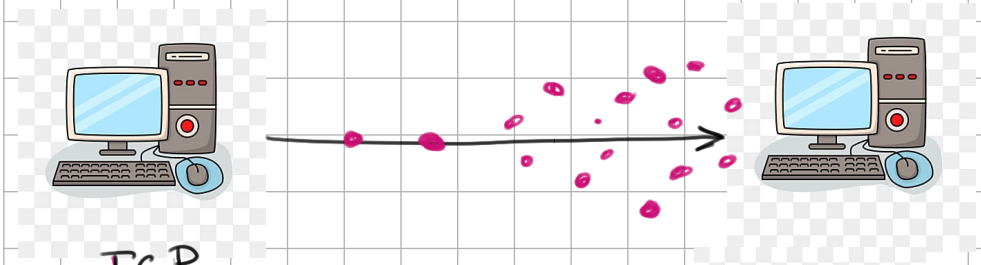
Transport Layer

Principles behind transport Layer Services:

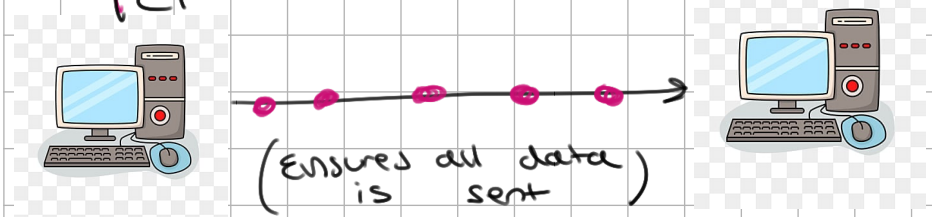
- TCP: Transmission Control Protocol
- UDP: User datagram Protocol

TCP	VS	UDP
• Reliable • Congestion control • Flow control • In-order		• Unreliable • Unordered

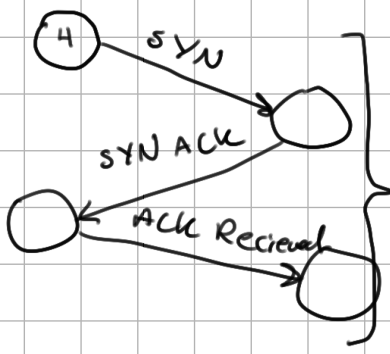
UDP Visual Example



TCP



TCP: Requires a connection. Three way handshake



TCP is a connection orientated Protocol

UDP: connectionless orientated protocol.

↓

fire and target protocol.

→ Faster

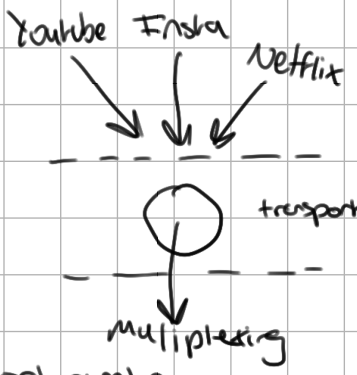
Multiplexing and Demultiplexing ♡

Multiplexing: Handles data at multiple sockets and adds transport Header.

De-multiplexing: Uses header info from packet to deliver information to the correct socket.

Socket: Endpoint assigned to a port. needs somewhere to enter

De-multiplexing



→ Taking a packets data and ensuring that it goes to the correct application

→ Taking data and condensing the data into an IP

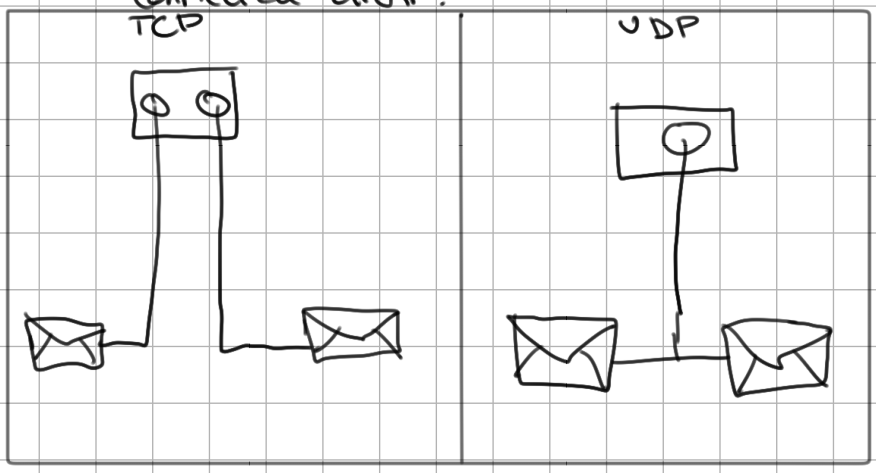
UDP (multiplexing) : same port number but different IP addresses or SRC port will be directed to the same socket at the receiving host.

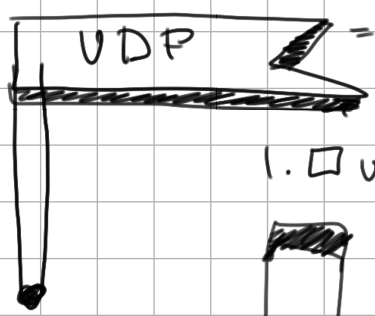
↳ uses port destination only

TCP (multiplexing) : 4 tuple. If they all have same port number. they will be delivered to different sockets due to IP.

SRC : Port + IP
DST : port + IP
→ Each socket is identified with a four tuple. Each socket has a different connected client.

e.g

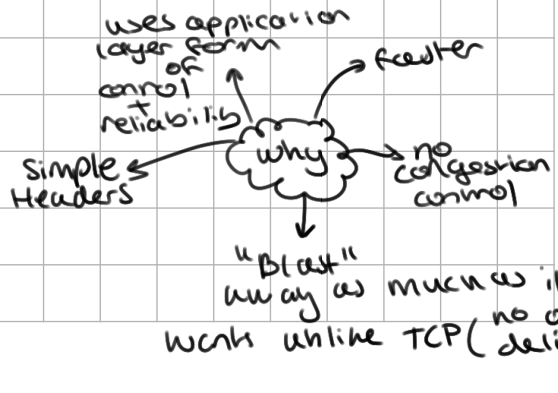




= user datagram Protocol

→ Simple
→ Hopes connection will get to other side
→ connectionless

1. ☐ UDP sender & reciever actions



Sender

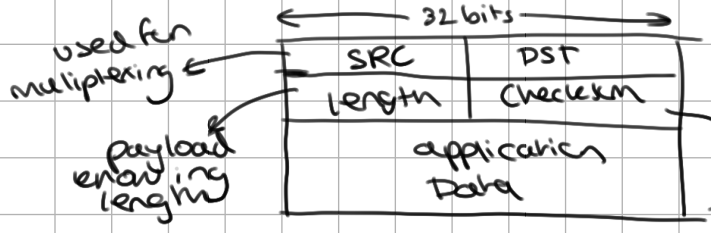
1. Application msg → 2. Header gets added → 3. IP gets added → 4. Transferred

Application
transport
Network
Link
Physical

msg
msg + Header + IP

Reciever

1. Gets segment IP → 2. Check Sum → 3. Extracts msg → 4. Demultiplex



Sent : 5 6 11 → Error!

not : 4 6 ≠ 11

16 bit integer segment.

Additions of segment con

eg 0000000011111111
+ 1111111100000000

Inverse will be the result of the checksum.

- compute checksum of recieved segment
- check if checksums equal
- checksum = weak if # changes = Undetected.