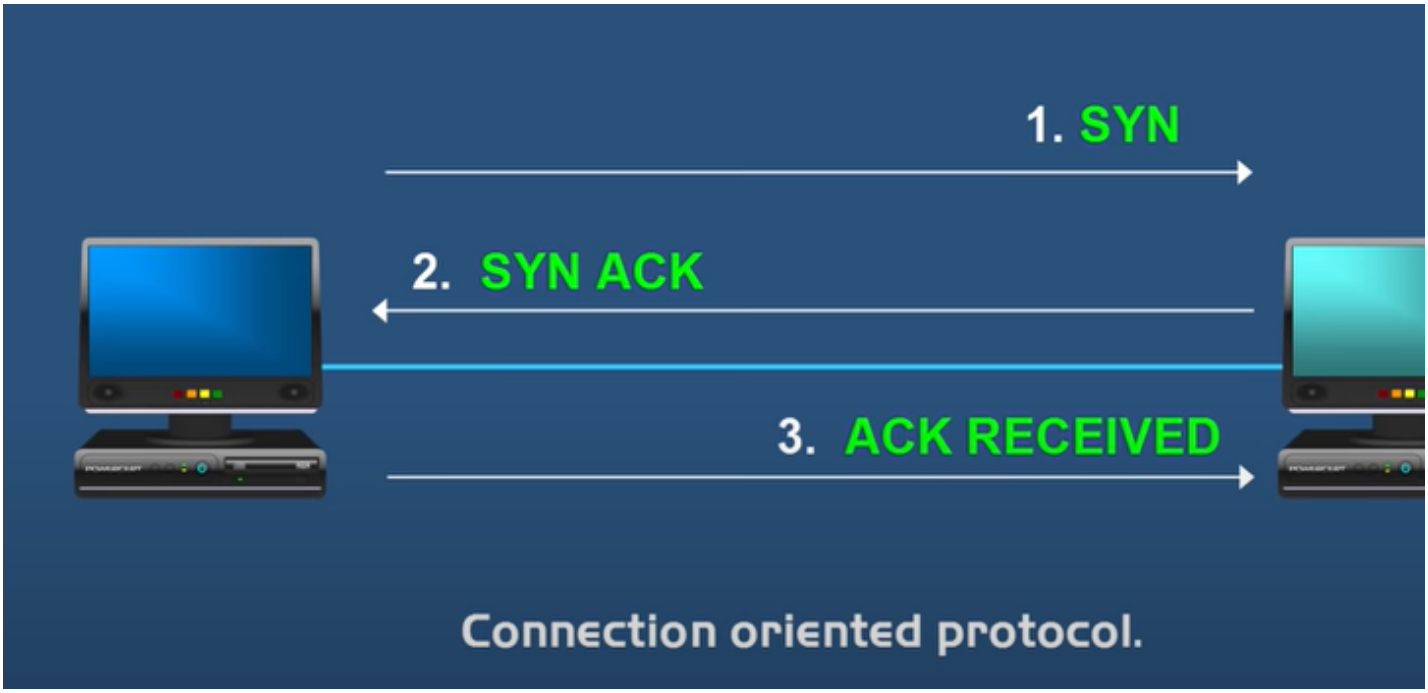
TCP vs UDP

TCP

> Transmission Control Protocol

- TCP is a Connection Oriented Protocol
- Which means it must first acknowledge a session between the two computers that are communicating.
- So the two computers can verify the connection before any communication takes place.
- It does by a way called Three way hand shake

