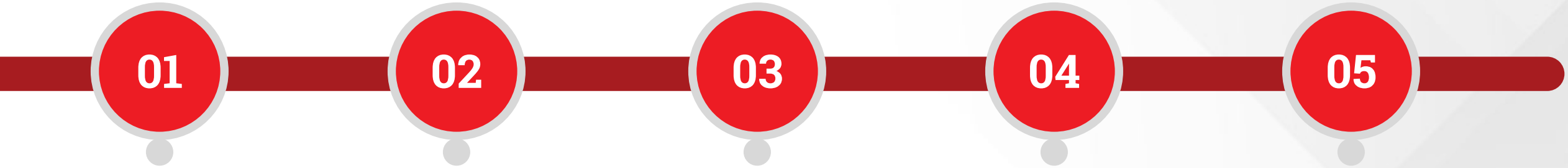
Types of Databases

Agenda



Understanding and Analyzing Types of Databases,(Network, Hierarchical, Relational)

Understanding the Difference Between Different Types of Databases

Analyzing the Data and Usage of SQL Editor

Understand the Difference Between SQL and NoSQL Database

Understanding the Client Server Architecture for SQL Databases

Hero

Understanding and Analyzing Types of Databases,(Network, Hierarchical, Relational)

Types of Database Structure

- **Single-file databases**, also known as flat-file databases, make use of simple structures and individual files to represent a single piece of data or information.

- **Multi-file relational databases**: Relational databases are more complicated databases that employ tables to display data relationships.

Types of Database Structure

- A **flat file database** stores information as a **plain text file**, with each line containing one entry. Fields are separated by delimiters such as commas or tabs. A flat file database has a simple structure and cannot include several tables and relations, unlike a relational database.

- A **relational database** is made up of s**everal tables of data with rows and columns** that are linked by special key fields. These databases are more versatile than flat file formats, and they allow you to read, write, update, and delete data. Structured Query Language (SQL) is a standard user application that provides an easy programming interface for database interaction in relational databases.

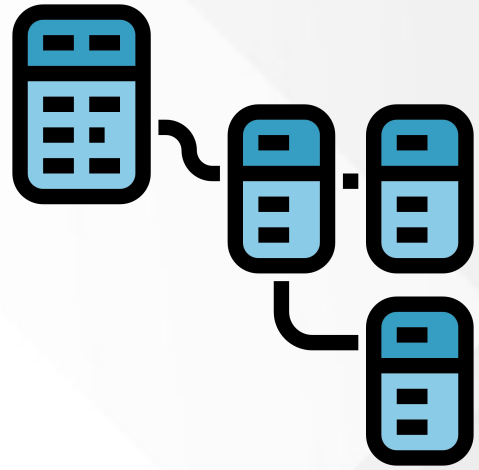
Understanding the Difference Between Different Types of Databases

Different Types of DBMS

There are 4 different types of database management systems

- Relational databases are the other major type of database, opposite of NoSQL. Relational databases store data in a structured way and about other data. A good representation of a relational database would be a sales associate and their client's purchase history. Companies prefer relational databases when their primary concern is the integrity of their data, or when they are not particularly focused on scalability.

- A hierarchical database model resembles a tree structure, comparable to your computer's folder design. Between 'parent and child' nodes, the relationships between records are pre-defined in a one-to-one manner. In order to access needed data, the user must first pass through a hierarchy. Because of their restrictions, such databases may be limited to specific applications.

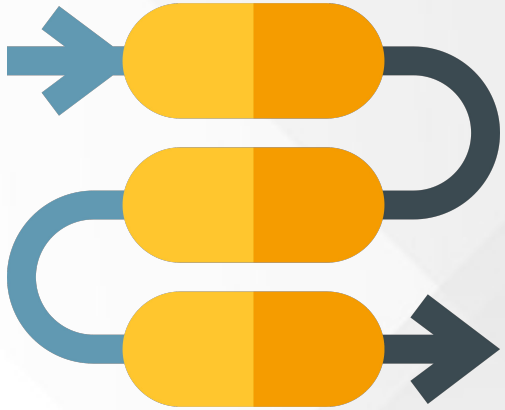


Different Types of DBMS

There are 4 different types of database management systems

- Network database models also have a hierarchical structure. However, instead of using a single-parent tree hierarchy, this model supports many to many relationships, as child tables can have more than one parent.

