

TOE1G-IP FTP Server Demo Instruction

Rev1.1 2-Sep-16

1 Environment Setup

As shown in Figure 1 - Figure 2, to run TOE1G-IP FTP demo, please prepare

- 1) FPGA Development board (KC705/ZC706)
- 2) ISE ver 14.4 or later, or Vivado tool
- 3) For ZC706 board, use SFP-RJ45 adapter

Note: The demo uses FCLF-8520-3/FCLF-8521-3 to be SFP-RJ45 adapter

https://www.finisar.com/sites/default/files/downloads/finisar_fclf-8520-3_fclf-8521-3_1000base-t_copper_sfp_optical_transceiver_productspecreve1.pdf

- 4) Ethernet cable (Cat5e or Cat6) for network connection between FPGA Development board and PC
- 5) PC with Gigabit Ethernet support
- 6) micro USB cable for programming FPGA between FPGA Development board and PC
- 7) Test Application “FileZilla” (test on ver 3.9.0.6) or “Default FTP Client on Windows OS” running on PC
- 8) (Optional) USB mini cable can be connected FPGA Development board and PC for monitoring FTP server operation through Serial console.

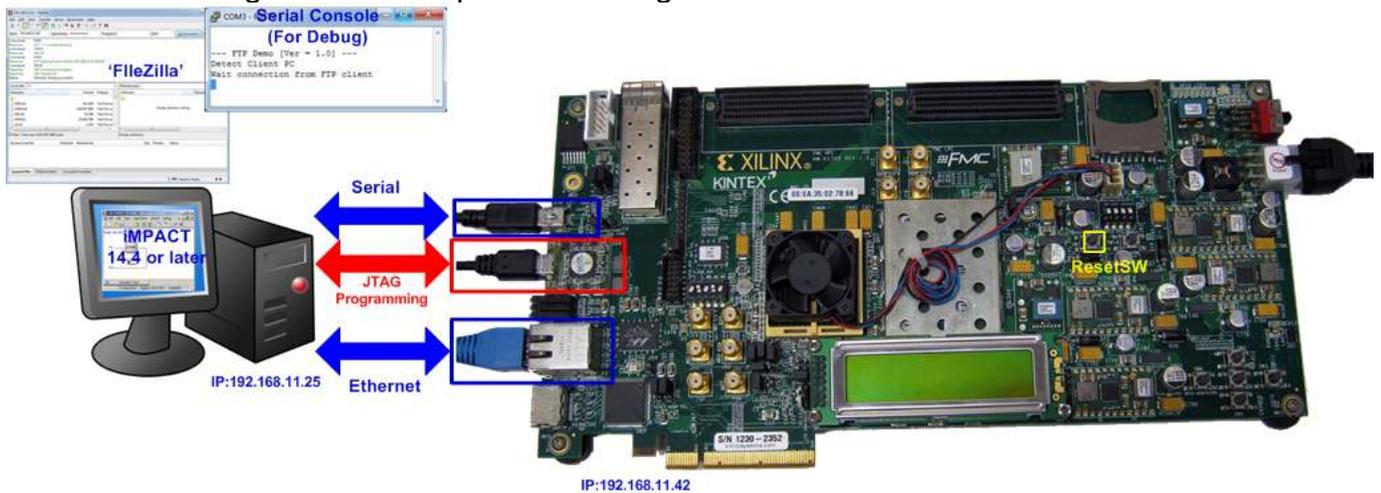


Figure 1 TOE1G-IP FTP Server Demo Environment Setup on KC705

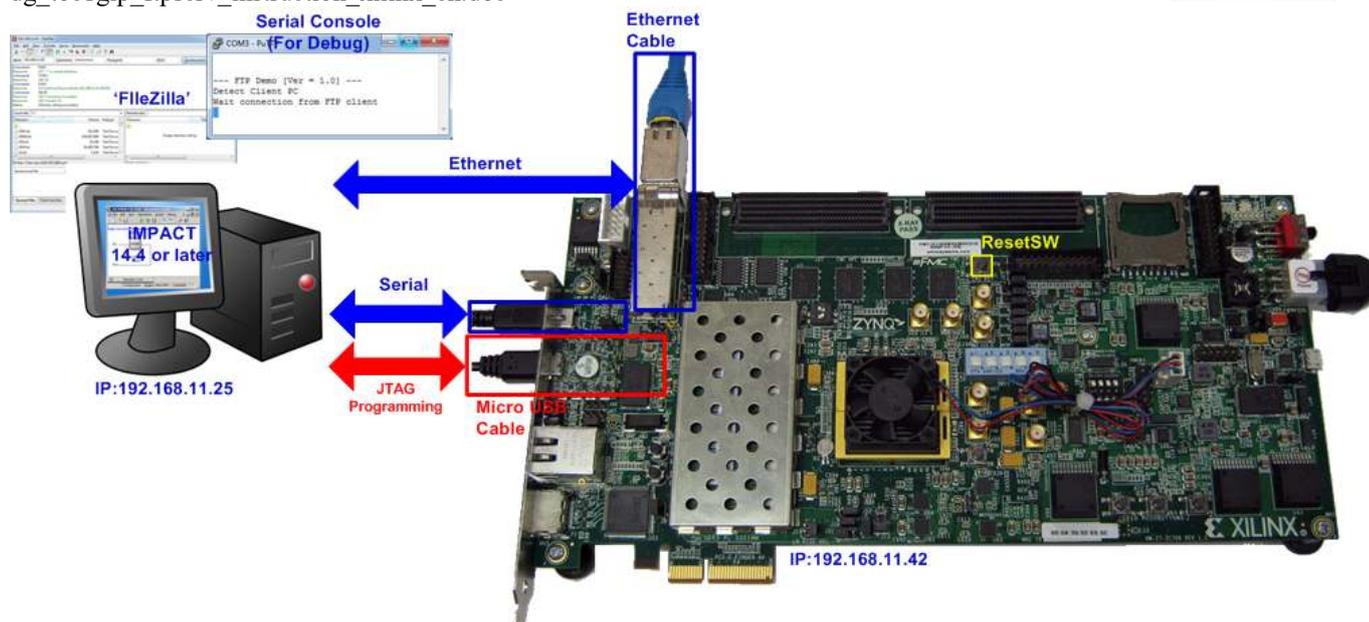


Figure 2 TOE1G-IP FTP Server Demo Environment Setup on ZC706

2 Demo description

The demo designs to use 1 GB DDR3 memory on FPGA board to be the storage of FTP server. The document shows FTP server operation when running by two FTP client applications, i.e. FileZilla and default FTP client on Windows OS.

During data transferring between FPGA board and Test PC, LED on the board will be ON/OFF. The description of LED is shown in Table 1.

Table 1 LED Definition

| GPIO LED | ON | OFF |
|----------|---------------------------------------|--------------------------|
| 0 | Data transferring | No data connection |
| 1/R | TOE1G-IP receives data from PC | No received data from PC |
| 2/C | Data transferring from TOE1G-IP to PC | No data transferring |
| 3/L | Data transferring from PC to TOE1G-IP | No data transferring |

3 PC Setup

Please follow the same setting as described in “dg_toe1gip_instruction_xilinx_en” document (standard demo).

4 How to run demo

4.1 FPGA Programming

To run the demo, please follow these steps.

- For ZC706 board only, set SW11="00000" to configure PS from JTAG and set SW4="01" to connect JTAG with USB-to-JTAG interface, as shown in Figure 3 - Figure 4.

