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ICSI 516 – Computer Communication Networks I

Project 1 Report

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Project 1 – Report

Tables

Table for delay of File 1, File 2, File 3, and File 4.

Delay	File 1 (16KB)	File 2 (32 KB)	File 3 (48 KB)	File 4 (62 KB)
TCP (sec)	0.007616	0.007317	0.011519	0.012050
UDP (sec)	0.055467	0.121433	0.100874	0.178673

Table for throughput of File 1, File 2, File 3, and File 4.

Throughput	File 1 (16KB)	File 2 (32 KB)	File 3 (48 KB)	File 4 (62 KB)
TCP (bps)	16484243.7	33938499.4	31460369.8	40000663.9
UDP (bps)	2341284	2098342	3771676	2828676

Methodology

How did you process the Wireshark traces to calculate the above metrics? Did you use a program, or did you do it manually?

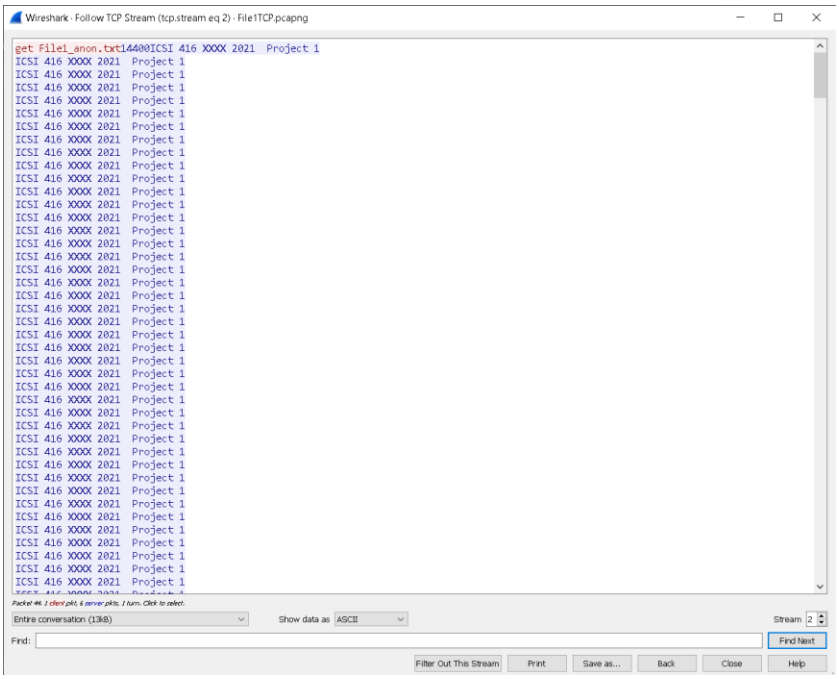
First of all, on Wireshark, I have filtered the packets with the IP address of the VM, “ip.addr == 169.226.22.20”.

I calculated the delay by right clicking on the first packet, then clicking “set/unset time reference”. After that, I looked at the last packet and it automatically calculates the difference between the first packet and the last packet.

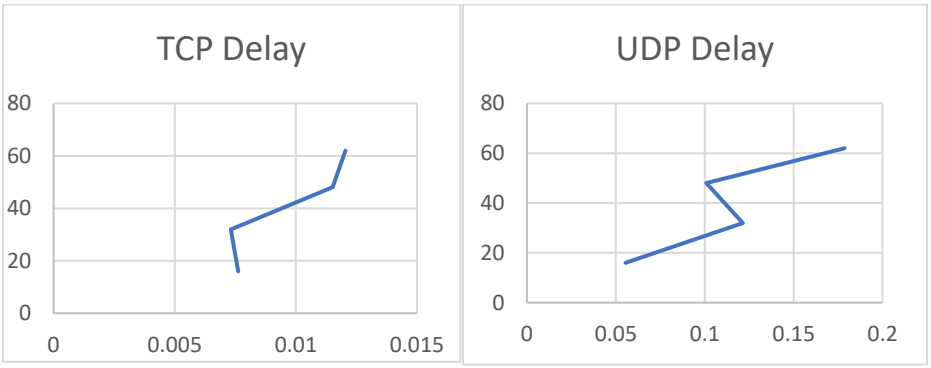
To calculate the throughput, on Wireshark, from “File”, I clicked “export packet dissections”, then chose CSV to save it in an CSV file. The I opened the file on Excel, added all “Length” values of all packets, then divided it by the overall delay, and acquired the throughput.

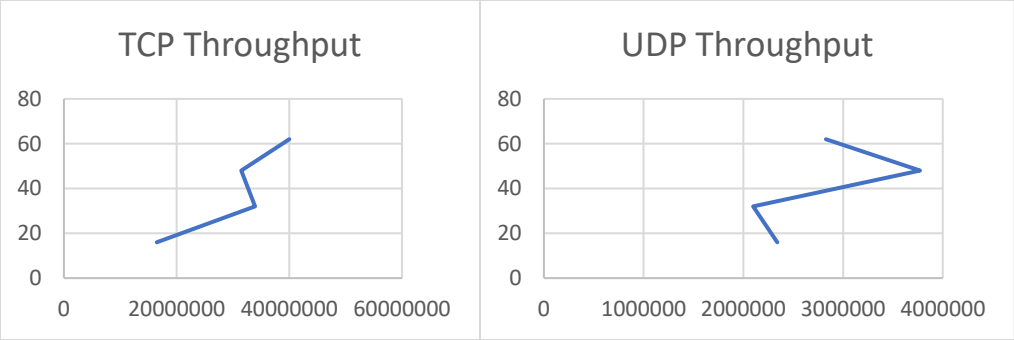
A description of the trends you see in your results along with a justification of these trends.

