CSS 432 Networking

Final Project (FTP Client)

Winter Quarter 2017

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**Documentation:**

FTP (File Transfer Protocol) is a way to send files from one computer to another using a TCP/IP connection. In this project I created a FTP client that is designed to mimic some of the functionality of the linux ftp client. It works by establishing a TCP connection between the client and the server over port 21 (standard port for FTP). This connection handles sending of control information (commands) from the client to the server and acknowledgments from the server to the client.

For commands such as ls, get, and put, a second connection needs to be established to the server with passive mode. First, the client requests a passive connection to the server. Then, the server responds with another hostname and port number for the client to connect to. When the data transfer is complete over this channel, the connection is terminated. This ftp client only supports passive mode connection in which the client has to establish this data channel instead of the server (active mode).

**Usage:**

Usage instructions are found in the corresponding README file in this project.

**Commands Supported:**

cd, ls, get, put, close, quit, open

**Execution Output**

raghut2@uw1-320-03:~/Documents/CSS432/Program5$ ./ftp ftp.tripod.com

ftp> open

220 Welcome to Tripod us FTP.

Name(ftp.tripod.com:raghut2): css432w17

331 Username set to css432w17. Now enter your password.

Password: UWB0th3ll

230- ==============================================================

230- IMPORTANT NOTICE

230- ==============================================================

230-

230- Powerful building tools. Traffic-generating, money-making

230- programs. It's all waiting for you at Tripod.

230-

230- http://www.tripod.lycos.com/

230-

230- ==============================================================

230-

230- Got a great idea for a website? Then don't

230- wait, get your own web address today!

230-

230- http://www.tripod.lycos.com/domains/

230-

230- ==============================================================

230-

230- We heard you loud and clear! You love your site, but

230- you don't like the ads. Remove those pesky popups

230- forever!

230-

230- http://www.tripod.lycos.com/web-hosting/compare\_plans.pl

230-

230- ==============================================================

230 User 'css432w17' logged on.

ftp> close

221 Goodbye...

ftp> open

220 Welcome to Tripod us FTP.

Name(ftp.tripod.com:raghut2): css432w17

331 Username set to css432w17. Now enter your password.

Password: UWB0th3ll

230- ==============================================================

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230- forever!

