CS & IT ENGINEERING

COMPUTER NETWORKS

TCP & UDP

Lecture No-4

By- Ankit Doyla Sir

Phases of TCP connection

16 bits							16 bits
Source Port ✓							Destination Port ✓
Sequence number ✓							
Acknowledgement number ✓							
HL (4 bit) ✓	Reserved (6 bits) ✓	URG	ACK	PSH	RST	SYN	FIN	Window Size or (Advertisement Window)
Check Sum							Urgent Pointer
MSS = 1460	Options (0-40 bytes)						

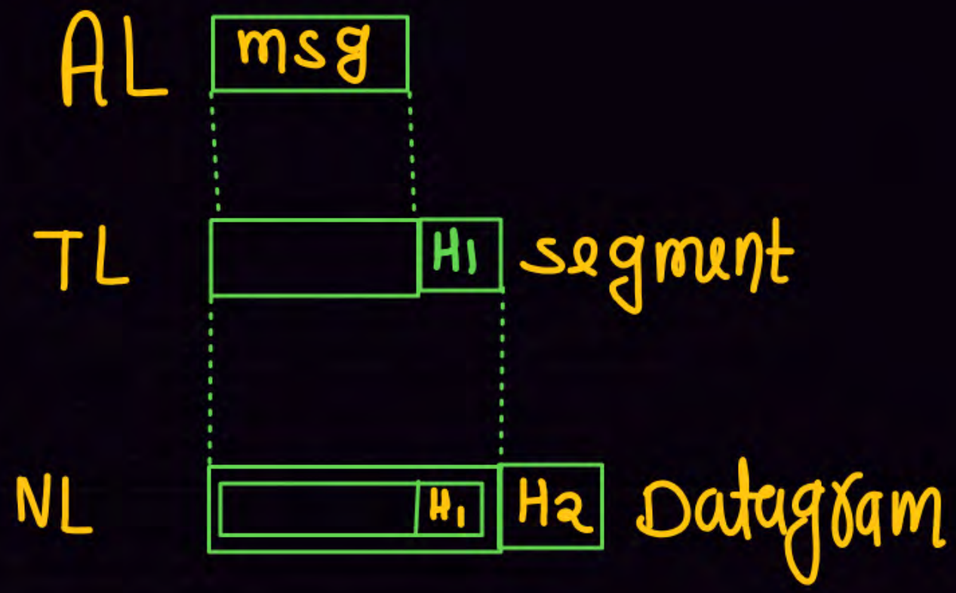
Phases of TCP Connection

Important Points about TCP

(1) TCP is a connection oriented & reliable protocol(TCP has both flow and error control mechanism)

(2) It is a virtual connection & not physical i.e segments of TCP may follow different paths ,some of them may lost or duplicated or arrive out of order. Segments are encapsulated in IP datagram.

(3) Virtual Connection means resources like buffers are allocated in advance at the client and server side before starting transmission


AL
msg
TL
H1
segment
NL
H1
H2
Datagram

(4) TCP connection have 3 phases.

