CS & IT ENGINEERING

COMPUTER NETWORKS

TCP & UDP

Lecture No-6

By- Ankit Doyla Sir

Push and URG Flag

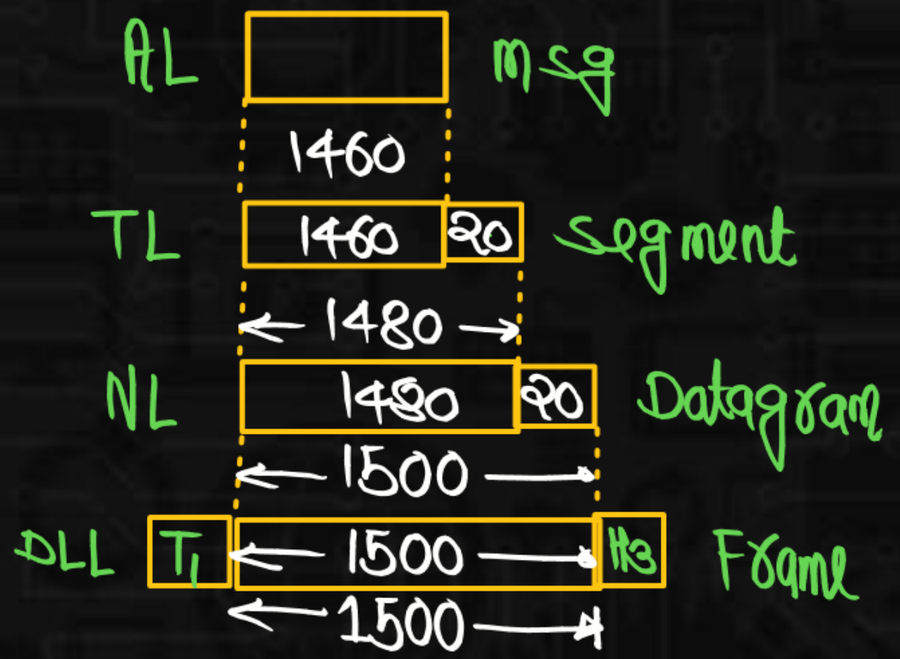
Flags

1. SYN] Connection establishment Phase
2. Ack]
3. FIN] connection termination Phase
4. PSH ✓
5. URG ✓
6. RST

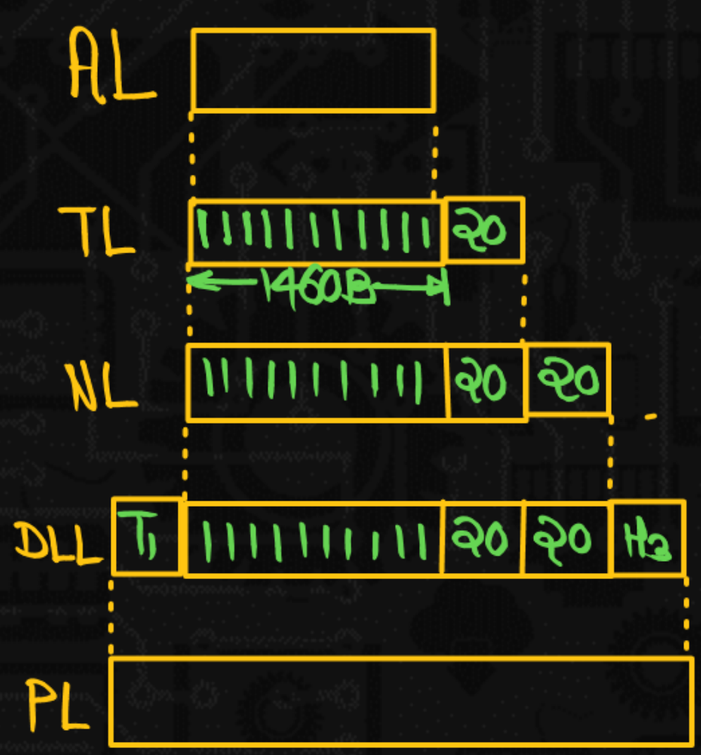
Push Flag

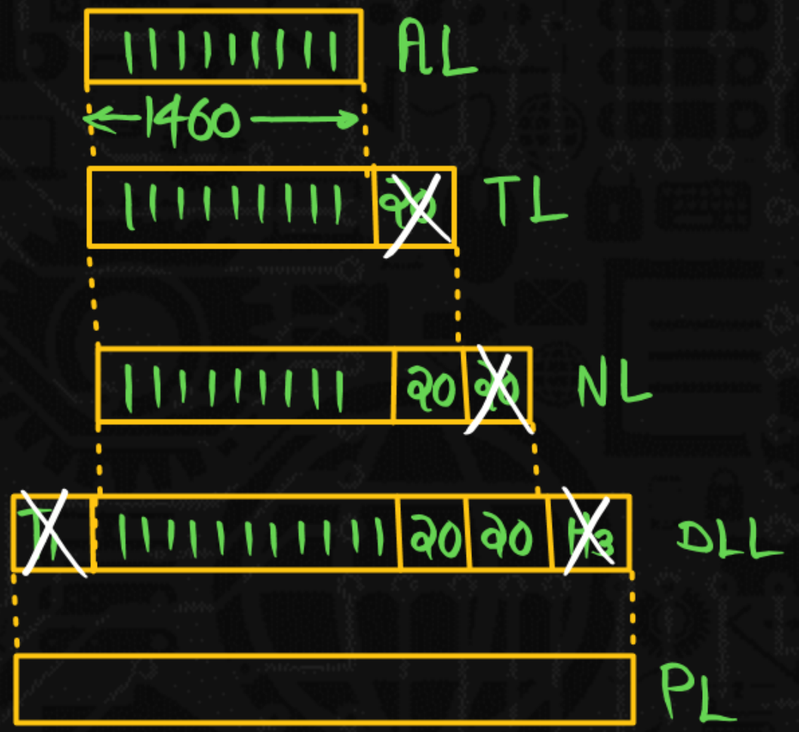
Push Flag

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.



