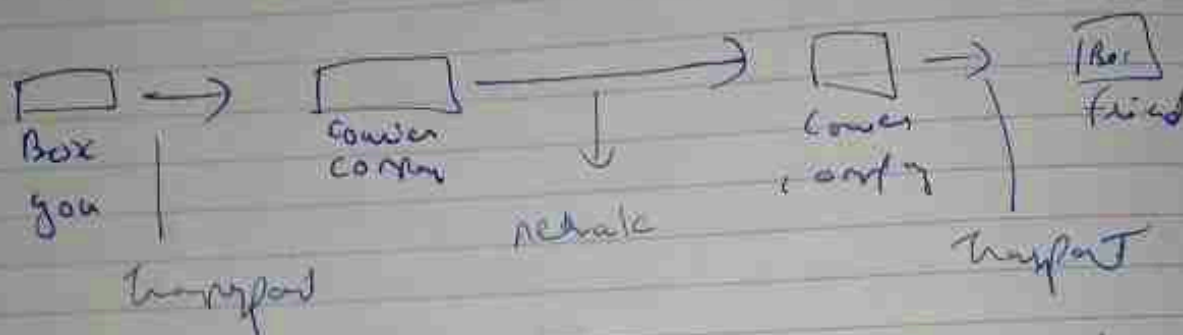


# TRANSPORT / NETWORK LAYER



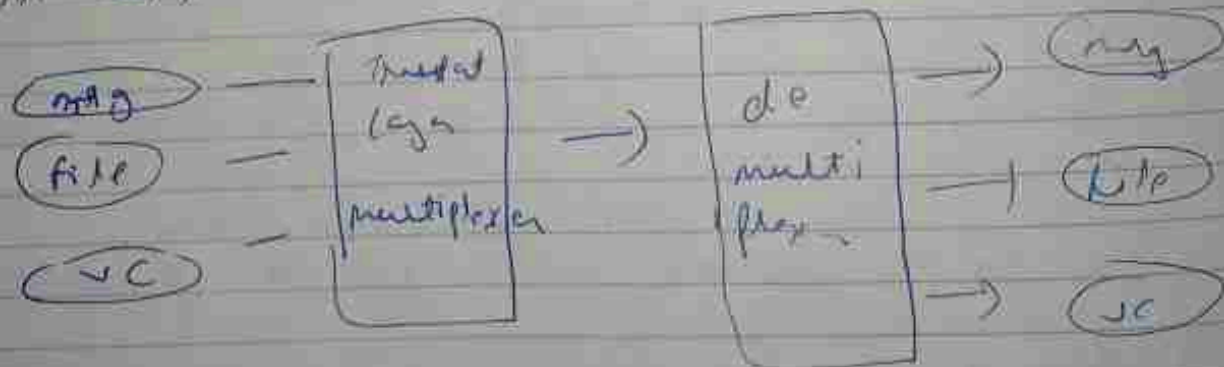
## 2) TRANSPORT LAYER

- Transportation is done by network layer
- Transport layer role is to take ~~from~~ information from network layer to app layer.
- Info the app for jageya - vah transport bathegi & provides an abstraction



\* Transport work in device, it is started in endpoints

\* Use Case,



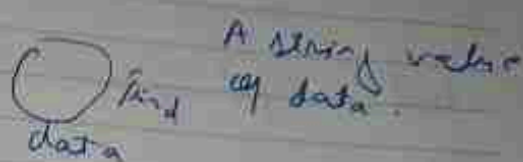
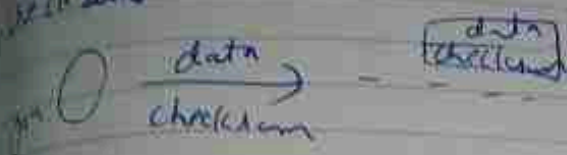
\* Socket have port no and they are gateway for two apps to interact

• Data travel in packets, so transport layer with socket port no to these packets.

transport layer also takes care of congestion control (traffic)  
 congestion control algorithm built in TCP



checksums



Timers  
 Acknowledgment timer (whether other person received packet or not)

To duplicate value, we use sequence no.

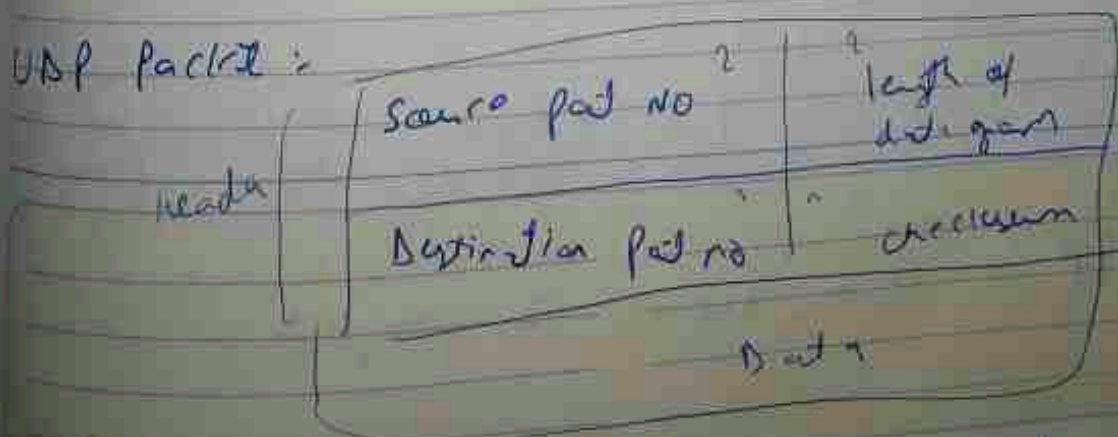
PROTOCOLS

transport - TCP & UDP  
 app - HTTP  
 network - IP

UDP - User Datagram Protocol

- data may or may not be delivered
- data may change on the way
- data may not be in order
- It is connectionless protocol
- It uses checksums, UDP is faster

