

CS & IT ENGINEERING

COMPUTER NETWORKS

TCP & UDP

Lecture No-7



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A stylized laptop icon with a blue screen and an orange base. The screen displays the text 'TOPICS TO BE COVERED'.

TOPICS TO
BE
COVERED

A dotted orange arrow that starts from the right side of the laptop screen, points right, then turns 90 degrees down, and finally turns 90 degrees right again to point at the 'Push and URG Flag' box.

Push and URG Flag

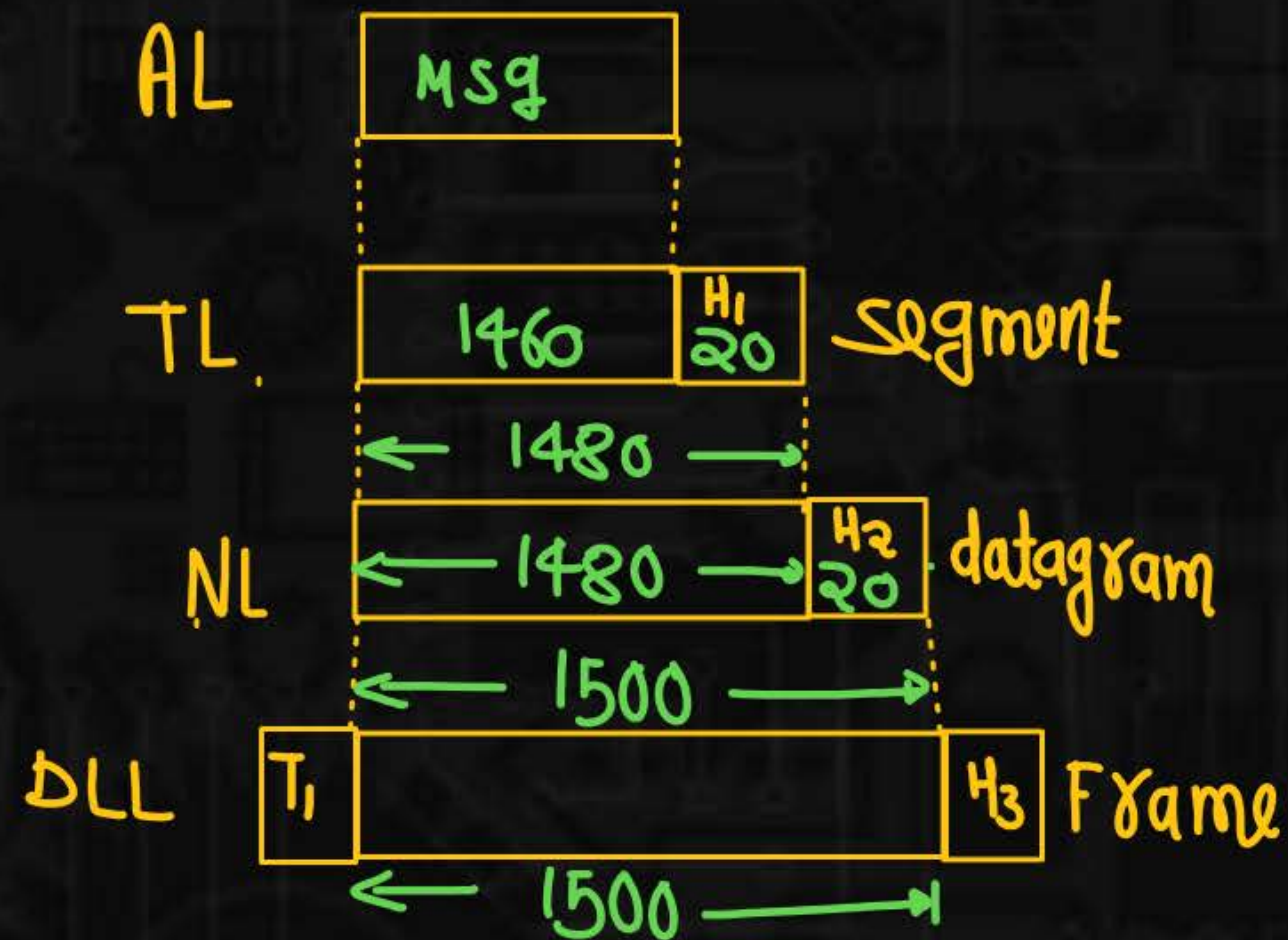
Flags

- ① SYN] connection establishment Phase
- ② ACK] connection establishment Phase
- ③ FIN] connection termination
- ④ URG
- ⑤ PSH
- ⑥ RST

