CS & IT ENGINEERING

COMPUTER NETWORKS

IPv4 Header & Fragmentation

Lecture No-5

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Fragmentation in IPv4

Q.15

An IPv4 packet has the first few Hexa decimal digit as shown below

45 0000 5C 000 3 0000 59 06

What is data size of IPv4 packet 72 .

VER = 4

HL = 5

⇓

Header size = 5*4

= 20 Byte

services

Total length : $(005C)_{16}$

16^1 16^0

$5*16^1+12*16^0$

$= 80+12 = 92$

$TL = D + H$

$D = TL - H$

$D = 92 - 20$

Data = 72 Byte

Q.14

Which can be possible header size (in bytes) in IPv_4 datagram ?

I. 20

II. 30

III. 50

IV. 60

Header size can be in b/w 20 to 60B
(But Alway multiple of 4)

A. I only

B. I and IV

C. IV only

D. I, II, III and IV

Q.14

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A. I only

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C. IV only

D. I, II, III and IV

Q.15

An IPv4 packet has the first few Hexa decimal digit as shown below

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What is data size of IPv4 packet _____ .

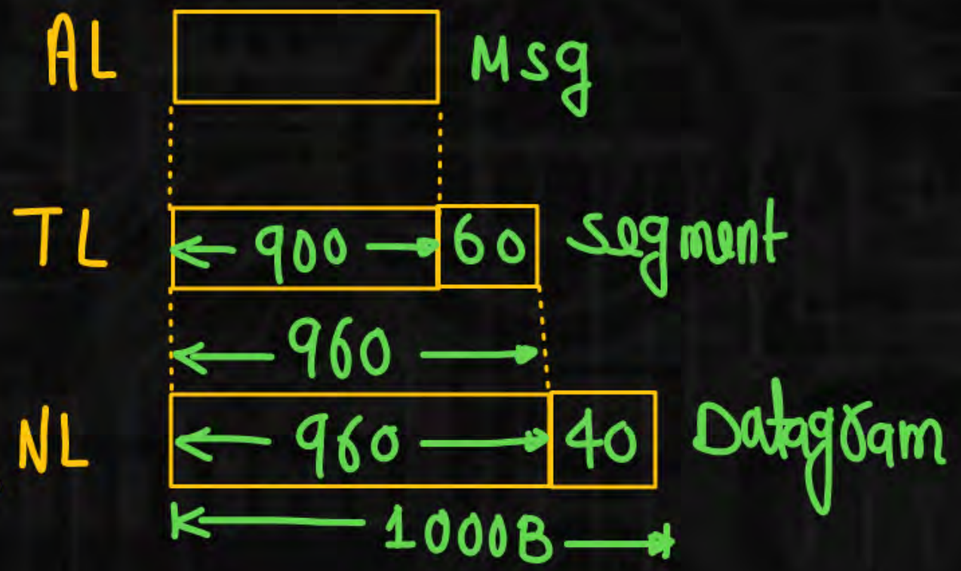
Q.16

In a IP datagram a TCP segments is present header length field of IP datagram is 10 total length of IP datagram is 1000 byte. Header length field in TCP header is 15, then what is the size of TCP data present in the datagram.

