Computer Networks(CS39006)
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Lab 3

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Client-Server model

You already know the basis of client server model by now,

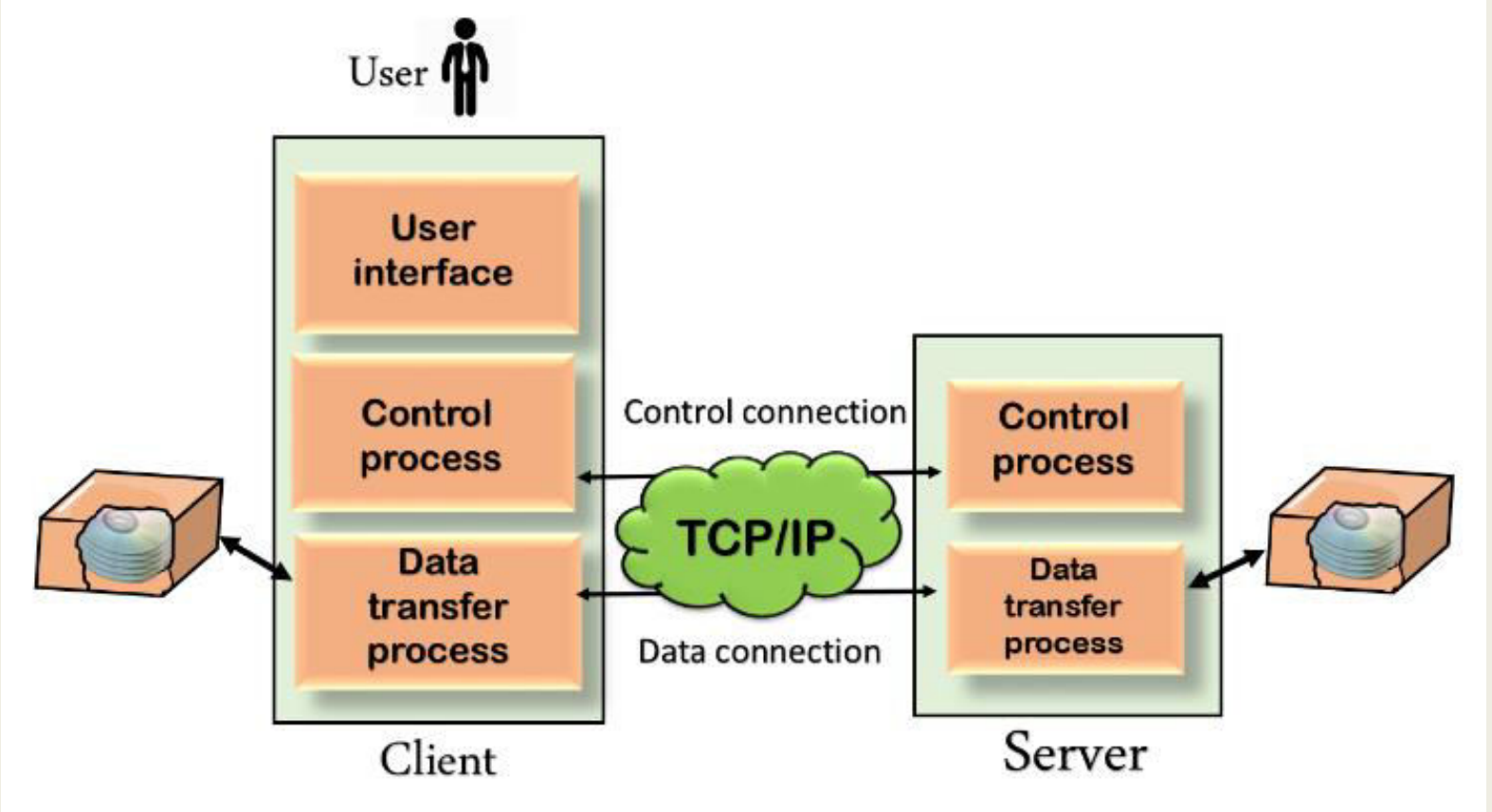
- There is a server computer that continuously runs to provide some service
- There is a client computer/multiple clients that can access the server and request(s) its services
- The client and server are logically (as well as physically) separate entities.
- All messages between clients and servers pass across an intermediary network like the Internet.
- For Internet type networks (socket AF_INET), both clients and servers have an associated IP address unique to them and uses TCP/UDP ports

Almost all network applications at their core use this basic client-server model along with further modifications to suit their requirements.

FTP - File Transfer Protocol

- FTP is a standard protocol used for general file transfer over a network.
- It is based on the client server model.
- **The FTP server** runs on a device where the files are organized in a directory structure.
- **FTP client** can log in to the server and request various file related actions - file transfer, file upload/download, file renaming, directory restructuring etc
- FTP enables heterogeneous devices to share different file types over a network using a standard protocol.
- FTP runs as a command-line tool, but later versions have GUI support as well.
- FTP clients are required to authenticate themselves first with the server before file transfer can take place.
- Two secure versions of FTP is FTP over SSL (**FTPS**) and FTP over SSH (**SFTP**), both support encryption.

FTP architecture



Source: https://www.javatpoint.com/computer-network-ftp

FTP - Advanced concepts

- FTP runs on the standard TCP/IP framework
- There are actually two TCP connections that a single client makes with a server,
  - **Control Connection -** This connection enables the client to exchange FTP control messages with the server, for example setting up a new authentication, exchanging commands etc. **TCP Port 21**.
  - **Data Connection -** This is the connection over which the actual data/file transfer takes place. **TCP Port 20**.
- There are different types of FTP operation - anonymous FTP, active FTP, passive FTP etc. Each has its own utility.
- For Assignment 3, you would need to implement a very simplistic FTP client server communication model.

Thank You!!!