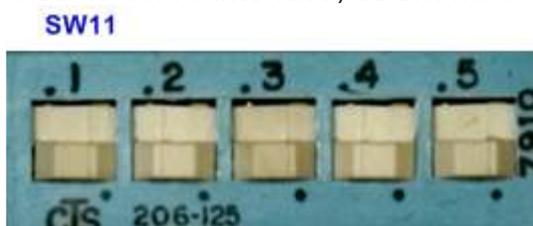


Figure 3 SW11 setting to configure PS from JTAG on ZC706 board



Figure 4 SW4 setting to use USB-to-JTAG on ZC706 board

- Connect micro USB cable from FPGA development board to PC and connect power supply to FPGA board.
- (Optional) Connect USB mini cable from FPGA development board to PC and open serial monitoring software on PC such as HyperTerminal. Terminal setting is BaudRate=115200, Data=8 bit, Non-Parity, Stop=1.
- Connect Ethernet cable between FPGA development board and PC.
- Set up network setting on PC, following Topic 3.
- Power on FPGA development board.
- For KC705, open iMPACT and download "download_ftpserv.bit" to FPGA development board. After download completely, check 1000 link status LED at DS11 (near RJ45). LED must be ON to show that the Ethernet link is ready, as shown in Figure 5.

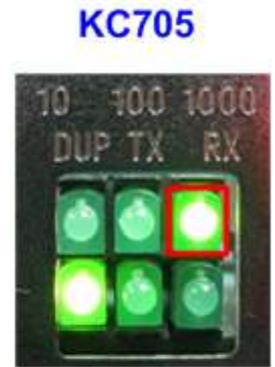
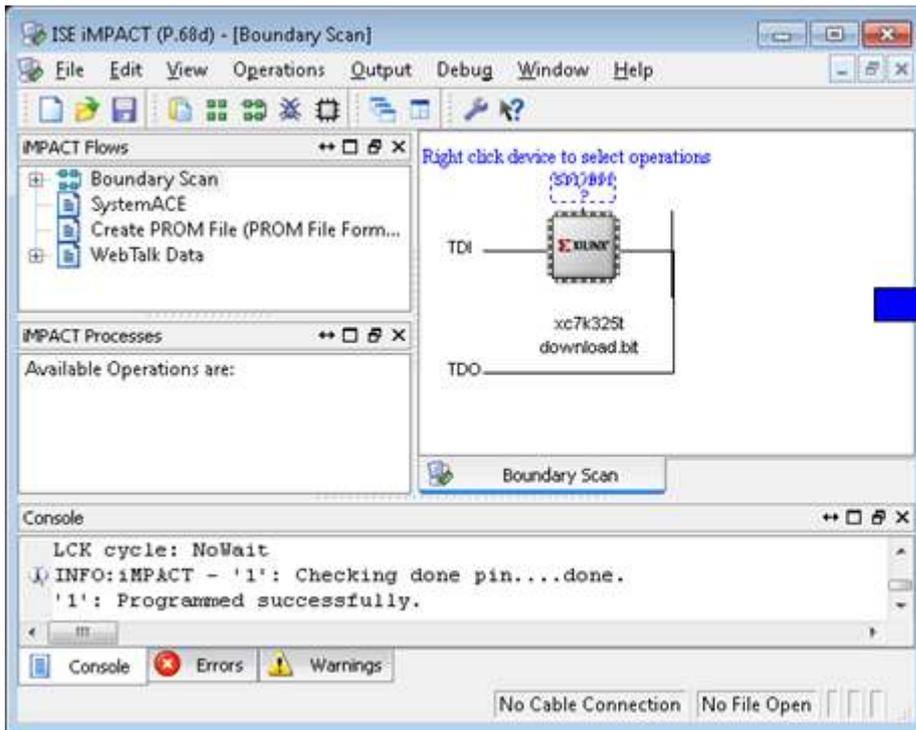


Figure 5 Programmer Environment

- For ZC706, open ISE command prompt or Vivado TCL Shell, change current directory to ready_for_download, and run batch file as shown in Figure 6 and Figure 7. There is no Ethernet LED status on ZC706, user can check from message on Serial console instead.

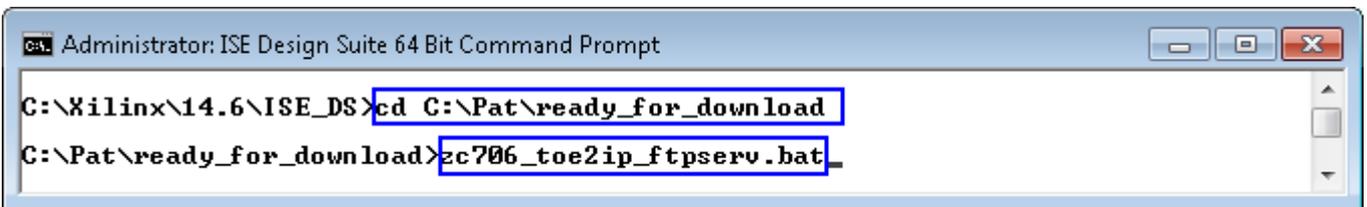


Figure 6 Example command script for download to ZC706 by ISE tool



Figure 7 Example command script for download to ZC706 by Vivado tool

- On serial console, “Detect Client PC” message will be displayed when FTP server can detect FTP client in the network. If message is not displayed, please check LAN cable and Ethernet connection setting on PC.

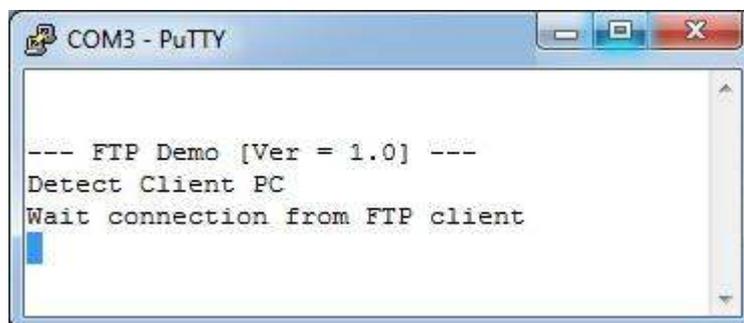


Figure 8 Bootup message on Serial console

4.2 FileZilla

This topic shows the step to use FileZilla software for connecting with FTP server. The demo can support only upload and download the file. Delete operation is not supported.

4.2.1 Setting and Connect

- Before connect to FTP server, open FileZilla setting firstly to set Maximum data connection to be 1 by selecting Edit->Settings.
- In the new window, select Transfers -> Maximum simultaneous transfers = 1 (Default value is 2), and click "OK" button as shown in Figure 9.

