

CS & IT ENGINEERING

COMPUTER NETWORKS

TCP & UDP

Lecture No-01

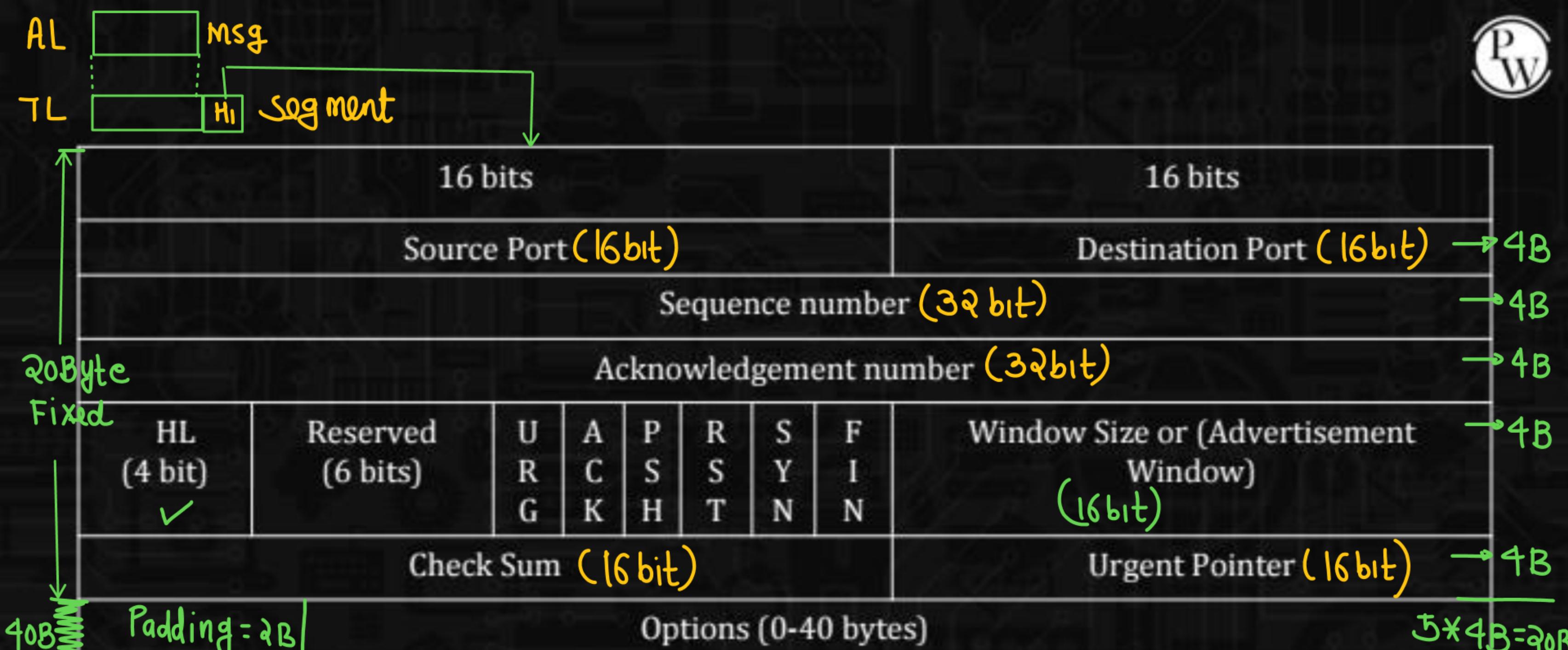


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TOPICS TO
BE
COVERED

TCP Header

TCP Header



minimum Header size = 20B + 0B = 20 Byte

maximum Header size = 20B + 40B = 60 Byte

HL = 4 bit Max No. \rightarrow 1111 \rightarrow 15

maximum Header size = 60B

$$(\Sigma F) \rightarrow \frac{60}{4} = 15$$

$$(\Sigma F) \rightarrow \frac{60}{1} = 15$$

Header size

$$\frac{20B}{4} = 5$$