IF PSH=0

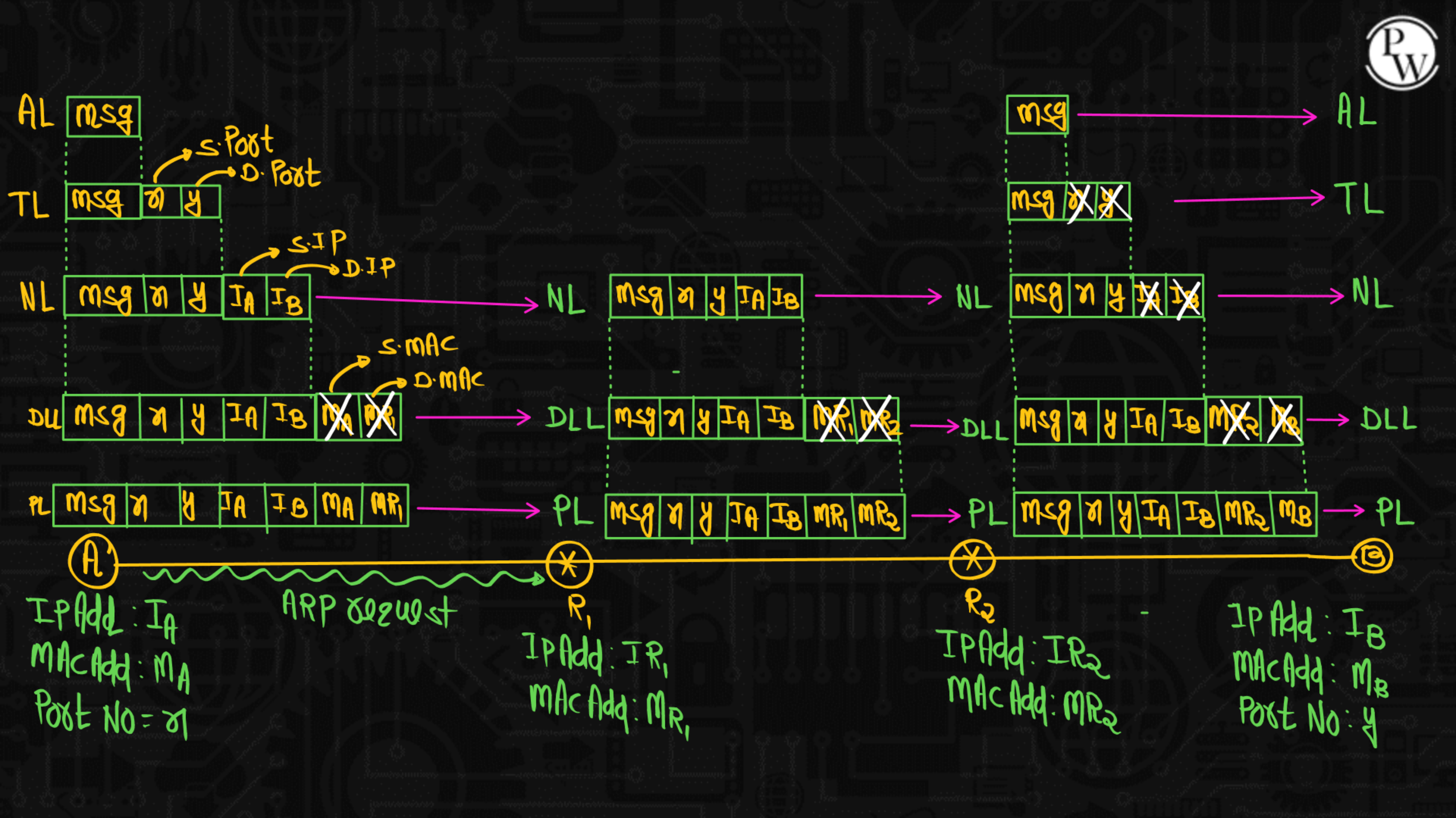

AL
TL
20
1460B
NL
20
20
DLL
T1
20
20
H3
PL

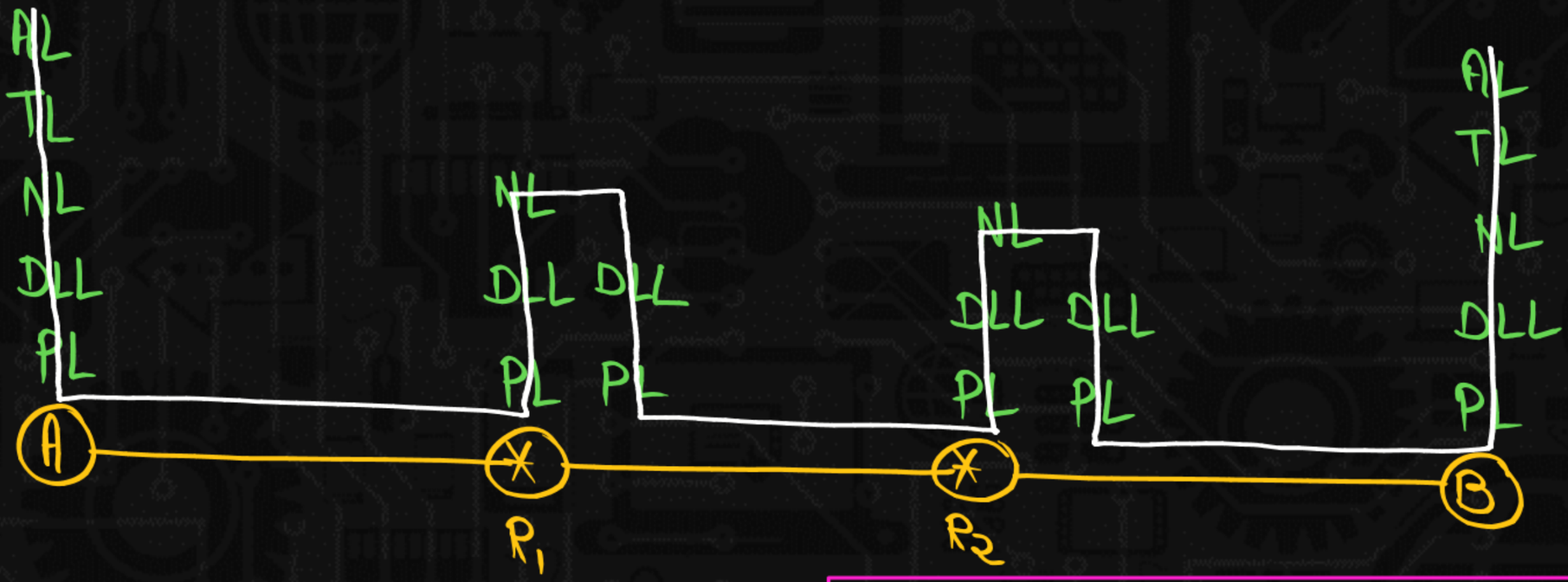

AL
1460
TL
NL
20
DLL
20
20
PL

A B

If PSH = 1


AL
TL
1 Byte
20
1400
NL
1 Byte
20
20
DLL
T1
1 Byte
20
20
H3
PL
A
B
1 Byte
AL
1 Byte
20
TL
1 Byte
20
20
NL
1 Byte
20
20
H3
DLL
PL