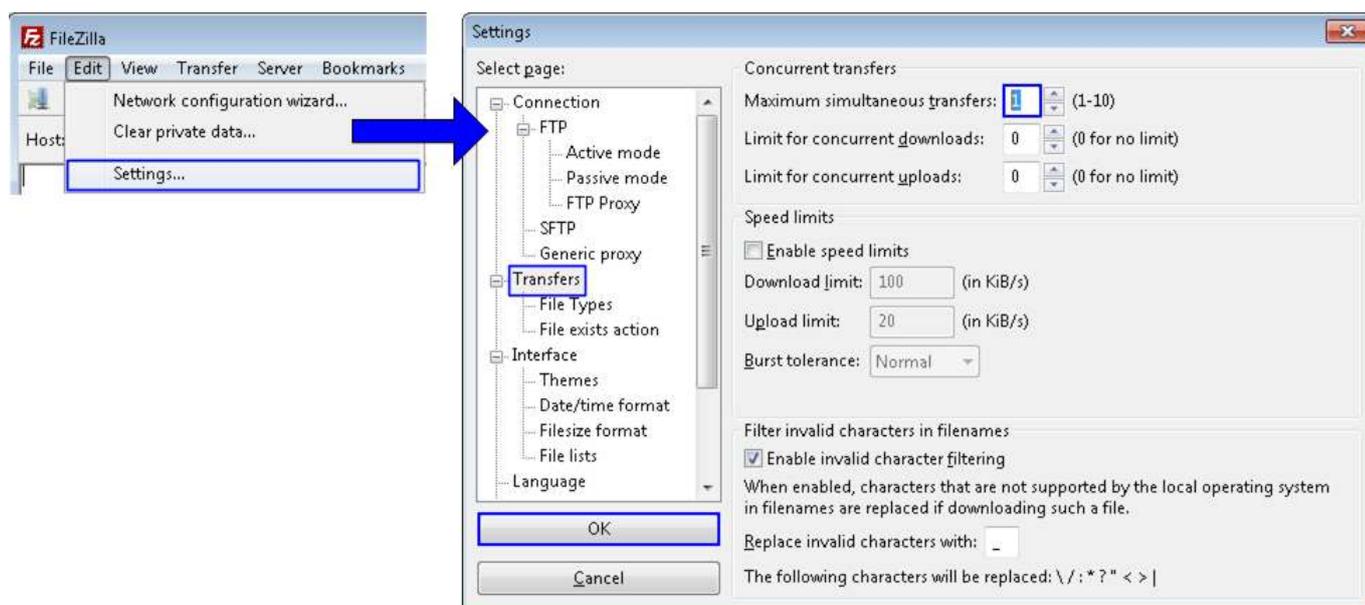


Figure 9 Set Maximum simultaneous transfers = 1

- Enter Host = "192.168.11.42", and then click "Quickconnect" button, as shown in Figure 10.

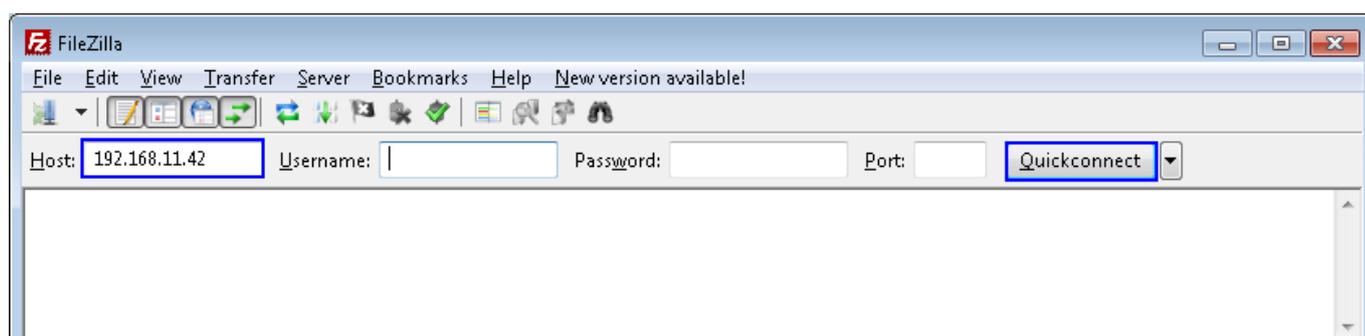


Figure 10 Enter Host name for FileZilla

- After connection successful, Empty directory is listed on the windows with "Directory listing successful" message, as shown in Figure 11.

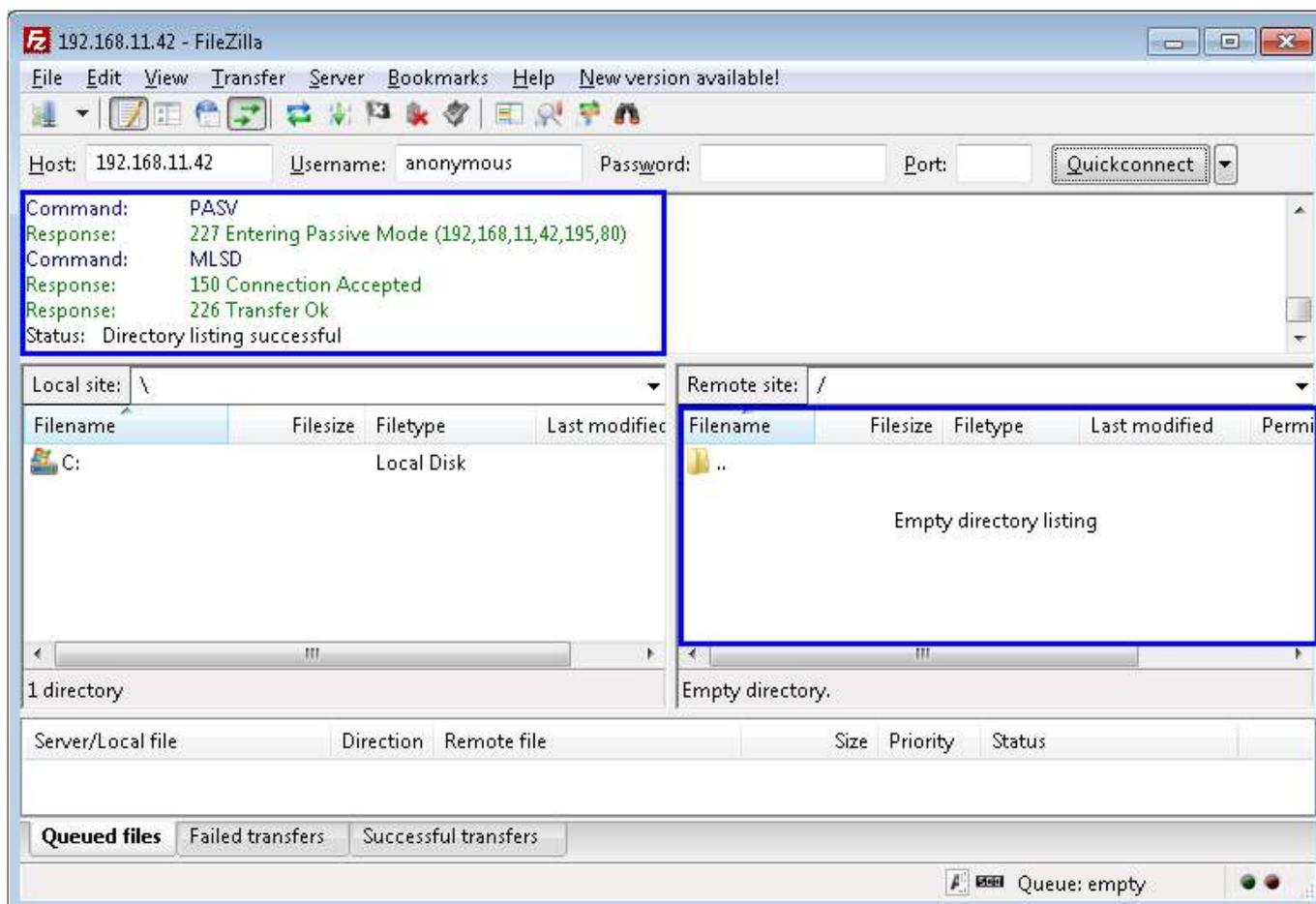


Figure 11 Connect successful

4.2.2 Upload File

Server uses 1 GB DDR3 memory to store file from the client. There are some limitations about file size, file name length, and total number of file as follows.

- 1) Maximum capacity of storage on FTP server is 1,072,624,640 Byte
- 2) Maximum file name length is 30 characters
- 3) Maximum total number of file is 16 file
- 4) Only file transfer without file directory is supported

- To upload file by FileZilla, user can select the file on PC, and then “double-click” or right-click->upload. Then, file will be uploaded to the server. Finally, the file will be displayed in the server list, as shown in Figure 12.

