

Assignment part C

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System: Ubuntu-based bash on Windows 10

How to compile

```
gcc -Wall -lm miniftp.c -o miniftp.out
```

FTP servers tested

1. ftp.ietf.org

Features tested

- Connect
- Print working directory
- Change working directory
- List all files in directory
- Download text file from particular directory

2. FileZilla Server (Own computer)

Features tested

- Connect
- Print working directory
- Change working directory
- List all files in directory
- Download text file from particular directory
- Upload text file to particular directory

Program prerequisites

- The FTP server needs a username and password for a successful connection.
- All hostnames cannot be entered in numerical form.

Connect

```
*****
*****Mini-FTP client*****
*****
1. Connect to FTP server
2. Print working directory
3. Change working directory
4. List all files
5. Upload file
6. Download file
7. Quit
Enter option (1-7): 1
Specify hostname: ftp.ietf.org
Enter port: 21
Connection success
220 FTP server ready

USER: anonymous

331 Anonymous login ok, send your complete email address as your password

PASS: anonymous

230 Anonymous access granted, restrictions apply
```

- 1) Specify ftp server's hostname (numerical ip address is not accepted).
- 2) Specify server's port (21 for ftp).
- 3) If valid, program prints out "Connection success" followed by "220 FTP server ready".
- 4) Program prompts user for username.
- 5) Program prints out "331 Anonymous login ok, send your complete email address as your password".
- 6) Program prompts for password.
- 7) Program prints out "230 Anonymous access granted, restrictions apply".
- 8) Connection to server has been successfully established.

Print working directory

```
*****
*****Mini-FTP client*****
*****
1. Connect to FTP server
2. Print working directory
3. Change working directory
4. List all files
5. Upload file
6. Download file
7. Quit
Enter option (1-7): 2
257 "/" is the current directory
```

- 1) Connection to the ftp server has to be established first.
- 2) Enter option 2 when prompted by the program.
- 3) Program prints out the current working directory.

Change working directory

```
*****
*****Mini-FTP client*****
*****
1. Connect to FTP server
2. Print working directory
3. Change working directory
4. List all files
5. Upload file
6. Download file
7. Quit
Enter option (1-7): 3

Which directory? charter
250 CWD command successful
```

- 1) Connection to the ftp server has to be established first.
- 2) Enter option 3 when prompted by the program.
- 3) Program prompts for the desired directory, enter the desired folder name without '/'.
4) If successful, program prints out the message "250 CWD command successful".

List all files

```
*****
*****Mini-FTP client*****
*****
1. Connect to FTP server
2. Print working directory
3. Change working directory
4. List all files
5. Upload file
6. Download file
7. Quit
Enter option (1-7): 4
229 Entering Extended Passive Mode (||63370|)

Enter port given by server: 63370

150 Opening ASCII mode data connection for file list
drwxr-x--  2 ftp      ftp      131072 Sep 29 22:08 charter
drwxr-x-- 265 ftp      ftp      12288 Sep 29 2010 concluded-wg-ietf-mail-archive
drwxr-x--  2 ftp      ftp      20480 Aug 28 18:13 conflict-reviews
drwxr-x-- 583 ftp      ftp      24576 Sep 25 21:50 iana
drwxr-x--  15 ftp      ftp       4096 May  4 00:00 iana-timezone
drwxr-x-- 647 ftp      ftp      20480 Mar 21 2015 ietf
drwxr-x-- 1045 ftp     ftp      32768 Sep 21 15:17 ietf-mail-archive
drwxr-x--  19 ftp      ftp       4096 Oct 29 2005 ietf-online-proceedings
drwxr-x--  2 ftp      ftp      634880 Oct  1 13:36 internet-drafts
drwxr-x--  2 ftp      ftp      684032 Oct  1 02:42 review
drwxr-x--  9 ftp      ftp      700416 Oct  1 09:30 rfc
drwxr-x--  2 ftp      ftp       4096 Sep 25 14:51 slides
drwxr-x--  2 ftp      ftp       4096 May  9 22:20 status-changes
drwxr-x--  6 ftp      ftp       4096 Dec  4 2017 yang
226 Transfer complete
```

- 1) Connection to the ftp server has to be established first.
- 2) Enter option 4 when prompted by the program.
- 3) Program prints out data connection port number with the reply from the server.
- 4) As no parsing of replies have been implemented, the user must manually enter the port number given by the server.
- 5) If successful, program prints out "150 Opening ASCII mode data connection for the file list".
- 6) Folder list gets printed out.

- 7) Program prints out "226 Transfer complete".

