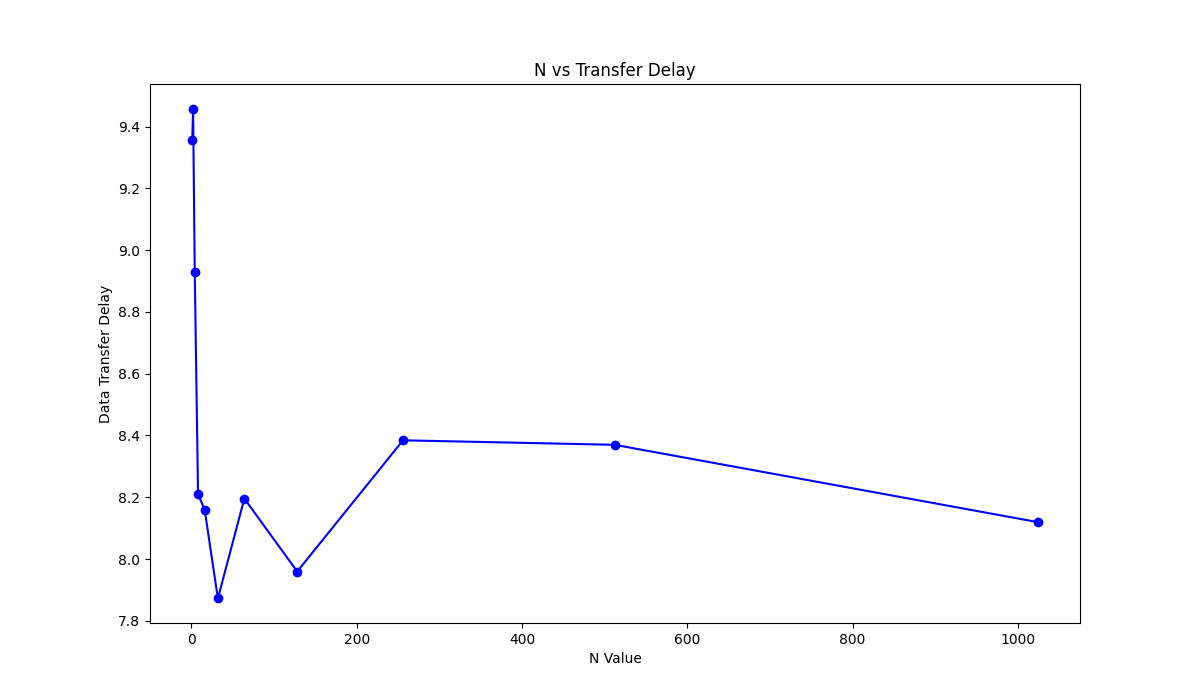
**Task 1: Effect of Window Size N**

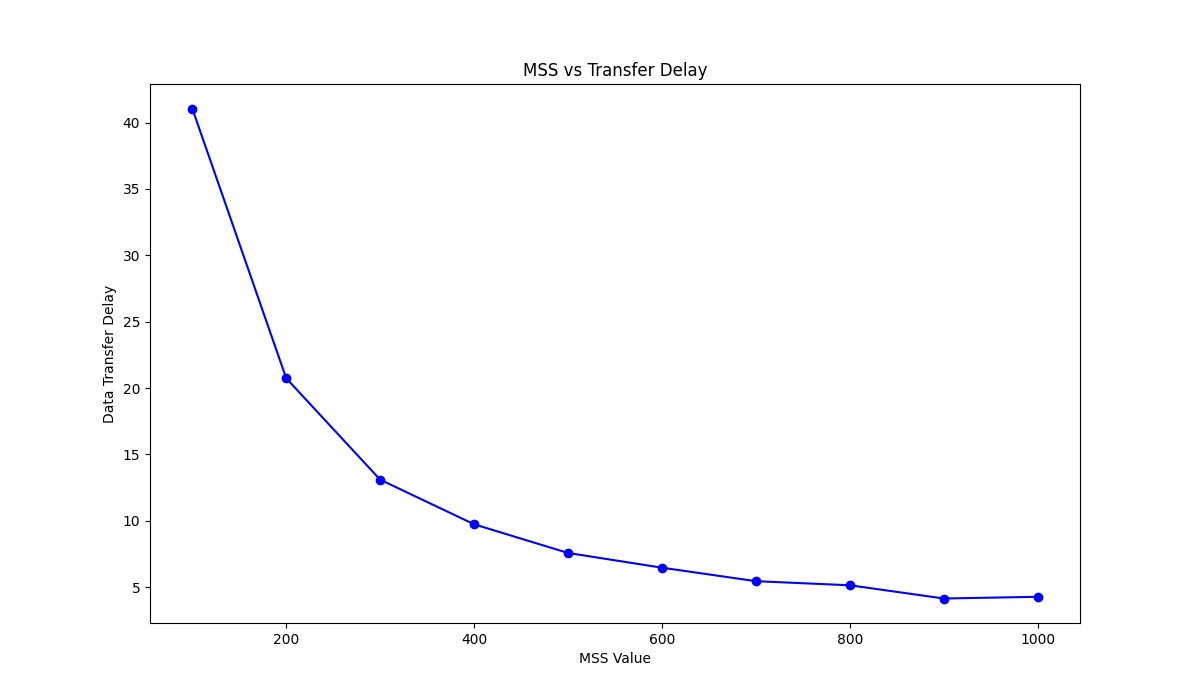
In this and the next two tasks, you will carry out a number of experiments to evaluate the effect of the window size N, MSS, and packet loss probability p on the total delay for transferring a large file. To this end, you must select a file that is at least 1MB in size, and run the client and server on two different hosts separated by several router hops; for instance, run the client on your laptop/desktop connected at home and the server on an EOS machine on campus. Record the size of the file transferred and the round-trip time (RTT) between client and server (e.g., as reported by traceroute), and include these in your report. For this first task, set the MSS to 500 bytes and the loss probability *p* = 0.05. Run the Go-back-N protocol to transfer the file you selected, and vary the value of the window size N = 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024.

For each value of N, transmit the file 5 times, time the data transfer (i.e., delay), and compute the average delay over the five transmissions. Plot the average delay against N and submit the plot with your report. Explain how the value of N affects the delay and the shape of the curve.



**Task 2: Effect of MSS**

In this experiment, let the window size N = 64 and the loss probability *p* = 0.05. Run the Go-back-N protocol to transfer the same file, and vary the MSS from 100 bytes to 1000 bytes in increments of 100 bytes. For each value of MSS, transmit the file 5 times, and compute the average delay over the five transmissions. Plot the average delay against the MSS value, and submit the plot with your report. Discuss the shape of the curve; are the results expected?



**Task 3: Effect of Loss Probability p**

For this task, set the MSS to 500 bytes and the window size N = 64. Run the Go-back-N protocol to transfer the same file, and vary the loss probability from *p* = 0.01 to *p* = 0.10 in increments of 0.01. For each value of *p* transmit the file 5 times, and compute the average delay over the five transfers. Plot the average delay against *p*, and submit the plot with your report. Discuss and explain the results and shape of the curve.

