Ahmedabad University

CSE 342: Computer Networks

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Faculty: Professor Shashi Prabh

Teaching Assistant: Dhruvil Dave & Arpit Vaghela

Submitted by

Name	Roll No
Sameep Vani	AU1940049
Kairavi Shah	AU1940177

Lab 2: Streaming multimedia over UDP

Server:
After declaring the header file and required variables. The first thing is to provide the sockaddr_in with address structure. Then we create the socket and bind it(which is optional in UDP). Now starts the main recvfrom and sendto function. The client automatically sends “GET” to the server once the socket is created. Now the server opens the video in “rb” mode and then it reads the bytes of the video till the end of the video file is reached and sends it to the client. Each consecutive packet is sent after a particular delay to ensure reliable delivery of packets.

Calculation of data rate to find the optimal delay for reliable delivery:
Data Rate = Size of Packet Sent / Time Delay Provided
In our case each size of packet is BUFSIZ(which is 8192 bytes or 8 KB).
We have here calculated the data rates for different values of delays and plotted the received video file size as a function of data rate.
By calculations, the optimal delay is 0.0001s but while experimenting it was found out that 0.001s is the best optimal as there is no buffering and all the frames are loaded nicely. However we have used a delay of 0.01 to show streaming is done even while transferring.

Delay (s)	Bufsize	Data rate	Received File Size (MB)	Sent File Size (MB)
0.0000000001	8192	81920000	15.89142011	20.02496156
0.000000001	8192	8192000	17.83247287	20.02496156
0.00000001	8192	819200	17.89508747	20.02496156
0.0000001	8192	81920	19.60133546	20.02496156
0.000001	8192	8192	18.68559686	20.02496156
0.00001	8192	819.2	19.85179388	20.02496156
0.0001	8192	81.92	20.03181087	20.02496156
0.001	8192	8.192	20.03181087	20.02496156

Figure 1: Different values of delays to find optional data rate(which in our case is highlighted in green color)

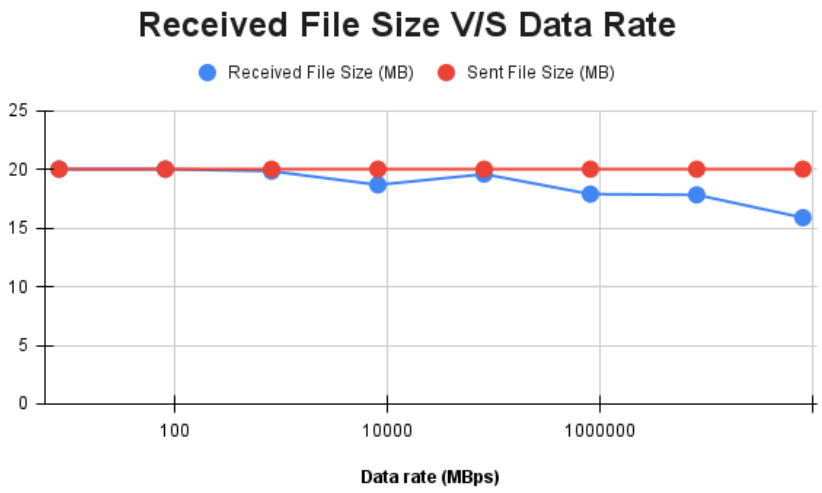

Figure 2: Graph of Received File Size V/S Data Rate

After all the bytes are sent and reached the end of the video, the server closes the video file and sends bye to indicate the completion of video.

Client:

After declaring the header file and required variables. The first thing is to provide the sockaddr_in with address structure. Then we create the socket(here we need not listen and connect as it is a UDP). Now starts the main recvfrom and sendto function. The client sends the “GET” directly to the server after the socket creation to invoke the server to send video. Now the client starts receiving the bytes in the packet but the no of bytes received in each packet depends on delay and no of bytes sent as sometimes due to low delay the packet may get lost. So, the client receives until the server sends “BYE” indicating the end of the file. Lastly, the file is closed. To stream, while transferring the bytes, we pipe the output of the client with “vlc sample.mp4” command to stream.