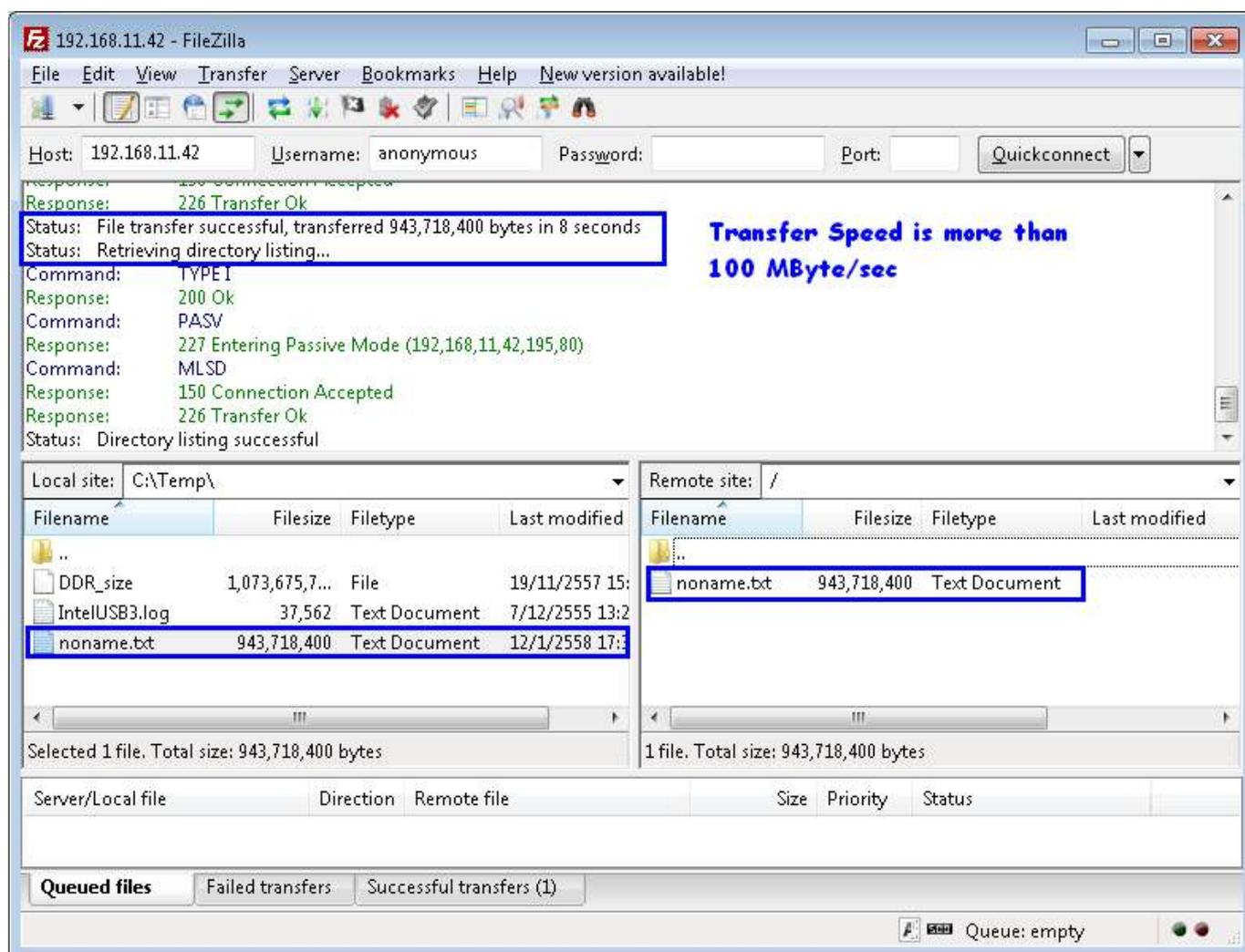


Figure 12 Example when upload file to server

- As shown in Figure 13, if file name length of uploaded file is more than 30 characters, only the first 30 characters will be used to be file name.
- As shown in Figure 14 and Figure 15, transfer error will be found when uploaded file size is too big or total number of file is more than 16.