$$\frac{32B}{4} = 8$$

$$\frac{40B}{4} = 10$$

$$\frac{60B}{4} = 15$$

HLF

0101

1000

1010

1111



Header size

$$\frac{30B}{4} = 7.5 \times$$

$$30B + 2B = \frac{32B}{4} = 8$$

dummy Byte

option

$$\text{Padding} = 2B$$

HLF

1000

Header size

$$20B - 60B$$

HLF

5 - 15

Port No = 16 bit



Range → 0 to $2^{16} - 1$

Range → 0 to 65,535



Well Known Port No

Assigned and controlled
by IANA

SMTP → 25

HTTP → 80

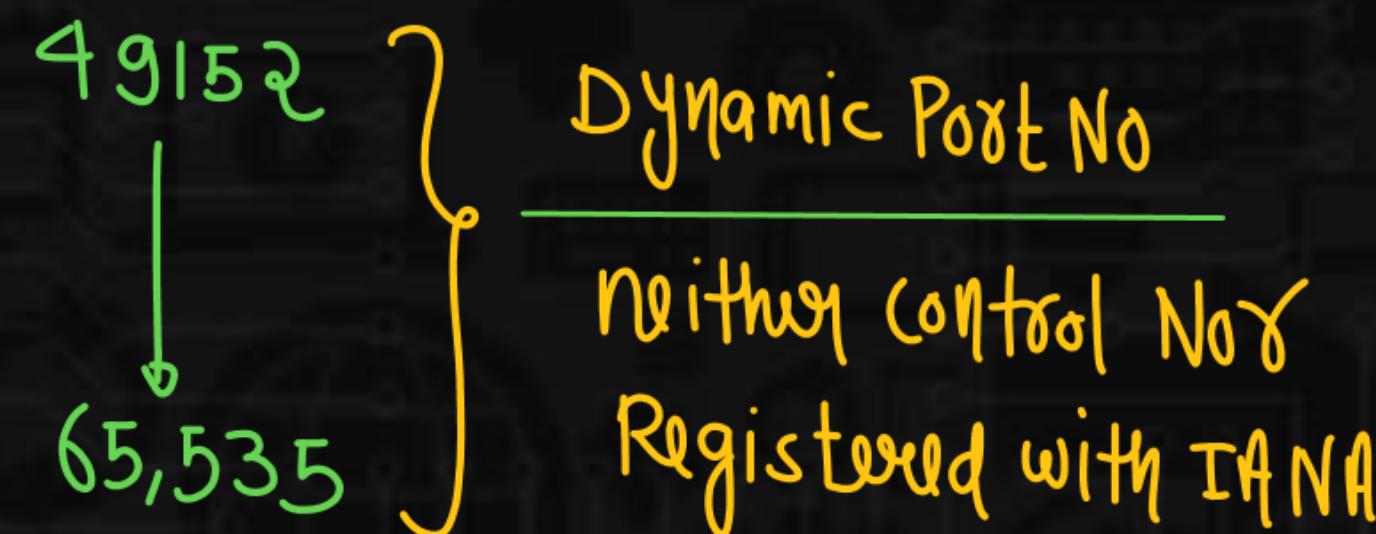
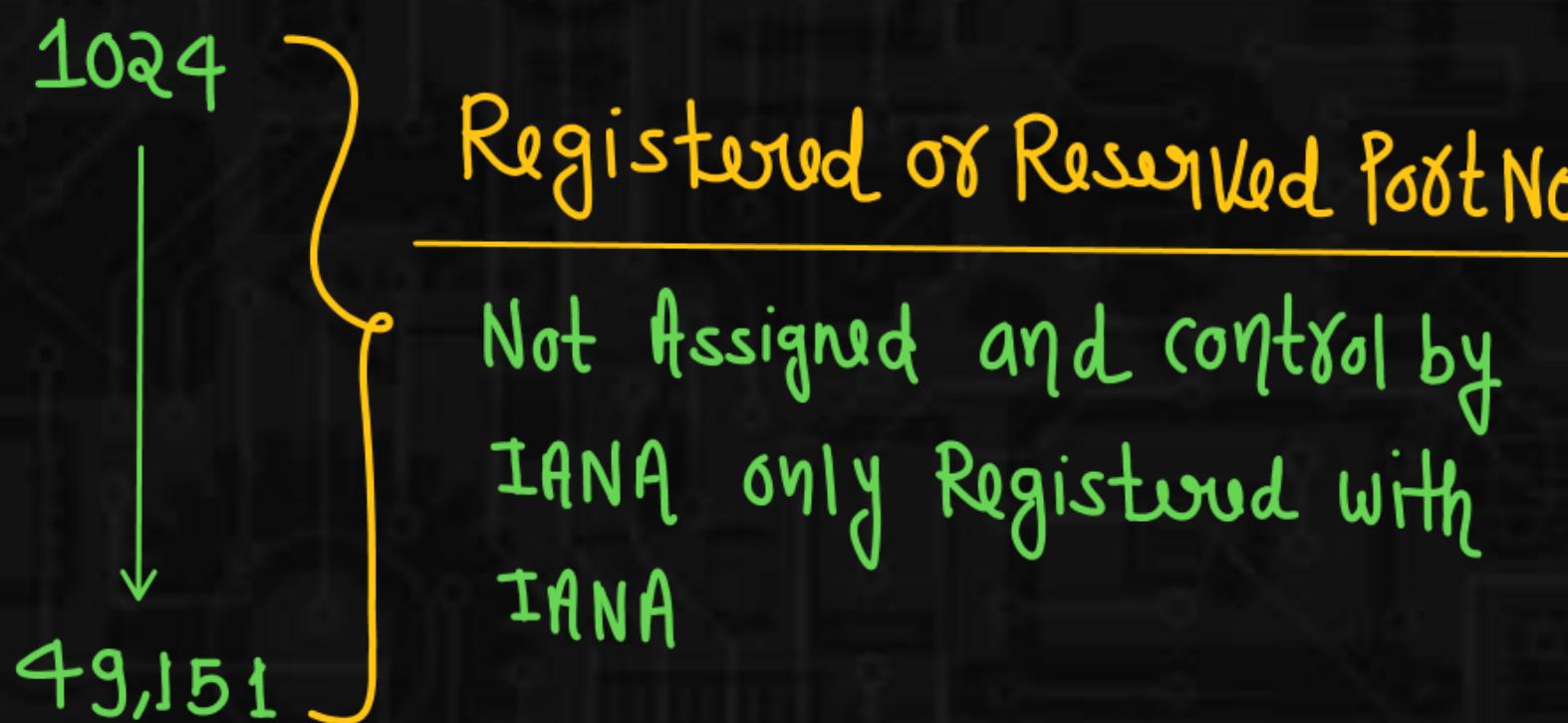
FTP [20
→ 21]

