

21174: Sistemas Computacionais

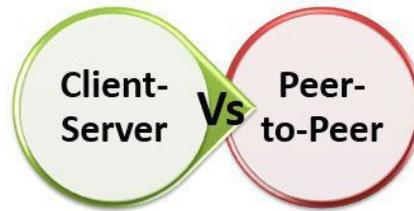
AF5 - Modelos cliente/servidor e peer-to-peer (P2P)

Leia o artigo "[Difference Between Client-Server and Peer-to-Peer network](#)" e apresente, fundamentando, no fórum da unidade curricular **2 exemplos** de aplicações de cada um dos dois modelos:

- Cliente/servidor
- Peer-to-peer

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Difference Between Client-Server and Peer-to-Peer Network



Working on computers for long you may have heard the terms Client-Server and Peer-to-Peer. These two are the common network models that we use in our day-to-day life. The Client-Server network model focuses on information sharing whereas, the Peer-to-Peer network model focuses on connectivity to the remote computers.

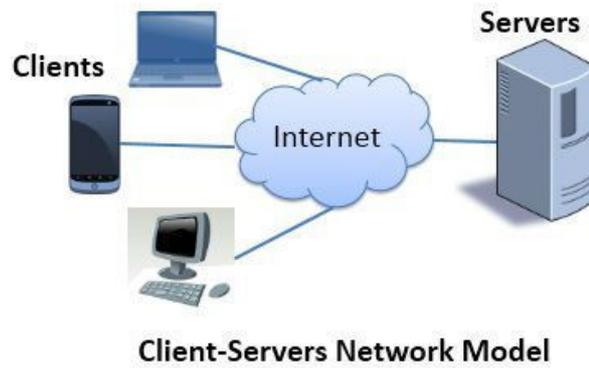
The main difference between the Client-Server and Peer-to-Peer network model is that in **Client-Server** model, the data management is centralised whereas, in **Peer-to-Peer** each user has its own data and applications. Further, we will discuss some more differences between Client-Server and Peer-to-Peer network model with the help of comparison chart shown below, just have a look.

Comparison Chart

BASIS FOR COMAPAIION	CLIENT-SERVER	PEER-TO-PEER
Basic	There is a specific server and specific clients connected to the server.	Clients and server are not distinguished; each node act as client and server.
Service	The client request for service and server respond with the service.	Each node can request for services and can also provide the services.
Focus	Sharing the information.	Connectivity.
Data	The data is stored in a centralized server.	Each peer has its own data.
Server	When several clients request for the services simultaneously, a server can get bottlenecked.	As the services are provided by several servers distributed in the peer-to-peer system, a server in not bottlenecked.
Expense	The client-server are expensive to implement.	Peer-to-peer are less expensive to implement.
Stability	Client-Server is more stable and scalable.	Peer-toPeer suffers if the number of peers increases in the system.

Definition of Client-Server

The Client-Server network model is widely used network model. Here, **Server** is a powerful system that stores the data or information in it. On the other hands, the **Client** is the machine which let the users access the data on the remote server.



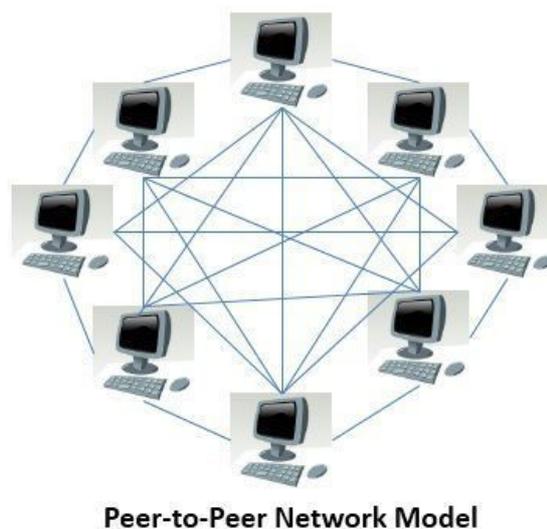
The **system administrator** manages the data on the server. The client machines and the server are connected through a **network**. It allows the clients to access data even if the client machine and server are far apart from each other.

In Client-Server model, the client process on the client machine sends the **request** to the server process on the server machine. When the server receives the client request, it lookouts for the requested data and **send** it back with the reply.

As all the services are provided by a centralized server, there may be chances of server getting **bottlenecked**, slowing down the efficiency of the system.

Definition of Peer-to-Peer

Unlike Client-Server, the Peer-to-Peer model does not distinguish between client and server instead each **node** can either be a client or a server depending on the whether the node is **requesting** or **providing** the services. Each node is considered as a **peer**.



To become a part of peer-to-peer, a node must initially **join** the network. After joining it must start to provide services to and must request the services from other nodes in the peer-to-peer system. There are **two ways** to know which node provides which services; they are as follow:

- When a node enters the peer-to-peer system, it must **register** the services it will be providing, into a **centralized lookup service** on the network. When a node desires for any specific service it must contact centralized lookup services to check out which node will provide the desired services. Rest of the communication is done by the desiring node and the service providing node.
- A node desiring for the specific services must **broadcast** the request for services to all other nodes in the peer-to-peer system. The node providing the requested service will **respond** to the node making the request.

Peer-to-Peer network has the advantage over client-server that the server is **not bottlenecked** as the services are provided by the several nodes distributed in a peer-to-peer system.

Key Differences Between Client-Server and Peer-to-Peer Network

1. The key difference between Client-Server and Peer-to-Peer network is that there is a **dedicated server** and **specific clients** in the client-server network model whereas, in peer-to-peer each **node** can act as **both** server and client.
2. In the client-server model, the **server** provides **services** to the client. However, in peer-to-peer, each **peer** can provide **services** and can also **request** for the services.
3. In the client-server model, **sharing information** is more important whereas, in peer-to-peer model **connectivity** between peers is more important.
4. In the client-server model, data is stored on a **centralized** server whereas, in peer-to-peer **each peer has its own data**.
5. In peer-to-peer model, the **servers are distributed** in a system, so there are fewer chances of server getting bottlenecked, but in the client-server model, there is a **single server serving the clients**, so there are more chances of server getting bottlenecked.
6. The client-server model is more **expensive** to implement than peer-to-peer.
7. The client-server model is more **scalable** and **stable** than peer-to-peer.

Conclusion

It depends on the environment which network model to implement; each model has its own strength and flaws.