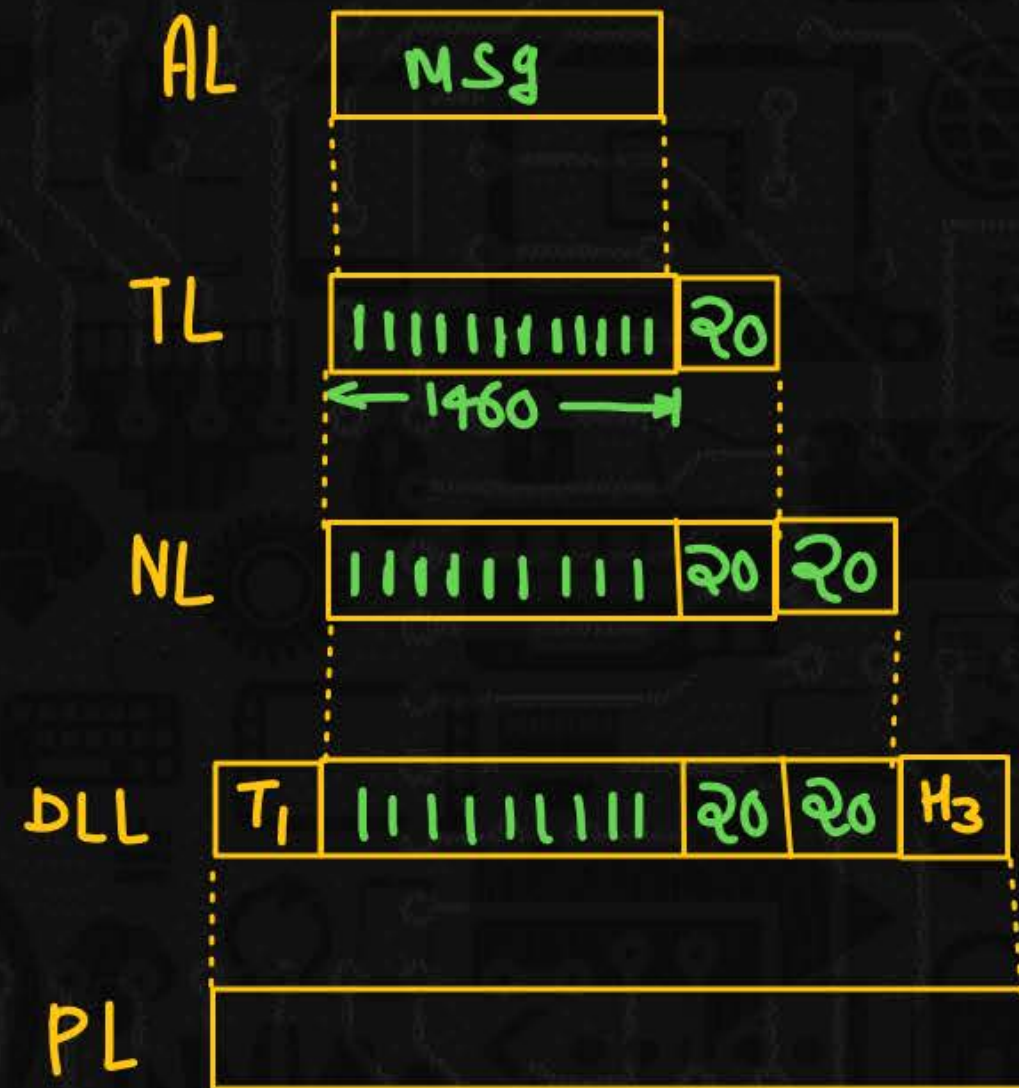
Push Flag

Push Flag

PSH (Push Flag): Push Flag is used to indicate that data should not be Buffered it must be pushed immediately to the lower layer or upper layer.