AL
msg
TL
msg
x
y
S.Port
D.Port
NL
msg
x
y
I_A
I_B
S.IP
D.IP
DLL
msg
x
y
I_A
I_B
M_A
MR_1
S.MAC
D.MAC
PL
msg
x
y
I_A
I_B
M_A
MR_1
A
ARP request
R_1
R_2
B
IPAdd : I_A
MACAdd : M_A
Port No = x
IPAdd : IR_1
MAc Add : M_{R_1}
IPAdd : IR_2
MAc Add : MR_2
IPAdd : I_B
MACAdd : M_B
Port No : y



AL → 2 times

TL → 2 times

NL → 4 times

DLL → 6 times

PL → 6 times

N → Intermediate Node OR Router

AL → 2 times

TL → 2 times

NL → N+2 times

DLL → 2N+2 times

PL → 2N+2 times

Q.1

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

A Segment

B Datagram

C Message

D Frame

AL msg

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

N = 2 → 4

NL → N+2 times → 2+2

DLL → 2N+2 times → 2×2+2 → 6

(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

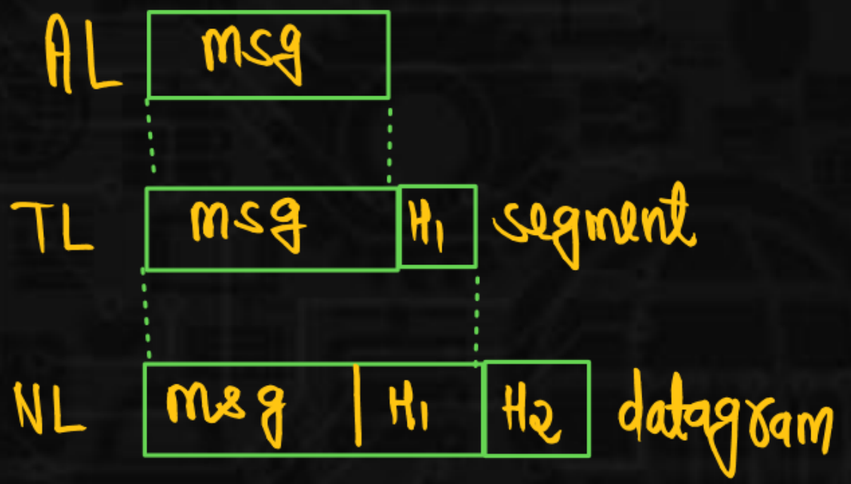
MCQ

A Segment

B Frame

C PDU

D Datagram



Q.4

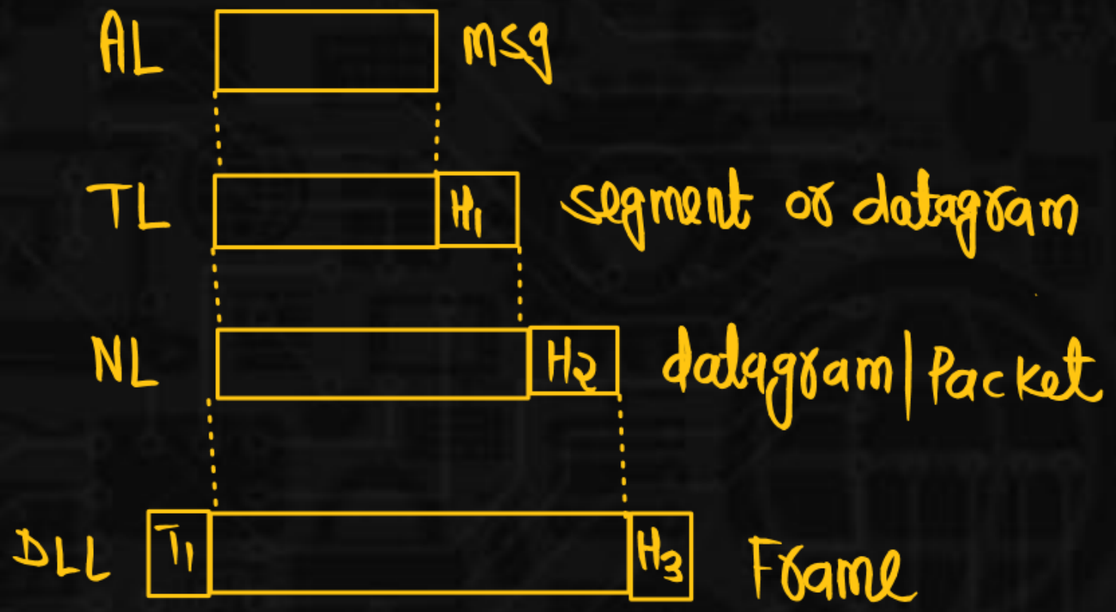
Which one of the following options encapsulates packet ?