- Object-oriented databases, the information is represented as objects, with different types of relationships possible between two or more objects. Such databases use an object-oriented programming language for development.



Analyzing the Data and Usage of SQL Editor

SQL Editor

What does it do?

An SQL editor allows SQL queries to be performed. In short, it creates a way for managing and manipulating data in the database.

Who uses it?

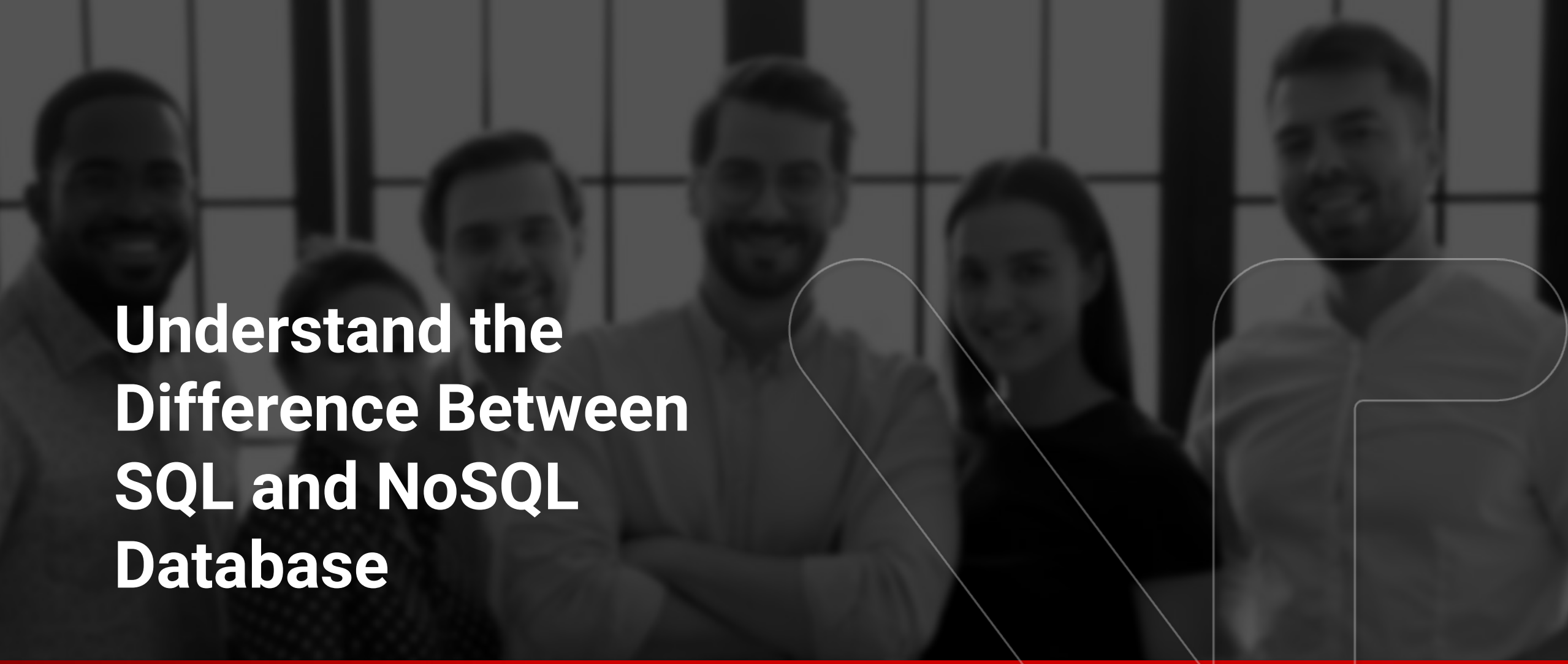
Data administrators and web developers.

SQL Database

An SQL database—also known as a relational database—and named for the programming language it's written in, Structured Query Language (SQL). It's the more **rigid, structured** way of storing data.

A relational database management system (RDBMS) executes **queries**, **retrieves data,** and **edits** data by updating, deleting, or creating new records.

