CS & IT ENGINEERING

COMPUTER NETWORKS

TCP & UDP

Lecture No-11

By- Ankit Doyla Sir

- TCP timer managment

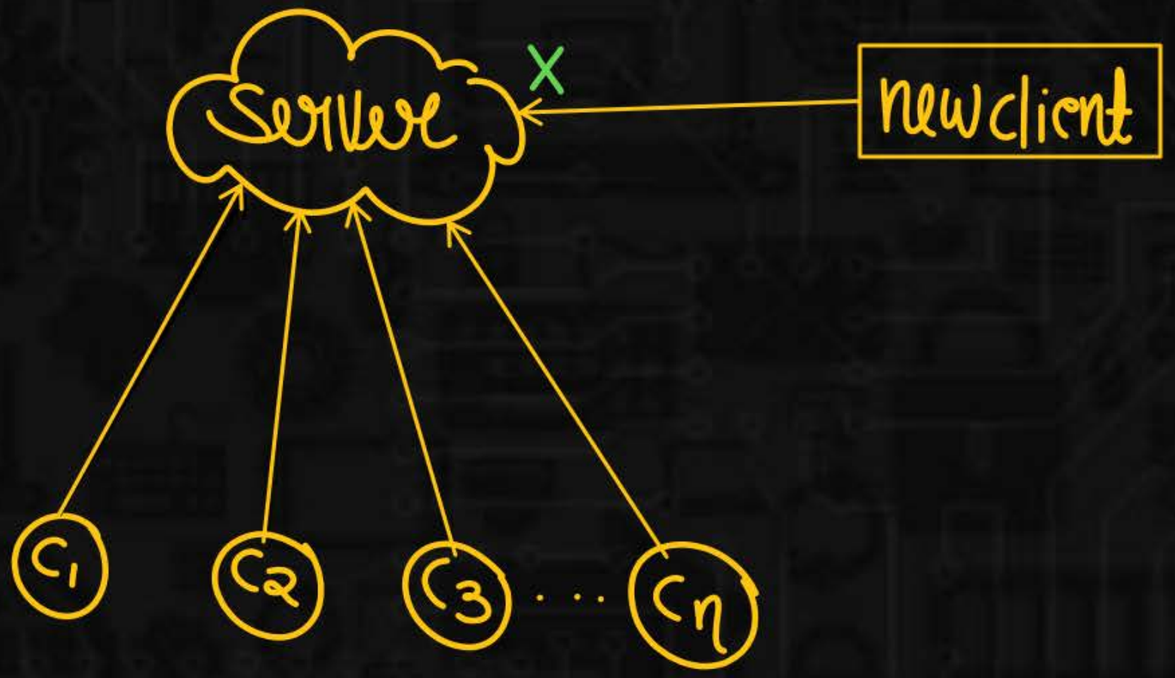
TCP Timer Management

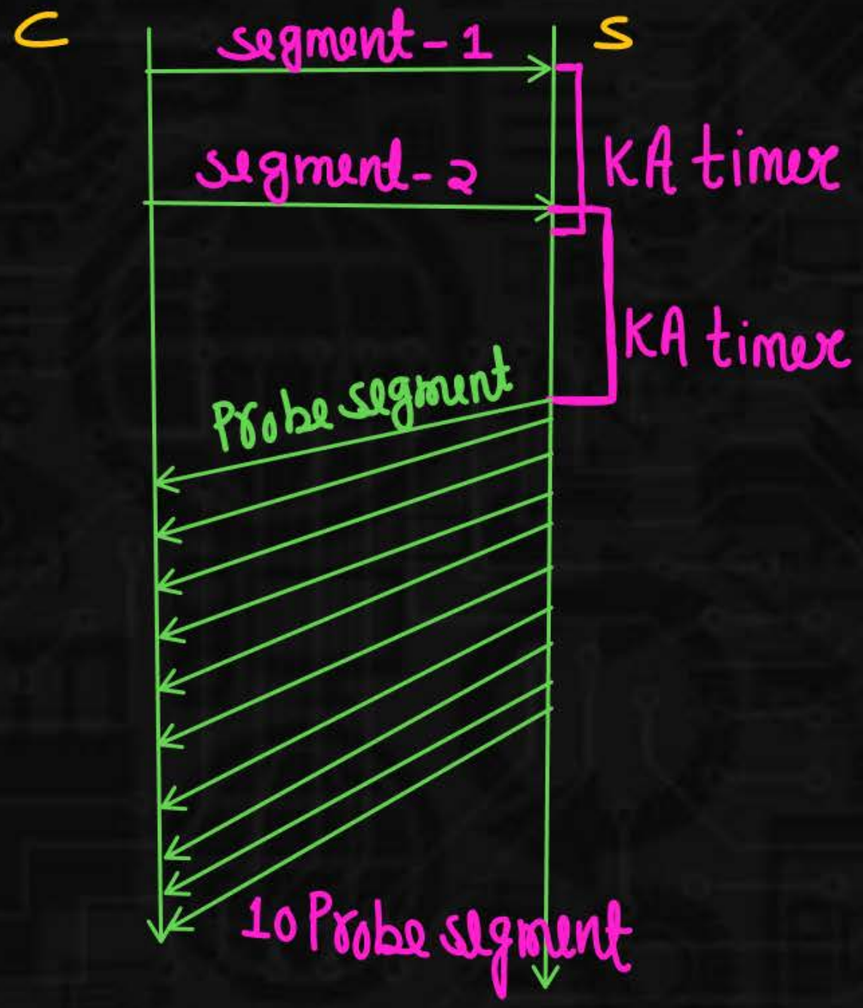
TCP timer management

1. Keep Alive timer
2. Persistent timer
3. Acknowledgement timer
4. Time wait timer
5. Time out timer

1. Keep alive timer:

It is used to keep track of ideal connection. Server will close the connection If client does not send any data for a fixed amount of time.





Note:

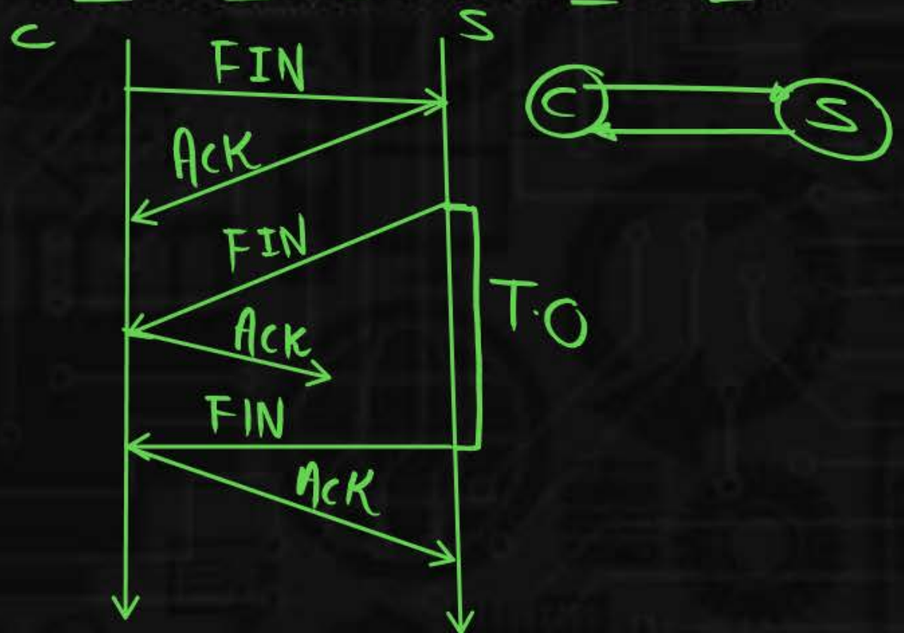
Each time the server receives the packet from a client, it reset the keep alive timer. If the server does not received packet from the client and keep alive timer expired .it send a probe segment. If there is no response after 10 probes, it assume that the client is down and terminate the connection.

2. Acknowledgement timer :

Whenever Receiver receives a segment. It will start a timer called Acknowledgement timer. Whenever Ack timer goes off the receiver send one Acknowledgment for all the segment received in this timer. This is known as commulative Ack.

3. Time wait Timer: (2 MSL)

The Time wait timer (2 MSL) is used during connection termination. The maximum Segment Life time (MSL) is the amount of time any segment can exist in the Network before being discarded. The implementation needs to choose a value for MSL. Common values are 30 sec, 1 min or even 2 min. The 2 MSL timer is used when TCP performs an Active close and send the Final Ack. The connection must stay open for 2 MSL amount of time to allow TCP to resend the final Ack in case of Ack is lost. This requires that the RTO timer at the other end times out and new FIN and Ack segment are resent.