On the table of delay, we can see that for TCP and UDP, as file gets bigger the delay slightly increases, this is because the file size gets bigger, and more data packets are being transmitted, and on Wireshark, from statistics, and conversations, we can see the file data being transmitted in the data packets:

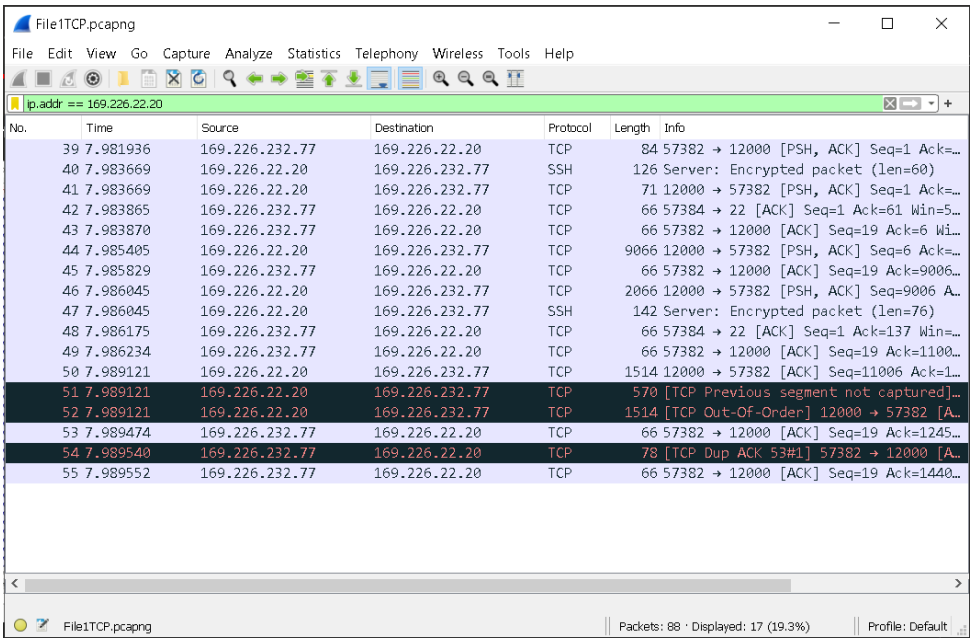


Plot graphs for delay and throughputs.

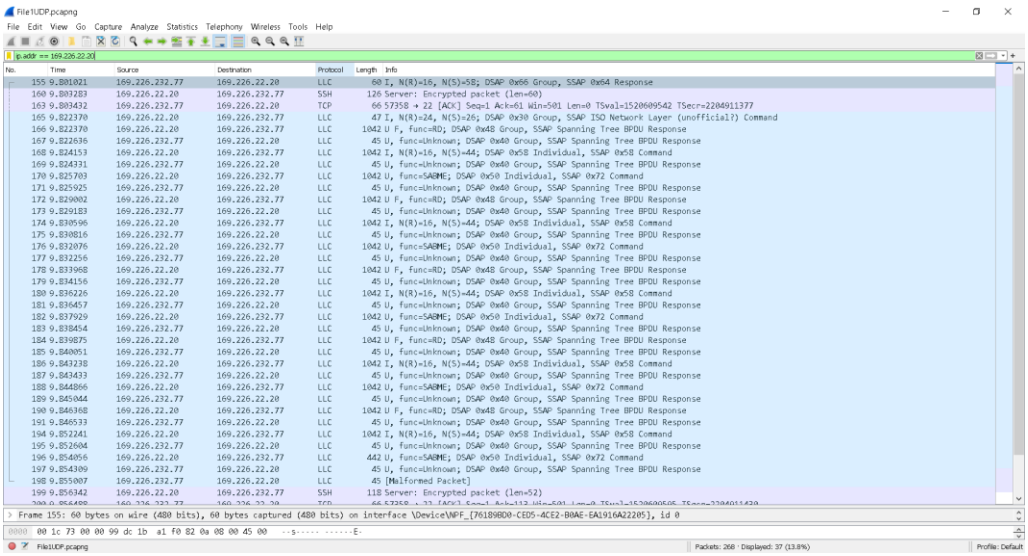




Some factors that cause increase in delay are packet losses and congestion control, in the below screenshot, we can see, for example for File1, there are packet losses, and this might be the reason of significant delays in the network:



An as we can see above in the plot graphs, the delay is a bit more linear in a constant rate as the file size grows bigger, and as we can see below, we see a reliable file transfer with UDP, thanks to stop and wait.



Looking at graphs for throughput, comparing it with the delay, we can see it is kind of going in the opposite direction. So Increase in delay means less throughput, and decrease in delay means more throughput. Similarly, lost packets mean reduced throughput. Observing higher throughput in TCP means that it has more successful message delivery over the machines.