IPV4 Header = 10

TL = 1000B

TCP Header Length = 15



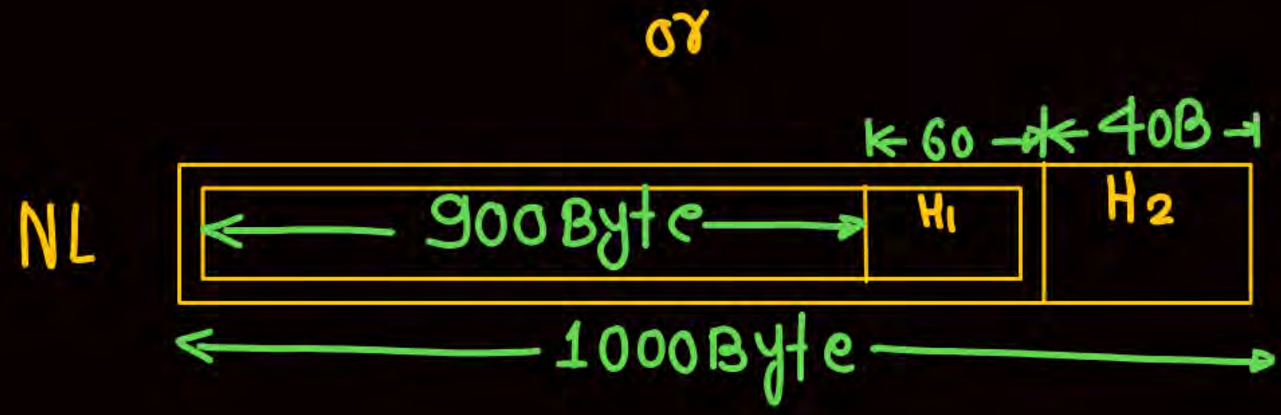
A 988

B 952

C 964

D 900 ✓

or



TCP data.size = Total Length(IP) - IP(H) - TCP(H)

= 1000 - 40 - 60

= 900

Q.17

An ipv4 packet has arrived with the first 16 bit as $(0100\,0010\,11110000)_2$ the receiver discard this packet why ?

A. Invalid VER

B. Invalid HLEN

C. Both A &B

D. NONE

$VER = (0100)_2 = 4$

$HLEN = (0010)_2 = 2$ (min HLEN value will be 5)

Header size = 2*4 = 8 Byte

minimum Header size = 20 Byte

min HLEN field value = $\frac{20}{4} = 5$

Q.18

An IPv4 packet has the first few Hexa decimal digit as shown below

S.I.P

450000 5C	000 3 0000	59 060000	0A0C0E05
1st row	2nd row	3rd row	4th row

What is Source IP Address(in decimal) of IPv4 packet _____.

$SIP = (0A.0C.0E.05)_{16}$

$(0A)_{16}$ $(0C)_{16}$ $(0E)_{16}$ $(05)_{16}$

16^0 16^0 16^0 16^0

$10*16^0 = 10$ $12*16^0 = 12$ $14*16^0 = 14$ $5*16^0 = 5$

$S.I.P = 10.12.14.5$

Q.19

Which of the following value is/are not possible of the TTL in a datagram ?

MSQ

A. 23

B. 0

C. 1

D. 301

TTL = 8bit

Range → 0 to $2^8 - 1$

→ 0 to 255

TTL value can never be 0. gt is in b/w (1-255)

Note

1. If their is No option field (in IPv4 Header) then HL field will not change when Packet is moving From one Router to Another Router

2. If their is a option Field Present (in IPv4 Header) then HL field may be changed when Packet is moving From one Router to another Router.