GF PSH = 0



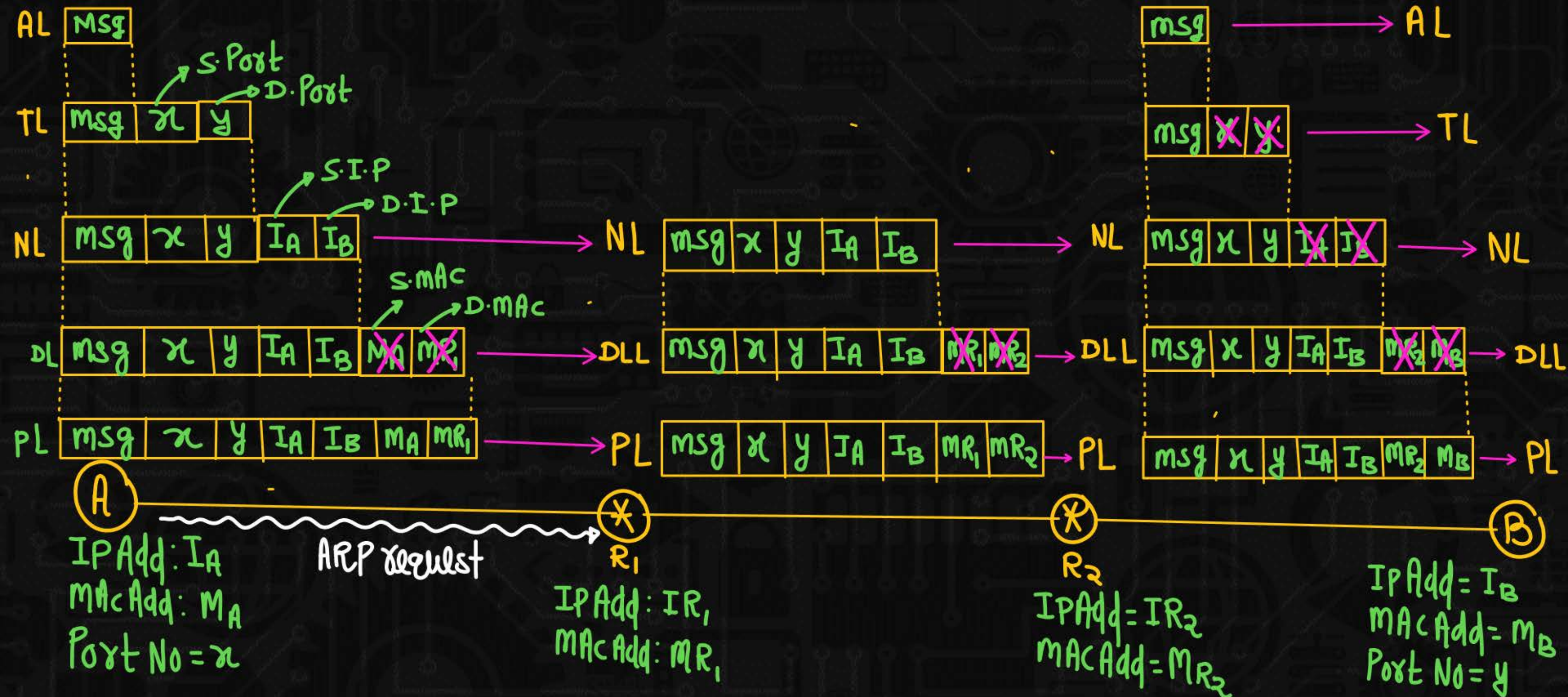
(A)

