Introduction to Database Management System

What is data?

Any raw and unprocessed fact that we can record is known as data.
Example - New Delhi, India
In the above example New Delhi, India could be an address of a person or capital of a country but we are unable to analyse anything meaningful from it, hence it is data.

What is information?

When we process the data to get meaningful facts, it is called information.
Example - New Delhi is the capital of India.
Here we are getting some meaningful facts about New Delhi, hence it is information.

Difference between data and information

Data	Information
Raw and unorganised facts is Data	Data that is meaningful is Information
Data is not helpful in decision making.	Information helps in decision making
999999999 is data	A person's phone number is 999999999 is information.
2000 is data	I was born in 2000 is information

What is a database?

A Database is a collection of related data organised in a way that data can be easily accessed, managed and updated.
Example - Let us consider Facebook. It needs to store, update and show related data of members, activities, messages etc. Here we can use the database to do all these operations efficiently.

Database Management System-

A Database Management System or DBMS is a system that allows creation, definition and manipulation of databases, allowing users to store, process and analyse data easily.

DBMS provides users with an interface or a tool, to perform various operations like creating a database, storing data in it, updating data, creating tables in the database and a lot more.

MySQL, PostgreSQL, Microsoft Access, Oracle, MongoDB, Cassandra etc are all examples of DBMS.

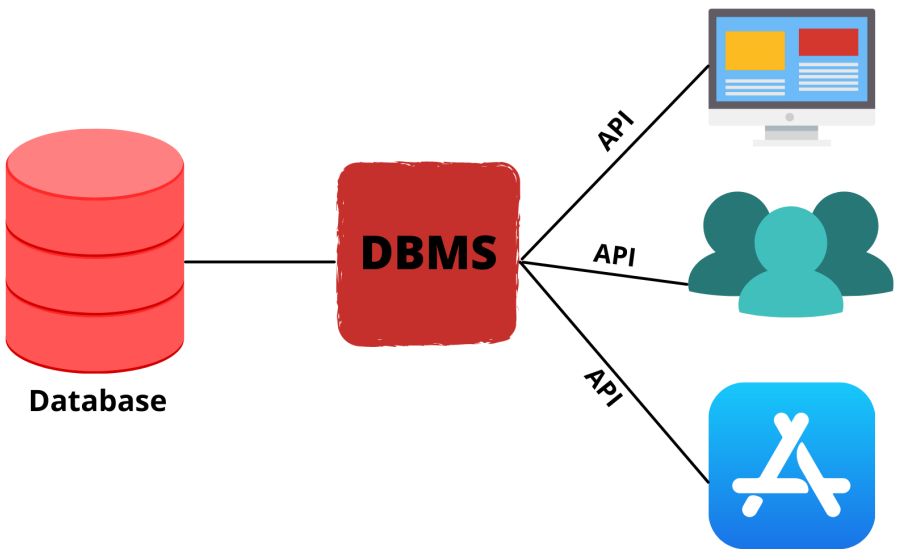

Figure: Database access through DBMS

What are File Systems ?

File System is a way of naming the files and storing them in a storage medium. File Systems helps in organizing the data and allows to retrieve the files easily when needed.

Due to the increase in data, the need for File Systems is also increasing. Different file systems are available for different operating systems.

Features of File Systems:

1. Data is stored as isolated data files and entities.
2. It costs less as compared to a database.

Client Server Architecture -

The main goal of client server architecture is to define specialized servers with specific functionalities.
Client - It is host (computer) i.e. capable of receiving information or using a particular service from the host. It provides user interface capabilities and local processing of requests.

Servers - Server is a remote computer which provides information or access to particular services. It provides services to client machines.

So basically the Client requests what is needed and the server serves it as long as it's present in the database.

