# AWS Database Services

## Database Primer

* Database systems and engines can be grouped into two broad categories: **Relational Database Management Systems** (RDBMS) and **NoSQL (or non-relational) databases**.

### Relational Databases

* Relational databases provide a common interface that lets users read and write from the database using commands or queries written using Structured Query Language (SQL).
* With relational databases, it is important to note that the structure of the table (such as the number of columns and data type of each column) must be defined prior to data being added to the table.
* A relational database can be categorized as either an **Online Transaction Processing (OLTP)** or **Online Analytical Processing (OLAP)** database system, depending on how the tables are organized and how the application uses the relational database.
* **Amazon Relational Database Service (Amazon RDS)** significantly simplifies the setup and maintenance of OLTP and OLAP databases.
* Amazon RDS provides support for six popular relational database engines: **MySQL, Oracle, PostgreSQL, Microsoft SQL Server, MariaDB, and Amazon Aurora.**

### Data Warehouses

* A data warehouse is a central repository for data that can come from one or more sources.
* This data repository is often a specialized type of relational database that can be used for reporting and analysis via OLAP.
* Organizations typically use data warehouses to compile reports and search the database using highly complex queries.
* Data warehouses are also typically updated on a batch schedule multiple times per day or per hour, compared to an OLTP relational database that can be updated thousands of times per second.
* **Amazon RDS** is often used for OLTP workloads, but it can also be used for OLAP.
* **Amazon Redshift** is a high-performance data warehouse designed specifically for OLAP use cases.

### NoSQL Databases

* NoSQL databases are instead often **key/value stores** or document stores with flexible schemas that **can evolve over time or vary.**
* Today, many application teams use **Hbase, MongoDB, Cassandra, CouchDB, Riak, and Amazon DynamoDB** to store large volumes of data with high transaction rates.
* A common use case for NoSQL is managing user session state, user profiles, shopping cart data, or time-series data.

# Amazon Relational Database Service (Amazon RDS)

* Amazon RDS is a service that simplifies the setup, operations, and scaling of a relational database on AWS.