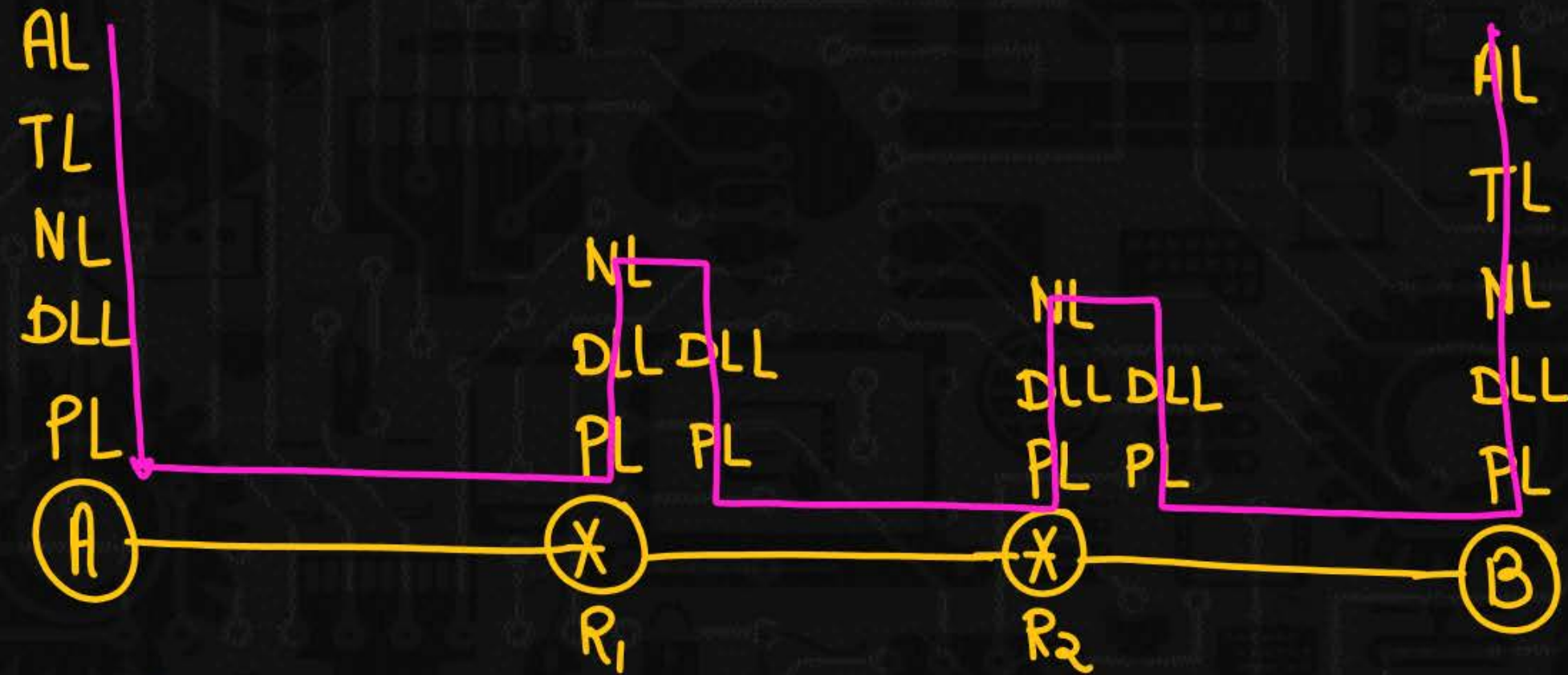


(B)

9F PS4 = 1







AL \rightarrow 2 times
 TL \rightarrow 2 times
 NL \rightarrow 4 times
 DLL \rightarrow 6 times
 PL \rightarrow 6 times

N \rightarrow Intermediate Node or Router
 AL \rightarrow 2 times
 TL \rightarrow 2 times
 NL \rightarrow N + 2 times
 DLL \rightarrow 2N + 2 times
 PL \rightarrow 2N + 2 times

Q.1

The protocol data unit (PDU) for the application layer in the Internet stack is



A

Segment

AL

msg

B

Datagram

C

Message

D

Frame

Q.2



Assume that source S and destination D are connected through two intermediate routers labelled R. Determine how many times each packet has to visit the network layer and the data link layer during a transmission from S to D

Gate-2008



$$N=2$$

$$\begin{aligned} \text{NL} &\rightarrow N+2 \text{ times} = 2+2=4 \\ \text{DLL} &\rightarrow 2N+2 \text{ times} = 2*2+2 \\ &= 6 \end{aligned}$$

