, instead of tables, there are documents called **Collections** that store data in **JSON** format.

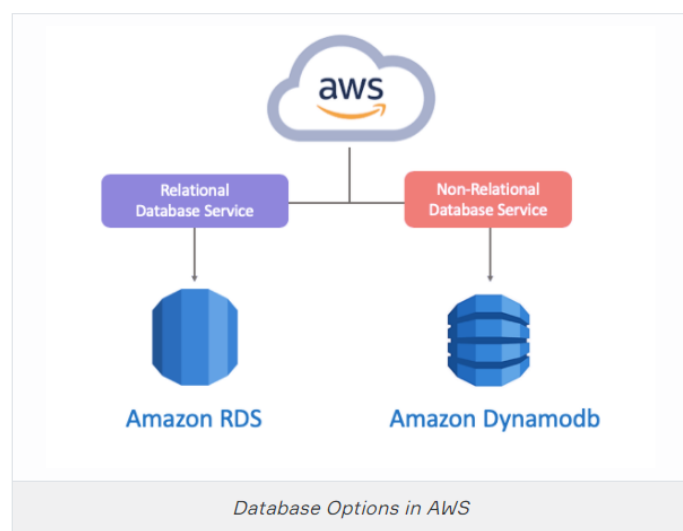
Assume that, if we say Microsoft Excel Sheet for SQL, we can say Microsoft Word for NoSQL.

As for the advantage of NoSQL; Unlike SQL, NoSQL eliminates the need to coordinate with the Database developer when writing database programs.

SQL vs. NoSQL

SQL	NoSQL
Relational	Non-Relational
Table-based	Document-based, key-value pairs, graph databases or wide-column stores
Predefined Schema	Dynamic Schema
Vertically Scalable	Horizontally Scalable
Uses SQL	As the name suggest, it doesn't use SQL.
Used for complex queries	Used for simple queries
Available for Join function	Not available for Join function

Database Options in AWS



AWS supports both SQL and NoSQL database types.

AWS provides a relational database solution with **Amazon RDS** service. Amazon RDS offers different types of relational database engines (Oracle, Microsoft SQL Server, MySQL, e.g.) which are widely used in the world.

Besides, Amazon Aurora, which is built on the open-source MySQL and PostgreSQL infrastructure and AWS's database engine, serves under the Amazon RDS service.

Normally, you can install these databases inside EC2 machines. However, the Amazon RDS service has taken the management burden of these databases from customers and made this service a SaaS (Software as a Service) service.

As for NoSQL, the service offered by AWS is **Amazon DynamoDB**. Unlike the SQL database service, AWS offers only its DynamoDB option in the NoSQL field.