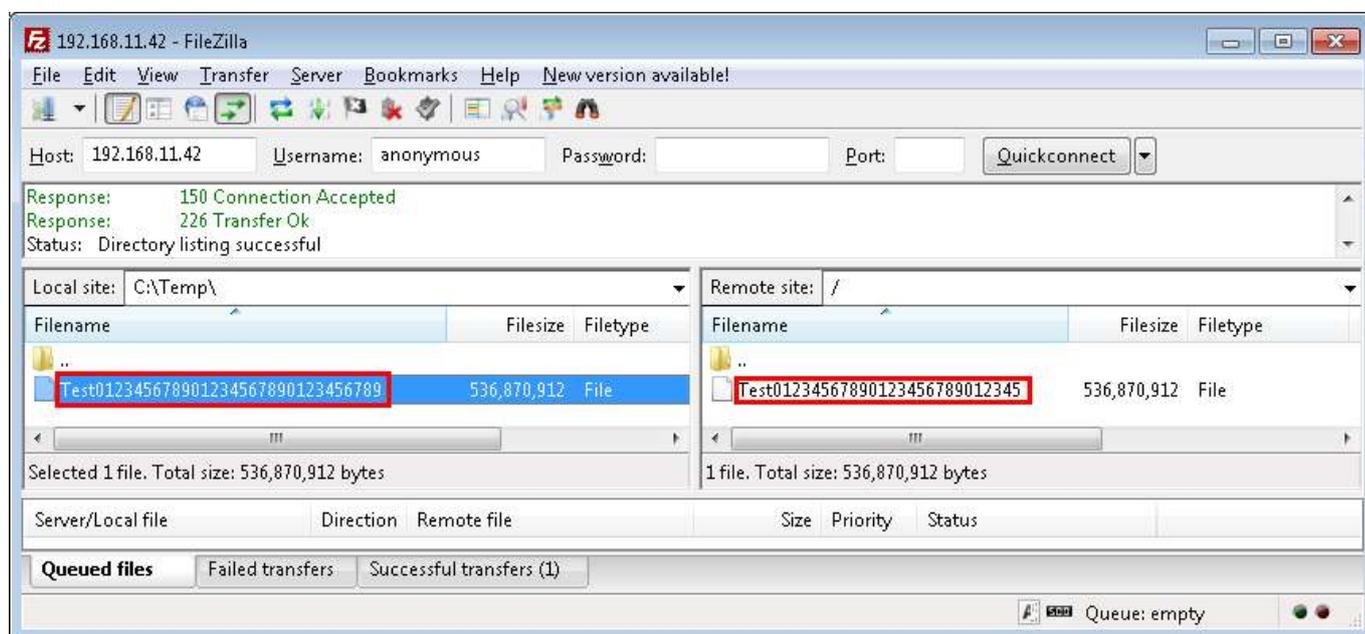


Figure 13 Example when File name length is more than 30 characters

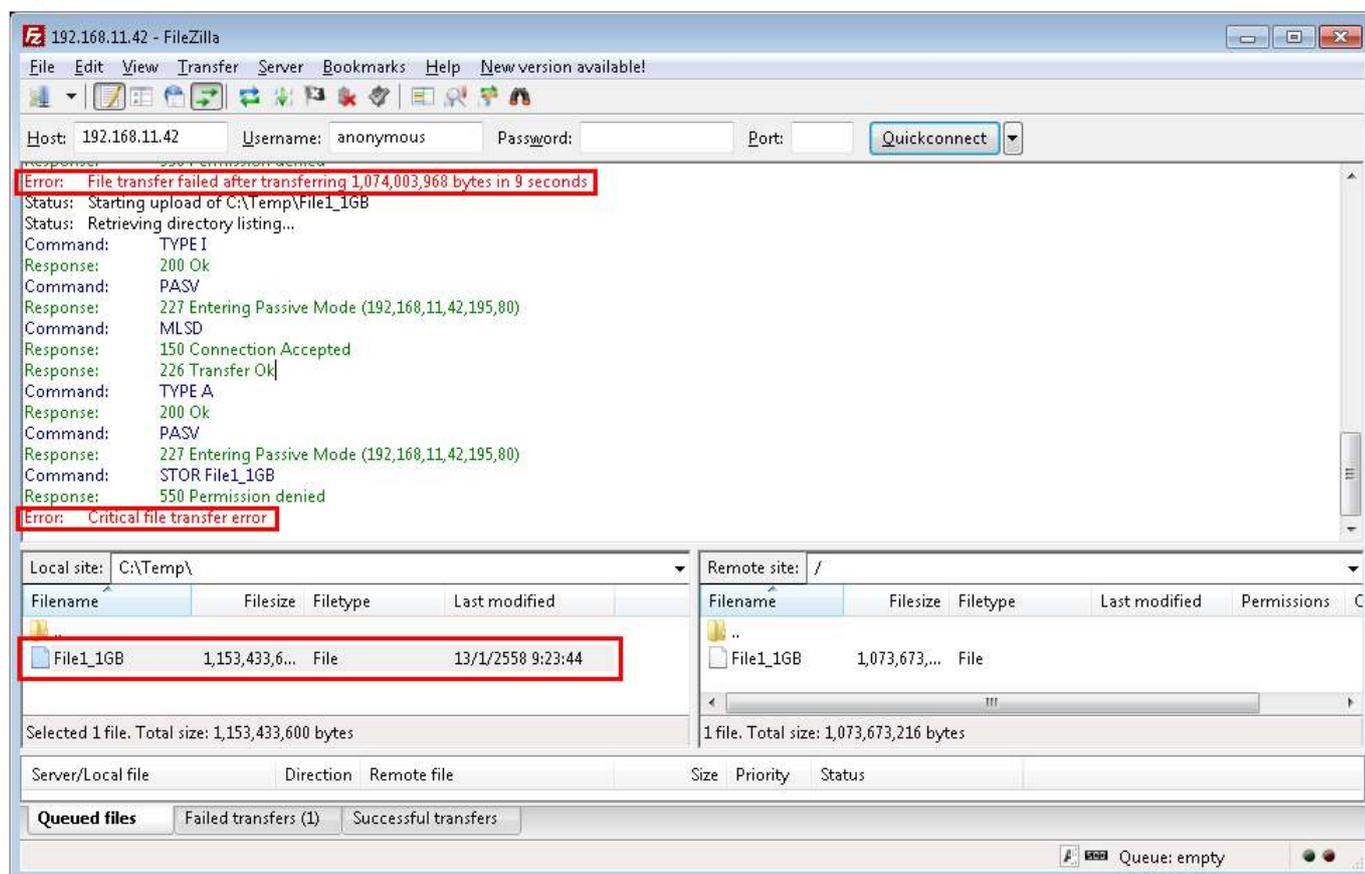


Figure 14 Error when uploaded file size is more than space area in DDR3

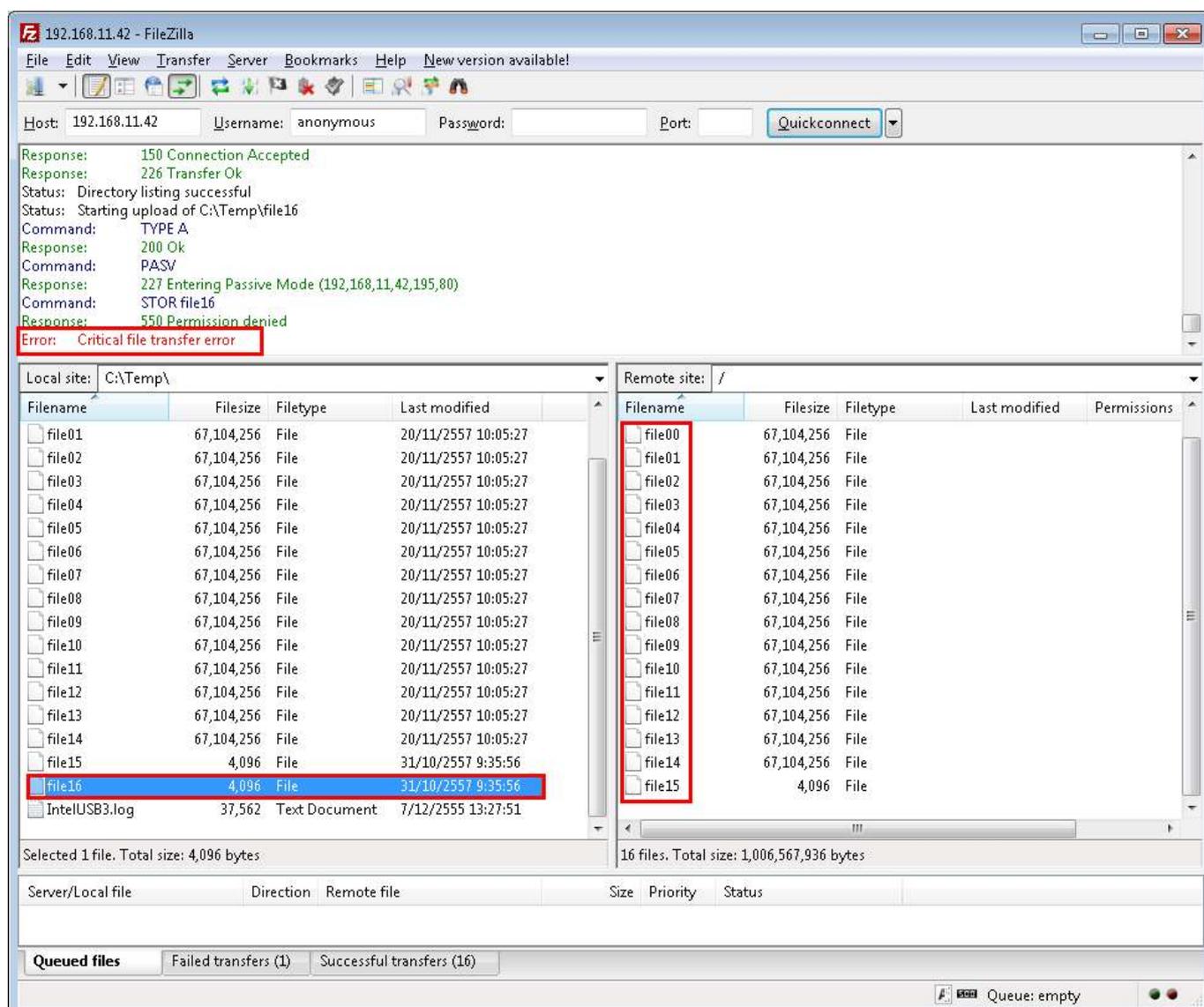


Figure 15 Error when uploading 17th file

4.2.3 Download File

To download file by FileZilla, user can select the file on server side, and then “double-click” or right-click->download. Then, file will be downloaded from server to store to current directory on PC. Finally, file will be stored in the current directory on PC.

“File transfer successful with the size and time usage” will be displayed.