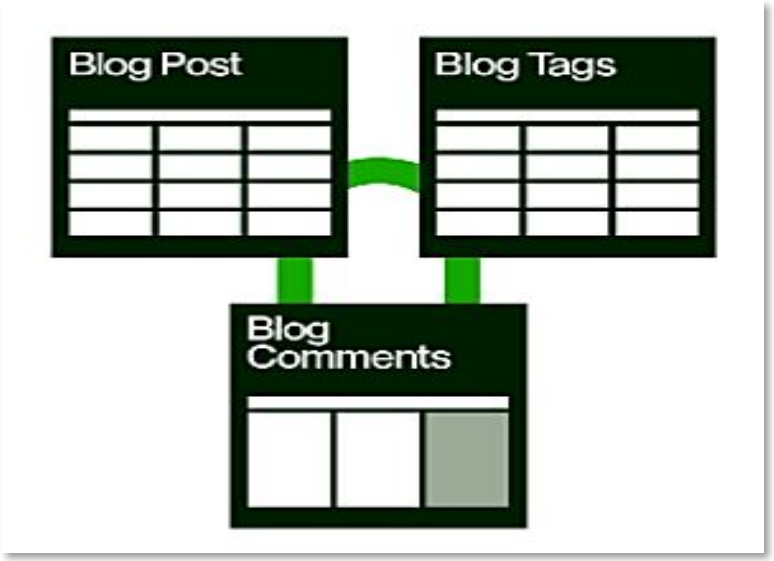
SQL is a **lightweight**, declarative language that does the heavy lifting for the relational database, acting as a database's version of a server-side script



Understand the Difference Between SQL and NoSQL Database

Difference between SQL and NoSQL Databases

SQL



A relational database table organizes structured data fields into defined columns.

NoSQL

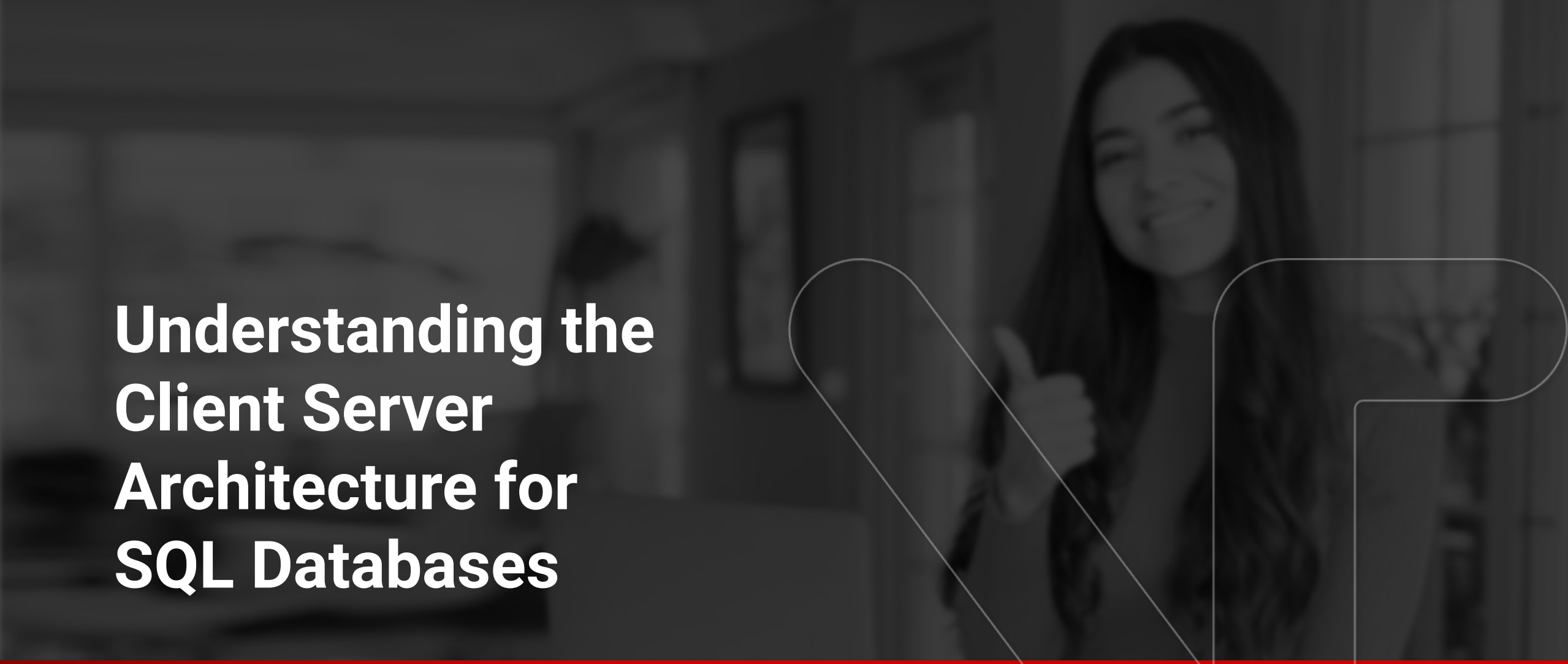
A non-relational database does not incorporate the table model. Instead, data can be stored in a single document file.