3 way hand shake



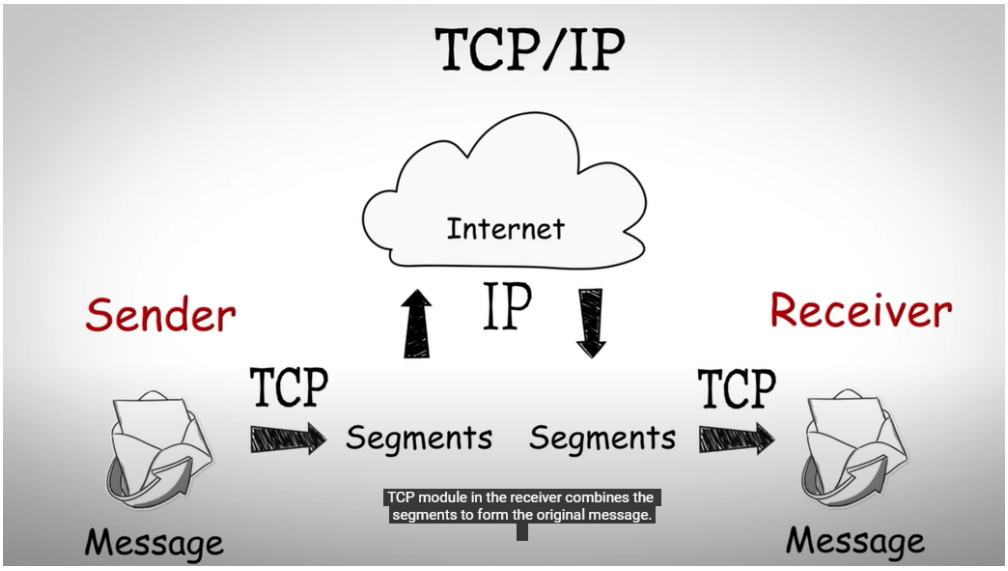
- It guaranties the delivery of the data.
- If the data package goes missing and didn't arrive, then TCP will resend it.
- HTTP, FTP, SMTP are some protocols which uses TCP.