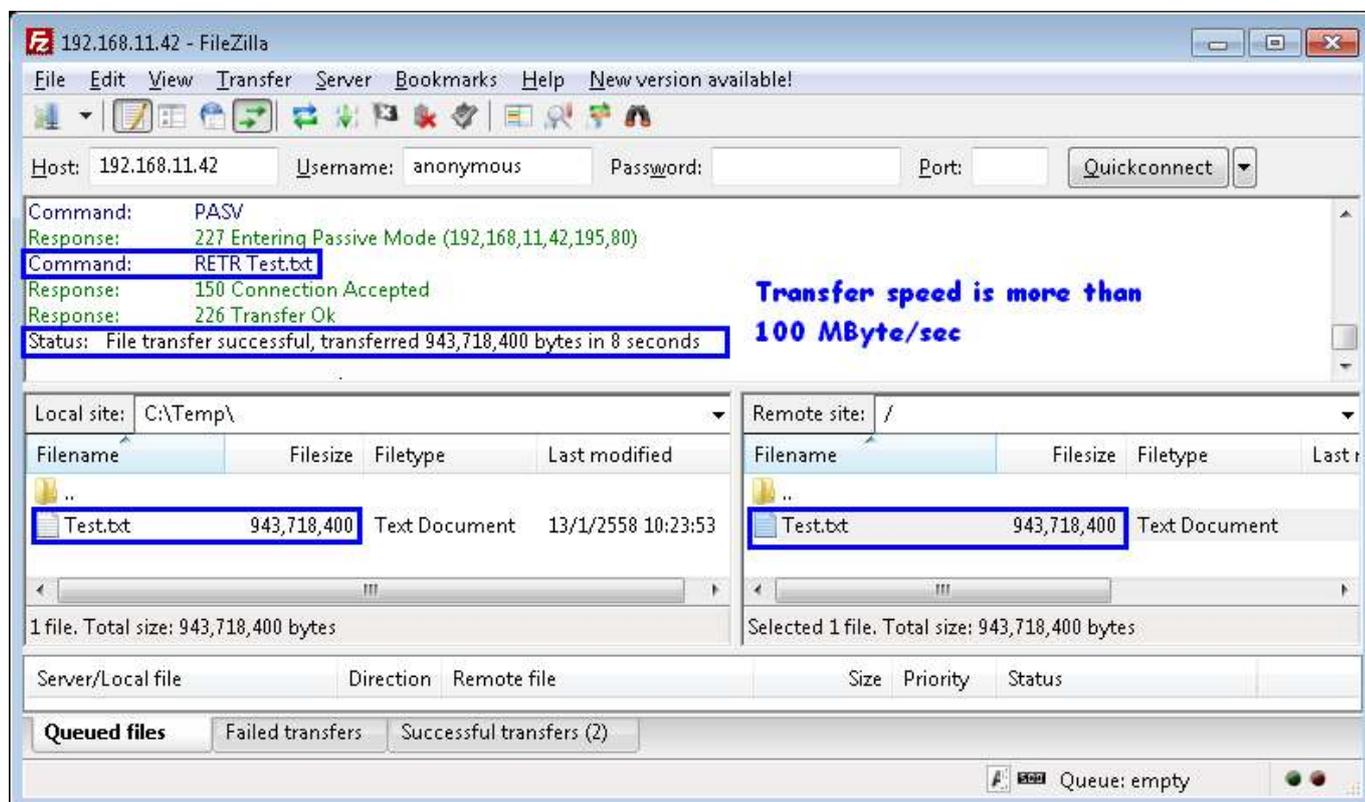


Figure 16 Example when download file from server

File on the server cannot be deleted by user, and all files on the server will be disappeared when the board is power-down.

As shown in Figure 17, “Permission denied” is returned from server when user delete the file from the server.

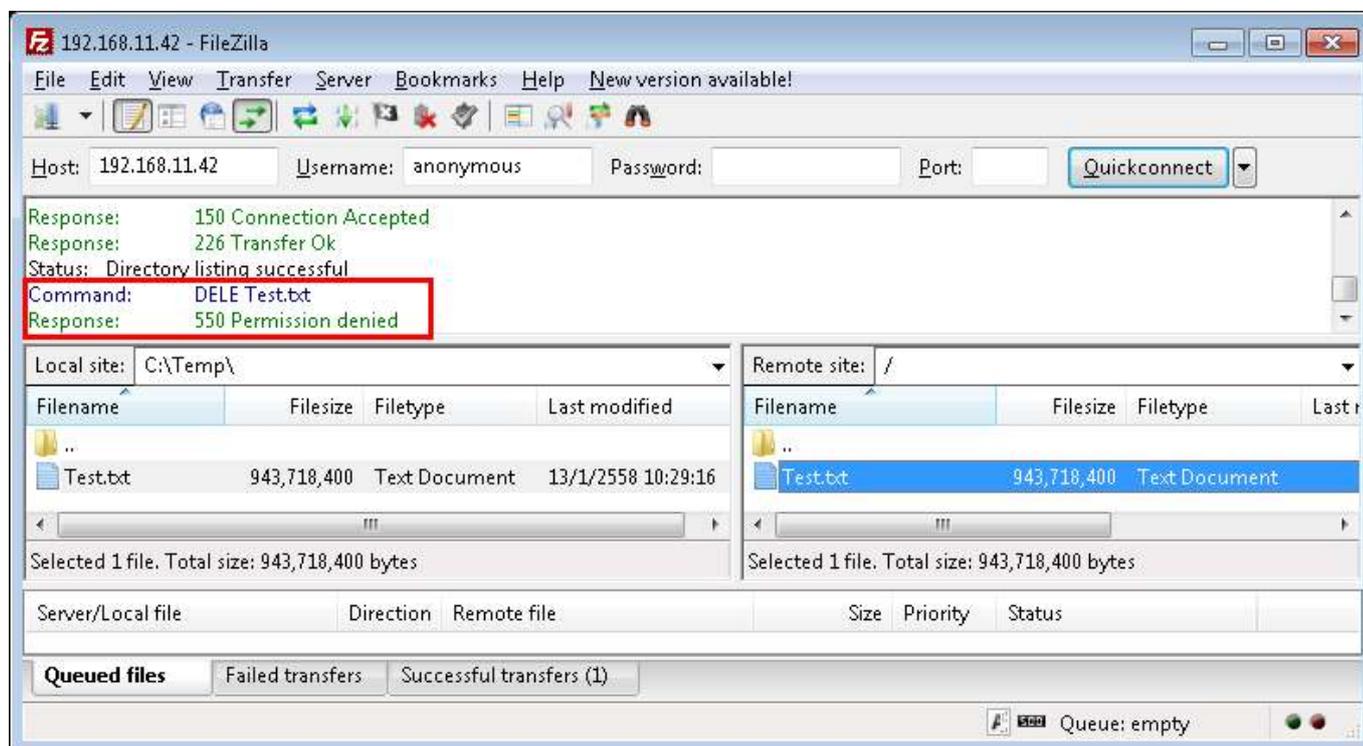


Figure 17 Permission denied when delete file from server

4.3 Default FTP Client on Windows OS

This topic shows the step to use default FTP client on Windows OS for connecting with FTP server. Similar to FileZilla, only upload and download the file are supported.

4.3.1 Connect

- Open windows explorer by selecting Start->Computer or using “windows key + E”.
- Type “ftp://192.168.11.42” into the address bar, and press enter.
- After that, FTP connection is available and empty folder on the server is displayed, as shown in Figure 18.

