

**CS 39006: Networks Lab**

**Assignment 3: Basic Socket Programing (Working with  
A Single Threaded File Transfer Application)**

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**Lab Report by:**

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## Observation for UDP server:

Q1. Total number of segments received for UDP and the segment size distribution.

Ans.

(i) For file1 (IGD.pdf):

Segments received by the server - 4318

Segments received by the client - 4318

Segment size distribution for Server side (all in bytes): 691,1074

Wireshark · Packet Lengths · wireshark_enp7s0_20180208114230_awexvo									
Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start	
▼ Packet Lengths	4318	1073.91	691	1074	2.1037	100%	2.8600	0.855	
0-19	0	-	-	-	0.0000	0.00%	-	-	
20-39	0	-	-	-	0.0000	0.00%	-	-	
40-79	0	-	-	-	0.0000	0.00%	-	-	
80-159	0	-	-	-	0.0000	0.00%	-	-	
160-319	0	-	-	-	0.0000	0.00%	-	-	
320-639	0	-	-	-	0.0000	0.00%	-	-	
640-1279	4318	1073.91	691	1074	2.1037	100.00%	2.8600	0.855	
1280-2559	0	-	-	-	0.0000	0.00%	-	-	
2560-5119	0	-	-	-	0.0000	0.00%	-	-	
5120 and greater	0	-	-	-	0.0000	0.00%	-	-	

Segment size distribution for Client side (all in bytes): 60,75

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start	
▼ Packet Lengths	4318	1073.91	691	1074	2.1036	100%	2.8600	0.855	
0-19	0	-	-	-	0.0000	0.00%	-	-	
20-39	0	-	-	-	0.0000	0.00%	-	-	
40-79	0	-	-	-	0.0000	0.00%	-	-	
80-159	0	-	-	-	0.0000	0.00%	-	-	
160-319	0	-	-	-	0.0000	0.00%	-	-	
320-639	0	-	-	-	0.0000	0.00%	-	-	
640-1279	4318	1073.91	691	1074	2.1036	100.00%	2.8600	0.855	
1280-2559	0	-	-	-	0.0000	0.00%	-	-	
2560-5119	0	-	-	-	0.0000	0.00%	-	-	
5120 and greater	0	-	-	-	0.0000	0.00%	-	-	

Display filter:

(ii) For file2 (sample.png):

Segments received by the server - 3926

Segments received by the client - 3926

Segment size distribution for Server side (all in bytes): 711,1074

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start
▼ Packet Lengths	3926	1073.91	711	1074	2.2441	100%	2.8700	1.000
0-19	0	-	-	-	0.0000	0.00%	-	-
20-39	0	-	-	-	0.0000	0.00%	-	-
40-79	0	-	-	-	0.0000	0.00%	-	-
80-159	0	-	-	-	0.0000	0.00%	-	-
160-319	0	-	-	-	0.0000	0.00%	-	-
320-639	0	-	-	-	0.0000	0.00%	-	-
640-1279	3926	1073.91	711	1074	2.2441	100.00%	2.8700	1.000
1280-2559	0	-	-	-	0.0000	0.00%	-	-
2560-5119	0	-	-	-	0.0000	0.00%	-	-
5120 and greater	0	-	-	-	0.0000	0.00%	-	-

Segment size distribution for Client side (all in bytes): 60,75

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start
▼ Packet Lengths	3926	60.00	60	75	2.6426	100%	2.8600	0.995
0-19	0	-	-	-	0.0000	0.00%	-	-
20-39	0	-	-	-	0.0000	0.00%	-	-
40-79	3926	60.00	60	75	2.6426	100.00%	2.8600	0.995
80-159	0	-	-	-	0.0000	0.00%	-	-
160-319	0	-	-	-	0.0000	0.00%	-	-
320-639	0	-	-	-	0.0000	0.00%	-	-
640-1279	0	-	-	-	0.0000	0.00%	-	-
1280-2559	0	-	-	-	0.0000	0.00%	-	-
2560-5119	0	-	-	-	0.0000	0.00%	-	-
5120 and greater	0	-	-	-	0.0000	0.00%	-	-

Display filter:

(iii) For file3 (sampletext.txt):

Segments received by the server - 1002

Segments received by the client - 1002

Segment size distribution for Server side (all in bytes): 459,1074

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start
▼ Packet Lengths	1002	1073.39	459	1074	1.1840	100%	2.4900	0.460
0-19	0	-	-	-	0.0000	0.00%	-	-
20-39	0	-	-	-	0.0000	0.00%	-	-
40-79	0	-	-	-	0.0000	0.00%	-	-
80-159	0	-	-	-	0.0000	0.00%	-	-
160-319	0	-	-	-	0.0000	0.00%	-	-
320-639	1	459.00	459	459	0.0012	0.10%	0.0100	0.841
640-1279	1001	1074.00	1074	1074	1.1828	99.90%	2.4900	0.460
1280-2559	0	-	-	-	0.0000	0.00%	-	-
2560-5119	0	-	-	-	0.0000	0.00%	-	-
5120 and greater	0	-	-	-	0.0000	0.00%	-	-

Segment size distribution for Client side (all in bytes): 60,75

Topic / Item	Count	Average	Min val	Max val	Rate (ms)	Percent	Burst rate	Burst start
▼ Packet Lengths	1002	60.01	60	75	2.3458	100%	2.4900	0.460
0-19	0	-	-	-	0.0000	0.00%	-	-
20-39	0	-	-	-	0.0000	0.00%	-	-
40-79	1002	60.01	60	75	2.3458	100.00%	2.4900	0.460
80-159	0	-	-	-	0.0000	0.00%	-	-
160-319	0	-	-	-	0.0000	0.00%	-	-
320-639	0	-	-	-	0.0000	0.00%	-	-
640-1279	0	-	-	-	0.0000	0.00%	-	-
1280-2559	0	-	-	-	0.0000	0.00%	-	-
2560-5119	0	-	-	-	0.0000	0.00%	-	-
5120 and greater	0	-	-	-	0.0000	0.00%	-	-

Display filter:

**Q2) Total number of retransmitted segments for UDP**

**Ans.**

- i) For file1 (IGD.pdf): 0 packets retransmitted
- ii) For file2 (sample.jpg): 0 packets retransmitted
- iii) For file3 (sampletext.txt) : 0 packet retransmitted

**Q3) Total time to receive the file for UDP and TCP (from previous report)**

**Ans.**

- i) For file1 (IGD.pdf):
  - UDP - 5.482s
  - TCP - 16.187s
- ii) For file2 (sample.png):he
  - UDP - 5.191s
  - TCP - 5.948s
- iii) For file3 (sampletext.txt):
  - UDP - 5.065s
  - TCP - 12.918s

**Justification for the time difference** - We would naturally expect the UDP(reliable) time to be higher than TCP time because stop and wait protocol that we have implemented is slower than the variant of sliding window protocol in TCP. But because these results have been taken at different times and due to fluctuations in the network, experimentally the UDP time is coming to be less than the TCP time. We can also see that there are no re-transmissions in the UDP case which means that at that time, there is very less congestion in the network and so the packets are simply getting transferred by a lighter weight UDP protocol thus reducing the time taken.