230-

230- http://www.tripod.lycos.com/web-hosting/compare\_plans.pl

230-

230- ==============================================================

230 User 'css432w17' logged on.

ftp> ls

227 Entering Passive Mode (209,202,252,54,235,171)

150 Opening ASCII mode data connection for LIST.

226 Transfer complete.

-rw-r--r-- 1 css432w17 Tripod 52 Mar 12 20:47 README.md

drwxr-xr-x 1 css432w17 Tripod 0 Feb 10 17:38 cgi-bin

drwxr-xr-x 1 css432w17 Tripod 0 Mar 13 22:22 project

-rw-r--r-- 1 css432w17 Tripod 6 Mar 12 20:50 Testing.txt

-rw-r--r-- 1 css432w17 Tripod 11960 Mar 13 01:52 testfile.txt

-rw-r--r-- 1 css432w17 Tripod 1457 Mar 13 15:26 SampleFile.txt

-rw-r--r-- 1 css432w17 Tripod 15 Mar 13 15:30 Hello.txt

-rw-r--r-- 1 css432w17 Tripod 83 Mar 13 19:27 PleaseWork.txt

-rw-r--r-- 1 css432w17 Tripod 4 Mar 13 19:48 oldold.txt

ftp> cd project

250 Directory set to '/project'.

ftp> ls

227 Entering Passive Mode (209,202,252,54,235,176)

150 Opening ASCII mode data connection for LIST.

226 Transfer complete.

-rw-r--r-- 1 css432w17 Tripod 306 Mar 13 05:37 stopdeletingmyvirus.bat

drwxr-xr-x 1 css432w17 Tripod 0 Mar 13 16:24 Real\_directory

-rw-r--r-- 1 css432w17 Tripod 34 Mar 12 13:23 rfc0959.txt

-rw-r--r-- 1 css432w17 Tripod 58 Mar 12 06:29 unique1.txt

-rw-r--r-- 1 css432w17 Tripod 0 Mar 13 02:33 ls

-rw-r--r-- 1 css432w17 Tripod 34 Mar 13 02:37 File001.txt

-rw-r--r-- 1 css432w17 Tripod 5414 Mar 12 22:01 ttcp.cpp

-rw-r--r-- 1 css432w17 Tripod 5414 Mar 11 22:33 ttcp732.cpp

-rw-r--r-- 1 css432w17 Tripod 0 Mar 11 22:36 barftext

-rw-r--r-- 1 css432w17 Tripod 5414 Mar 11 22:41 ttcp741.cpp

-rw-r--r-- 1 css432w17 Tripod 0 Mar 11 22:54 rpb\_test5.txt

-rw-r--r-- 1 css432w17 Tripod 34 Mar 12 13:21 rfc959.txt

-rw-r--r-- 1 css432w17 Tripod 151 Mar 11 23:43 MyNameisMuchogusto.cpp

-rw-r--r-- 1 css432w17 Tripod 151 Mar 11 23:48 symphony.php

-rw-r--r-- 1 css432w17 Tripod 729 Mar 12 16:34 command.php

-rw-r--r-- 1 css432w17 Tripod 16 Mar 12 22:16 dudeTest.txt

-rw-r--r-- 1 css432w17 Tripod 7 Mar 12 10:15 peanuts2.txt

-rw-r--r-- 1 css432w17 Tripod 1386 Mar 12 07:38 CSS432\_final\_answers\_w17.txt

-rw-r--r-- 1 css432w17 Tripod 5 Mar 13 02:34 kkkkkk

-rw-r--r-- 1 css432w17 Tripod 0 Mar 12 21:18 asd.txt

-rw-r--r-- 1 css432w17 Tripod 5 Mar 13 02:39 kk

-rw-r--r-- 1 css432w17 Tripod 11960 Mar 13 21:58 testfile.txt

-rw-r--r-- 1 css432w17 Tripod 764 Mar 13 03:47 z

-rw-r--r-- 1 css432w17 Tripod 46 Mar 13 03:10 myText3.txt

-rw-r--r-- 1 css432w17 Tripod 151 Mar 12 16:32 somePhpFile.php

-rw-r--r-- 1 css432w17 Tripod 729 Mar 13 05:11 AnotherTestFile.h

-rw-r--r-- 1 css432w17 Tripod 46 Mar 13 05:39 simpleText.txt

-rw-r--r-- 1 css432w17 Tripod 151 Mar 12 17:51 testingNewMod.mov

-rw-r--r-- 1 css432w17 Tripod 151 Mar 13 05:13 testtest123.txt

-rw-r--r-- 1 css432w17 Tripod 147316 Mar 13 05:44 rfc.txt

-rw-r--r-- 1 css432w17 Tripod 5414 Mar 12 19:28 test-file-4567.cpp

-rw-r--r-- 1 css432w17 Tripod 5 Mar 12 22:20 Myfrient.txt

-rw-r--r-- 1 css432w17 Tripod 3927 Mar 13 18:53 writetestfile.txt

-rw-r--r-- 1 css432w17 Tripod 0 Mar 13 07:46 writefiletest.txt

-rw-r--r-- 1 css432w17 Tripod 5414 Mar 12 20:52 cool-file-42.cpp

-rw-r--r-- 1 css432w17 Tripod 3927 Mar 13 08:04 writetestfile2.txt

-rw-r--r-- 1 css432w17 Tripod 2 Mar 13 22:06 raymondzhanglikescats.txt

-rw-r--r-- 1 css432w17 Tripod 3927 Mar 13 09:45 writetestfile3.txt

-rw-r--r-- 1 css432w17 Tripod 3927 Mar 13 09:50 writetestfile4.txt

-rw-r--r-- 1 css432w17 Tripod 5621 Mar 13 17:48 ttcprj.cpp

-rw-r--r-- 1 css432w17 Tripod 0 Mar 13 14:03 test

-rw-r--r-- 1 css432w17 Tripod 0 Mar 13 13:13 test2

