Networks Lab Report - Lab 3

- *Nilay Pochhi (15CS10033)*
- *Surya Sen Dwivedi (15CS10044)*

TCP

The network application transfers a file from client to server using TCP as the underlying transport layer protocol. The protocol implemented at the application layer is as follows :

1. The client sends a hello message to the server along with the file name and file size. Format - "<file_name> <file_size> hello"
2. The server acknowledges this message.
3. The client initiates the file transfer writing data in chunks of 256 bytes to the socket.
4. The server upon receiving the entire file calculates the MD5 hash sum of the file and sends it to the client.
5. The client matches the received hash sum with the hash sum of the original file and prints a message at the console accordingly.

Directions to use the network application

1. Start the server :
    a. Compile using gcc TCPserver.c -lssl -lcrypto
    b. Execute using ./a.out <server_port>
2. Start the client :
    a. Compile using gcc TCPclient.c -lssl -lcrypto
    b. Execute using ./a.out <server_ip> <server_port>

Experiment

The file transferred was a 5 MB pdf file. The server was running on a PC at LBS Hall, while the client was running on a PC at Azad Hall, both of which were connected to the Local Area Network.

The parameters observed were :

- *Total number of segments received*: 3880
- *Packet Distribution*:

▼ Packet Lengths	3880	1345.27	66	1514	0.3007	100%	4.1200	243.538
0-19	0	-	-	-	0.0000	0.00%	-	-
20-39	0	-	-	-	0.0000	0.00%	-	-
40-79	415	66.07	66	78	0.0322	10.70%	0.8400	243.417
80-159	4	99.25	82	130	0.0003	0.10%	0.0200	241.286
160-319	20	247.60	194	266	0.0016	0.52%	0.0500	244.254
320-639	19	360.84	322	514	0.0015	0.49%	0.0400	243.691
640-1279	0	-	-	-	0.0000	0.00%	-	-
1280-2559	3422	1513.74	1322	1514	0.2652	88.20%	3.7900	243.538
2560-5119	0	-	-	-	0.0000	0.00%	-	-
5120 and greater	0	-	-	-	0.0000	0.00%	-	-

- *Number of retransmitted packets for TCP*: 1

No.	Time	Source	Destination	Protocol	Length	Info
9514	246.837566650	10.117.17.172	10.109.65.213	TCP	66	[TCP Retransmission] 7005 → 60392 [FIN, ACK] Seq=47 Ack=4963482

- *Total time to receive the file for TCP*: 246.853 - 233.954 secs = 12.899 secs

We observe that all the segments are not of the same size. TCP, being a connection oriented protocol sends SYN/ACK messages which are not of the same size as the actual data messages. The data messages are also not all of the same size.