(i) Connection Establishment

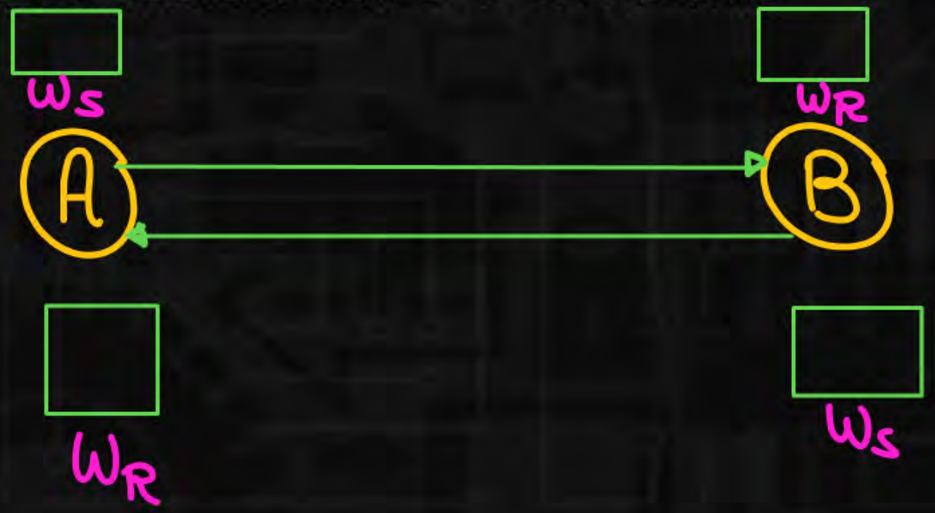
(ii) Data Transfer

(iii) Connection Termination

(5) TCP Connection is a Full Duplex Connection i.e data can be sent in both the direction

(6) TCP uses sliding window protocol for its flow control (GBN & SR)

(7) Each TCP connection have 4 window.



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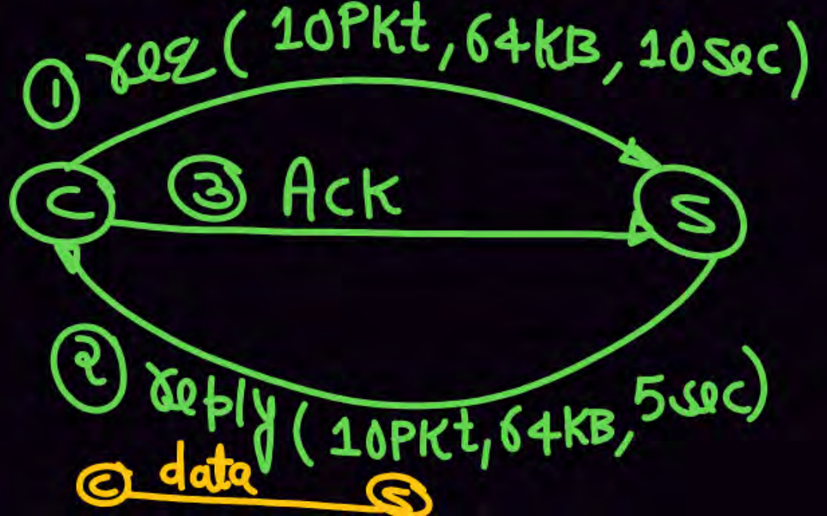
Communication

Connection oriented

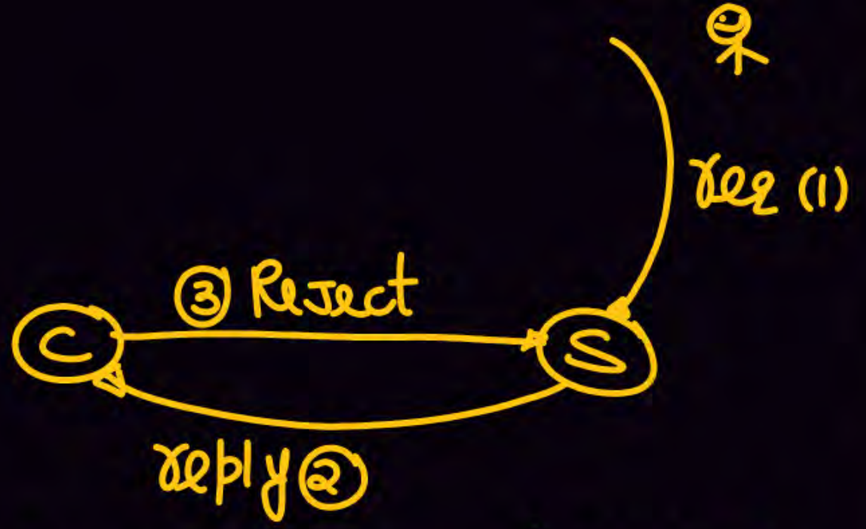
Connection establishment

3 way Handshaking



Connection less

1.