4. Time Out Timer:

At DLL

$$RTT = T_d + 2 * P_d$$

Assume $T_d = 0$

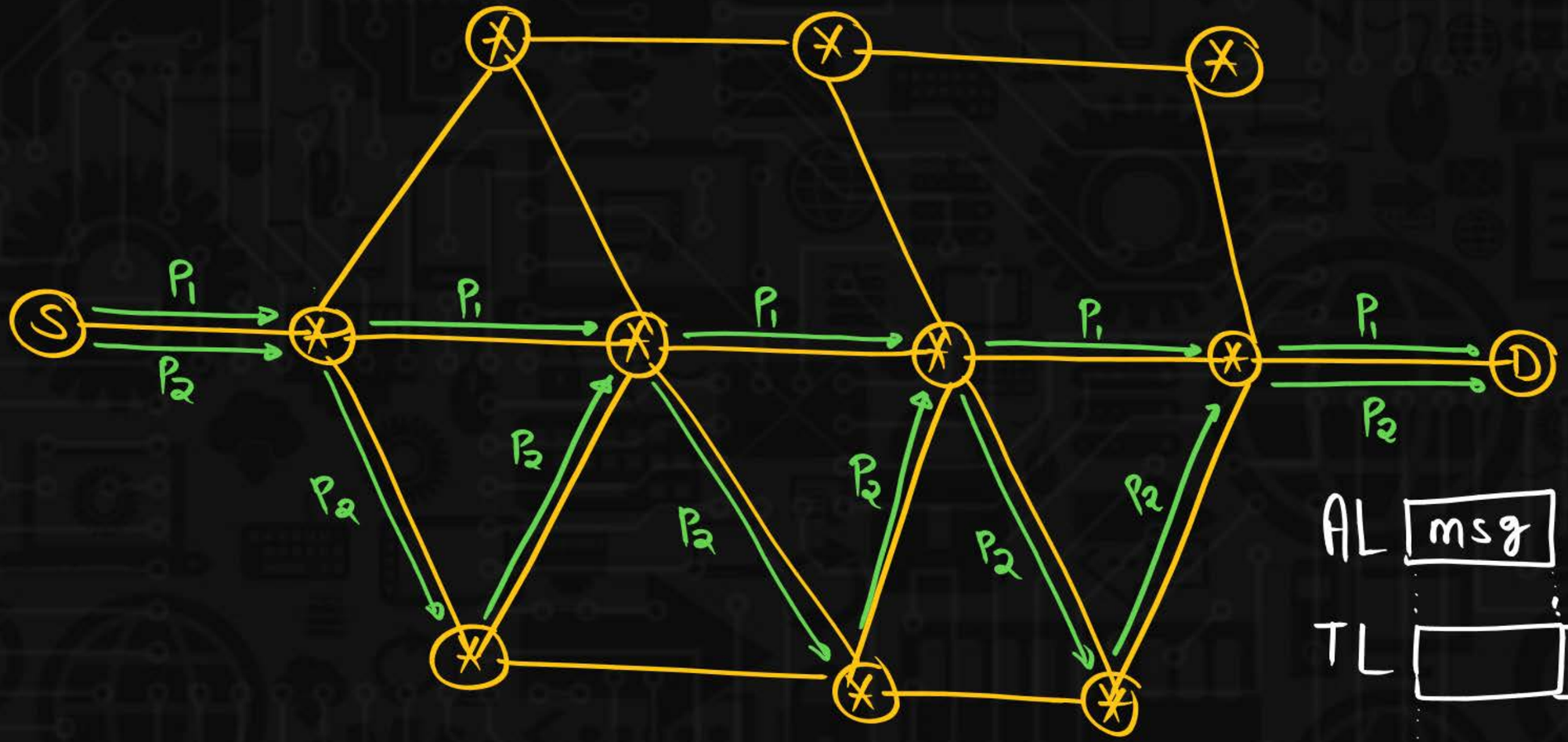
$$RTT = 2 * P_d$$

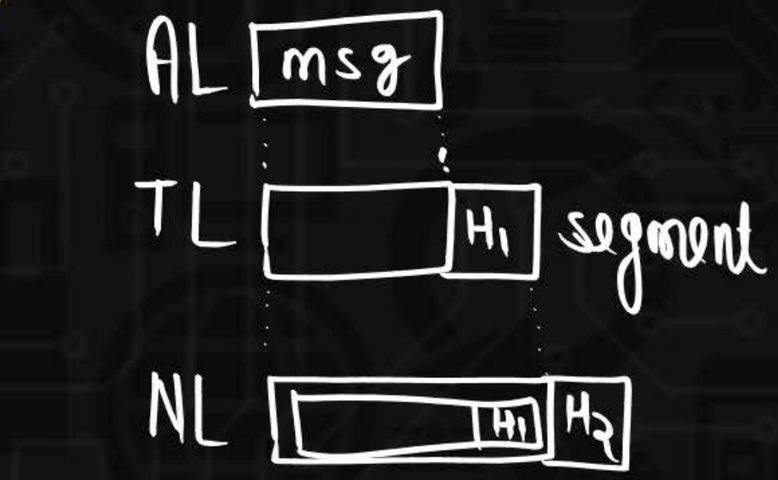
$$RTT = 2 * 10sec = 20sec$$

