**Talking about the “Project1.tar” File**

* 2 Folders

1. server

2. client

* 7 PROGRAM files
  1. server\_part1.cpp (Implementing SERVER for Web Browser Request)
  2. server\_part2.cpp (Implementing SERVER for persistent/non-persistent TCP Request)
  3. client\_part2.cpp (Implementing CLIENT for persistent/non-persistent TCP Request)
  4. server\_part3.cpp (Implementing SERVER for non-persistent UDP Request)
  5. client\_part3.cpp (Implementing CLIENT for non-persistent UDP Request)
  6. server\_part4.cpp (Implementing MULTITHREADED SERVER for persistent/non-persistent TCP Request)
  7. client\_part4.cpp (Implementing CLIENT for persistent/non-persistent TCP Request)
* Separate “makefile” for both the FOLDERS
* 7 EXECUTABLE files

1. spart1

2. spart2

3. spart3

4. spart4

5. cpart2

6. cpart3

7. cpart4

* Sample test files (in “server” folder)
  1. Contents.txt
  2. Alaska.txt
  3. Northern Lights.txt
  4. HelloWorld.html
  5. main.cpp
  6. Alaska1.txt
  7. HD\_log.txt
* Readme File (The file you are reading)

**Talking about code execution**

* Always execute the server before the client for proper file transfer
* General Syntax:

**PART 1**

SERVER: ./spart1 \*port\_number\*

**PART 2 (FOR BOTH PERSISTENT/NON-PERSISTENT COMMUNICATION)**

SERVER: ./spart2 \*port\_number\*

CLIENT:./cpart2 \*server\_IP\_address\* \*port\_number\* \*connection\_type\* \*file\_name\*

(Use “Contents.txt” file for PERSISTENT COMMUNICATION)

**PART 3**

SERVER: ./spart3 \*port\_number\*

CLIENT:./cpart3 \*server\_IP\_address\* \*port\_number\* \*file\_name\*

**PART 4**

SERVER: ./spart4 \*port\_number\*

CLIENT:./cpart4 \*server\_IP\_address\* \*port\_number\* \*connection\_type\* \*file\_name\*

**——————————————————————————————————————————————**

1.png - WIRESHARK SCREENSHOT

**Time taken for a sample PERSISTENT Connection (10 FILES)**

Time taken: 0.000370979

Time taken: 0.00102091

Time taken: 0.00017786

Time taken: 0.001333

Time taken: 0.000843048

Time taken: 0.002285

Time taken: 0.000714064

Time taken: 0.00229001

Time taken: 2.31266e-05

Time taken: 4.05312e-06

The time taken did not grow or vary because of the number of files. It was completely dependent on the size of the file (more precisely, bigger the file, more number of packets transmitted, more time taken).

**Time taken for a sample NON-PERSISTENT Connection (10 FILES)**

Time taken: 0.00259209

I did not experience any packet loss during UDP data transfer, but that is due to the fact of the small file size I used in my test cases. For big files and long distance communication over the Internet, UDP data transfer can experience packet losses.