



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

AY: 2025-26

Class:	T. E.	Semester:	V
Course Code:	CSC501	Course Name:	COMPUTER NETWORKS

Name of Student:	CHRUTI GAUCHANDRA
Roll No. :	18
Assignment No.:	04
Title of Assignment:	TCP, SMTP, HTTP
Date of Submission:	25/09/25
Date of Correction:	15/09/25

Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Completeness	5	05
Demonstrated Knowledge	3	03
Legibility	2	02
Total	10	10

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Completeness	5	3-4	1-2
Demonstrated Knowledge	3	2	1
Legibility	2	1	0

Checked by

Name of Faculty : Mrs. SNEHA YADAV

Signature :

Date :

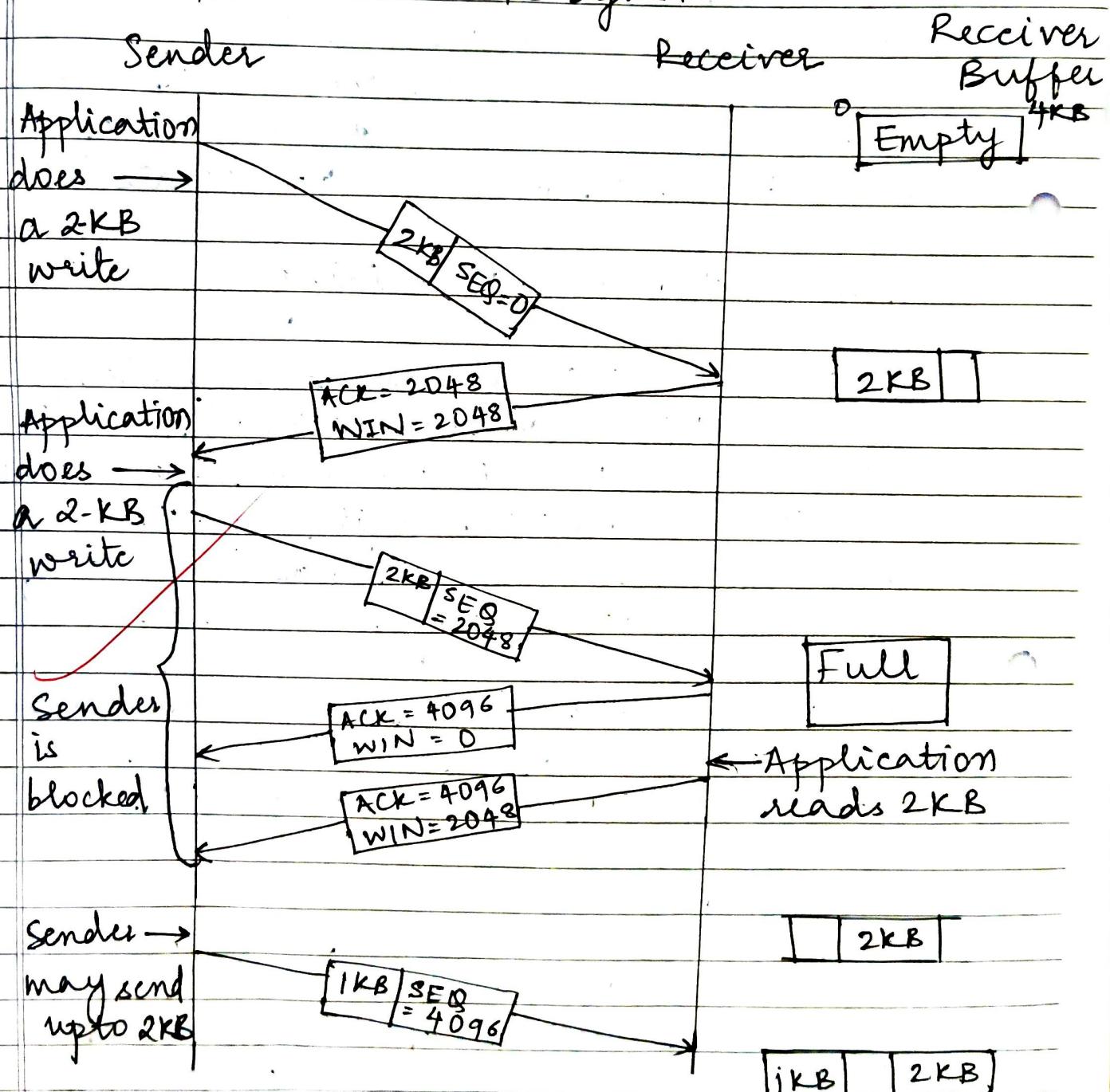
CSC504.4 Apply sliding window technique for TCP flow control and SMTP, HTTP, Telnet for sending emails.

- Q1. A livestock market application must send continuous updates to a client using TCP.
Determine how the sliding window mechanism helps maintaining a steady stream of updates without packet loss with appropriate diagram.