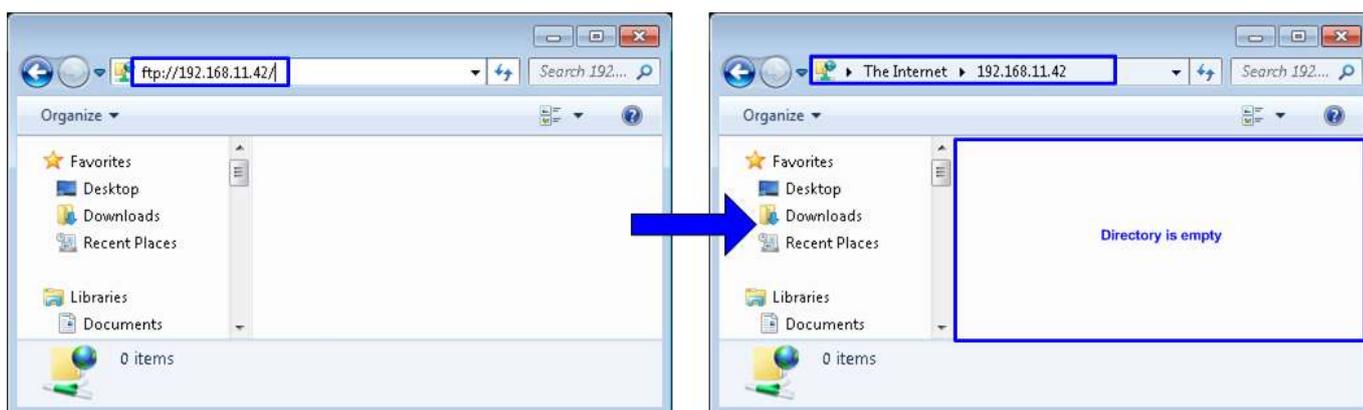


Figure 18 FTP connect by default FTP client on Windows OS

4.3.2 Upload/Download File

- To upload/download file, user can drag and drop file from PC to the server for uploading or from the server to PC for downloading, as shown in Figure 19.
- Progress of copying status is displayed during data transferring, as shown in Figure 20.
- File is available on server after completing file transfer, as shown in Figure 21.

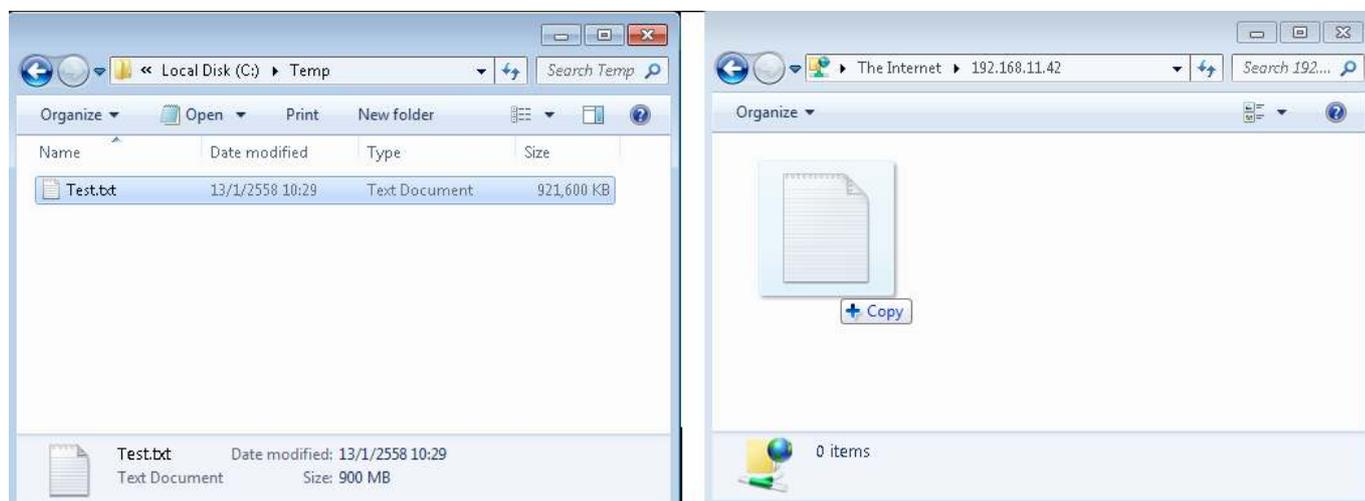


Figure 19 Drag and Drop to upload/download file

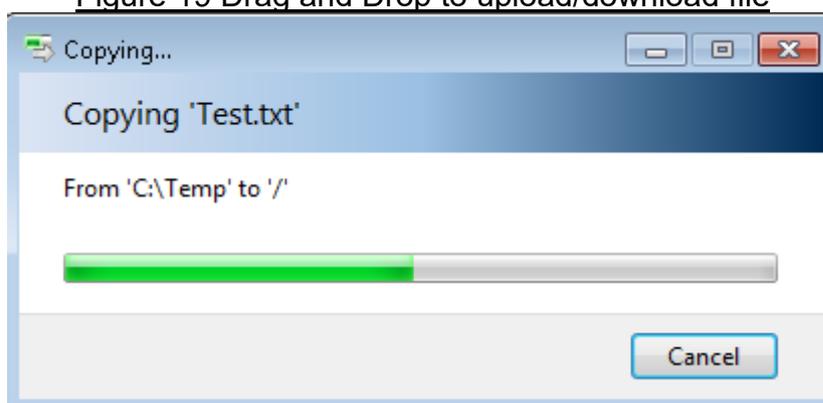


Figure 20 Copying in process

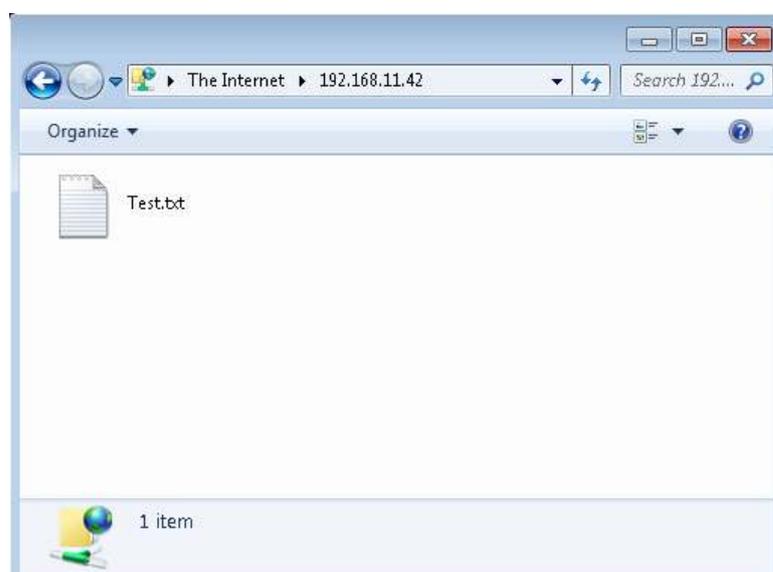


Figure 21 Upload/download file complete

- Similar to FileZilla step, FTP server has some limitations about storage capacity, file name length, total numbers of file, not supported sub-directory, and not support delete command. The example of situation from above limitation is follows.
- Figure 22 shows the test result when file name length is more than 30 characters. Only the first 30 character will be used to be file name in the server.
Note: User must refresh folder at server to update file name length after complete data transfer.

