FILE TRANSFER/PROTOCOL ANALYSIS – TECHNICAL REPORT

COMP 4985

ASSIGNMENT 2 – FILE TRANSFER/PROTOCOL ANALYSIS

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Introduction

The goal of this assignment is to send and receive data through sockets using TCP and UDP and comparing the differences between the two protocols. The assignment was developed using C++ and the Win32 API. The I/O models used in this implementation of the assignment were Asynchronous I/O and Overlapped I/O. Using these I/O models help increase the programs efficiency and performance.

Prior to creating the application, in previous courses I was taught that TCP is known to be reliable and slow. TCP would mostly be used in situations where the transfer of data is much more important than the speed at which they are being transferred. Secondly, UDP is known to be fast, but unreliable. UDP would mostly be used in situation where the speed of transfer is more important than the potential loss of data.

After implementing the program, I was able to put the common beliefs of both TCP and UDP to the test and analyze each of their differences. This document is a collection of the data gathered whilst testing the program. The variables used for testing for both TCP and UDP are with 1KB, 4KB, 20KB, and 60KB packet sizes. Each of these variables are then tested further by sending those packets either 10 times or 100 times.

Analysis

The next two following sections will compare the various characteristics of both TCP and UDP. First, we will look compare both protocols based on their performance when it comes to transfer time. Second, we will compare how both protocols are with packet loss.

Transfer Time:

The following graphs will be used to represent the difference between TCP and UDP with respects to Transfer Time. Each test was calculated using an average of three tests.

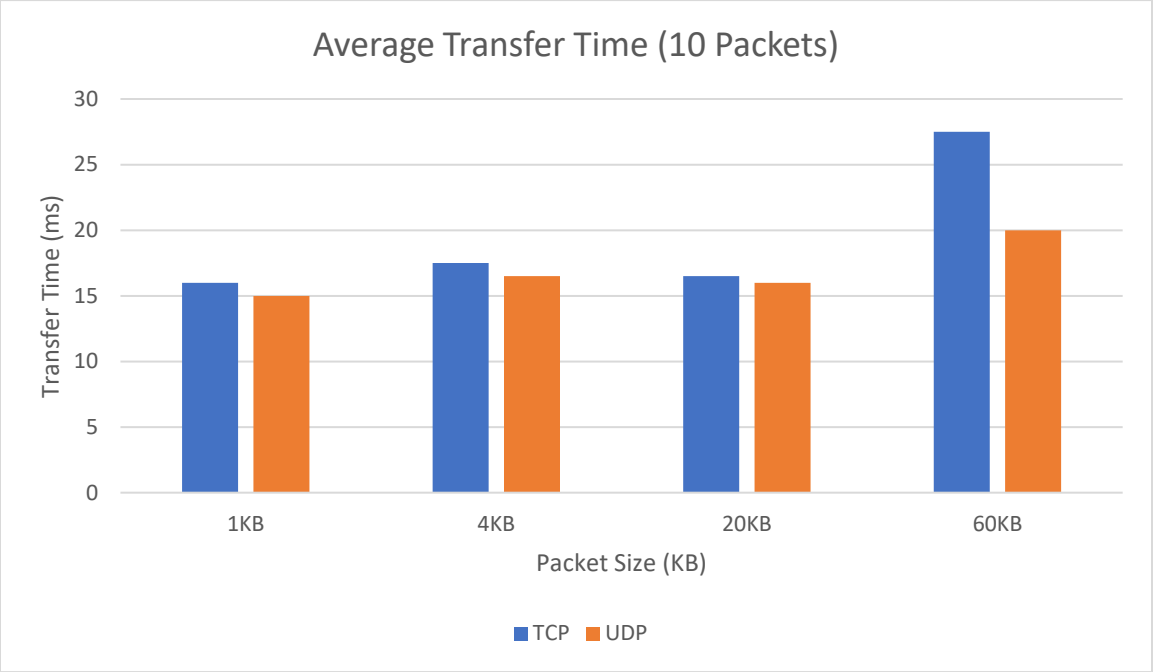

Figure 1

Based on the graph shown above in *Figure 1*, the average transfer time seem to very similar when sending small packet sizes. In this case the packet sizes of 1KB, 4KB, and 20KB seem to show similar transfer times. However, it differs quite significantly as we increase the packet size to 60KB, showing an improvement of transfer time for UDP compared to TCP

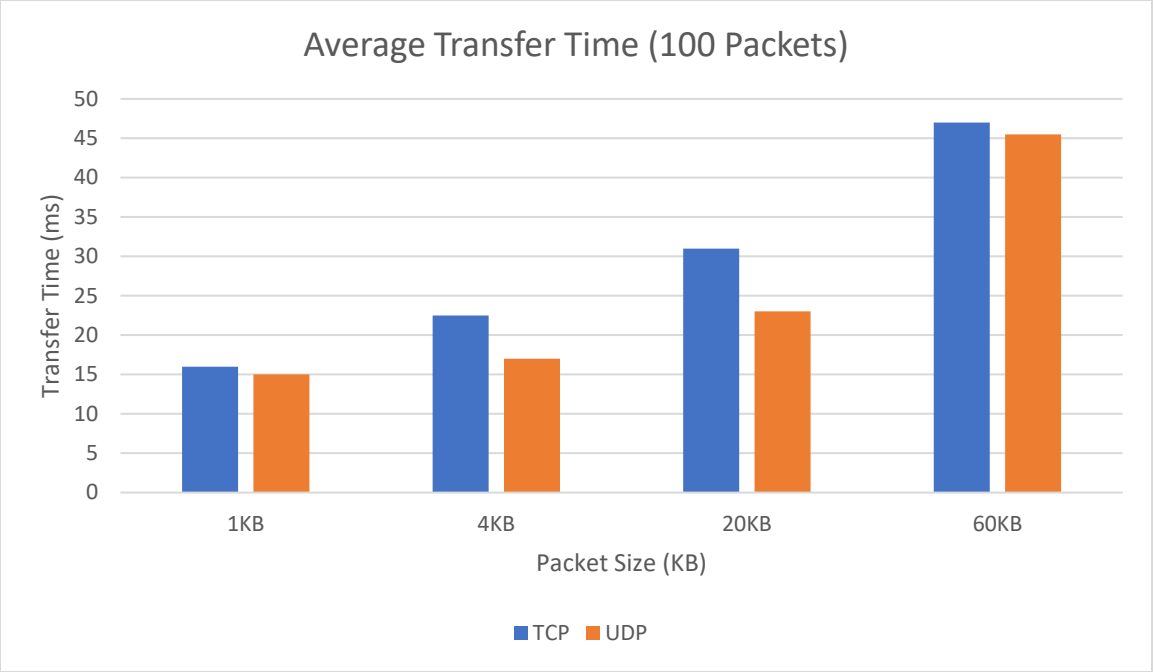

Figure 2

Now in the graph shown in *Figure 2* shows similar results to the previous graph. The smaller packet sizes seem to show little differences in their average transfer times with the UDP slightly faster than TCP. However, as we get to the larger 60KB packet size we can see that the difference becomes smaller between TCP and UDP.

Conclusion

In conclusion, the analysis seems to agree with the common characteristics of both TCP and UDP. UDP being slightly faster when it comes to smaller packet sizes compared to TCP. However, based on the results, as the packet size continued to increase the differences in transfer time decreased between TCP and UDP. Lastly, there seems to be quite a difference between sending 10 packets and 100 packets. In the case of UDP, as the number of packets to send increases, the slower the transmission time.