Download file

```
*****
*****Mini-FTP client*****
*****
1. Connect to FTP server
2. Print working directory
3. Change working directory
4. List all files
5. Upload file
6. Download file
7. Quit
Enter option (1-7): 6
File to retrieve ? charter-ietf-codec-01.txt
229 Entering Extended Passive Mode (|||62708|)

Enter port given by server: 62708

150 Opening ASCII mode data connection for charter-ietf-codec-01.txt (8964 bytes)

Bytes received: 9138
226 Transfer complete
```

- 1) Connection to the ftp server has to be established first.
- 2) Use option 3 to change to the desired directory.
- 3) Enter option 6.
- 4) Program prompts for desired file to download, enter the complete filename including with '.txt'.
- 5) As per the list command, enter the data port number given by the server.
- 6) If successful program prints out "150 Opening ASCII mode data connection for **FILENAME (FILE SIZE)**".
- 7) After some time, program prints out the number of bytes received. Note that the received file size will always be larger than the file size given by the server in the reply in step 6. I have narrowed it down to formatting issues. In addition, for large files that cannot be completely received in one read of the data socket, multiple "Bytes received" statements might be observed. Each just states the amount of bytes received in one read action of the data socket. This statements will be observed till the file has been completely received.

- 8) If everything is successful, program prints out "226 Transfer complete".

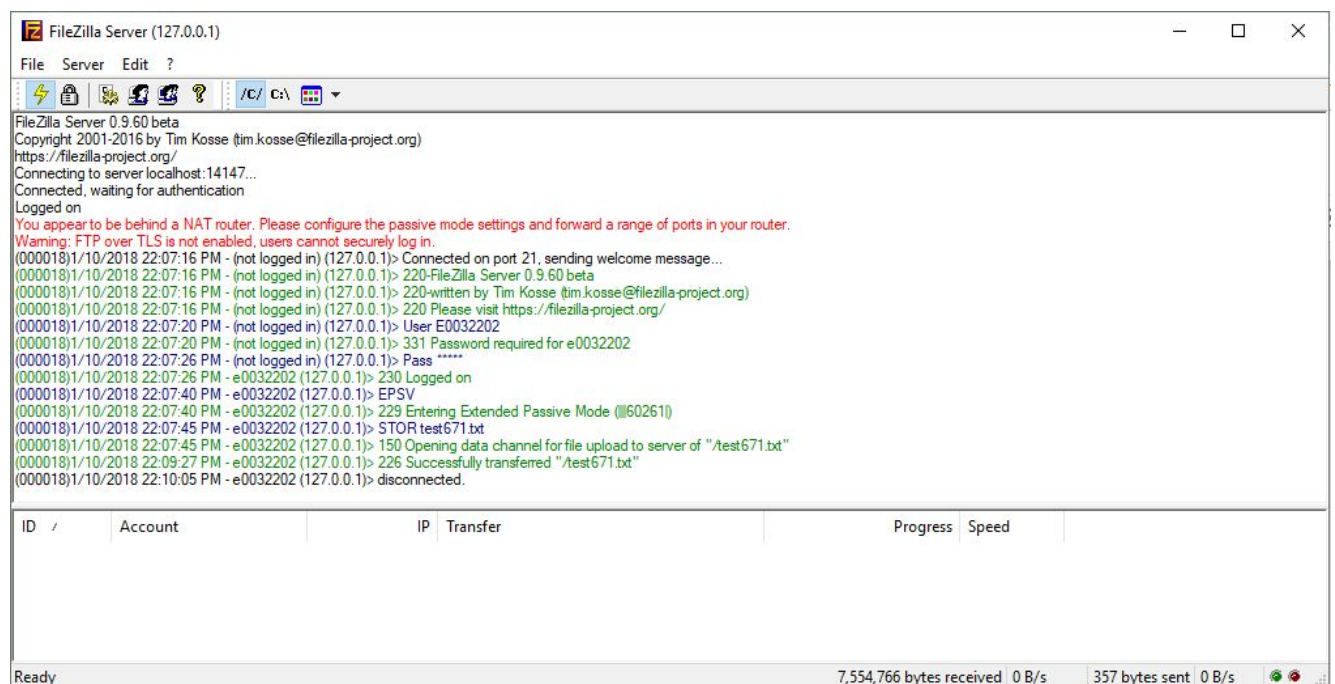
Upload file (FileZilla Server on own computer)

```
*****
*****Mini-FTP client*****
*****
1. Connect to FTP server
2. Print working directory
3. Change working directory
4. List all files
5. Upload file
6. Download file
7. Quit
Enter option (1-7): 5
File to send ? test671.txt
229 Entering Extended Passive Mode (|||60261|)

Enter port given by server: 60261

150 Opening data channel for file upload to server of "/test671.txt"

File has been sent
226 Successfully transferred "/test671.txt"
```



- 1) Connection has to be first established to the ftp server. For FileZilla i used the hostname 'localhost' and port 21.
- 2) Enter option 5.
- 3) File to be uploaded has to be in the same directory as the program.

- 4) Program prompts for the name of file to be transferred.
- 5) As per previous commands, user must enter data port number given by the server.
- 6) Program prints out "150 Opening data channel for file upload to server of **FILENAME**"
- 7) Depending on the file size, the program might appear to hang after step 6, this is expected as the transfer is a blocking process.
- 8) If successful, program prints out "File has been sent" followed by "226 Successfully transferred **FILENAME**".