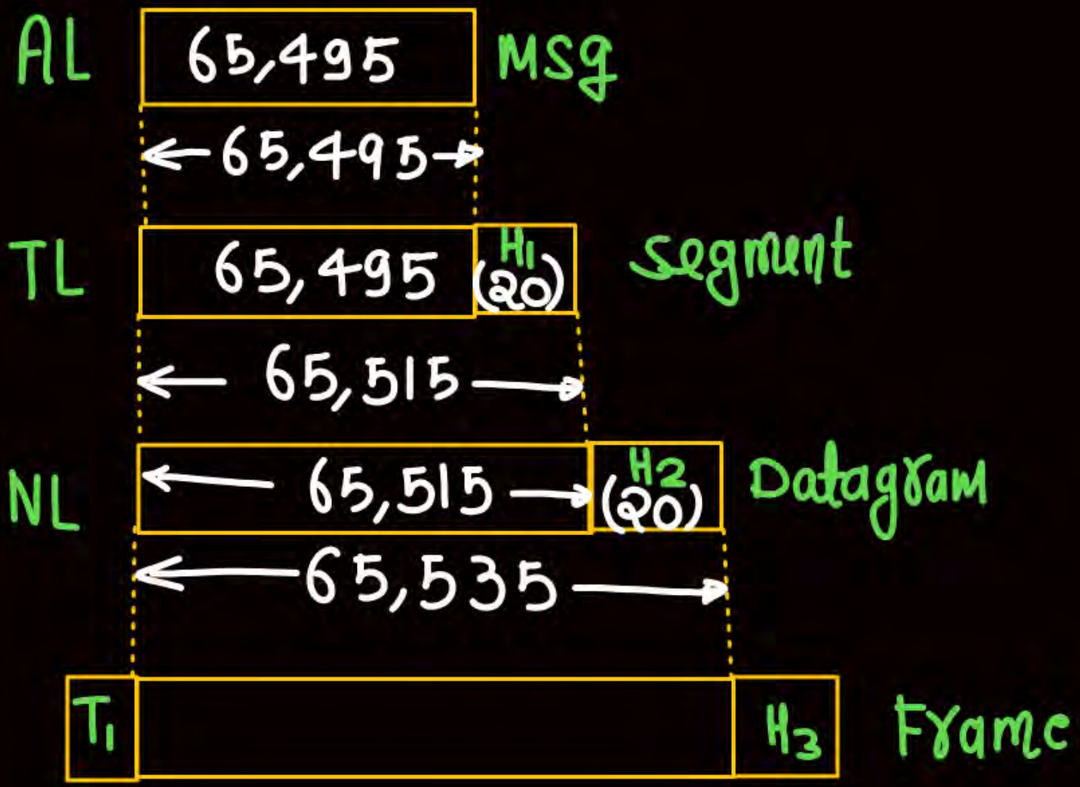
IPv4 Header

VER	HL	Services	Total Length (16bit)
Identification No.		Flags	Fragment offset
Time to Live		Protocol	Header checksum
Source IP Address			
Destination IP Address			
Option			