→ Flow Control or TCP Sliding Window:

- ① TCP uses sliding window to handle flow control. Sliding window protocol in TCP looks like the Go-Back-N protocol because it doesn't use NACK and it looks like Selective Repeat because receiver holds the out-of-order segments until missing one arrives.
- ② Windows management in TCP is different from data link layer in following ways:
- (a) Windows of TCP is byte oriented. (in DLL its frame oriented).
 - (b) In TCP, sliding window is of variable size (whereas in DLL it's fixed size). eg: suppose sender has a buffer, size is 4096 byte. Consider sender transmit 2048 byte segment, which is received by receiver correctly.

Then receiver will acknowledge segment. It's left with buffer space of size 2028 bytes. Now advertise a window of 2048, which tells next updated bytes. After that, sender transmits 2048 bytes!



Window management in TCP.

③ Receiver will acknowledge it, but this time size of advertise window is 0 byte.

This is indication for sender to stop sending data until application removes some data from buffer, after TCP can advertise large window.

④ Livestock market application uses TCP for reliable delivery. TCP establish a connection with 3-way handshake and then uses sliding window mechanism for flow control.

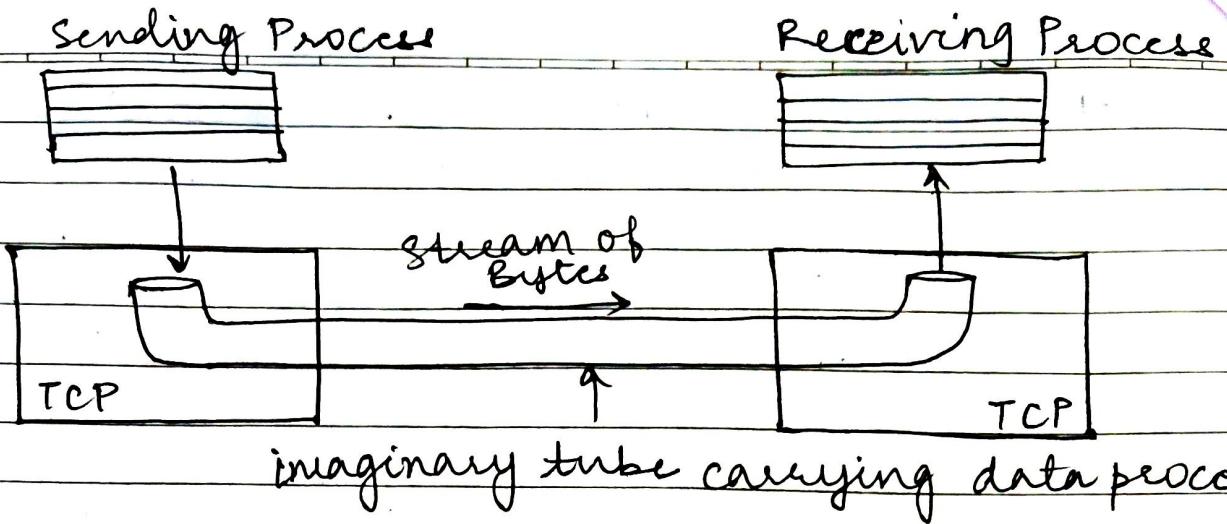
⑤ In sliding window, sender can transmit multiple updates before waiting for acknowledgement. The receiver advertises its available buffer size as a 'window', ensuring sender doesn't overflow it.

⑥ As acknowledgement are received, window slides forward, allowing continuous transmission of new updates. This mechanism maintains a steady stream of updates without packet loss and ensure efficient utilization of network.

Stream Delivery Service:

① TCP is stream oriented protocol.

② Sending process delivers data in form of stream of bytes and receiving process receives it in same manner.



- ③ TCP needs buffers for storage of data at both ends.
 - (a) sending Buffer
 - (b) receiving Buffer.

- ④ Senders are not supposed to transmit data as soon as data is obtained from application. Receivers also are not supposed to send acknowledgements as soon as they received it.

- ⑤ This is done in order to reduce usage of system. One way to reduce system usage is to use an algorithm Nagle's algorithm is used. This algorithm improves efficiency of TCP/IP networks by reducing number of packets that need to be sent over network.

Q2. Below is a hexadecimal dump of an UDP datagram captured.

E2 A7 00 0D 00 20 74 9e De ff 00 00 00 01 00 00
00 00 00 00 06 69 73 61 74 61 70 00 00 01 00

D)

1. Find the source Port number.
2. Find the destination port number.
3. Find the total length of the user datagram.
4. Find the total length of data.
5. Is packet directed from client to server or vice versa?

→ Following is UDP datagram structure.

The UDP header is of size 8 bytes and remaining bytes are of data.

1) Source Port number

$(E2\ A7)_{16}$

2) Destination Port number

$(000D)_{16}$

3) Total length of the user datagram.

$(0020)_{16} = (32)_{10}$ bytes.

4) Total length of data

= total length - header length

= $32 - 8$

= 24 bytes.

5) Packet directed from client to server.

