Framing, Flow and Errors

Basic Flow -

There are 2 servers and 4 hosts, among which one is used for attendance and others for login. The client first sends the username and password to both servers which authenticate the user. If the user is authenticated then file transmission is started. Before transmitting the file, the client sends the size of the data to be used to the hosts and RTT is calculated by the servers. Then the client chooses the servers alternatively and sends the frame containing the data. The client then waits for the acknowledgement message. The host calculates the checksum and sends the acknowledgement message back to the client. If there was an error in transmission then the frame is sent again using the different server than before. The host stores the data in the file side by side.

Framing -

The framing is done using *struct,* At client the *data, frame number and checksum* is packed in the struct and sent to the host.
Before transmission of the data, the size of data is sent from client to the host, using struct, which packs the size of data and checksum of the same in it. This helps the host to unpack the data as now it knows the size it has to unpack.
The acknowledge message contains the message and the frame number for which the message is sent to the client by the host.

Random Delays -

RTT is calculated using the time library. After the authentication of the client, the client sends the size of data it uses in one frame. At the server, data of the same size is generated and is transmitted to the host, which then sends the acknowledgement message and time between these 2 is the RTT.
Then every time our server chooses a random delay between RTT, RTT + 1 before transmitting.

Checksum -

Checksum is the same as taught in the class, we take the bytes and add all of them. Wrapping is done if the sum exceeds 16 bits. 1's complement is taken of the sum and transferred to the host. Host follows the same procedure but it also adds the checksum sent by the client to the sum of data.

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