UDP Packet:



16 = 8

65536 bytes of data we can send



TCP Use case of UDP  
- very fast  
- video conferencing  
- DNS  
- Gaming

sudo tcpdump -c 5

\* TCP - Transmission Control Protocol  
App layer adds raw data

• TCP segments this data, divides in chunks  
add header and checksum

• It may also collect the data from network layer

• Congestion Control

• Takes care of

1) when data doesn't arrive

2) maintain the order of data by using sequence number.

SMTP, IMAP, POP3 use TCP

features

1) Loss Error avoided

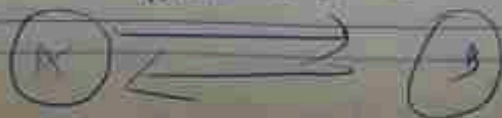
2) Error Control

3) Congestion Control

4) Full duplex

Bi-directional

data can be done simultaneously



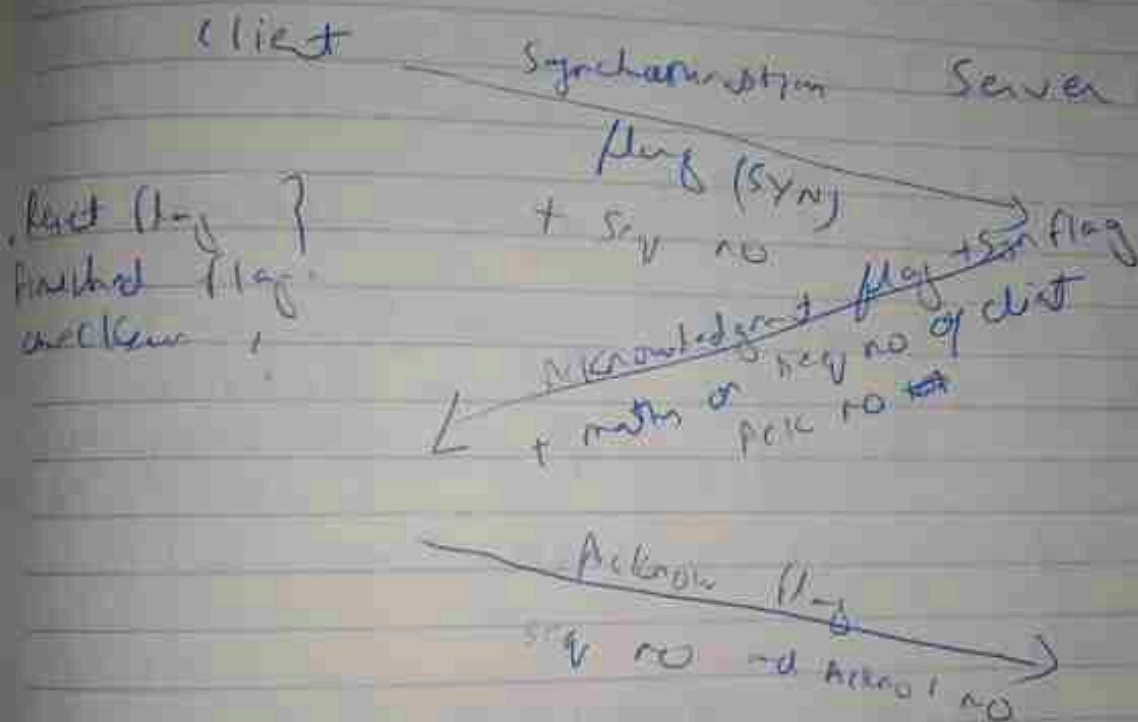
1) TCP connection between 2 computers.



for connection, it have  
 source and destination port number  
 the data  
 sequence no and acknowledge no  
 checksum



### 3 WAY HANDSHAKE \*



### \*\*\* NETWORK LAYER \*\*\*

The data travel in form of  
 transport  $\rightarrow$  segments  
 network  $\rightarrow$  packets  
 data link  $\rightarrow$  frames

- Router works at network layer.
- Every device has their own network address.
- Packet layer will contain the network address of the destination, and of sender and what info we want to send.



- Hop BY Hop FORWARDING
- Routing table contains forwarding table.
  - Routing table may have multiple path packets.
  - Forwarding table only contains one path.
  - Forwarding table is like data structure.

192.168.2.30  
Net. at add device (Host address)

\* Central plane (links routing table)  
Every route is a node, links between nodes are edges of a graph. // It shows the network topology

1) Static routing, we manually add routes.

2) Dynamic routing

Algorithm - Bellmanford ~~technique~~ <sup>dijkstra</sup>, path finding algo

\* INTERNET PROTOCOL

The protocol that lies in network layer.

IPv4  $\rightarrow$  32 bit, 4-words  $2^{32}$

IPv6  $\rightarrow$  128 bit

Hopping takes place at ISP.