DNS → 53

POP → 110

IMAP → 143

RFC



Source Port Address

This is a 16 - bit field that defines the port number of the application program in the host that is sending the segment.

Destination Port Address

This is a 16 - bit field that defines the port number of the application program in the host that is receiving the segment.

Sequence Number (32bit)

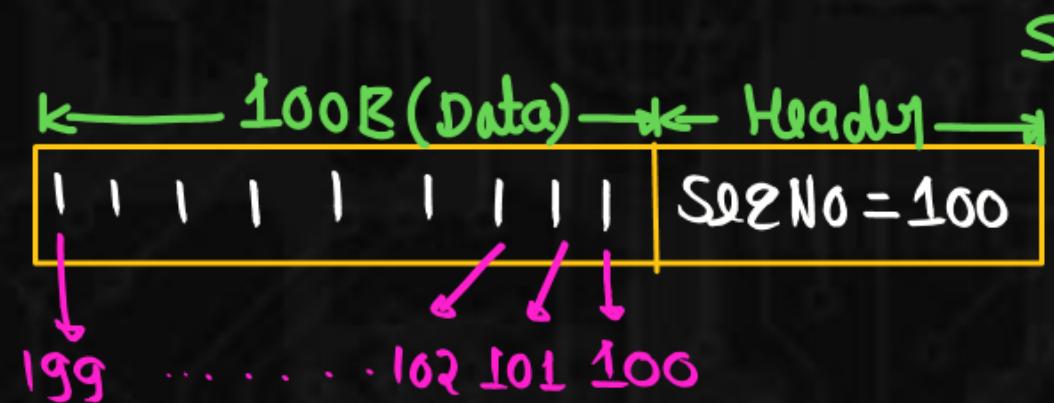
This is a 32-bit field defines the sequence number of the first data byte.