A

Network layer – 4 times and Data link layer – 4 times

B

Network layer – 4 times and Data link layer – 3 times

C

Network layer – 4 times and Data link layer – 6 times

D

Network layer – 2 times and Data link layer – 6 times

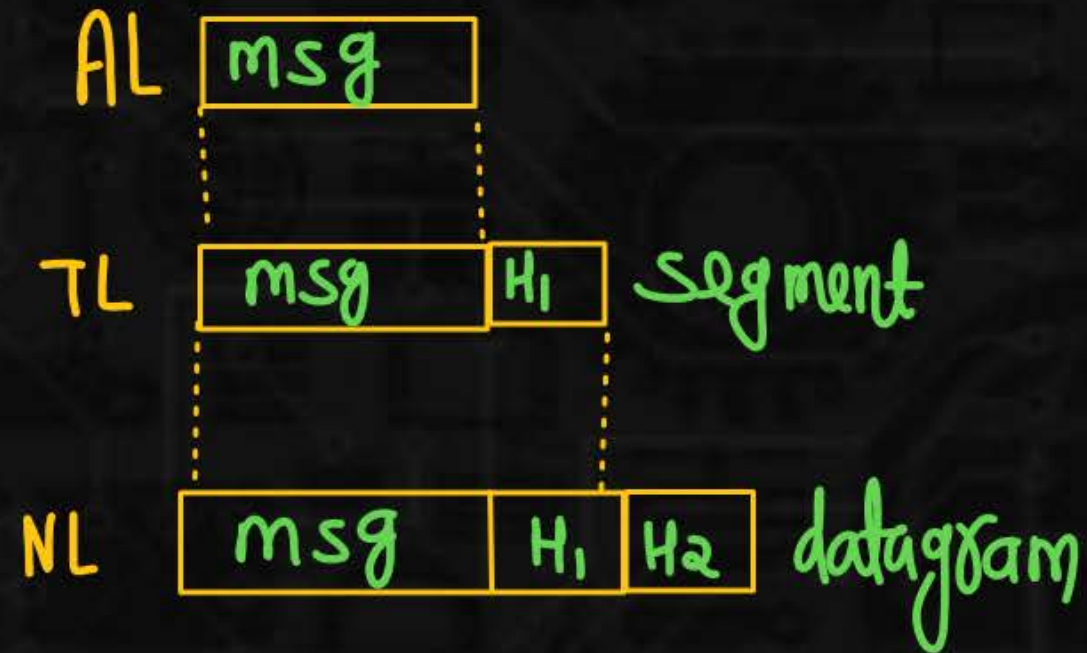
Q.3

The payload in IP packet



MCC

- ☒ A Segment
- ☐ B Frame
- ☐ C PDU
- ☐ D Datagram



Q.4

Which one of the following options encapsulates packet ?



H.W

- A** Segment
- B** Frame
- C** PDU
- D** Datagram

Q.5

Which layer is responsible for Segmentation & reassembly ?



H.W

- A Application layer
- B Data Link layer
- C Transport layer
- D Presentation layer

Q.6

Consider the following scenario where source and destination are connected via three intermediate Router



H.W



Let P be the number of times the packet visit Network Layer and Q be the number of times the packet visit data link layer during a transmission of packet from source to destination. The value of $P + Q$ is:

Q.7

A system has 'n' layers protocol hierarchy. Applications generate messages of length 'm' bytes. At each of the layers, an 'h' byte header is added. What is the fraction of the network bandwidth wasted on headers ?

H.W

- A (nh)
- B $(m+nh)$
- C $(nh)/(m+nh)$
- D $(m+nh)/(nh)$

URG Flag & Urgent pointer

URG: Urgent flag

- Urgent Flag is used to indicate that some Bytes are urgent in the data

Note:-

- Sender create a segment and Insert the urgent data at the beginning of the segment

Urgent pointer:

Urgent pointer Indicate end of the urgent data i.e. last urgent Byte

- If URG Flag = 0, Then we have no need to read the urgent pointer
- If URG Flag = 1 then we have to read the urgent pointer.

Urgent Pointer (16 bit)

It is valid only if the urgent Flag is set. It is used where the segment contains urgent data. It defines a value that must be added to the sequence number to obtain the number of the last urgent Byte in the data section of the segment.

Q.8

If the size of TCP segment is 1KB and header length value is 6, the sequence no = 3500. given that URG flag = 1 and urgent pointer = 45. then what is the total size of data, how many bytes are urgent, sequence no of urgent bytes respectively

- A 1000 byte , 45 byte , sequence no = 3500-3544
- B 1024 byte , 45 byte , sequence no = 3500-3544
- C 1000 byte , 46 byte , sequence no = 1024-1070
- D 1000 byte , 46 byte , sequence no = 3500-3545

