LECTURE NOTE 4 [CSC 421]

CLIENT-SERVER COMPUTING

In client-server computing, the client 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, as pictured in Figure 1 below, but sometimes they may reside in the same system.

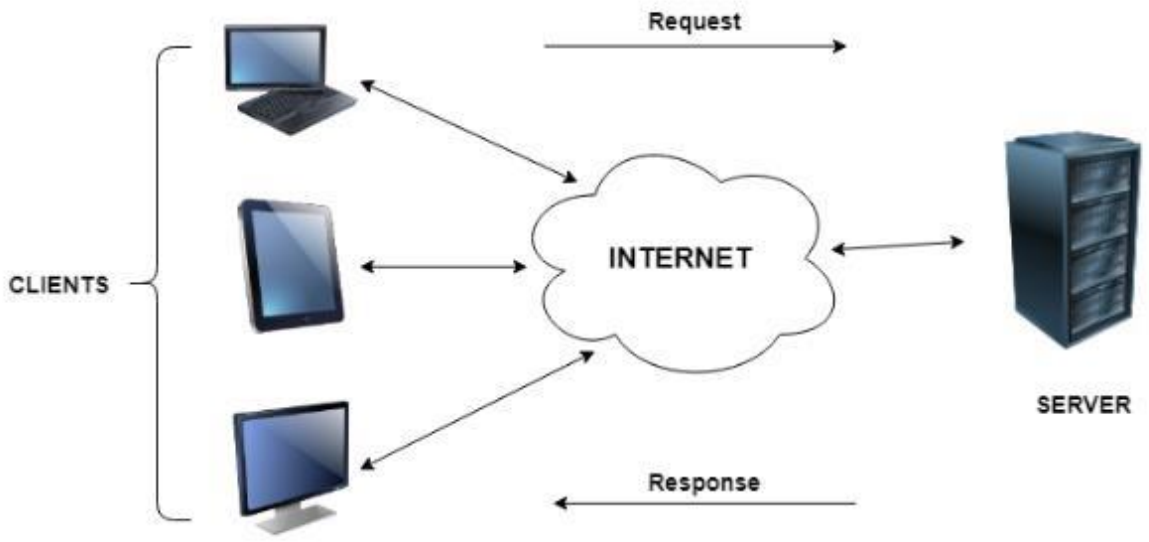

Figure 1 client-server computing

4.1 Characteristics of Client Server Computing

1. 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.

2. 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.

3. A server can only accommodate a limited number of client requests at a time. So, it uses a system based on priority to respond to the requests.

4. Denial of Service (DoS) attacks hinder servers' ability to respond to authentic client requests by inundating them with false requests.

5. An example of a client-server computing system is a web server. It returns the web pages to the clients that requested them.

4.2 Differences between Client-Server and Peer-to-Peer Computing

The major differences between client-server computing and peer-to-peer computing are as follows:

- In client-server computing, a server is a central node that services many client nodes. On the other hand, in a peer-to-peer system, the nodes collectively use their resources and communicate with each other.
- In client-server computing, the server is the one that communicates with the other nodes. In peer-to-peer computing, all the nodes are equal and share data directly.
- Client-server computing is believed to be a sub-category of peer-to-peer computing.

4.3 Advantages of Client-Server Computing

1. 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.
2. The server need not be located physically close to the clients yet, the data can be accessed efficiently.
3. 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.
4. All the nodes i.e., clients and server may not be built on similar platforms yet, they can easily facilitate the transfer of data.

4.4 Disadvantages of Client-Server Computing

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