

CS39006: Computer Networks Lab

Assignment 3 Report

Basic Socket Programming

Report by:

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Objective:

The objective of this assignment is to understand the basic functionalities of POSIX socket programming through a single threaded file transfer application.

PART I: Documentation

Compilation :

Step 1: Extract the zip folder

Step 2: Open the folder containing folders Server and Client in a terminal

Step 3: run “make” in terminal

```
mayank@devil13:~/Documents/networks_lab/Assignment3/Socket/TCP$ make
(cd Server; make all)
make[1]: Entering directory '/home/mayank/Documents/networks_lab/Assignment3/Socket/TCP/Server'
g++ tcpserver.cpp -Wno-write-strings -o server
make[1]: Leaving directory '/home/mayank/Documents/networks_lab/Assignment3/Socket/TCP/Server'
(cd Client; make all)
make[1]: Entering directory '/home/mayank/Documents/networks_lab/Assignment3/Socket/TCP/Client'
g++ tcpclient.cpp -std=c++11 -Wno-write-strings -o client
make[1]: Leaving directory '/home/mayank/Documents/networks_lab/Assignment3/Socket/TCP/Client'
```

Running :

Step 1: Open the folder Server in a terminal

Step 2: run “./server PORTNO” in terminal

```
mayank@devil13:~/Documents/networks_lab/Assignment3/Socket/TCP/Server$ ./server 8080
Server Running ....
```

Step 3: Open the folder Client in another terminal

Step 4: run “./client localhost PORTNO FILENAME” in terminal

```

mayank@devil13:~/Documents/networks_lab/Assignment3/Socket/TCP/Client$ ./client localhost 8080 export.pdf
File Name : export.pdf
-----Client Running-----

```

Step 3: Open the folder Client in another terminal

Sample I/O

Server :

```

mayank@devil13:~/Documents/networks_lab/Assignment3/Socket/TCP/Server$ ./server 8080
Server Running ....
server received 22 bytes: Hello export.pdf 54431
FileSize : 54431
Here
096372938a2981bf1809ccd56e3255df export.pdf
MD5 Sent : 096372938a2981bf1809ccd56e3255df

```

Client :

```

mayank@devil13:~/Documents/networks_lab/Assignment3/Socket/TCP/Client$ ./client localhost 8080 export.pdf
File Name : export.pdf
-----Client Running-----
Client Hello message sent.
Message contents : Hello export.pdf 54431
Echo from server: Hello Acknowledged
Transferring FILE : export.pdf
1024 bytes sent, Total bytes by now : 1024
1024 bytes sent, Total bytes by now : 2048
1024 bytes sent, Total bytes by now : 3072
1024 bytes sent, Total bytes by now : 4096
1024 bytes sent, Total bytes by now : 5120
1024 bytes sent, Total bytes by now : 6144
1024 bytes sent, Total bytes by now : 7168
1024 bytes sent, Total bytes by now : 8192
1024 bytes sent, Total bytes by now : 9216
1024 bytes sent, Total bytes by now : 10240
1024 bytes sent, Total bytes by now : 11264
1024 bytes sent, Total bytes by now : 12288
1024 bytes sent, Total bytes by now : 13312
1024 bytes sent, Total bytes by now : 14336
1024 bytes sent, Total bytes by now : 15360
1024 bytes sent, Total bytes by now : 16384
1024 bytes sent, Total bytes by now : 17408
1024 bytes sent, Total bytes by now : 18432
1024 bytes sent, Total bytes by now : 19456
1024 bytes sent, Total bytes by now : 20480
1024 bytes sent, Total bytes by now : 21504
1024 bytes sent, Total bytes by now : 22528
1024 bytes sent, Total bytes by now : 23552
1024 bytes sent, Total bytes by now : 24576
1024 bytes sent, Total bytes by now : 25600
1024 bytes sent, Total bytes by now : 26624
1024 bytes sent, Total bytes by now : 27648
1024 bytes sent, Total bytes by now : 28672
1024 bytes sent, Total bytes by now : 29696
1024 bytes sent, Total bytes by now : 30720
1024 bytes sent, Total bytes by now : 31744
1024 bytes sent, Total bytes by now : 32768