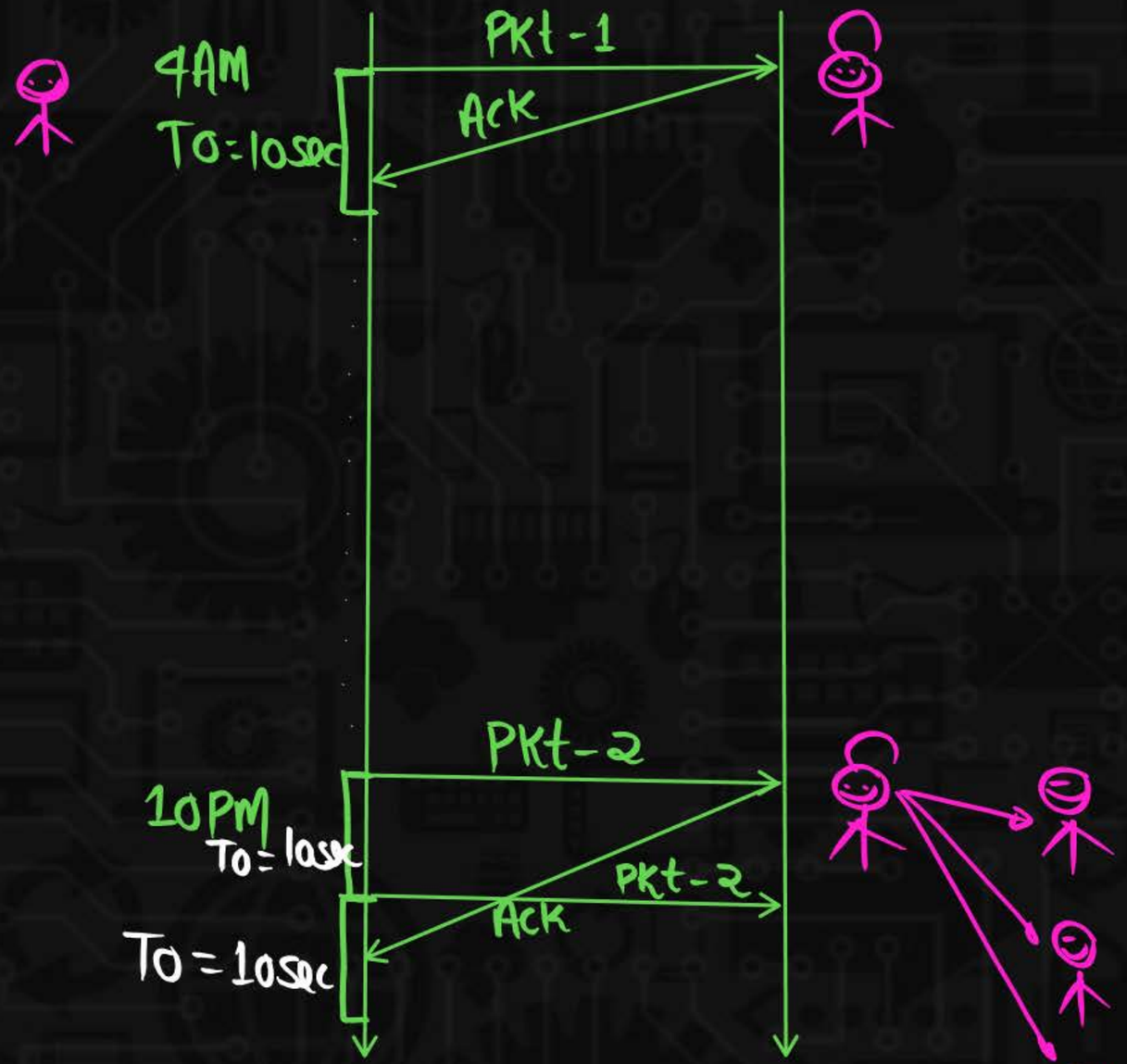
$$T.O = 2 * RTT$$

$$To = 2 * 20sec = 40sec$$

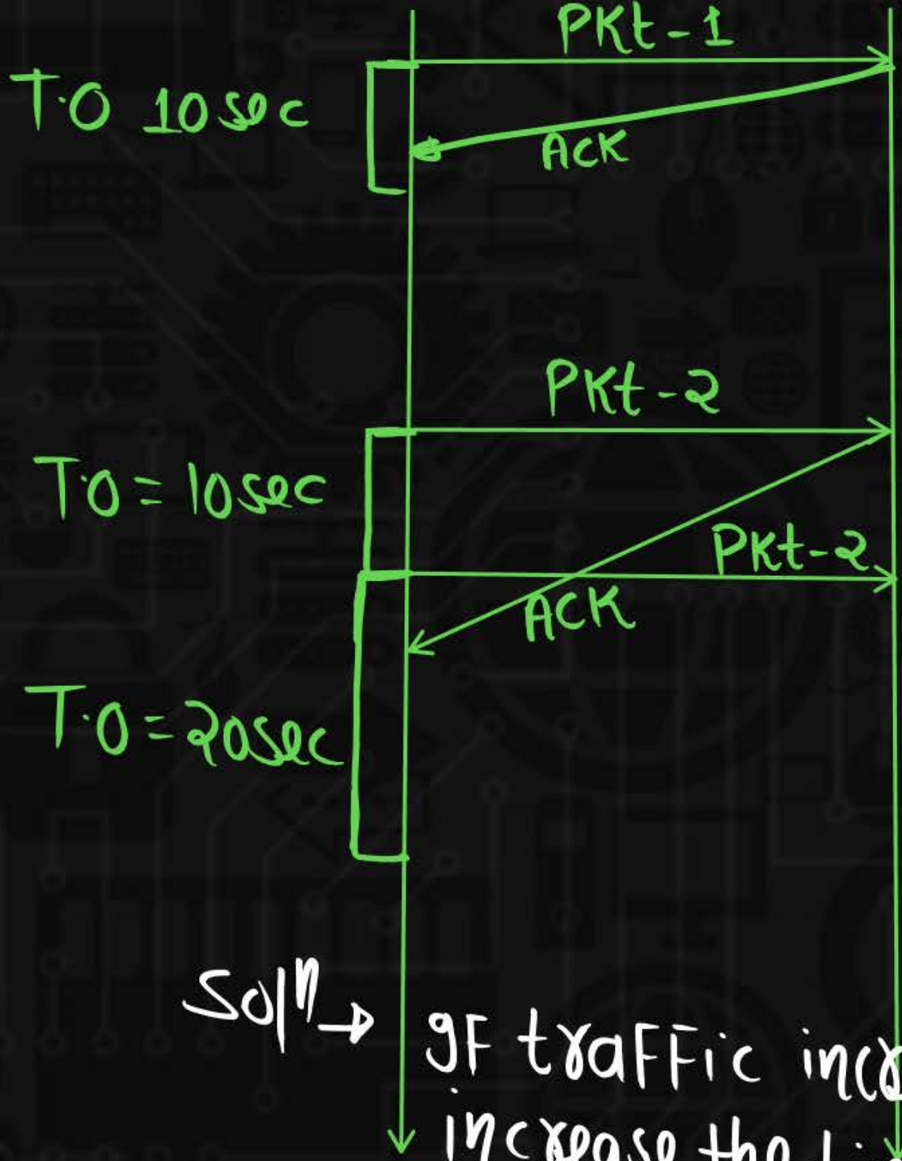
Time out timer at Transport Layer





