# Fast and Reliable TCP:
# Sliding Window and Cumulative ACKs

## 1. Motivation

Stop-and-wait protocol is inefficient because the sender can transmit only one packet at a time. TCP uses sliding window protocol to enable pipelining to increase throughput.

## 2. Sliding Window – Basic Idea

The sender may have multiple unacknowledged packets in the network.
The number allowed is called *window size*.
When an ACK is received, the sender slides the window forward.

## 3. Cumulative ACKs

TCP receiver acknowledges data cumulatively:
ACK N means "*I have received all packets up to N-1*"

## 4. Summary

Sliding window enables high throughput.
Cumulative ACKs reduce overhead.
Together they provide reliable, efficient transport for TCP.