Client-Server

- **Tell us about the features of client/server.**

In client server computing, the clients requests a resource and the server provides that resource. A server may serve multiple clients at the same time while a client is in contact with only one server. Both the client and server usually communicate via a computer network but sometimes they may reside in the same system.

The salient points for client server computing are as follows:

- The client server computing works with a system of request and response. The client sends a request to the server and the server responds with the desired information.
- The client and server should follow a common communication protocol so they can easily interact with each other. All the communication protocols are available at the application layer.
- A server can only accommodate a limited number of client requests at a time. So it uses a system based to priority to respond to the requests.
- Denial of Service attacks hind era servers ability to respond to authentic client requests by inundating it with false requests.
- An example of a client server computing system is a web server. It returns the web pages to the clients that requested them.

Advantages of Client Server Computing

The different advantages of client server computing are −

- All the required data is concentrated in a single place i.e. the server. So it is easy to protect the data and provide authorization and authentication.
- The server need not be located physically close to the clients. Yet the data can be accessed efficiently.
- It is easy to replace, upgrade or relocate the nodes in the client server model because all the nodes are independent and request data only from the server.
- All the nodes i.e. clients and server may not be build on similar platforms yet they can easily facilitate the transfer of data.

Disadvantages of Client Server Computing

The different disadvantages of client server computing are −

- If all the clients simultaneously request data from the server, it may get overloaded. This may lead to congestion in the network.
- If the server fails for any reason, then none of the requests of the clients can be fulfilled. This leads of failure of the client server network.
- The cost of setting and maintaining a client server model are quite high

- **What is a Web server in a client server environment?**

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A web server is software and hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web. The main job of a web server is to display website content through storing, processing and delivering webpages to users. Besides HTTP, web servers also support SMTP (Simple Mail Transfer Protocol) and FTP (File Transfer Protocol), used for email, file transfer and storage.

Web server hardware is connected to the internet and allows data to be exchanged with other connected devices, while web server software controls how a user accesses hosted files. The web server process is an example of the client/server model. All computers that host websites must have web server software.

Web servers are used in web hosting, or the hosting of data for websites and web-based applications -- or web applications.

- **What is the role of the presentation layer**

The **Presentation Layer** is concerned with the syntax and semantics of the information exchanged between two communicating devices.

- The **presentation layer** takes care that the data is sent in that way the receiver of the data will understand the information (data) and will be able to use the data.
- Languages that are syntax can be different from the two communicating machines. In this condition, the **presentation layer** plays the role of translator between them.
- It is possible for two machines to communicate with different data representations, data structures to be exchanged can be defined in an abstract way.
- These abstract data structures will be managed by the **presentation layer** and this layer allows higher-level data structures (For example banking records), to be defined and exchanged.

- **What is a Database Server in a client server environment?**

Database servers are networked computers on a network dedicated to database storage and data retrieval from the database. The database server is a key component in a client/server computing environment. It holds the database management system (DBMS) and the databases. In the database context, the client manages the user interface and application logic, acting as a sophisticated workstation on which to run database applications. The client takes the user's request, checks the syntax, and generates database

requests in SQL or another database language. It then transmits the message to the server, waits for a response, and formats the response to the end-user. The server accepts and processes the database requests, then transmits the results back to the client. The process involves checking authorization, ensuring integrity maintaining the system catalog, and performing query and update process

- Explain 2-Tier and 3-Tier architecture

A two-tier architecture is a database architecture where

1. Presentation layer runs on a client (PC, Mobile, Tablet, etc)
2. Data is stored on a Server.

An application interface which is called ODBC (Open Database Connectivity) an API which allows the client-side program to call the DBMS. Today most of the DBMS offers ODBC drivers for their DBMS. 2 tier architecture provides added security to the DBMS as it is not exposed to the end user directly.

3-tier schema is an extension of the 2-tier architecture. 3-tier architecture has following layers

1. Presentation layer (your PC, Tablet, Mobile, etc.)
2. Application layer (server)
3. Database Server

	Two-Tier Architecture	Three-Tier Architecture
1	It is a Client-Server Architecture.	It is a Web-based application.
2	In two-tier, the application logic is either buried inside the user interface on the client or within the database on the server (or both).	In three-tier, the application logic or process resides in the middle-tier, it is separated from the data and the user interface.
3	Two-tier architecture consists of two layers : Client Tier and Database (Data Tier).	Three-tier architecture consists of three layers : Client Layer, Business Layer and Data Layer.
4	It is easy to build and maintain.	It is complex to build and maintain.
5	Two-tier architecture runs slower.	Three-tier architecture runs faster.
6	It is less secured as client can communicate with database directly.	It is secured as client is not allowed to communicate with database directly.

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7	It results in performance loss whenever the users increase rapidly.	It results in performance loss whenever the system is run on Internet but gives more performance than two-tier architecture.
8	Example – Contact Management System created using MS-Access or Railway Reservation System, etc.	Example – Designing registration form which contains text box, label, button or a large website on the Internet, etc.

- **What is a File server?**

A file server is a central server in a computer network that provides file systems or at least parts of a file system to connected clients. File servers therefore offer users a **central storage place** for files on internal data media, which is **accessible to all authorized clients**. Here, the server administrator defines strict rules regarding which users have which **access rights**: For instance, the configuration or file authorizations of the respective file system enable the admin to set which files can be seen and opened by a certain user or user group, and whether data can only be viewed or also added, edited, or deleted.

- **What are Super servers in client server environments?**

A super server is a server process, it monitors the arrival of a client request and starts the appropriate server service. A super server daemon is a prominent example of a super server for Unix systems. The assignment of network services is subject to the port numbers in the file / etc / services.

In the classical approach the server monitors a process to a port. If there are many ports, many processes will be in the waiting list and thereby will consume system resources, especially the memory. In *super server* approach, only the relatively small servers will be maintained, which requires less memory when idle server services.