source:https://www.upwork.com/mc/documents/111.png

Difference Between SQL And NoSQL Databases

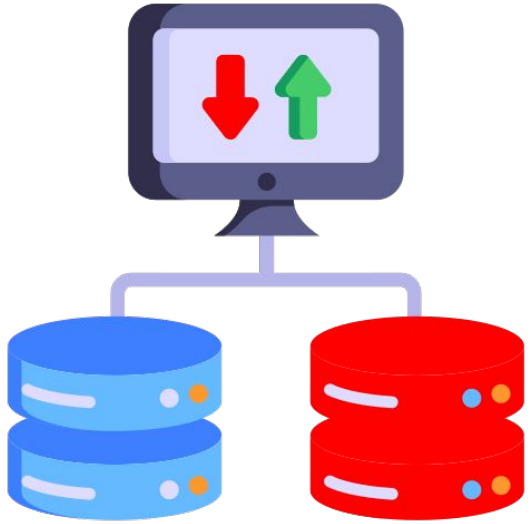
SQL	NoSQL
Relational Database Management System (RDBMS)	Non-relational or distributed database system.
These databases have fixed or static or predefined schema	They have dynamic schema
These databases are not suited for hierarchical data storage.	These databases are best suited for hierarchical data storage.
These databases are best suited for complex queries	These databases are not so good for complex queries
Vertically Scalable	Horizontally scalable
Follows ACID property	Follows CAP (consistency, availability, partition tolerance

Understanding the Client Server Architecture for SQL Databases



Client Server Architecture for Databases

- Client-server architecture is a computing model in which the server hosts, delivers and manages most of the resources and services to be consumed by the client. This type of architecture has one or more client computers connected to a central server over a network or internet connection.
- Client-server architecture is also known as a networking computing model or client-server network because all the requests and services are delivered over a network.