A Segment

B Frame

C PDU

D Datagram



Q.5

Which layer is responsible for Segmentation & reassembly ?

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

NL → N+2 times → 3+2 = 5

DLL → 2N+2 times → 2*3+2 = 8

N = 3

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: 5+8 = 13

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 ?

A (nh)

B (m+nh)

C (nh)/(m+nh)

D (m+nh)/(nh)

n → Layers

msg size = m Byte

Header size at each Layer = h Byte

Total Header size = nh

Total Packet size = msg + Header
= m + nh

∴ overhead = $\frac{nh}{m+nh}$

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: (16 bit)

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.

URG Flag = 1

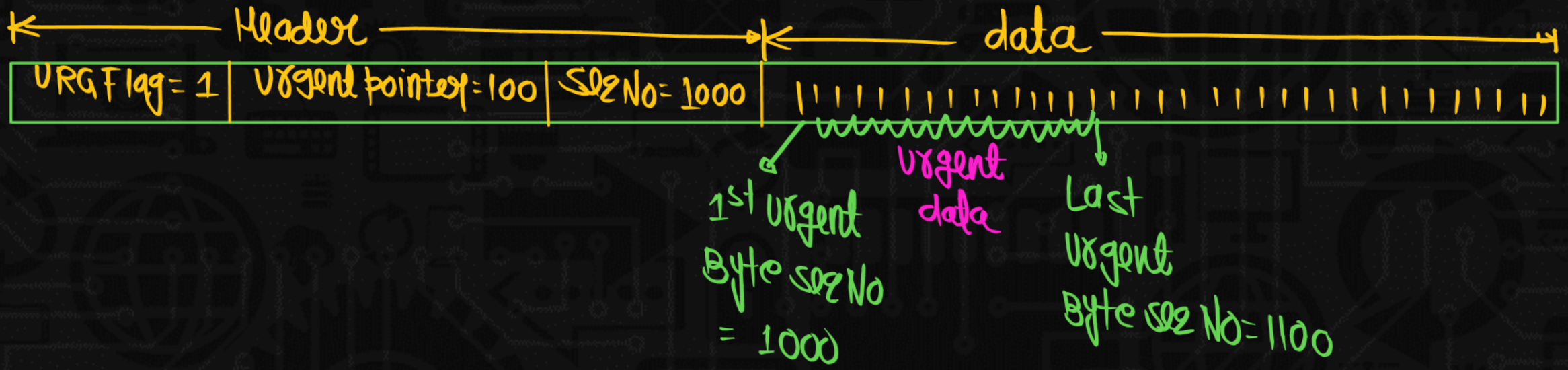
Urgent pointer = 100

SeqNo = 1000

Last Urgent Byte SeqNo = 100 + 1000 = 1100

Urgent Bytes = 1000 —— 1100

101 Byte



If urgent pointer = x

No. of urgent Byte = x + 1

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

Segment size = 1KB = 1024 Byte

HL = 6

Header size = 6×4 = 24B

data size at TCP = 1024 − 24 = 1000 Byte

Seq No = 3500

URG Flag = 1

Urgent pointer = 45

No. of Urgent Byte = 45 + 1 = 46

Last urgent Byte Seq No = 45 + 3500 = 3545

Urgent Byte = 3500 — 3545

46 Byte


THANK YOU
GW
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