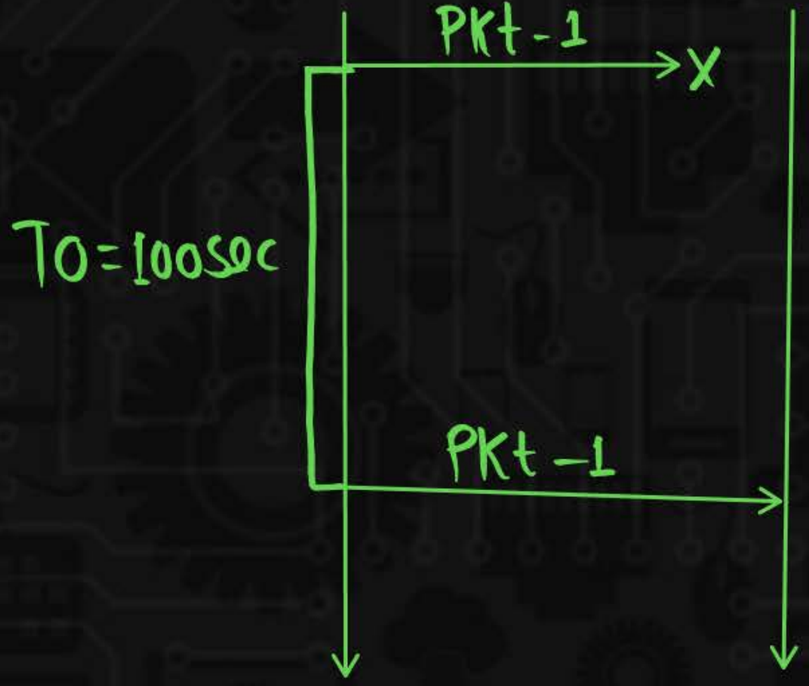


Solution



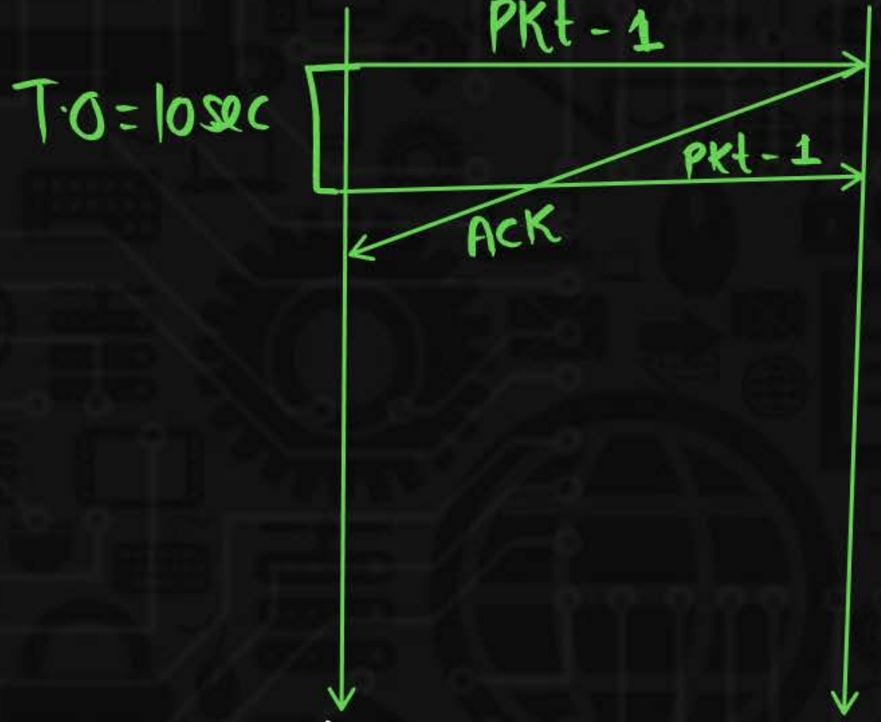
Soln → If traffic increase then increase the time out timer

Case I



Note: If time out timer is very large then lost