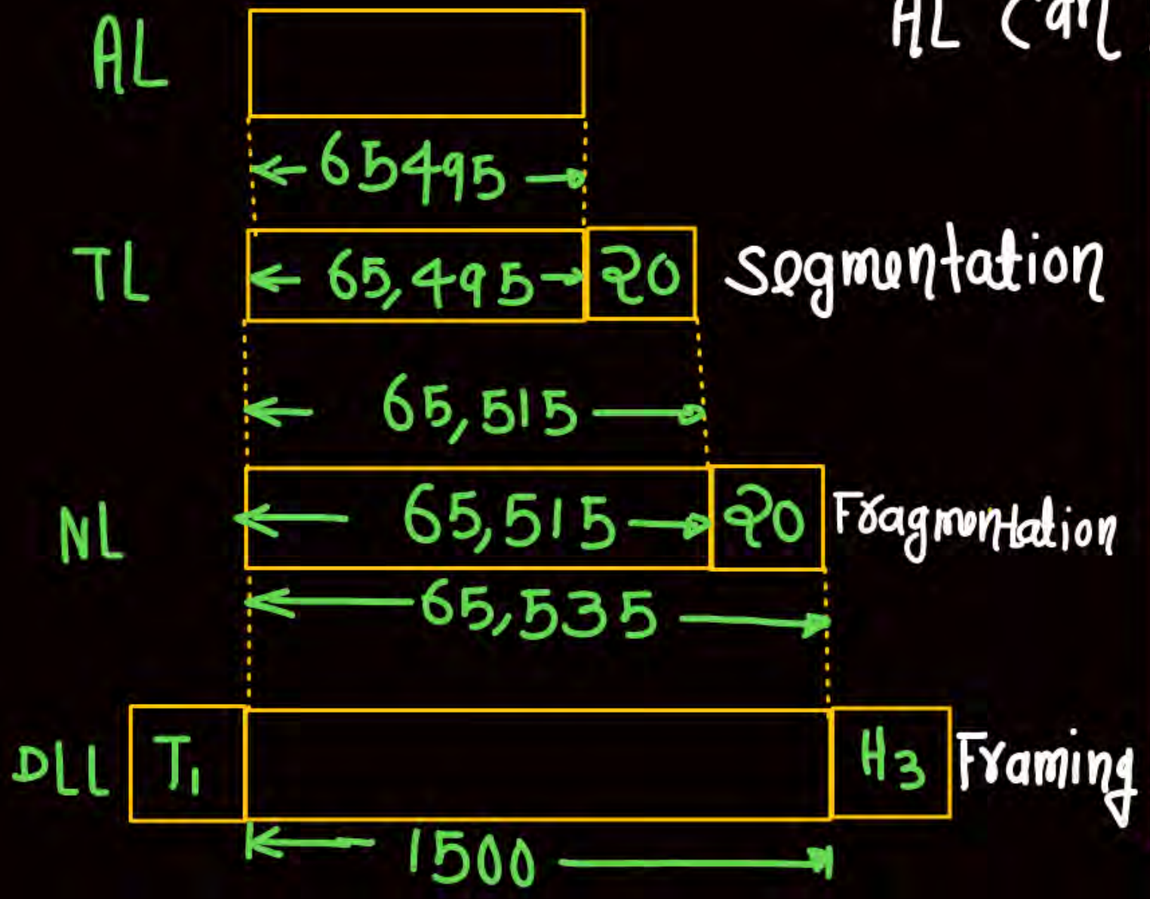
Total Length = 16 bit

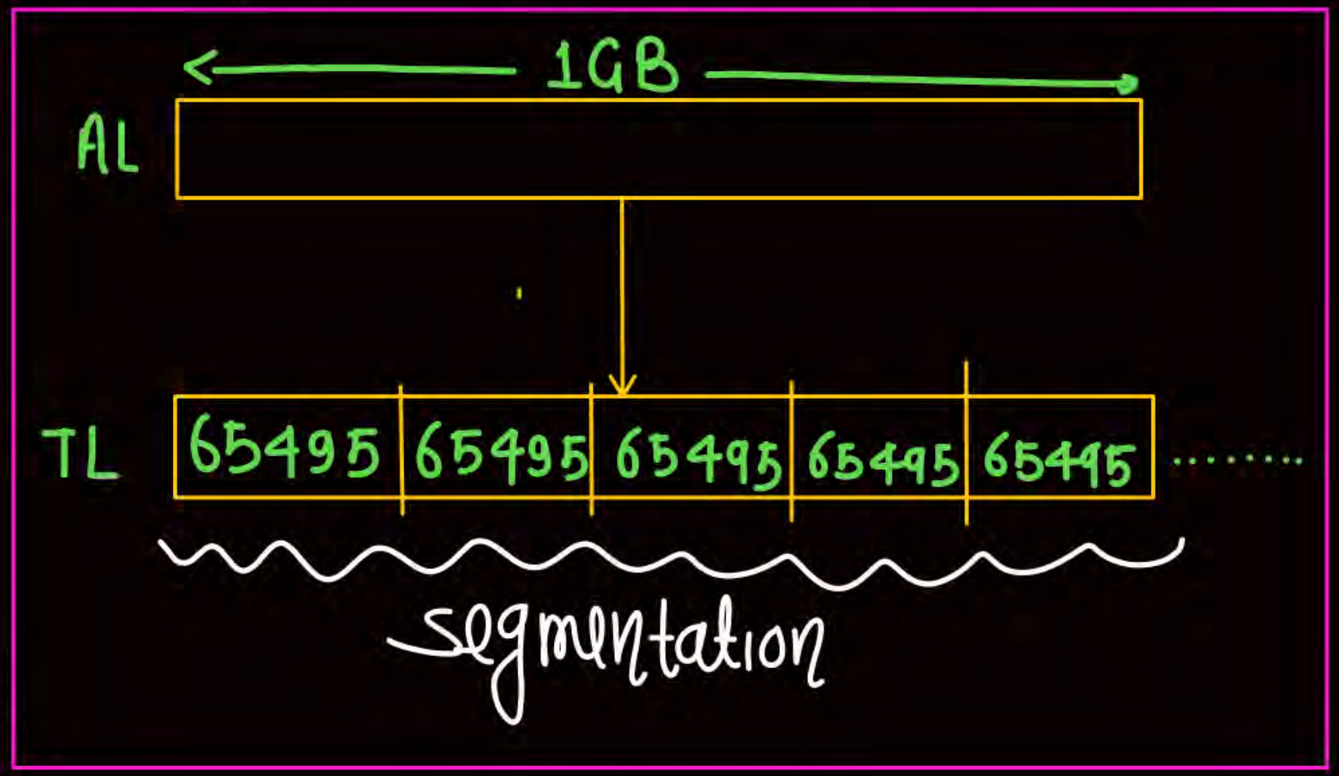
Maximum No = $2^{16} - 1 = 65,535$

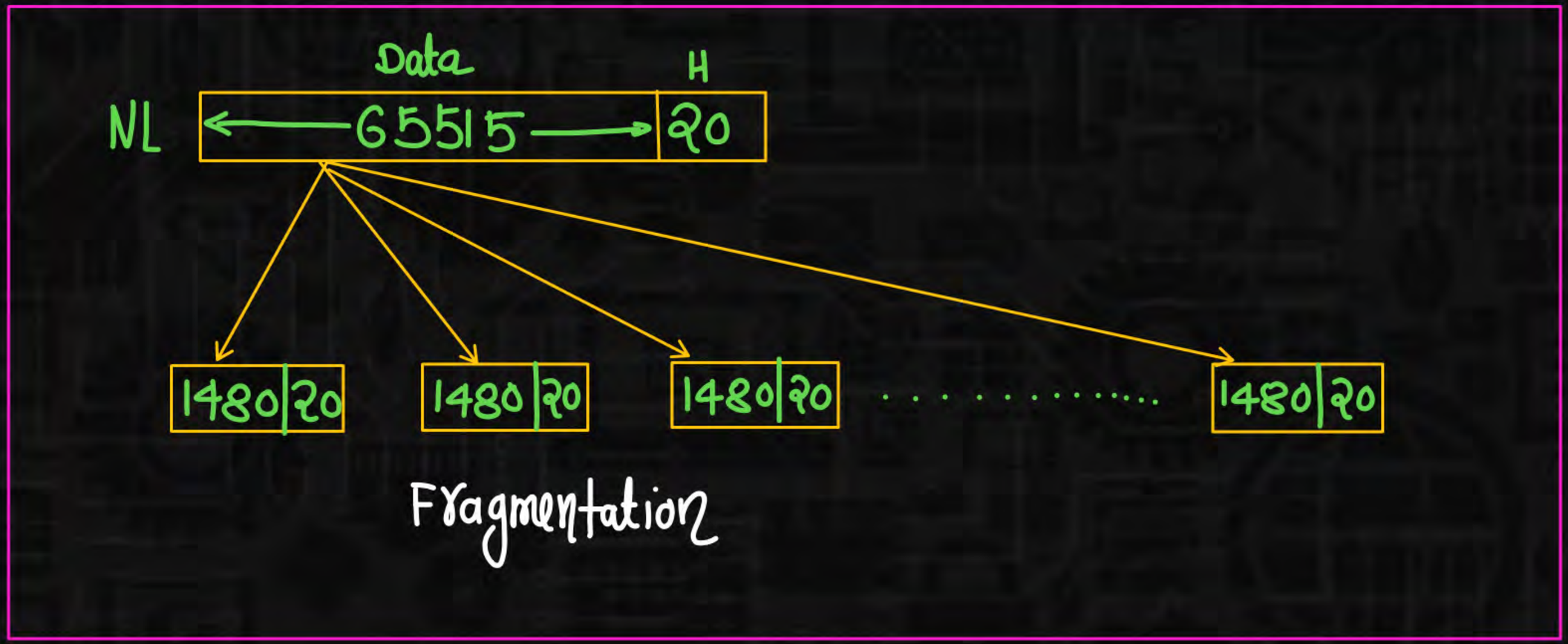
Total length = Data + Header



AL can Pass any size of data to transport Layer



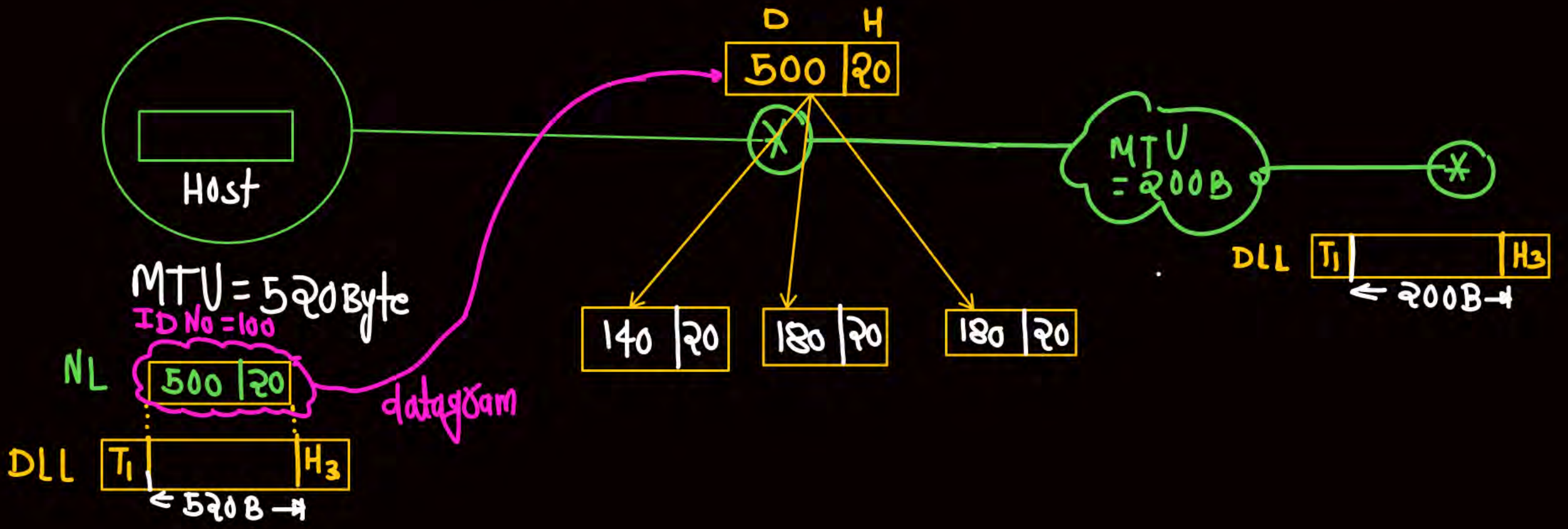