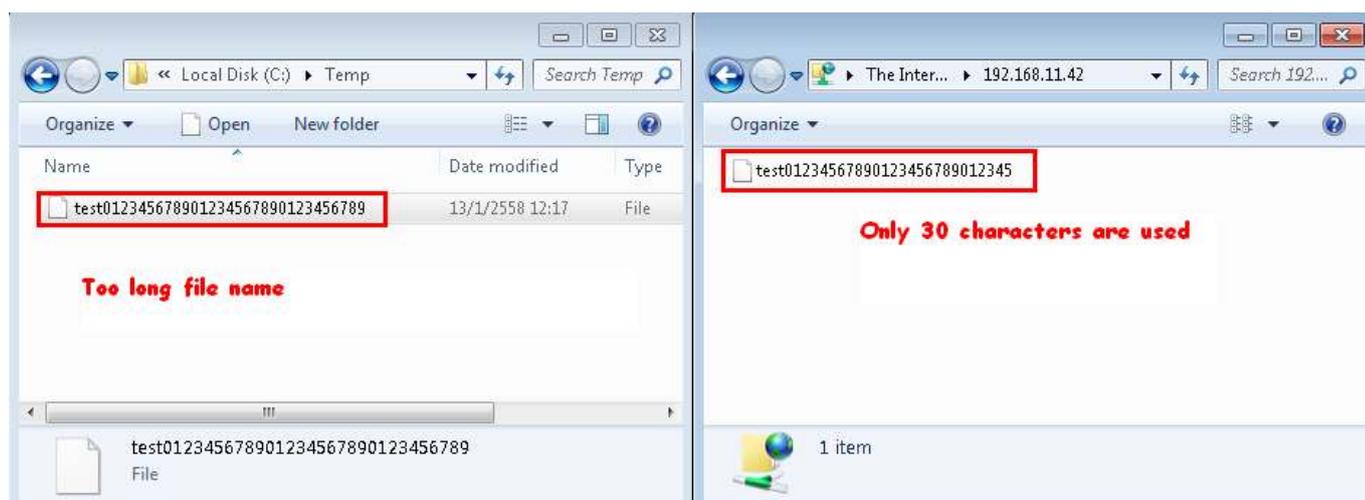


Figure 22 The example of too long File name

- Figure 23 - Figure 25 shows error message when transfer size of the file is bigger than space area in DDR3, when total number of file is more than 16, and when user deletes the file from the server in a sequence.

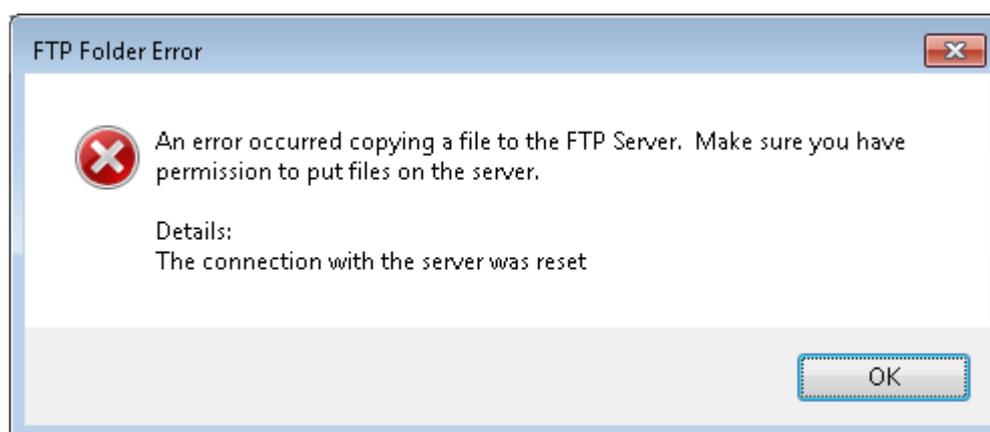


Figure 23 Error message when transfer size is more than space area in DDR3

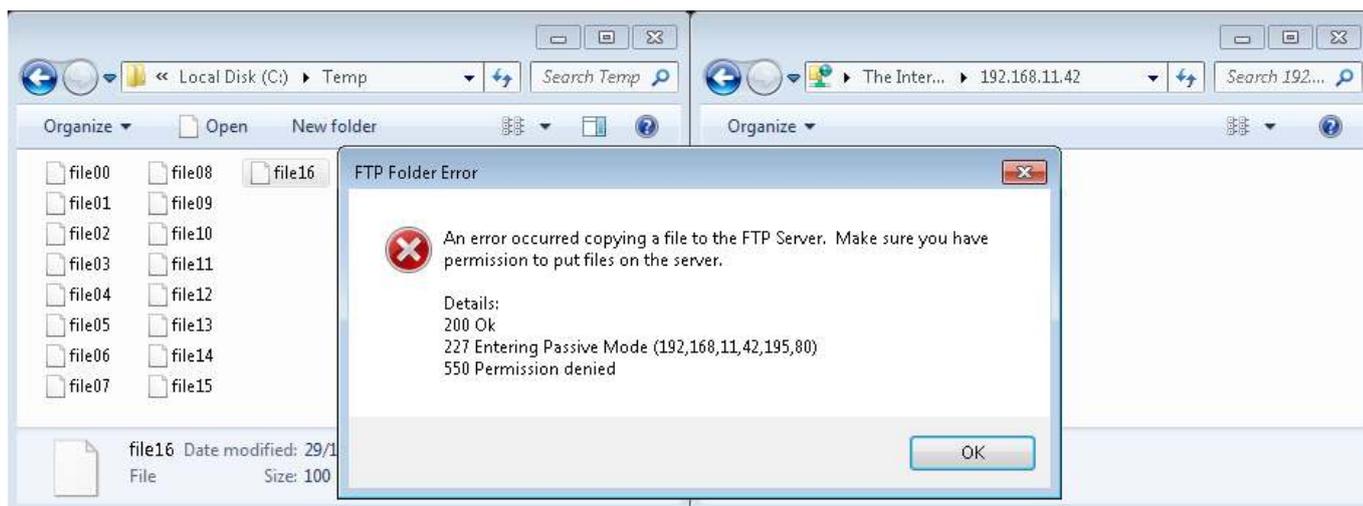


Figure 24 Error message when transfer 17th file to the server

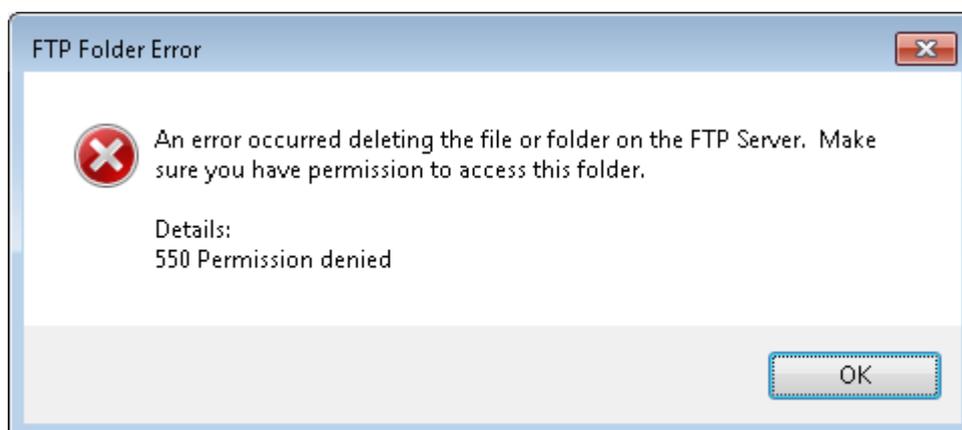


Figure 25 Error message when delete the file in the server

5 Revision History

| Revision | Date | Description |
|----------|-----------|--|
| 1.0 | 16-Jan-15 | Initial version release |
| 1.1 | 2-Sep-16 | IP core product renamed from TOE2-IP to TOE1G-IP |