Packet will be retransmitted late.
For ex: After 100 sec

Case II



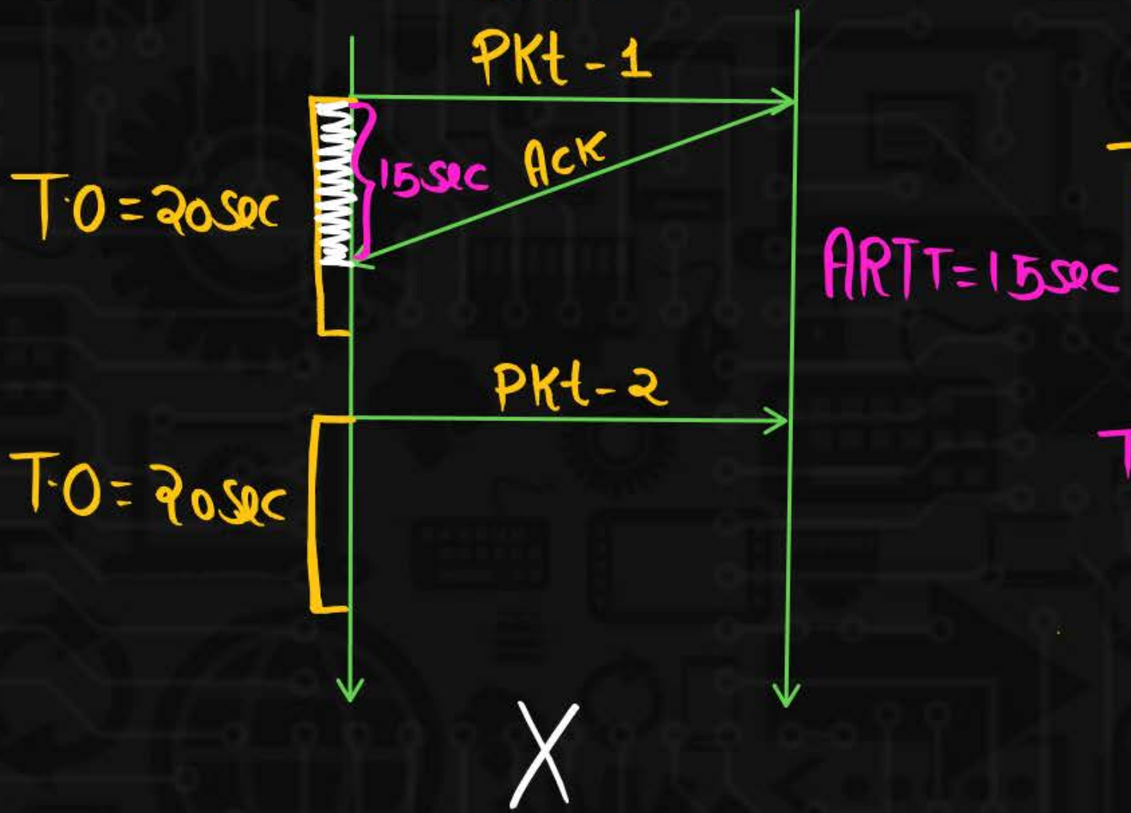
Note: If time out timer is very small then unnecessary Pkt will be retransmitted.

