CS 258 Project Assignment

Spring 2021 Prof. Navrati Saxena

Team Project: (2 members per team)

Implement a very basic TCP client and server implemented on two separate machines. The TCP client/server will communicate over the network and exchange data to maintain TCP Sliding window protocol. The server will start in passive mode listening for a transmission from the client. The client will then start and contact the server (on a given IP address and port number). The client will pass the server an initial string (e.g.: "network"). On receiving a string from a client, the server should respond with connection setup "success" message.

Now the client will start sending the TCP segments in the sliding window manner. For simplicity, instead of sending actual packets, the client will send only the TCP sequence numbers to the server. On reception of the sequence numbers, the server will respond to the client with the corresponding "ACK numbers". On receiving an ACK, the client will adjust the sliding window.

The server, on the other hand, will continue receiving the sequence numbers and keep track of any missing sequence number. If there is no missing sequence number, the server will consider all the packets till that sequence number are received.

Now, while sending the packets (represented by sequence numbers), the client probabilistically drop 1% of the packets. Server will keep track of the missing packets. After a specific time (e.g. 100 sequence numbers), the client will retransmit the dropped packets with the same probability.

Note:

The program should be executed for 10,000,000 packets and maximum sequence number should be limited to 2^{16}.

Output: The server will keep a count of received packets and missing packets. Calculate good-put (received packets/sent packets) periodically after every 1000 packets received at the server and report the average good-put.