-rw-r--r-- 1 css432w17 Tripod 0 Mar 13 13:20 test3

-rw-r--r-- 1 css432w17 Tripod 9 Mar 13 14:15 8.txt

drwxr-xr-x 1 css432w17 Tripod 0 Mar 13 17:15 testdir

-rw-r--r-- 1 css432w17 Tripod 11920 Mar 12 22:30 aaaaaaaaa

-rw-r--r-- 1 css432w17 Tripod 0 Mar 12 22:34 no-a-file.cpp

-rw-r--r-- 1 css432w17 Tripod 147316 Mar 13 15:44 4th\_rfc.txt

-rw-r--r-- 1 css432w17 Tripod 7 Mar 13 16:40 peanuts3\_thecopy.txt

-rw-r--r-- 1 css432w17 Tripod 7 Mar 13 17:34 local\_nuts.txt

-rw-r--r-- 1 css432w17 Tripod 45 Mar 12 23:30 jjjjjjjjj

-rw-r--r-- 1 css432w17 Tripod 12 Mar 12 23:51 Testing2.txt

-rw-r--r-- 1 css432w17 Tripod 12026 Mar 12 23:51 testfile3.txt

-rw-r--r-- 1 css432w17 Tripod 46 Mar 13 03:45 myText.txt

-rw-r--r-- 1 css432w17 Tripod 831 Mar 13 16:48 Socket.h

-rw-r--r-- 1 css432w17 Tripod 147316 Mar 13 17:58 copy3.txt

-rw-r--r-- 1 css432w17 Tripod 7 Mar 13 17:18 ayylmao.txt

-rw-r--r-- 1 css432w17 Tripod 5621 Mar 13 17:24 llllll

-rw-r--r-- 1 css432w17 Tripod 151249 Mar 13 17:26 rfc-again.txt

-rw-r--r-- 1 css432w17 Tripod 831 Mar 13 17:29 ssssss

-rw-r--r-- 1 css432w17 Tripod 0 Mar 13 17:31 tesssst.txt

-rw-r--r-- 1 css432w17 Tripod 5621 Mar 13 17:39 fdasjfkdls

-rw-r--r-- 1 css432w17 Tripod 11960 Mar 13 01:11 ahjgsajkasjk.txt

-rw-r--r-- 1 css432w17 Tripod 147316 Mar 13 01:41 2nd\_rfc0959.txt

-rw-r--r-- 1 css432w17 Tripod 147316 Mar 13 01:43 3rd\_rfc.txt

-rw-r--r-- 1 css432w17 Tripod 5 Mar 13 01:50 lllllllllllllllll

-rw-r--r-- 1 css432w17 Tripod 5621 Mar 13 17:41 jkdfjkfdkjfdkjfd

-rw-r--r-- 1 css432w17 Tripod 0 Mar 13 17:44 lastminutetestingLOL.txt

-rw-r--r-- 1 css432w17 Tripod 101728 Mar 13 17:53 bin

-rw-r--r-- 1 css432w17 Tripod 0 Mar 13 17:58 s

drwxr-xr-x 1 css432w17 Tripod 0 Mar 13 20:26 myDir

-rw-r--r-- 1 css432w17 Tripod 101728 Mar 13 18:09 binnnnnnnn

-rw-r--r-- 1 css432w17 Tripod 41 Mar 13 18:04 qt.txt

-rw-r--r-- 1 css432w17 Tripod 41 Mar 13 18:06 qt1.txt

-rw-r--r-- 1 css432w17 Tripod 41 Mar 13 18:06 qt2.txt

-rw-r--r-- 1 css432w17 Tripod 11960 Mar 13 18:14 newjkfnskj.txt

-rw-r--r-- 1 css432w17 Tripod 23920 Mar 13 18:24 sdjnsf.txt

-rw-r--r-- 1 css432w17 Tripod 365 Mar 13 19:49 MyTest.txt

-rw-r--r-- 1 css432w17 Tripod 4 Mar 13 19:50 oldold.txt

drwxr-xr-x 1 css432w17 Tripod 0 Mar 13 20:49 ruby

-rw-r--r-- 1 css432w17 Tripod 1386 Mar 13 22:12 c.txt

-rw-r--r-- 1 css432w17 Tripod 1386 Mar 13 22:15 newData.txt

-rw-r--r-- 1 css432w17 Tripod 147316 Mar 13 22:15 rfc2.txt

-rw-r--r-- 1 css432w17 Tripod 1386 Mar 13 22:18 blah.txt

-rw-r--r-- 1 css432w17 Tripod 41 Mar 13 22:22 qt5.txt

ftp> get blah.txt

200 Type set to 'I' (IMAGE aka BINARY).

227 Entering Passive Mode (209,202,252,54,235,180)

150 Opening BINARY mode data connection for 'blah.txt'.

226 Transfer complete. (1386 bytes sent.)

ftp> put

(local file) data.txt

(remote file) data3.txt

200 Type set to 'I' (IMAGE aka BINARY).

227 Entering Passive Mode (209,202,252,54,235,201)

150 Opening BINARY mode data connection for 'data3.txt'.

226 Transfer complete. (1386 bytes sent.)

**Performance Evaluation**

When executing the get command the performance between the linux ftp client and this program was very similar, same amounts of bytes sent, and similar amount of time for the command to run.

**Discussions**

Since the entire ftp client functionality is written into one program, this program is not very extensible. It would be fairly simple to add additional commands and functionality but that would make this program (with the current design) very big and unwieldy. Overall the performance of this program and unix ftp is very similar for the functionality both clients implement.