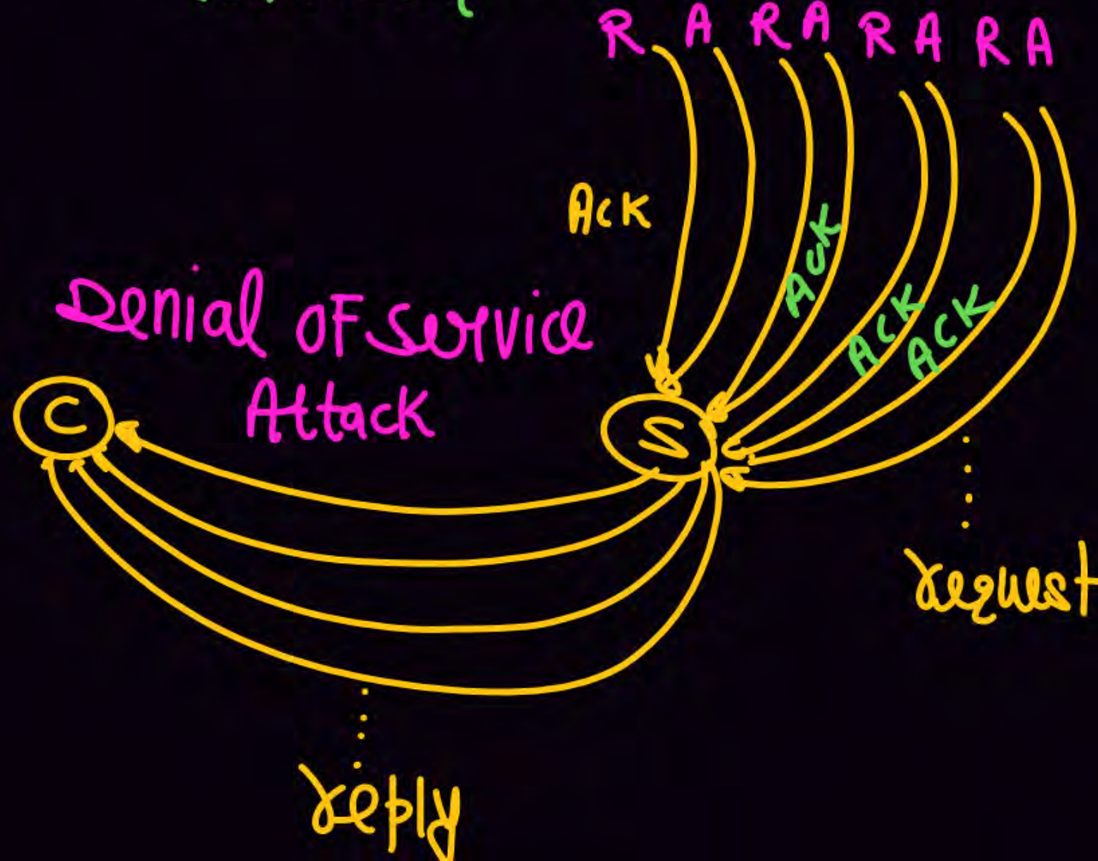


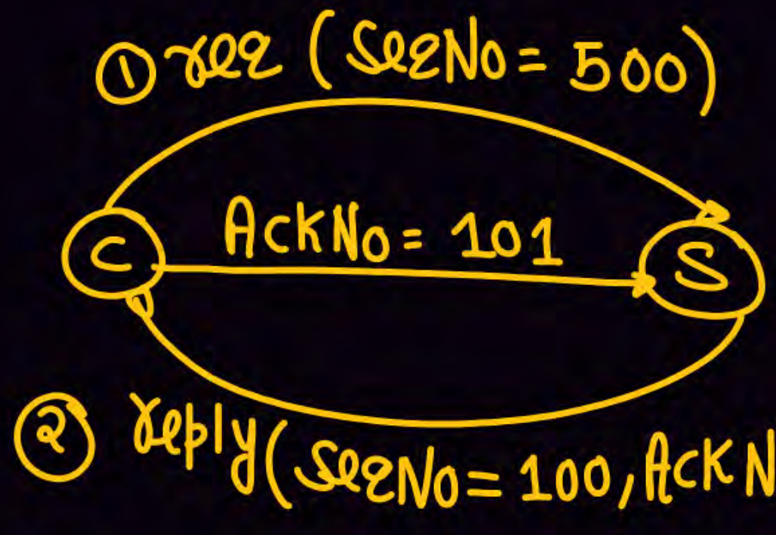
Connection not established

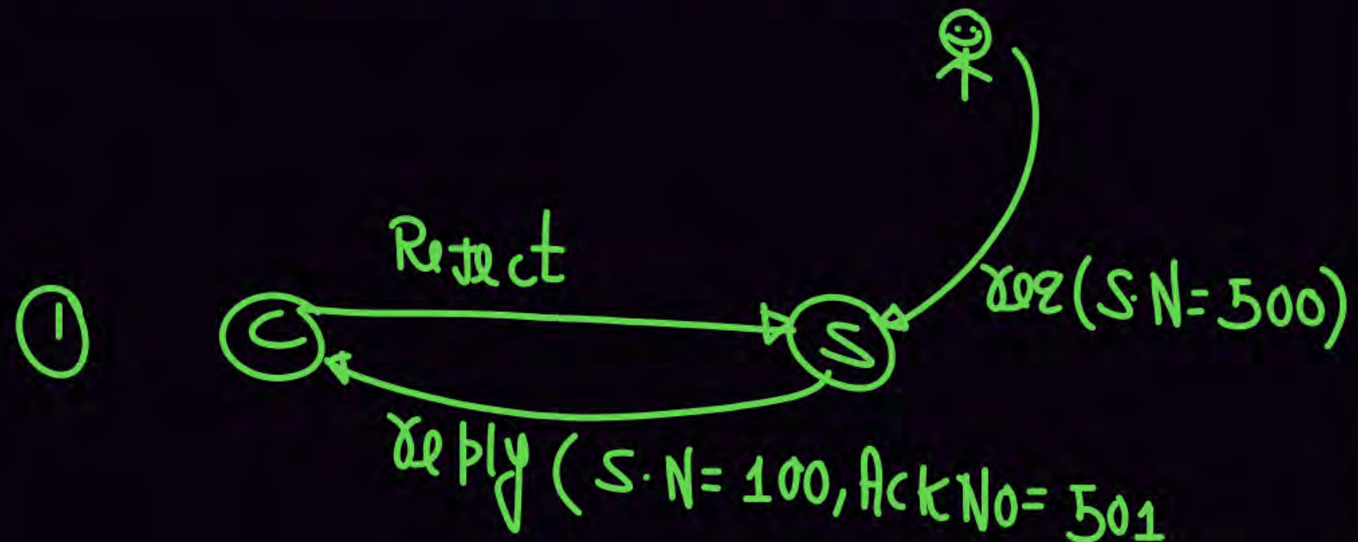
2

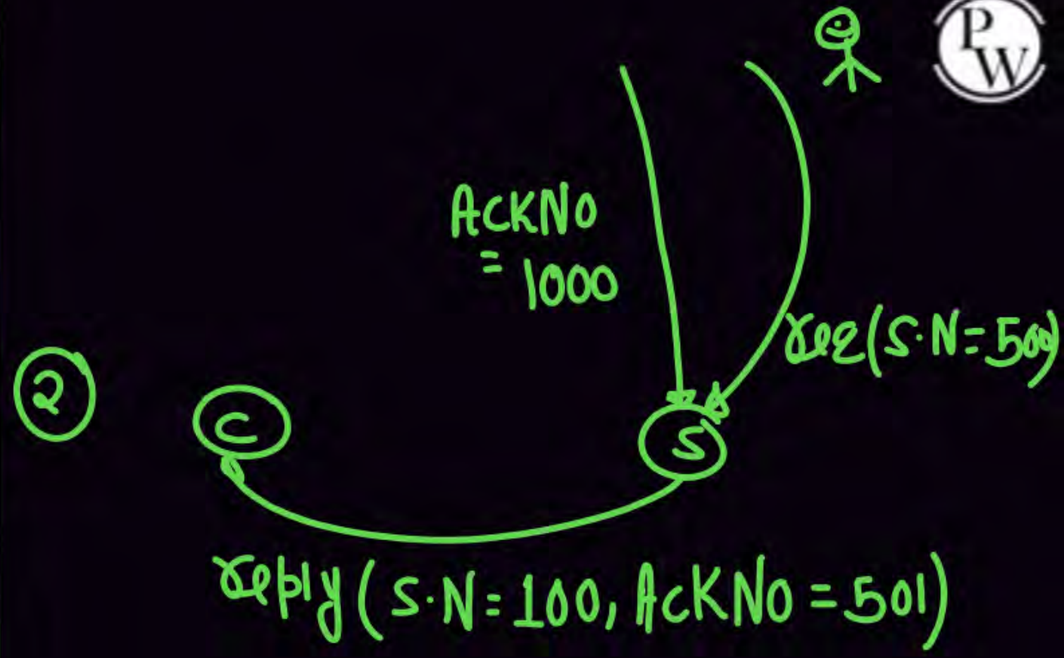
Connection established

3









Connection not established

Note: SeqNo and AckNo are also used for Authentication purpose

Flages = 6 bit

URG → urgent Flag

Ack → Acknowledgement Flag

PsH → Push Flag

RST → Reset Flag

SYN → synchronization Flag

FIN → Finished Flag

Note: SYN and Ack Flags are used in connection establishment Phase.