```

PART I: Documentation

Sample I/O

PART II: Observations

("IMG_20180113_134648.jpg", size: 2.1MB) was transferred using protocol and the following was observed:

tcpserver.cpp

27368618_16...jpg

```
1024 bytes sent, Total bytes by now : 33792
1024 bytes sent, Total bytes by now : 34816
1024 bytes sent, Total bytes by now : 35840
1024 bytes sent, Total bytes by now : 36864
1024 bytes sent, Total bytes by now : 37888
1024 bytes sent, Total bytes by now : 38912
1024 bytes sent, Total bytes by now : 39936
1024 bytes sent, Total bytes by now : 40960
1024 bytes sent, Total bytes by now : 41984
1024 bytes sent, Total bytes by now : 43008
1024 bytes sent, Total bytes by now : 44032
1024 bytes sent, Total bytes by now : 45056
1024 bytes sent, Total bytes by now : 46080
1024 bytes sent, Total bytes by now : 47104
1024 bytes sent, Total bytes by now : 48128
1024 bytes sent, Total bytes by now : 49152
1024 bytes sent, Total bytes by now : 50176
1024 bytes sent, Total bytes by now : 51200
1024 bytes sent, Total bytes by now : 52224
1024 bytes sent, Total bytes by now : 53248
1024 bytes sent, Total bytes by now : 54272
159 bytes sent, Total bytes by now : 54431
MD5 Received
MD5 Matched : 096372938a2981bf1809ccd56e3255df
```

PART II: Observations

(IMG_20180113_134648.jpg', size: 2.1MB) was transferred using

PART II: Observations

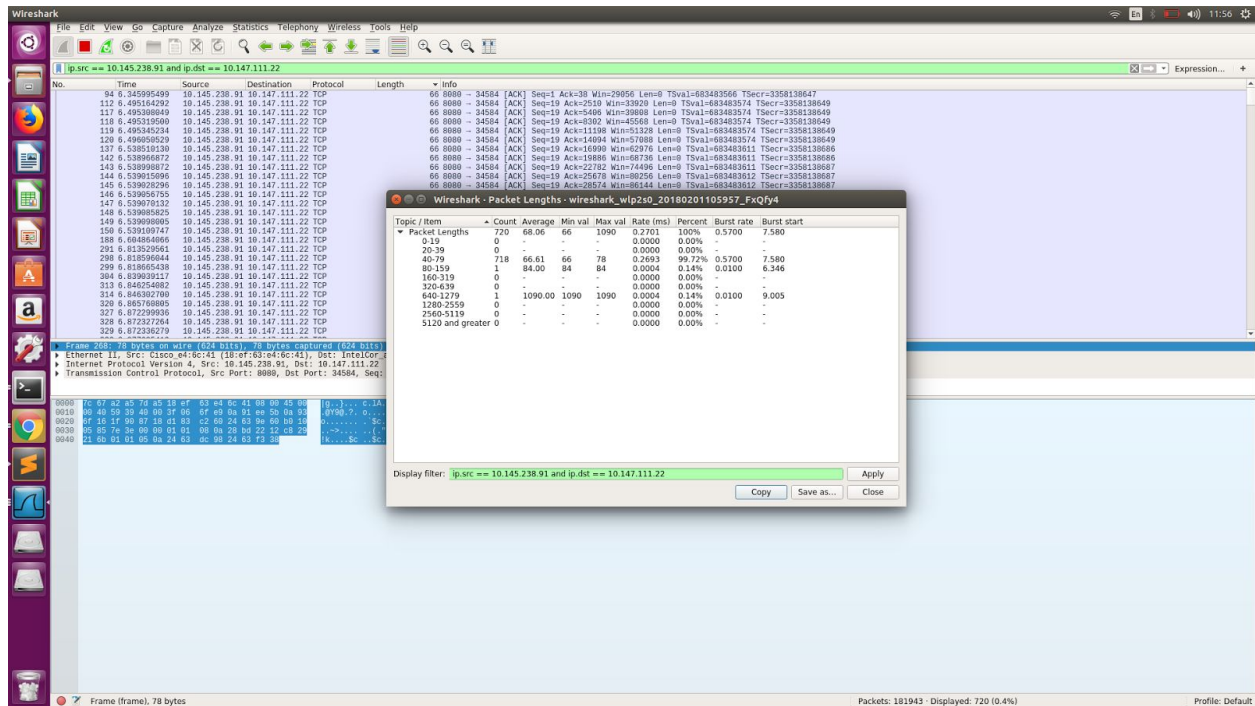
A jpg file ('IMG_20180113_134648.jpg', size: 2.1MB) was transferred using the given protocol and the following was observed:

1. Total number of segments received for TCP and the segment size distribution.

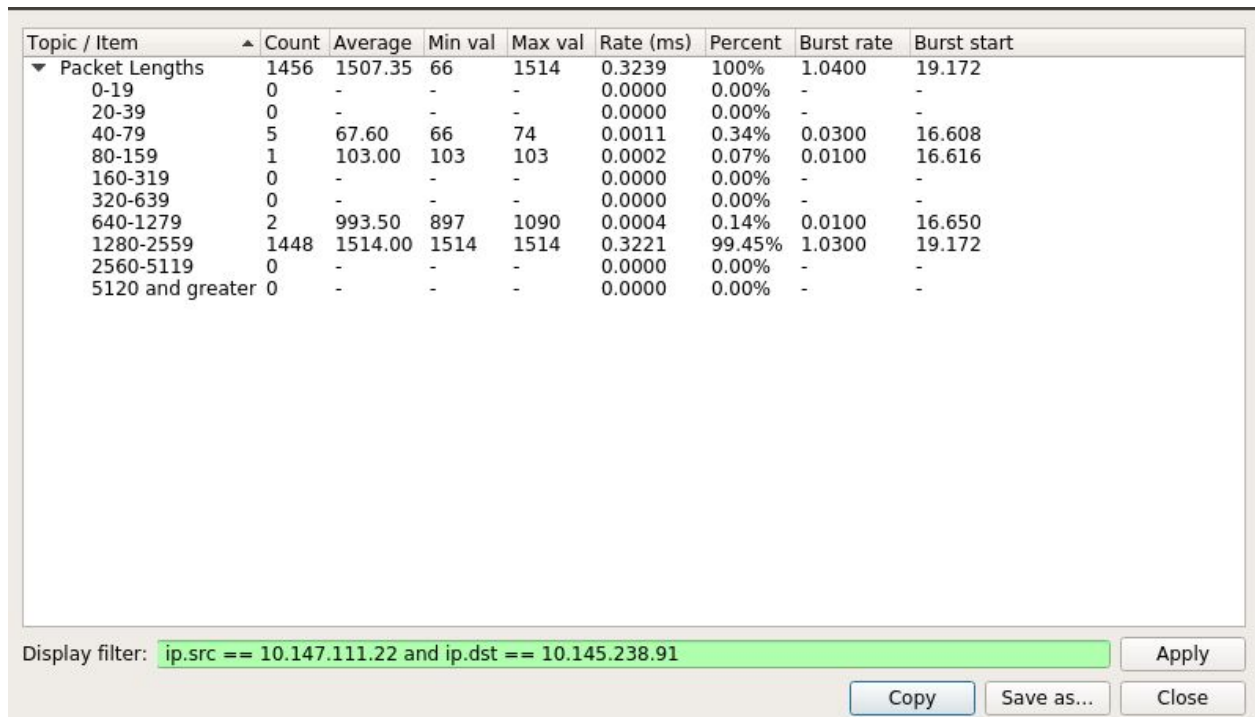
Segments received by the server: 1456

Segments received by the client: 720

Segment size distribution for the client: 66, 74, 78, 84, 1090



Segment size distribution for the server: 1514,1090,897,103,74,66



2. Total number of retransmitted segments for TCP.

For server: 32

For client: 9

3. Total time to receive the file for TCP

Client: 4.581 s

Server: 4.495 s