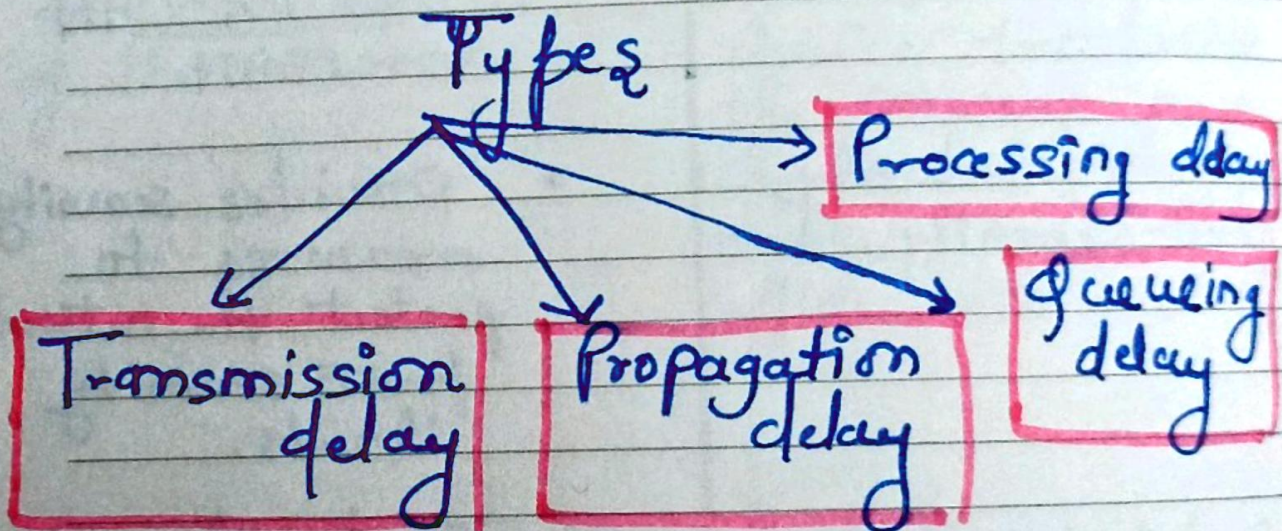




Delays in Computer Networks -

means — ??

the **time** for which the **processing** of a **particular** **packet** take place.

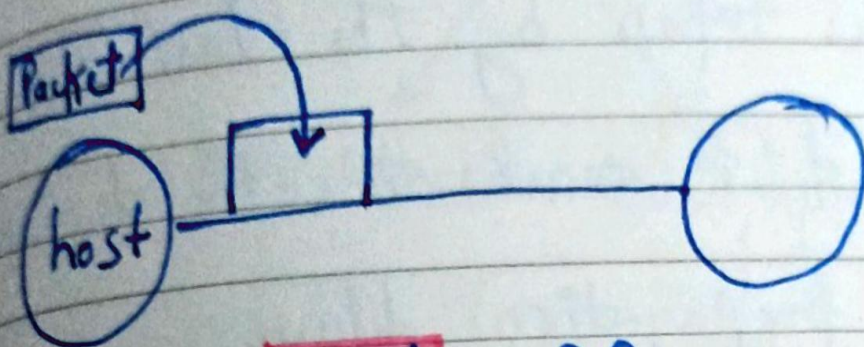


Remarks

Explain all \Rightarrow

Transmission delay -

Time to transmit a packet from host to the transmission medium is called transmission delay.



How to find = ??

Bandwidth = \pm bps
data = \pm bits

\rightarrow in \pm sec we transmit \pm bit

$$T_t = \frac{L \text{ (bits)}}{B \text{ (bits per sec)}}$$

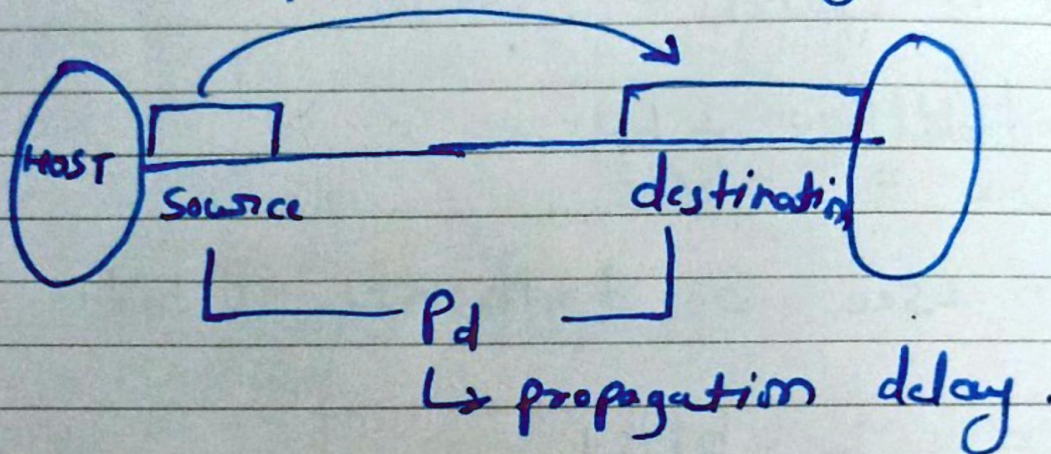
Remarks

if BW is high then T_t is less.



Propagation delay -

After the packet is transmitted to the transmission medium, it goes through the medium to destination. The time taken by the last bit of packet to reach the destination is called propagation delay.



$$T_p = \frac{d \text{ (distance)}}{v \text{ (velocity)}}$$

where $v = 3 \times 10^8$

Remarks

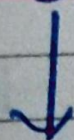


In case of **optical fibre**

$$V = 3 \times 10^8 \times 0.7 \\ = 2.1 \times 10^8 \text{ m/s}$$

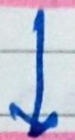
factor affecting $T_p \rightarrow$

Distance



take more time to reach the destination, **$d \uparrow$**

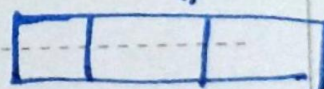
Velocity



velocity \uparrow then Packet will receive faster.

Queueing delay —

Packet \rightarrow **received** \rightarrow **destino.**



queue.

Packet wait in **queue** for sometime called **buffer**.

Date ___/___/___

Notes



delay depends on following factors —

Size of queue is \uparrow (increases)

queue delay \uparrow (increases)

Processing delay —

Time taken to process the data packet by the processor that is the time required by routers to decide

to forward packets,

update TTL, header, checksum.

Remarks



It does not have any
formula \rightarrow depend on
speed of the processor.

$$T_{\text{total}} = T_s + T_p + T_q + T_{\text{pro}}$$

$$T_{\text{total}} = T_s + T_p \quad (T_q \text{ and } T_{\text{pro}} \text{ equal to } 0)$$

Remarks