IRTT = 10sec (Assumption)

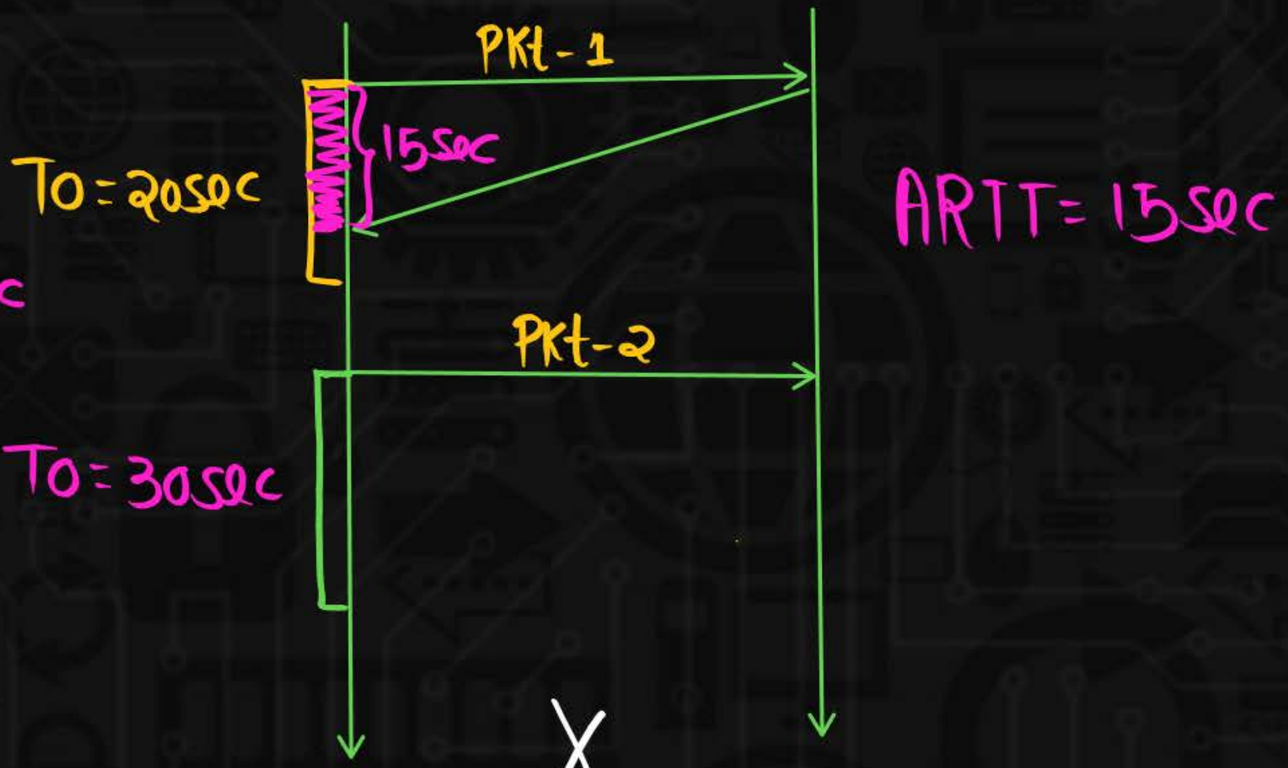
TO = 2 * RTT

TO = 2 * 10sec = 20sec

case I



case II



Note: The value of time out timer should be such that:

