Networking Report

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A. Difference in Implementations of TCP

Our implementation of TCP is different from traditional TCP in the following manners:

1. There is a 3 way handshake in TCP. We don't do that.
2. There is a SYN bit for synchronisation. We don't use it.
3. In TCP, acknowledgement may be sent not after every chunk but after a couple of them. We send after every chunk we receive.
4. We don't have flow control i.e. when the transmission and receiving speeds for the client and server are different, then TCP employs flow control and limits the data that can be sent or received. We don't implement that.
5. TCPs are bidirectional and data can go from client to server and vice versa concurrently. Ours is also bidirectional, but needs to be done in a sequential manner i.e. client to server, then server to client and so on.
6. There are flags like FYN and RST for termination. We don't employ them in our implementation.

B. Accounting for Flow Control

Flow control in TCP is when transmission speed and receiving speed are different, causing problems in "flow" of data. To avoid this, traditional TCP uses a window size for sender and receiver, i.e., the maximum data that can be sent or received without any problem.

To implement this in our system, we can

1. After initial connection, the client initially sends the maximum amount of data it can send to the receiver.
2. The receiver receives the number and then compares it with the maximum it can receive. It then takes the minimum of the 2 and sends it back.
3. The client recognises this as the window size. Now the chunk size is set to this number.
4. The client then proceeds to send chunks in the above mentioned size.

For a dynamic flow control, we can

1. Instead of dividing the input beforehand, we will send a certain size of chunk to the sender and maintain the rest of input
2. Compare the time for sending a chunk and receiving acknowledgment and take their difference on the client side.
3. After this, if the time is higher than a threshold, then we reduce the size of chunks for the consequent chunks.
4. If we then find the difference to be lower than threshold, we can increase the size and send more sized chunks to the receiver.
5. By doing this, we can maintain a dynamic flow control.