Acknowledgement Number

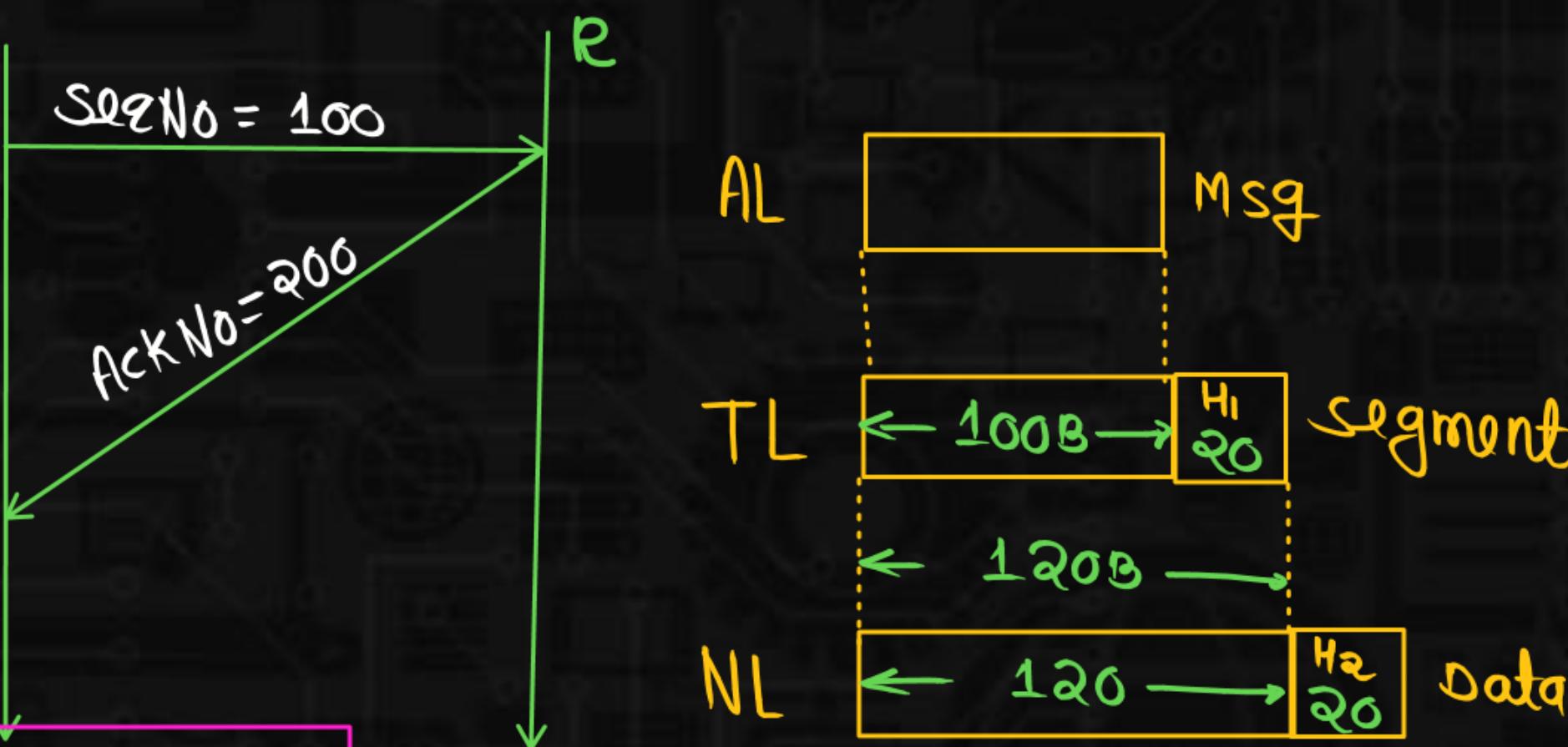
This is a 32-bit field defines the sequence number of the next expected byte. If receiver has successfully received byte number x from other party, it returns x+1 as the acknowledgement number.

