CSC573: Internet Protocols

Project 2 Report

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Simple FTP with Go-back-N

Team:

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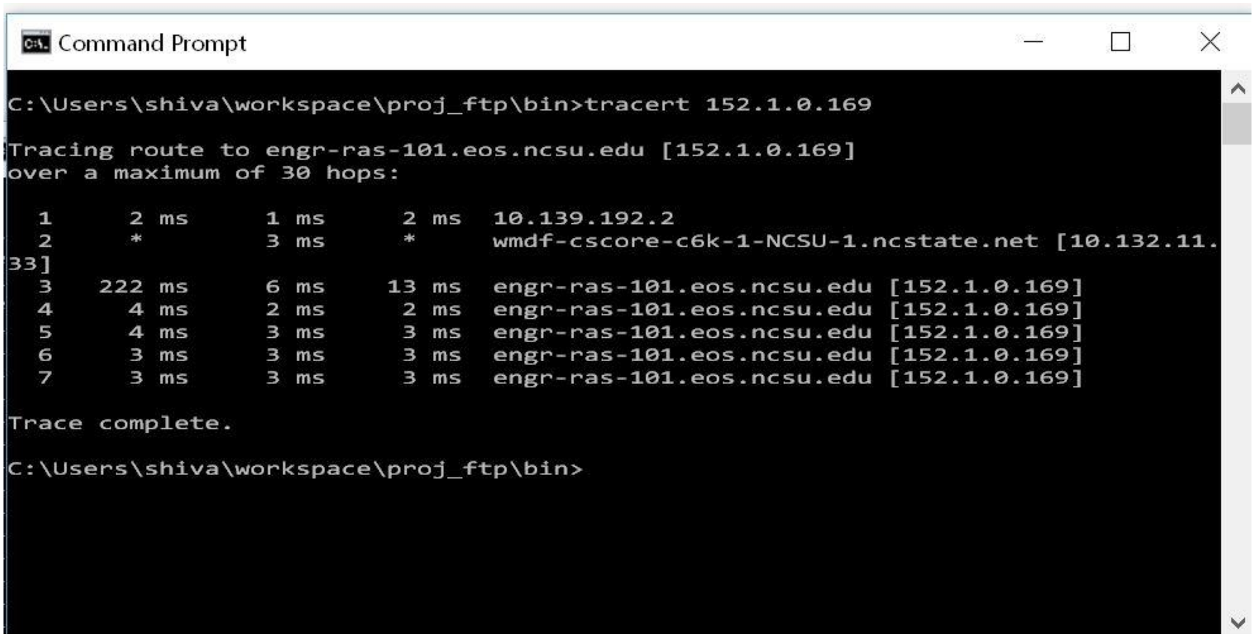
We used a personal PC and a machine on remote NCSU network to compute the transfer and delays. We had a sample 1.1MB text file we used for transfer.

The below figure gives the Hops and RTT info for the machines when we used traceroute command from the prompt.



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Command Prompt

C:\Users\shiva\workspace\proj_ftp\bin>tracert 152.1.0.169

Tracing route to engr-ras-101.eos.ncsu.edu [152.1.0.169]
over a maximum of 30 hops:

  1     2 ms     1 ms     2 ms  10.139.192.2
  2     *        3 ms     *     wmdf-cscore-c6k-1-NCSU-1.ncstate.net [10.132.11.
33]
  3   222 ms     6 ms    13 ms  engr-ras-101.eos.ncsu.edu [152.1.0.169]
  4     4 ms     2 ms     2 ms  engr-ras-101.eos.ncsu.edu [152.1.0.169]
  5     4 ms     3 ms     3 ms  engr-ras-101.eos.ncsu.edu [152.1.0.169]
  6     3 ms     3 ms     3 ms  engr-ras-101.eos.ncsu.edu [152.1.0.169]
  7     3 ms     3 ms     3 ms  engr-ras-101.eos.ncsu.edu [152.1.0.169]

Trace complete.