i) **It decrease when there is a low traffic in the network**

ii) **It Increase when there is a High traffic in the network**

Basic Algorithm

$$NRTT = \alpha(IRTT) + (1-\alpha)ARTT$$

$0 \le \alpha \le 1$, $\alpha = \frac{1}{2} = 0.5$

PKt-1

IRTT = 10 sec

T.O = 2 * RTT

T.O = 2 * 10 = 20 sec

ARTT = 15 sec

NRTT = α(IRTT) + (1-α)ARTT

= 0.5 * 10 + 0.5 * 15

= 5 + 7.5 = 12.5 sec

PKt-2

IRTT = 12.5 sec

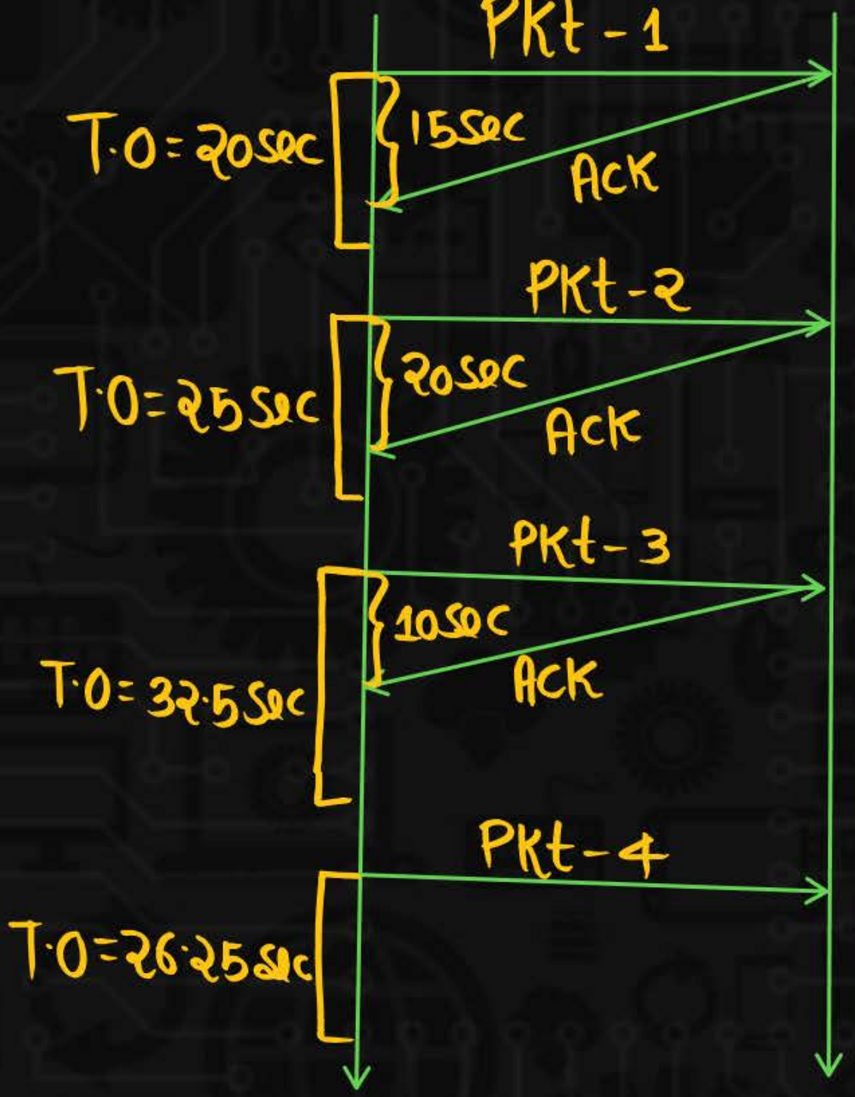
T.O = 2 * RTT = 2 * 12.5 = 25 sec

ARTT = 20 sec

NRTT = α(IRTT) + (1-α)ARTT

= 0.5 * 12.5 + 0.5 * 20

= 6.25 + 10 = 16.25



Pkt-3

IRTT = 16.25 sec

T.O = 2 * RTT

T.O = 2 * 16.25

T.O = 32.5 sec

ARTT = 10 sec

NRTT = α(IRTT) + (1-α) ARTT

= 0.5 * 16.25 + 0.5 * 10

= 8.125 + 5

= 13.125

Pkt-4

IRTT = 13.125

T.O = 2 * RTT

T.O = 2 * 13.125

T.O = 26.25 sec


THANK YOU
GW
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