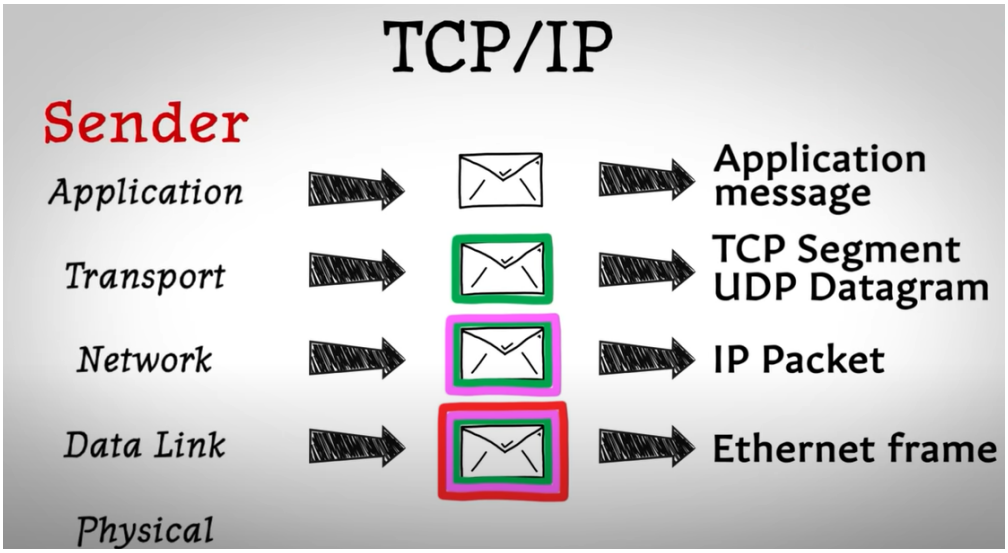
Network and Communication

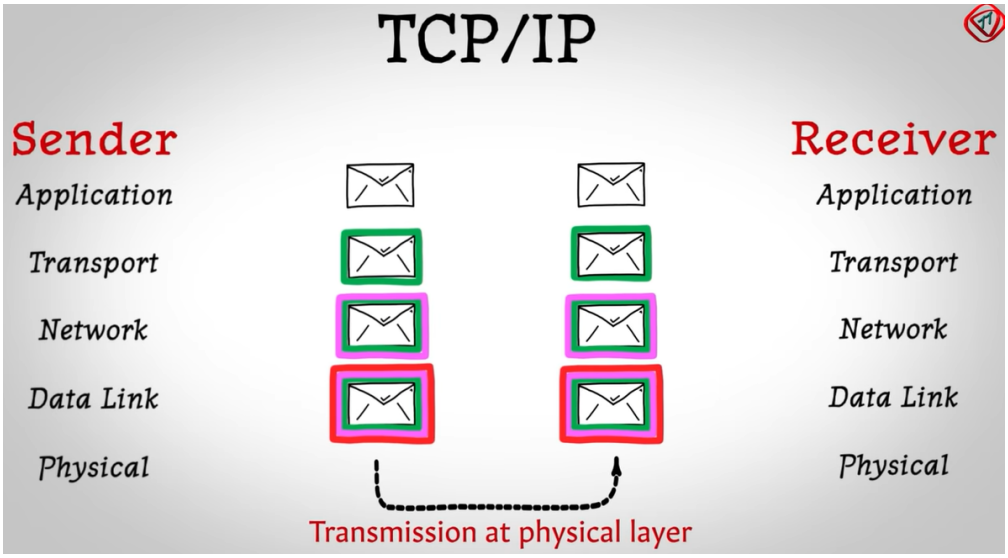
> Two computers connected via a LAN cable, sharing data with the help of *Network Interface Cards* forms a network.

> The process of sending messages from one place to another through a wired or wireless medium is called communication.

- The messages are not sent as a single unit. Instead they are *broken into small data units*.
- These data units are transmitted *through the network* and
- *restored* at the receiver into its original message.







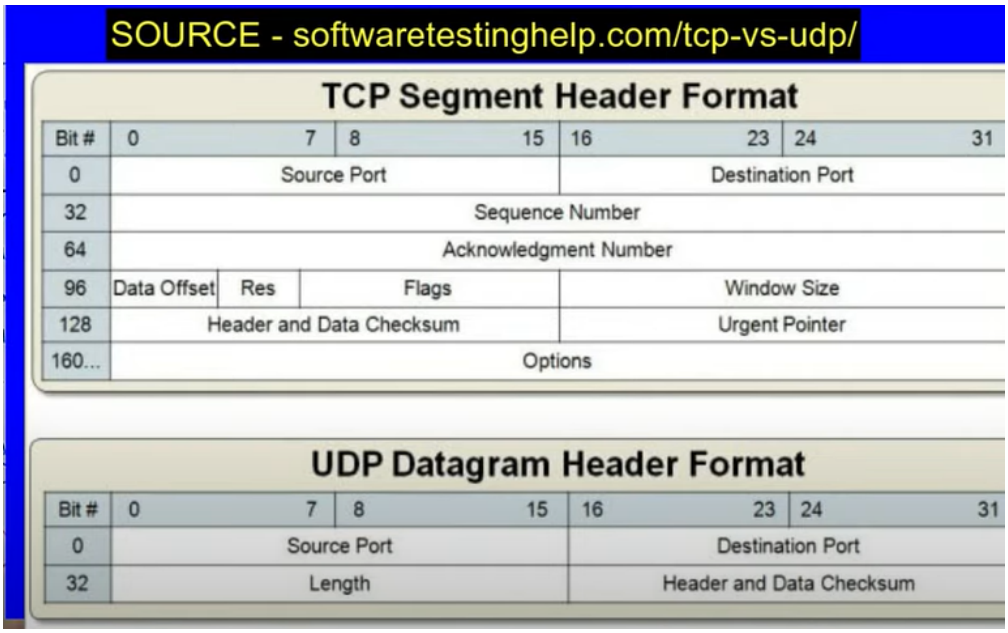
Physical Layer

- The Physical layer is the layer where the actual communication takes place.
- The physical layer converts the binary sequence into signals and transmits them over the local medium.
- signal generated by the physical layer depends on the type of media used to connect the two devices.