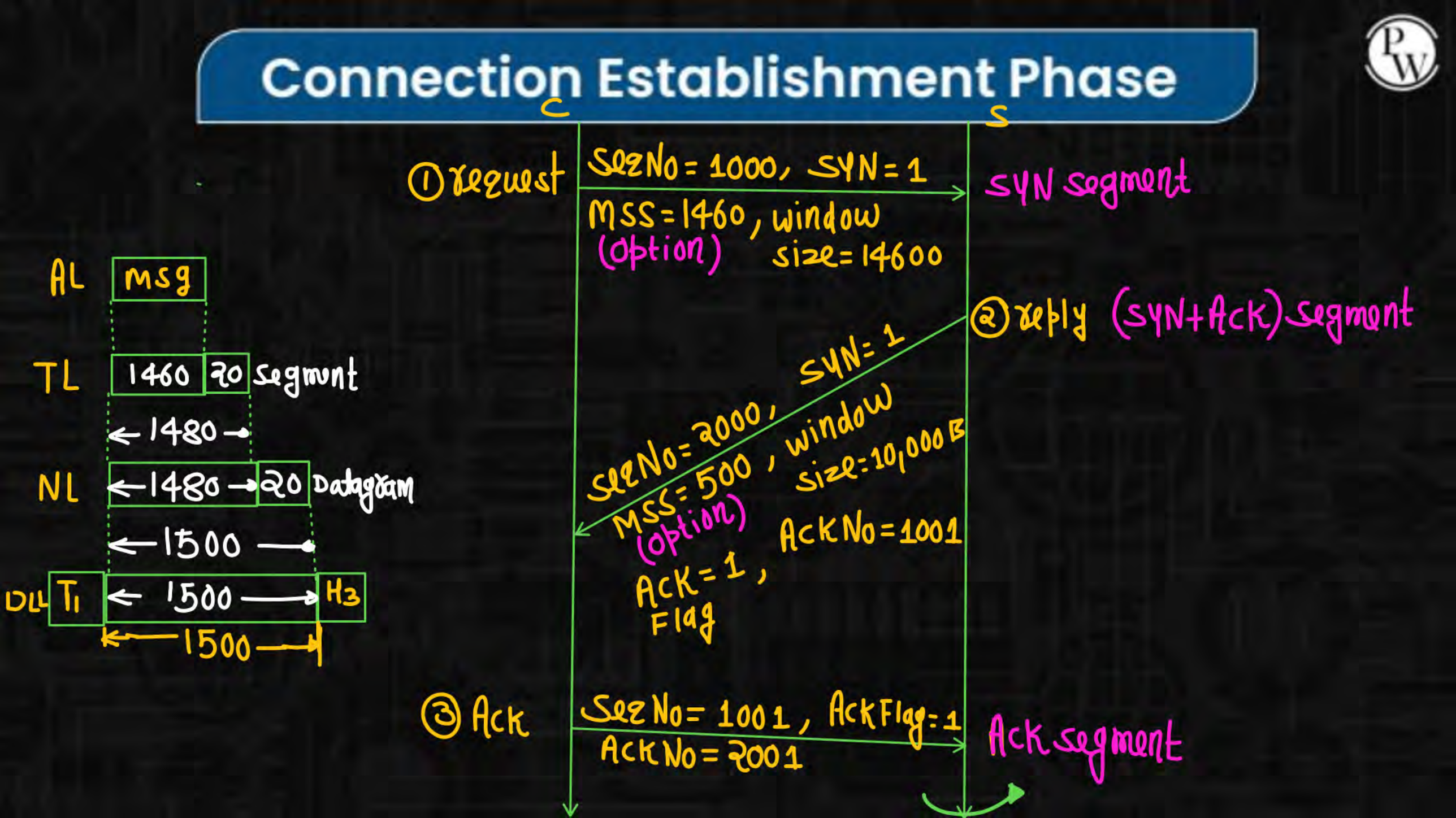
Phases of TCP Connection

i) Connection establishment Phase

ii) Data transfer Phase

iii) connection termination Phase

Connection Establishment Phase



14600 Byte

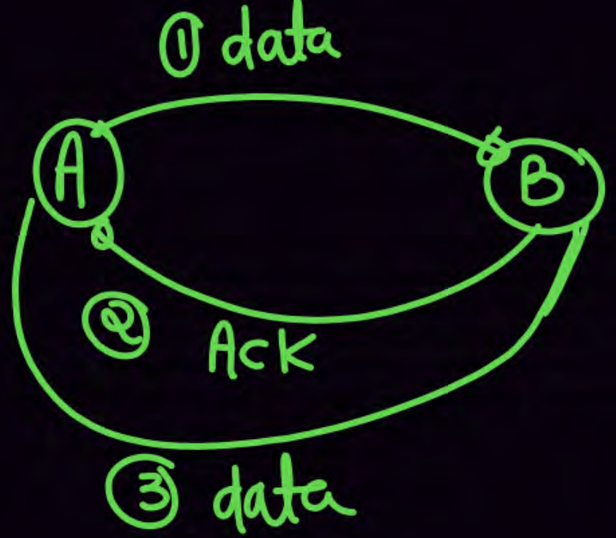
10,000 Byte

No. of segments = $\frac{14600\ \text{Byte}}{1460\ \text{Byte}}$

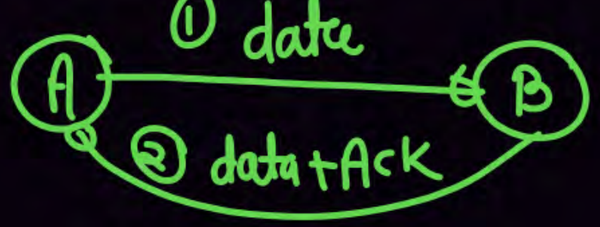
No. of segments = 10

No. of segments = $\frac{10,000\ \text{Byte}}{500\ \text{Byte}}$ = 20

General Approach



Piggybacking



SYN = 1 → Consume one Sequence Number

FIN = 1 → consume one sequence Number

Ack = 1 → Consume No sequence Number

1 Data Byte → Consume one sequence Number

SYN	Ack	
1	0	→ Request
1	1	→ Reply
0	1	→ Ack | Piggybacking
0	0	→ Data

Note:-

(1) A SYN segment cannot carry data, but it consume one sequence number.

(2) A SYN + ACK segment cannot carry data, but it consume one sequence number.

(3) An ACK segment, If carry no data then it will not consume sequence number.


THANK YOU
GW
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