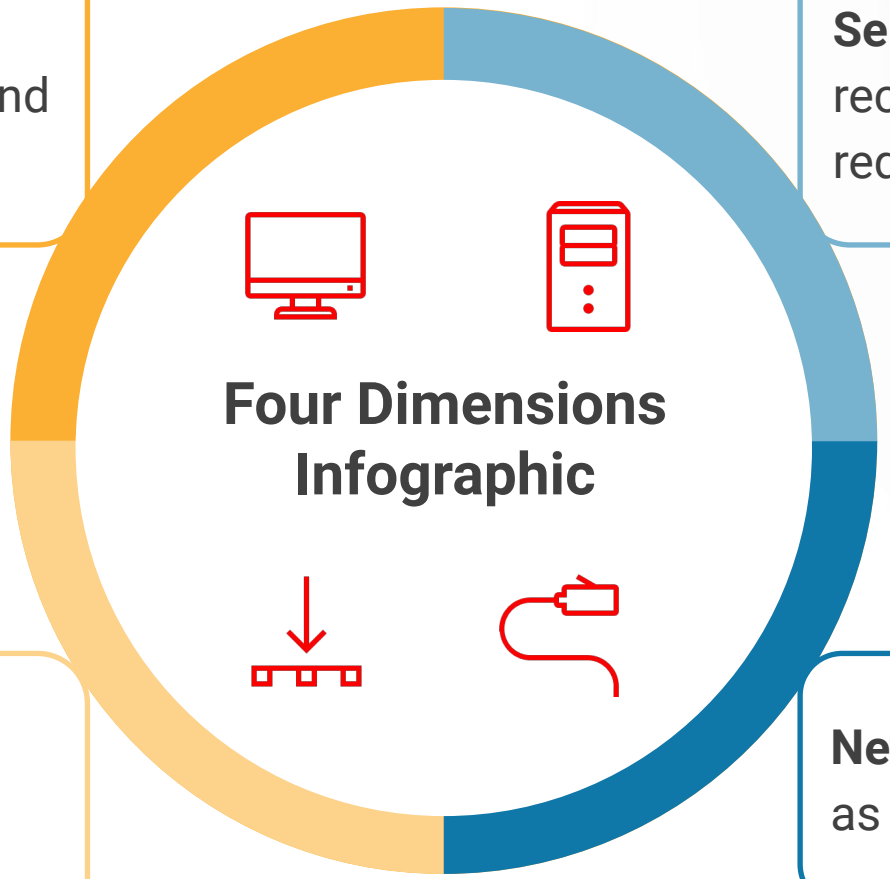


Client Server Architecture For Databases

Vocabulary for components and connectors:

Client: a piece of software or application that takes the input and sends request to the servers.

Server: a piece of software that receives and processes requests from clients.



Load balancer: responsible for distributing incoming network traffic across a group of backend servers to optimize resource usage

Network layer protocols such as TCP/IP

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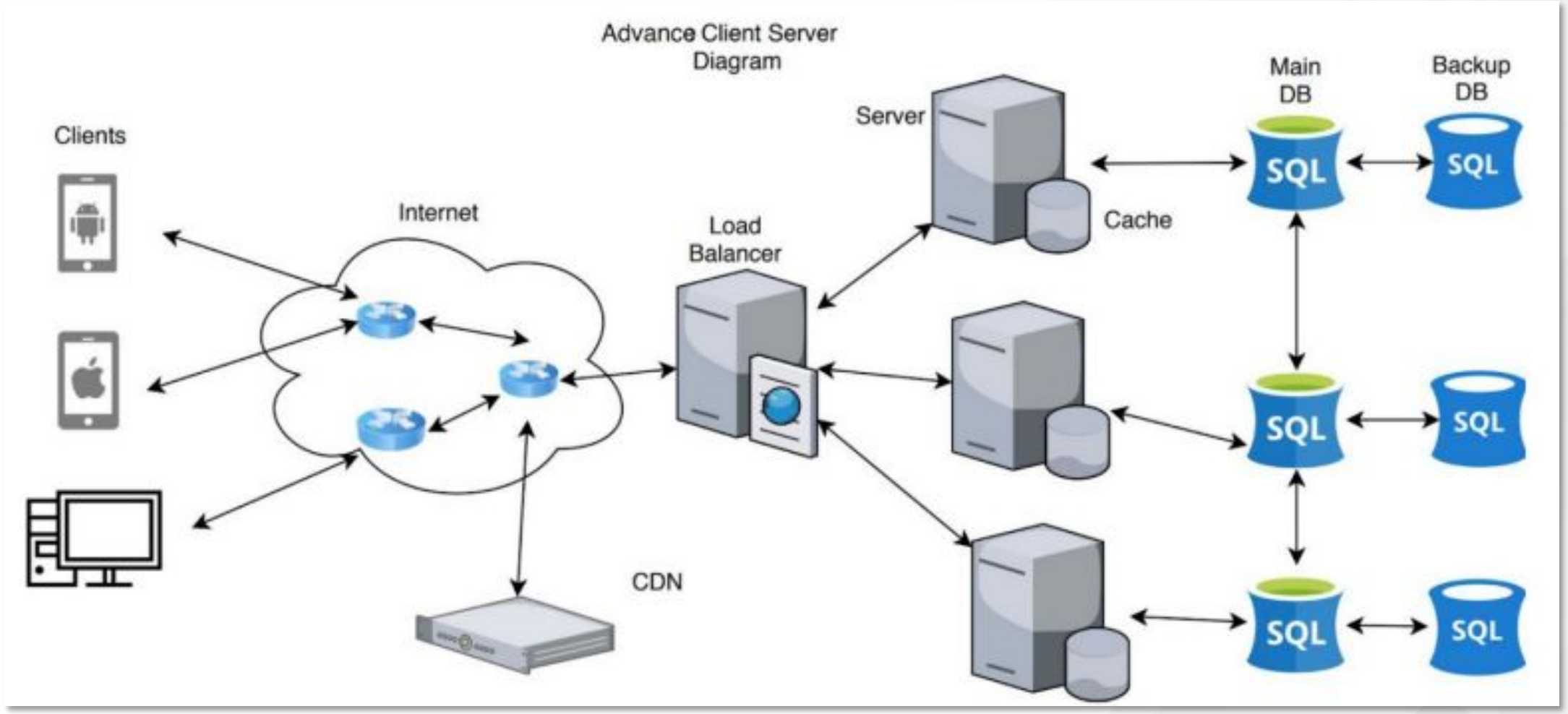
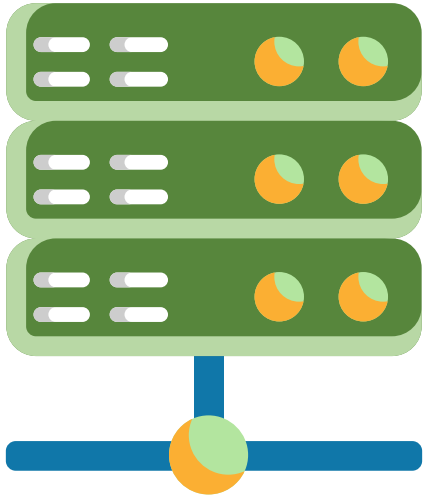
Client Server Architecture for Databases



