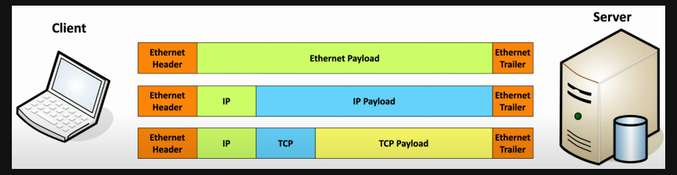
Internet Protocol (IP)

Introduction

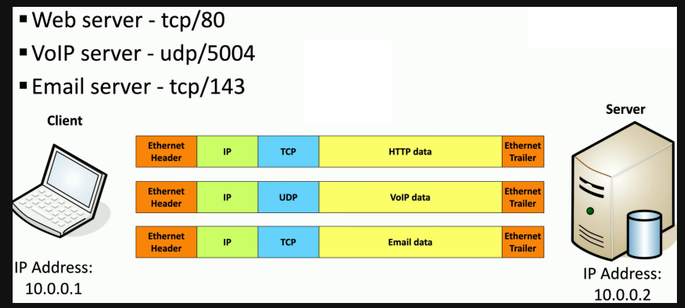
Internet protocol is the delivery method of data over network

You can imagine it as the truck that moves boxes (the boxes being TCP/UDP packets)

The network topology (Routers/Switches) is the road that the IP uses



Each IP payload contains either a TCP/UDP payload



Multiplexing is using many different applications with TCP/UDP at the same time

IP addresses alongside port numbers are used to determine where the packets are going

IPv4 Sockets are the combined IP address, protocol, and application protocol

Ports

Port or port number is a number assigned to uniquely identify a connection endpoint

Non-ephemeral port numbers (permanent port numbers)

Ports from 0 through 1023
Usually on a server or service

Ephemeral port numbers (Temporary port numbers)

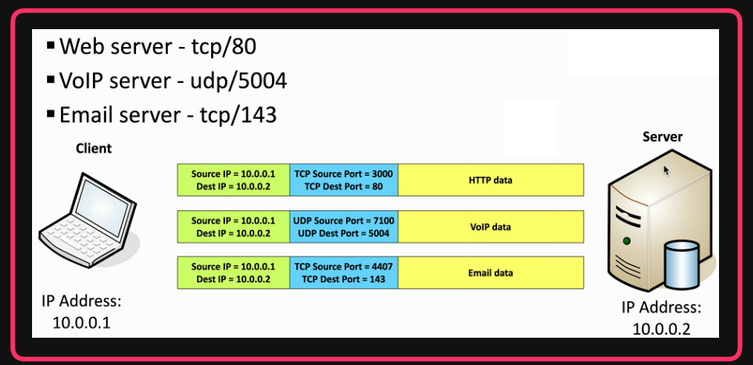
Ports from 1024 through 65535

They might be used interchangeably. However, it's the convention to use it this way

TCP and UDP port numbers can be any number between 0 and 65535 but they have to be one different ports

Most servers (services) use non-ephemeral port numbers

Service port numbers needs to be well-known so that the clients can access that service



UDP

Connectionless (No formal open or close to the connection)

Unreliable delivery (no acknowledgment)

No error recovery and no re-ordering or re-transmitting

No flow control, sender determines the amount of data transmitted

Transmission Control Protocol (TCP)

Connection-oriented (There is a formal connection setup and close)

Reliable delivery, each packet needs to be acknowledged

Recovery from errors and can manage out-of-order messages (Using the sequence numbers in the header)

There is flow control, such that, the receiver can request slower/faster transmission