Note

- ① TCP is a Byte stream Protocol i.e every Byte is Associated with one Sequence Number
- ② IP is a Packet stream Protocol i.e every Packet is Associated with one Sequence Number

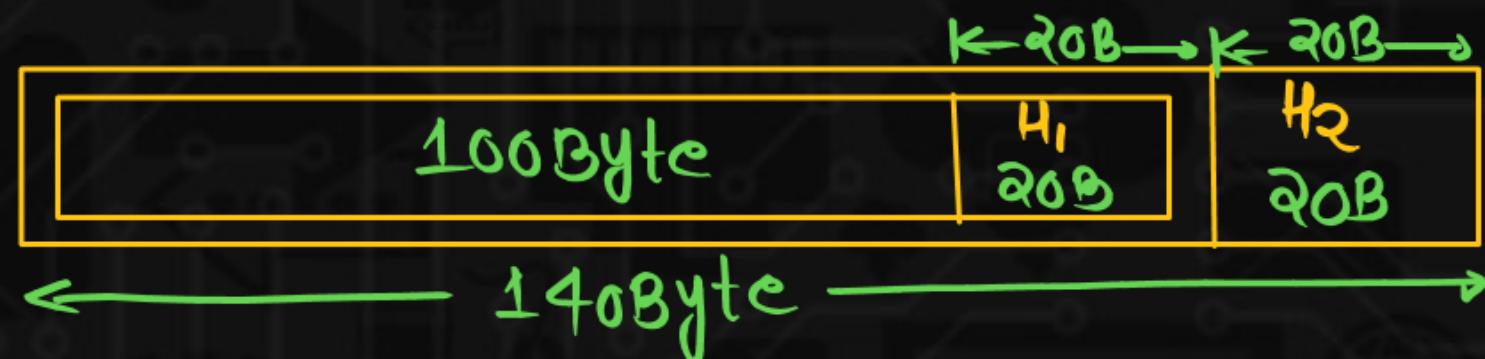


1st Byte SeqNo = 100
 Data size at TL = 100 Byte
 Last Byte SeqNo = $100 + 100 - 1 = 199$
 ACK No = 200



Total Length at NL(IP) = 140Byte

NL

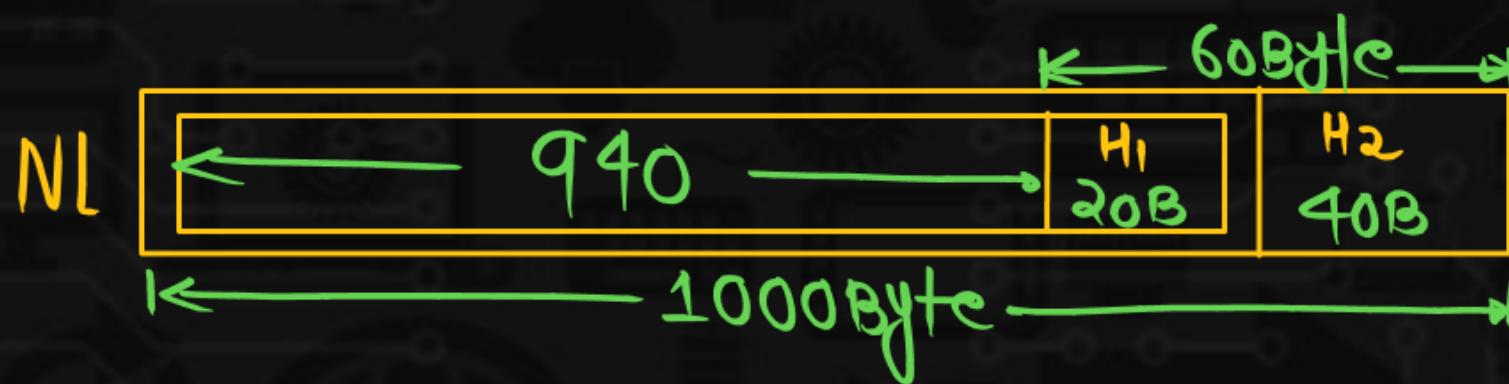


$$\begin{aligned}\text{data size at TL} &= \text{Total length(IP)} - \text{IP(H)} - \text{TCP(H)} \\ &= 140 - 20 - 20 = 100\text{Byte}\end{aligned}$$

Q: $HL = 10$
 $Total\ length = 1000$

$HL = 5$
 $Seq\ No = 100$

Ack No = ?