Fragmentation

Fragmentation at Router

MTU → maximum Amount of data that can be stored in any data Link Layer frame

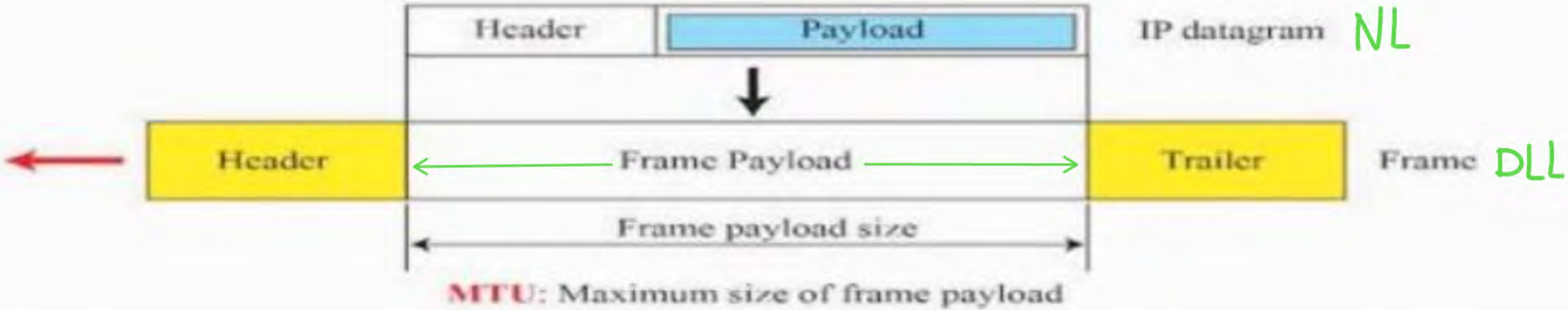



AL
Msg
1460
TL
1460
20
1480
NL
1480
20
1500
DLL
T1
1500
H3
1500

Source


1GB
AL
TL
1460
1460
1460
1460
1460

Maximum transfer unit (MTU)



When a datagram is encapsulated in a frame, the total size of the datagram must be less than this maximum size of the frame payload.

The value of the MTU differs from one physical network protocol to another. For example, the value for a LAN is normally 1500 bytes, but for a WAN it can be larger or smaller.


THANK YOU
GW
SOLDIERS !