UDP

> User Datagram Protocol

- UDP is also for sending and receiving data.
- UDP is a **connectionless oriented Protocol**.
- It does not establish a session and does not guaranty data delivery.
- The source doesn't care the if the data is received at the other end.
- UDP is also know to be *Fire-and-Forget protocol*.
- Because of less overhead that's involved of not guaranteeing data delivery, **UDP is Faster than TCP**.



- DSN, DHCP, VOIP are some of the protocols uses UDP.

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Here are the main differences between #TCP and #UDP:

Factor	TCP	UDP
Connection type	Requires an established connection before transmitting data	No connection is needed to start and end data transfer
Data sequence	Can sequence data (send in a specific order)	Cannot sequence or arrange data
Data retransmission	Can retransmit data if packets fail to arrive	No data retransmitting. Lost data can't b retrieved
Delivery	Delivery is guaranteed	Delivery is not guaranteed
Check for errors	Thorough error-checking guarantees data arrives in its intended state	Minimal error-checking covers the basics may not prevent all errors
Broadcasting	Not supported	Supported
Speed	Slow, but complete data delivery	Fast, but at risk of incomplete data deli

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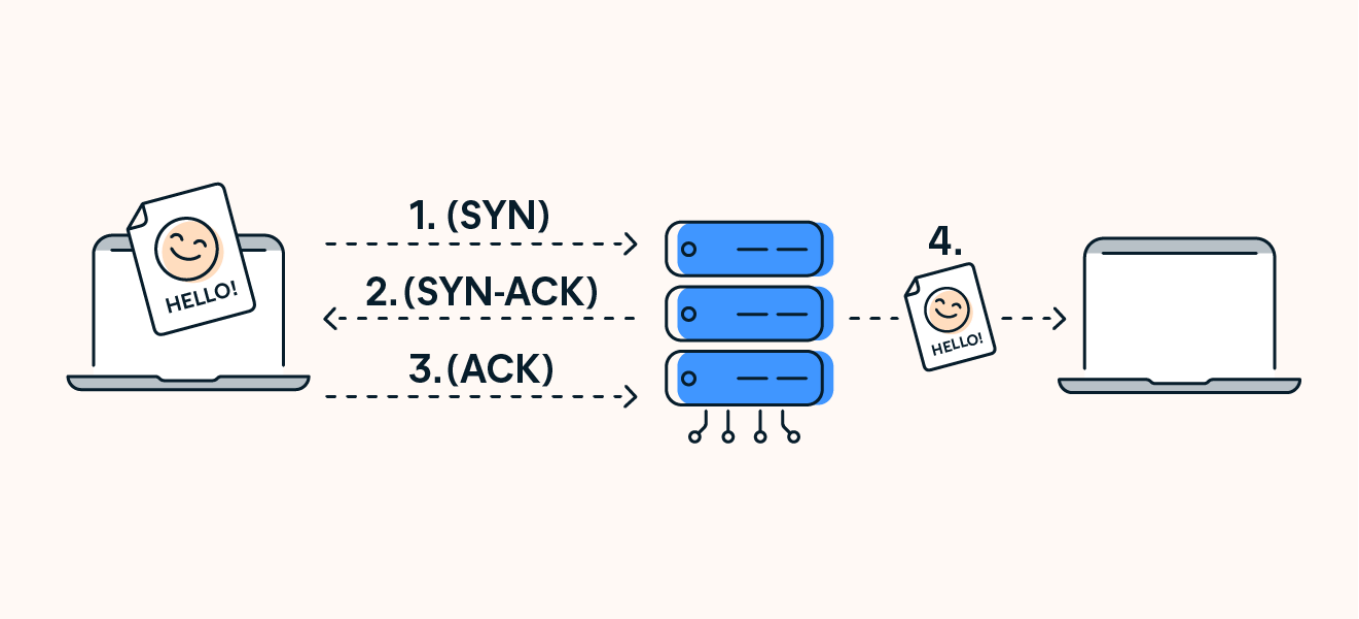
TCP is best for:

- ✅ Email or texting
- ✅ File transfers
- ✅ Web browsing

UDP is best for:

- ✅ Live streaming
- ✅ Online gaming
- ✅ Video chat

TCP



UDP