C:\Users\shiva\workspace\proj_ftp\bin>
```

RTT was 3ms in this scenario and we had a total of 7 Hops between Client and the Server.

Tasks:

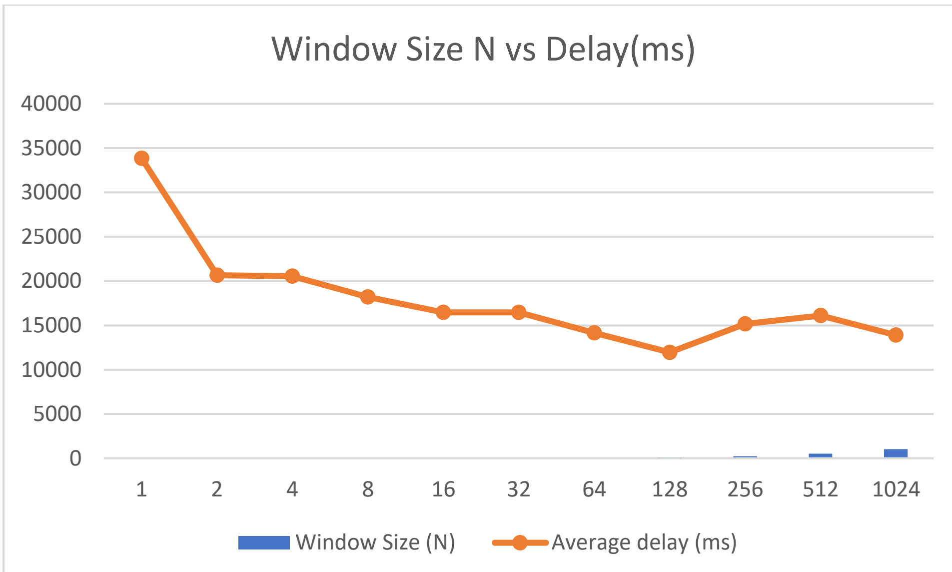
Task 1: Effect of Window Size N

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.

- The average times (ms) with 5 transmissions were recorded as below with changing N value.

Window Size (N)	Average delay (ms)
1	33854
2	20657
4	20563

8	18216
16	16455
32	16462
64	14154
128	11962
256	15161
512	16092
1024	13899



We see the average delay gradually decreasing when we increase the window size from 1 till around 128 or so. From N being 128 till 1024 it fluctuates a little and increases in some scenarios but by a smaller margin.

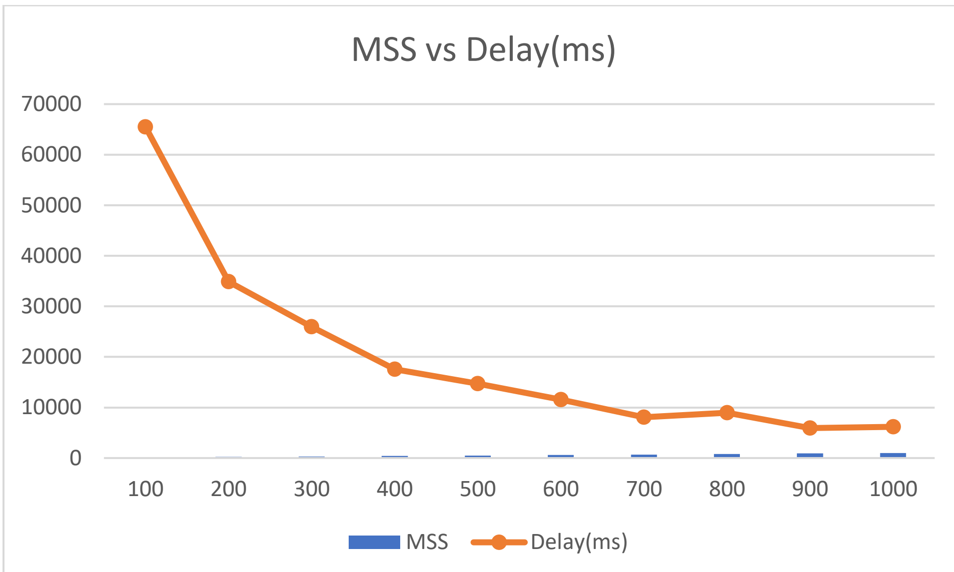
Task 2: Effect of MSS

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?

- The average times (ms) with 5 transmissions were recorded as below with changing MSS value.

MSS	Delay(ms)
100	65512
200	34865
300	25937

400	17562
500	14718
600	11571
700	8052
800	8946
900	5928
1000	6201



With average delay falls sharply initially when we increase MSS from 100 bytes with increments of 100 as well. We slowly reach a point where the decrease is very less and it almost becomes similar towards higher MSS values. This is due to the face that high MSS leads implies more data being transferred and reduces the overall delay.

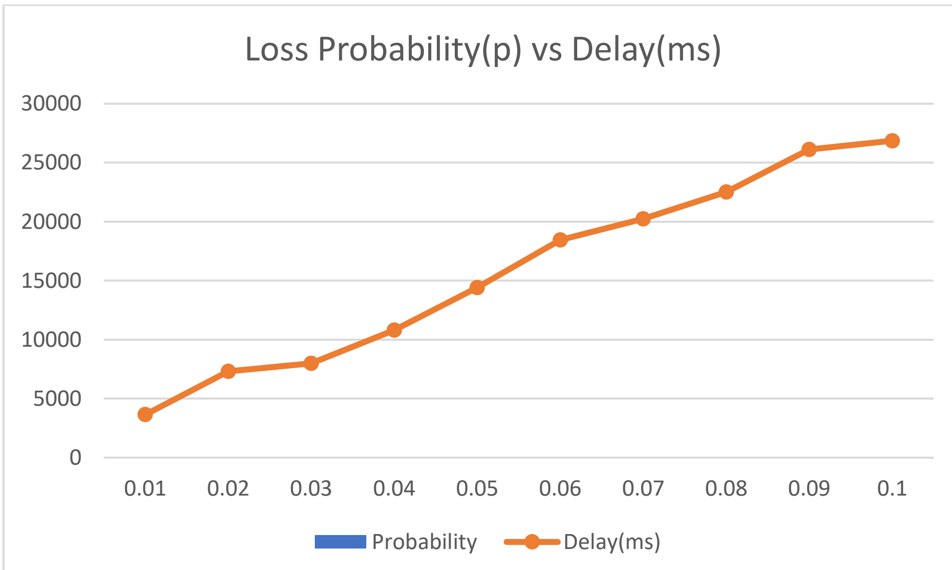
Task 3: Effect of Loss Probability p

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.

- The average times (ms) with 5 transmissions were recorded as below with changing loss probability value.

Loss Probability	Delay(ms)
0.01	3645
0.02	7312

0.03	8000
0.04	10824
0.05	14406
0.06	18453
0.07	20255
0.08	22519
0.09	26120
0.1	26862



The average delay keeps increasing as we increase the probability values starting from 0.01 to 0.10. It is close enough to appear like a straight line but fluctuates a little towards higher values. More loss probabilities implies higher number of packets could be dropped, and hence the overall average delay would increase due to retransmission.