



Academic Year 2023 - 2024

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**Branch: CSE (ICB)**

**Div: B1**

**Course: Computer Networks Laboratory**

## **EXPERIMENT NO. 5**

**Aim:** To study Sliding Window Protocols- Selective Repeat, Go Back N.

**Theory:**

- 1) Explain the term sliding window.

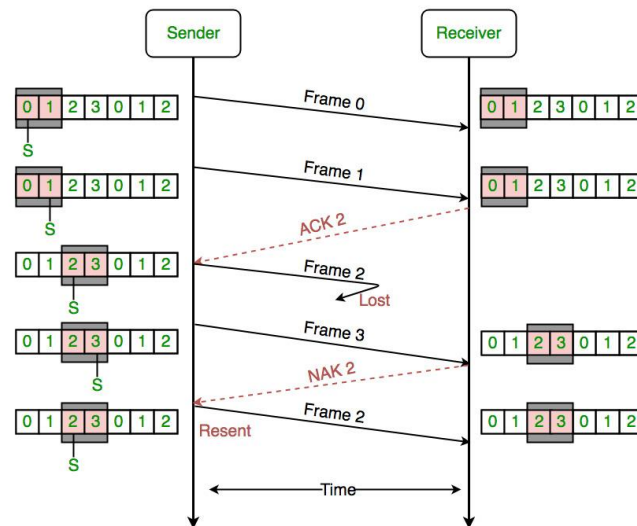
The sliding window is a technique for sending multiple frames at a time. It controls the data packets between the two devices where reliable and gradual delivery of data frames is needed. It is also used in TCP (Transmission Control Protocol). In this technique, each frame is sent from the sequence number. The sequence numbers are used to find the missing data in the receiver end. The purpose of the sliding window technique is to avoid duplicate data, so it uses the sequence number. A sliding window is also known as windowing. It is a method for controlling sending data packets between two network devices where dependable and sequential delivery of data packets is needed, such as using the Data Link Layer (OSI model) or Transmission Control Protocol (TCP). In the sliding window technique, each data packet (for most data link layers) and byte (in TCP) includes a unique consecutive sequence number used by the receiving computer to place data in the correct order. The objective of the sliding window technique is to use the sequence numbers to avoid duplicate data and to request missing data.

Following are the two types of Sliding Window Protocol:

- Go Back-n Protocol
- Selective Repeat ARQ

- 2) With a diagram describe Selective repeat sliding window protocol.

The Selective Repeat Protocol (SRP) is an advanced version of the sliding window protocol that allows for more efficient data transmission by selectively retransmitting only the packets that are lost or corrupted, rather than retransmitting all packets following a lost or corrupted packet. This protocol is particularly useful in environments with high error rates, where retransmitting all packets would lead to significant bandwidth inefficiency.



### Working of Selective Repetitive ARQ:

- **Sender and Receiver Windows:** Both the sender and receiver maintain a window of packets. The window size is typically half the sequence number space ( $2^m$ ) to avoid confusion between old and new packets if an ACK is lost. This ensures that the sender doesn't send packets that the receiver might mistake for retransmissions.
- **Packet Transmission and Acknowledgment:** The sender can transmit new packets as long as their sequence number is within the window of unacknowledged packets. The receiver acknowledges all correctly received packets, and if a packet is lost or corrupted, the receiver sends a negative acknowledgement (NAK) for that specific packet.
- **Buffering and Reordering:** The receiver buffers packets out of order and stores them until they can be delivered in sequence to the higher layer. This is possible because the receiver can identify and request retransmission of only the lost or corrupted packets, allowing it to continue accepting and storing subsequent packets.
- **Retransmission:** Upon receiving a NAK for a specific packet, the sender retransmits only that packet, rather than retransmitting all packets following the lost or corrupted packet as in Go-Back-N. This selective retransmission is more efficient in terms of bandwidth and time.



