CS348 Notes
Transport Layer Introduction & UDP
Video Numbers: 22

OjMaha

I have prepared these notes by watching the videos from Networks Playlist. The following notes may be asynchronous and irrelevant to what Prof. Vinay teaches in class (cuz I do not pay attention during lectures lol). Further, these notes might not cover *everything* as explained in the video lectures. Consider these to be a supplemental read :). If you find any errors, do notify me so they can be edited.

TRANSPORT LAYER

(Layer - 4) (TL for short)

It is the link b/w Network & application layer. → most basic kaam hai

It does the job of "demultiplexing". The same IP packet could be requested by various APPs so it forwards the pkts on diff ports. (each app with diff port).

If you only want to demultiplex; use UDP (User Datagram Protocol).

But suppose you wanna do a file transfer.

The TL will receive what we call "segments" of ≈1500 B.

A few packets may get lost, or they may get re-ordered.

Note that even if all routers follow FIFO; re-ordering is possible owing to change in routing paths.

TCP (Transmission Control Protocol) does the job of reordering segments, reliable data transfer (retransmitting lost segments), congestion control, flow control

Say the segments recd in order are: 1, 2, 4, 5, 7, 8, 6, 9, 10 (3 is dropped)

TCP sends 1, 2 to App; waits for 3 (reliable data transfer. src retransmits it). After receiving 3; it sends 4, 5. Then it doesn't send 7, 8 since it didn't receive 6. Once it receives 6; it sends rest of the packets.

TCP is a heavy weight protocol and does a lotta stuff apart from this.
UDP is just a demultiplexer, it is an awesi protocol. → only sends packets to correct port no.

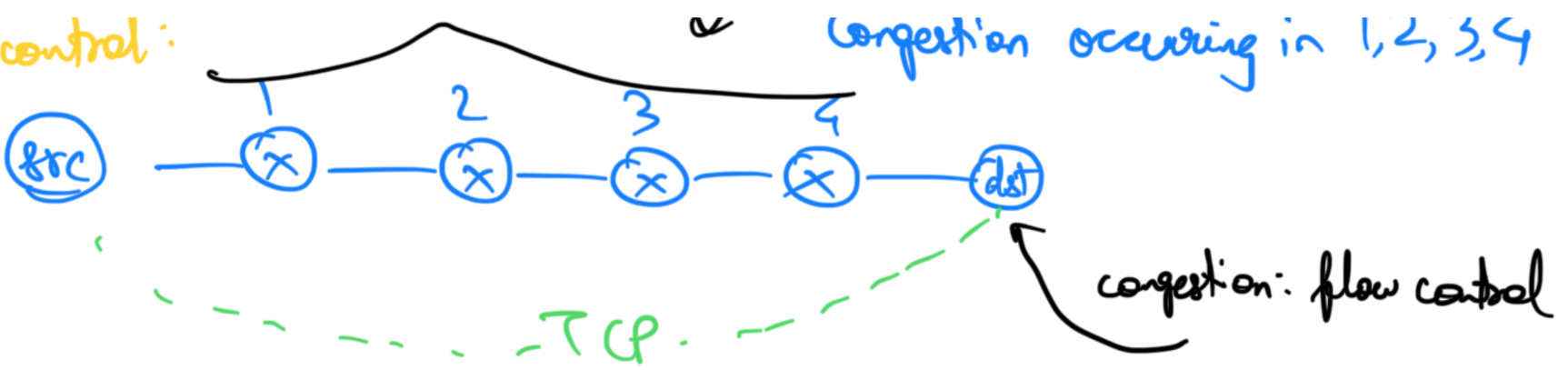
Drop-tail mechanism: If the output queue in a router gets full, you drop any more packets that try to secure a place in the queue. → "congestion".

If all routers use UDP, then prolonged congestion might occur leading to very high packet loss rate.

TCP also does congestion control. It reduces segment sending rate when it senses congestion has occured.

congestion control takes care of any

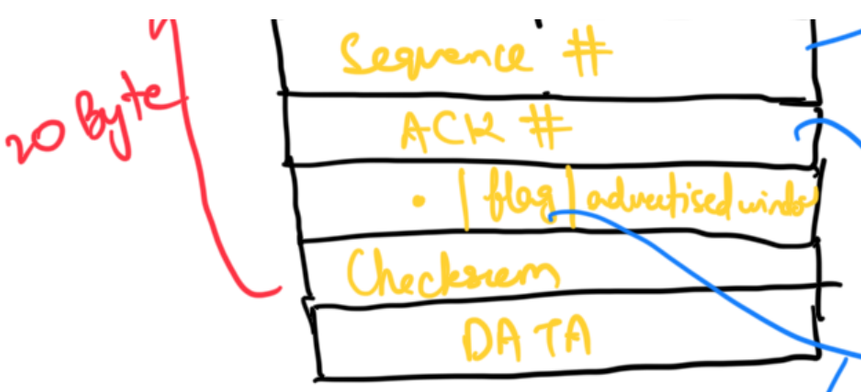
flow control:



If congestion occure @ dst; then use flow control. How is it diff from congestion control? src & dst communicate directly via TCP so this handling can be done more precisely.

UDP Header:

TCP Header:



what byte no. you expect next. (I hv recd everything till the previous byte)

synchronisation

SYN | FIN | RESET | PUSH | URG | ACK.

(start) (end) of connection.

forget for now

Bits are set to 0/1.

means ack is present in segment.

There is a Protocol Field @ IP layer that tells which protocol is used in TL.

↳ 6: TCP
17: UDP