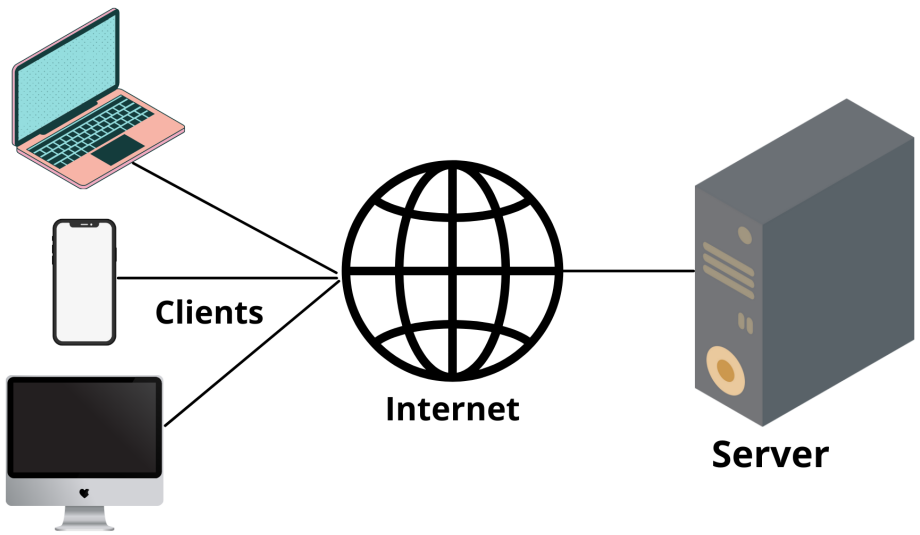

Figure: Client server architecture

Type of Client Server Architecture -

It could be further classified as

Tier 1 Architecture -

In this type of architecture Client, Server and Database all reside in a single machine.

Example of one tier architecture would be anytime you install a database in your system and access it to practice SQL queries.

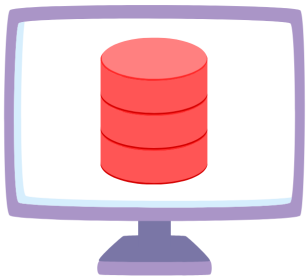

Figure: 1 tier architecture

Tier 2 Architecture -

In this architecture client reside in one machine and Server and database in another. It provides security to the DBMS as it is not exposed to the end-user directly. In this architecture multiple users can request from the same database server.

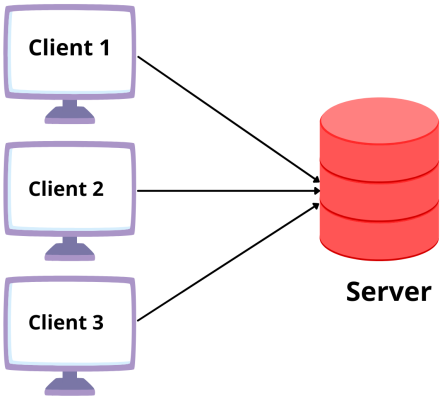

Figure: 2 Tier Architecture

Tier 3 Architecture -

In this architecture Client (User), Server and database all three reside in different machines. It is an extension of two tier architecture. Server resides between the client/user and database which is responsible for communicating the user's request to the DBMS system and sending the response from the DBMS to the user.

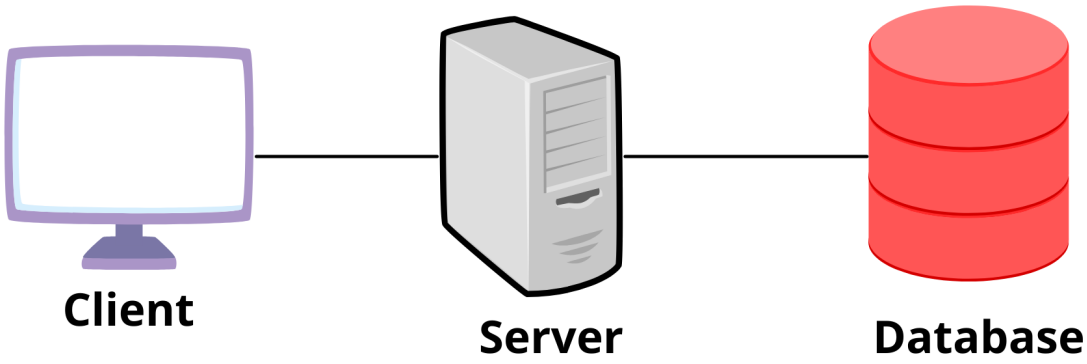

Figure: 3 Tier Architecture