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CN exp-5

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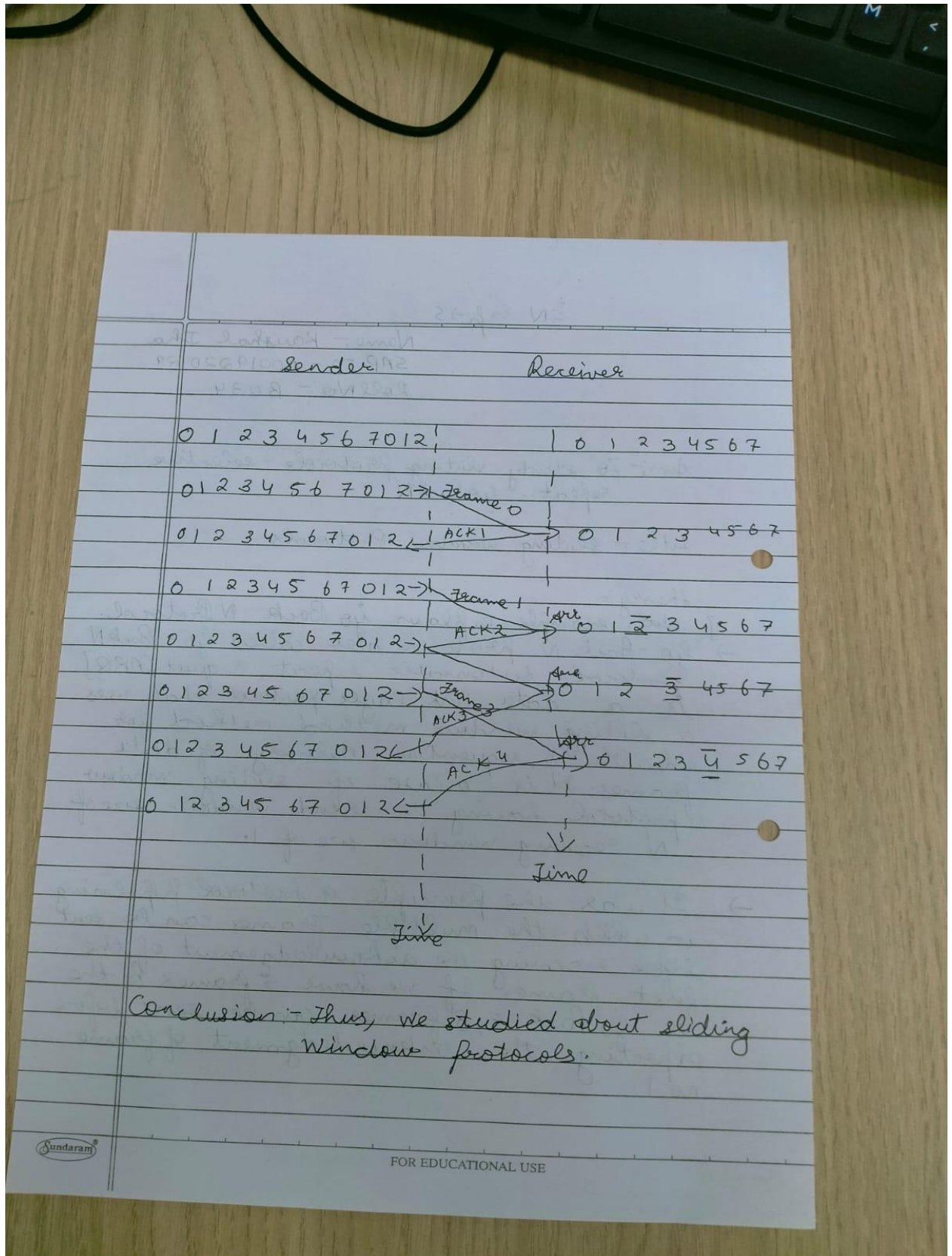
Aim:- To study sliding protocols - selective repeat & Go Back N

Title:- sliding window protocols

Theory:-

- 1] With example explain Go Back N Protocol.
- Go Back N protocol also called Go Back N protocol automatic repeat request [ARQ] is a data link layer protocol that uses a sliding window method for reliable & sequential delivery of data frames. It is a case of sliding window protocol having to send window size of N receiving window size of 1.
- It uses the principle of protocol pipelining in which the multiple frames can be sent before receiving the acknowledgement of the first frame. If we have 5 frames & the 1st frame is lost, 3 frames can be sent before retransmitting the acknowledgement of frame no 1.







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Conclusion: Thus we successfully studied about Sliding Window Protocols- Selective Repeat & Go Back N.