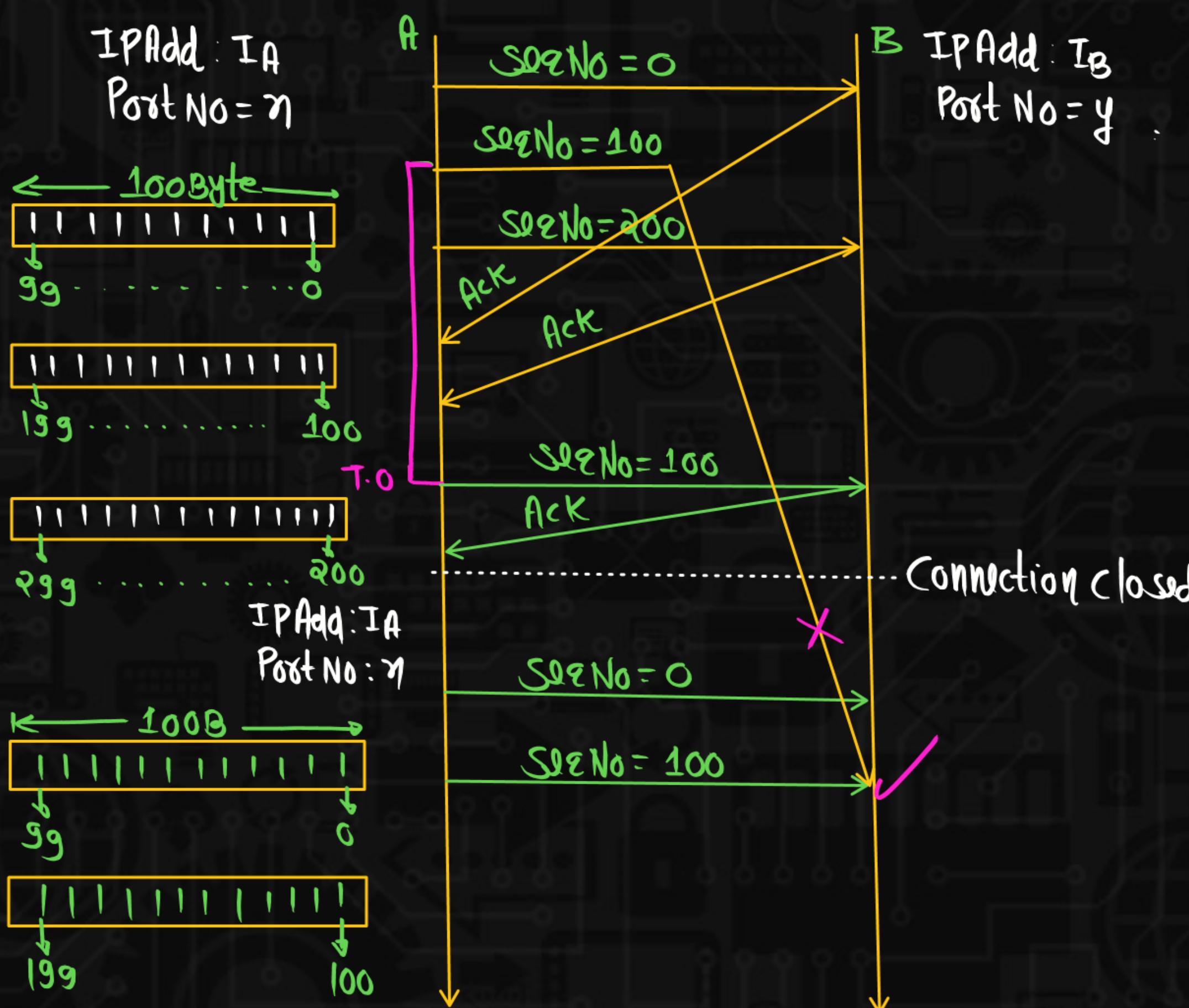


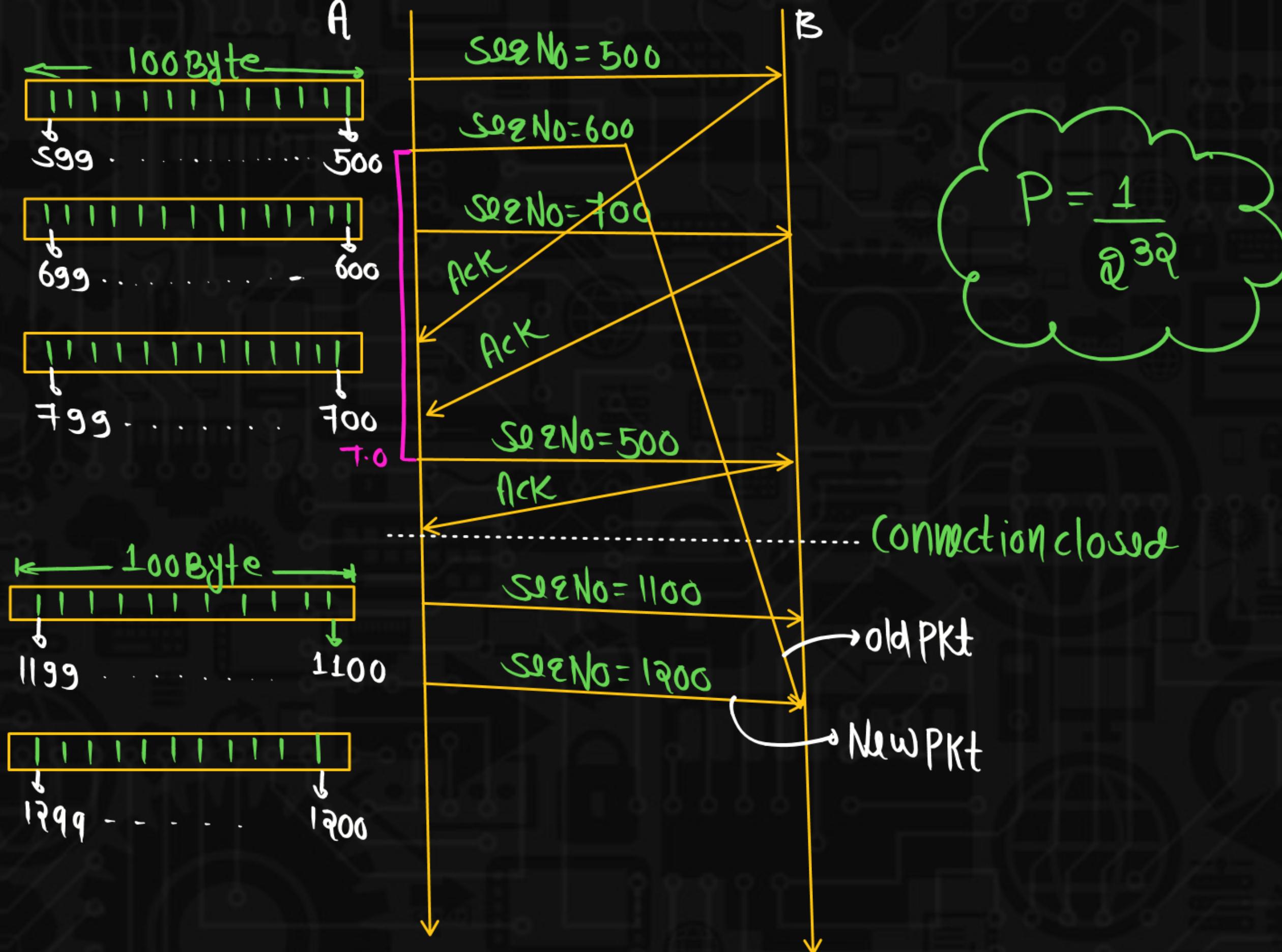
Data size at TL = 940 Byte

1st Byte sequence No = 100

$$\begin{aligned} \text{Last Byte seqNo} &= 100 + 940 - 1 \\ &= 1039 \end{aligned}$$

Ack No = 1040





Note

TCP suggest that do not start with the sequence Number or Always choose any Random Sequence Number initially.

9-11PM



THANK YOU
GW
SOLDIERS !