

SE331: Introduction to Computer Networks Semester 1 5785 Lecturer: Michael J. May	Recitation 4 27 Nov 2024 Kinneret College
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Sliding Window

1 Simple Sliding Window

Draw a timeline diagram for the sliding window algorithm with $SWS = RWS = 3$ frames for the following two situations. Use a timeout interval of $2 \times RTT$.

- (a) Frame 4 is lost.
- (b) Frames 4–6 are lost.

To be more concrete, let's choose some numbers for the parameters. Each packet is 1KB, the medium has a 1Mbps bandwidth, and the RTT is 100ms. ACK packets are 100B.

2 Sliding Window with Duplicate ACKs

Modify the time lines from the previous question using the following modification to the sliding window algorithm (a *fast retransmit modification*):

The receiver sends a duplicate acknowledgement if it does not receive the expected frame. For example, it sends `DUPACK[1]` when it expects to see `FRAME[2]` but receives `FRAME[3]` instead. When the sender receives a `DUPACK` message, it immediately sends the (assumed) lost message.

Continue with the existing assumption that the receiver sends a cumulative acknowledgment after it receives all the outstanding frames. For example, it sends `ACK[4]` when it receives the lost frame `FRAME[2]` after it already received `FRAME[3]` and `FRAME[4]`. Use a timeout interval of about $2 \times RTT$.

- (a) Frame 4 is lost, but the sender works with the fast retransmit modification.
- (b) Frames 4–6 are lost, but the sender works with the fast retransmit modification.

Does using the fast retransmit modification make a difference?