source:https://cs.uwaterloo.ca/~m2nagapp/courses/CS446/1195/Arch_Design_Activity/ClientServer.pdf

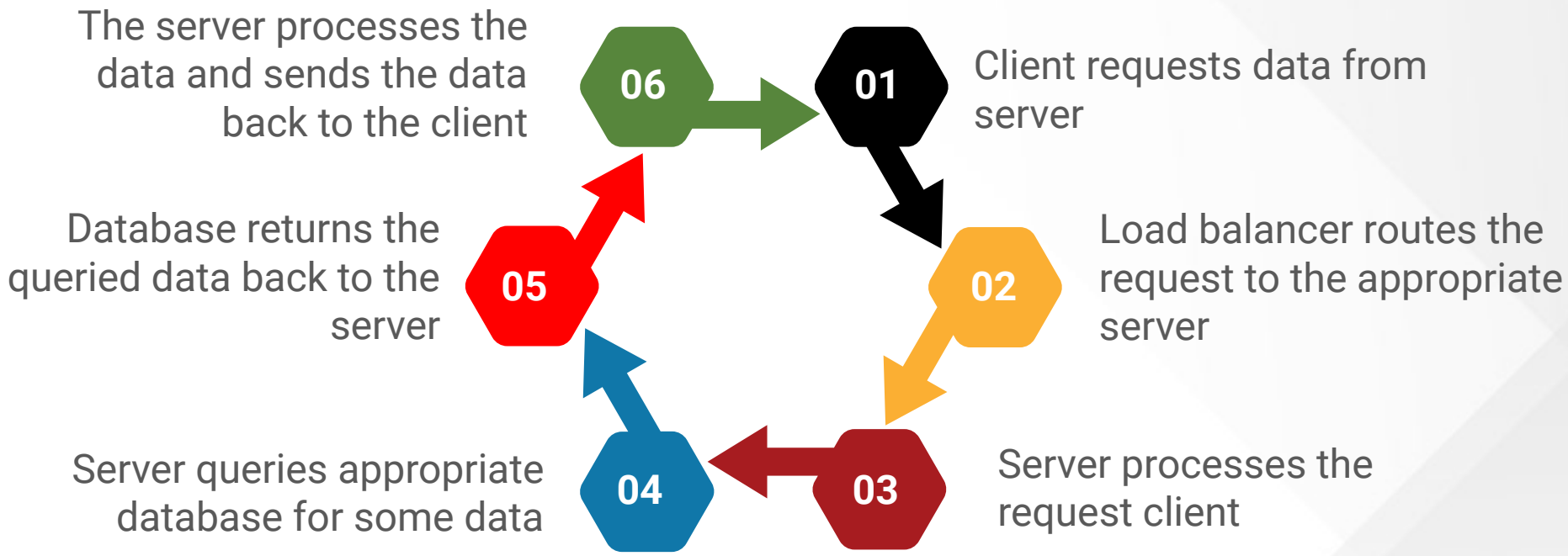
Client Server Architecture for Databases

- The flow of the data is unidirectional and forms a cycle. It is usually initiated by the client requesting some kind of data and the server processing the request and sending some kind of data back to the client via a protocol. Clients cannot directly talk to each other.



Client Server Architecture for Databases

A typical topological data flow goes as follows:



This process repeats

Thank You!