

FTP Server Demo Instruction

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This document describes the instruction to run FTP Server demo on FPGA development board by using FileZilla version 3.45.1 as FTP client. SATA-III device is applied as the storage to store file for transferring with TestPC by using FTP protocol through 1 Gb Ethernet. To interface with SATA device and 1 Gb Ethernet, exFAT-IP for SATA and TOE1G-IP are implemented in FPGA design. User interface for setting the test parameters on FPGA and monitoring the hardware status is NiosII command shell.

1 Environment Setup

To operate FTP Server demo, please prepare following test environment.

- 1) FPGA development boards (Cyclone10 GX development board)
- 2) 1-Gb Ethernet connection on Test PC
- Micro USB cable for JTAG connection connecting between FPGA development board and PC
- 4) Ethernet cable (cat5e or Cat6) for network connection between FPGA development board and PC
- 5) AB09-FMCRAID board provided by Design Gateway
- 6) SATA-III device connecting to CN0 on AB09 board
- 7) ATX power supply for AB09 board
- 8) QuartusII Programmer for programming FPGA and NiosII command shell, installed on PC
- 9) Test Application named FileZilla version 3.45.1



Figure 1-1 FTP Server demo (FPGA<->PC) on Cyclone10 GX



2 PC Setup

Before running demo, please check the network setting on PC. The example to set the network is shown as follows.

2.1 Ethernet Setting

| Network and Sharing Center | | \bigcirc | | | | |
|-------------------------------------|--|---|--|--|--|--|
| ← → × ↑ 🔽 > Control | Panel > Network and Internet > Network | and Sharing Center | | | | |
| Control Panel Home | View your basic network info | rmation and set up connections | | | | |
| Change adapter settings | View your active networks | | | | | |
| Change advanced sharing settings | Network Public network | Access type: Internet 2 Connections: <u>Ethernet</u> | | | | |
| | Change your networking settings — | | | | | |
| • | <u>Figure 2-1 IPv4 settir</u> | ng | | | | |

- 1) Open Ethernet setting option from Control Panel -> Network and Internet -> Network and Sharing Center.
- 2) Click Ethernet icon which is used to connect with FPGA board.

| 🖗 Ethernet Status | × Ethernet Properties | > |
|---|--|----------|
| General | Networking | |
| Connection IPv4 Connectivity: No Internet access IPv6 Connectivity: No network access Media State: Enabled Duration: 01:56:55 Speed: 1.0 Gbps Details Activity Sent — Received Putter: 20.200 EE4 | Connect using: 1-Gb LAN connection Intel(R) Ethemet Connection (7) 1219-V Configure This connection uses the following items: Cient for Microsoft Networks Cient for Microsoft Networks Coo S Packet Scheduler Configure Internet Protocol Version 4 (TCP/IPv4) Microsoft LLDP Protocol Driver Anticosoft LLDP Protocol Driver Install Uninstall Properties | ` |
| Bytes: 39,299,554 503,073,087 | Description Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks. OK Cance | el |

Figure 2-2 Select IP address setting menu

- 3) Click Properties button in Ethernet Status window.
- 4) Select "TCP/IPv4".
- 5) Click Properties button in Ethernet Properties window.



| Internet Protocol Version 4 (TCP/IPv4) Properties | \times |
|---|----------|
| General | |
| You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. | |
| Obtain an IP address automatically | |
| Use the following IP address: (6a) | |
| IP address: 192 . 168 . 11 . 25 | |
| Subnet mask: 255 . 255 . 255 . 0 | |
| Default gateway: | |
| Obtain DNS server address automatically | |
| Use the following DNS server addresses: | |
| Preferred DNS server: | |
| Alternate DNS server: | |
| Validate settings upon exit | |
| (6b) OK Cancel | |
| Figure 2-3 Set IP address | |

- 6) Set IP address = 192.168.11.25 and Subnet mask = 255.255.255.0. After that, click OK button to confirm IP address setting.
- 7) Click Configure button in Ethernet Properties window. On Link Speed, select "1 Gbps Full Duplex" and click OK button

| Intel(R) Etherne | et Connection (7 |) I219-V Proper | ties | 2 |
|--|--|--|--|--|
| Teaming | VLANs | Driver | Details | Events |
| General | Link Speed | Advanced | Power M | Management |
| Link Status Speed: | Link Speed and Intel(R) PROSe 1.00 Gbp | d Duplex Setting et Version: 23.2.0 ps Full Duplex (El | s).1006 EE: Active) | |
| Speed and Du 1.0 Gbps Full Auto Negotia 10 Mbps Half 10 Mbps Full 100 Mbps Half | uplex: Duplex Duplex Duplex If Duplex | | Diagnostic Identify Ada | 28 pter |
| 1.0 Gbps Full to automatin If the adapt settings to Infor This icon is | Duplex Cally detect and no er fails to connec match those of the mation icon displayed when t | t, you can set the e link partner. | II® adapters a nd duplex set e speed and o | duplex |
| | Teaming General Cintel Link Status ● Speed Link Status ● Speed Link Status ● Speed Link Status ● Speed Link Status ● Speed Link Status ● Speed Link Status ■ Speed Link Speed | Teaming VLANs General Link Speed Link Speed Link Speed and Intel(R) PROSe Link Status Intel(R) PROSe Link Status Speed and Duplex: 1.00 Gbp Speed and Duplex: 1.00 Gbps Intel(R) PROSe Link Status Speed and Duplex: 1.00 Gbps Intel(R) PROSe Link Status Speed and Duplex: 1.00 Gbps IO Mbps Full Duplex 100 Mbps Full Duplex IO Mbps Full Duplex 100 Mbps Full Duplex Interval Interval Interval | Teaming VLANs Driver General Link Speed Advanced Link Speed and Duplex Settings Intel(R) PROSet Version: 23.2.0 Link Status Speed: 1.00 Gbps Full Duplex (Ell Speed and Duplex: 1.00 Gbps Full Duplex (Ell Jo Gbps Full Duplex: Link Status Io Mbps Full Duplex: Link Status Io Mbps Full Duplex Link Status Io Gbps Full Duplex Link Status Io automatically detect and net 7b e speed at If the adapter fails to connect, you can set the settings to match those of the link partner. Image: Information icon Image: Information icon This icon is displayed when the device is not | Teaming VLANs Driver Details General Link Speed Advanced Power I Link Speed and Duplex Settings Intel(R) PROSet Version: 23.2.0.1006 Intel(R) PROSet Version: 23.2.0.1006 Link Status Intel(R) PROSet Version: 23.2.0.1006 Diagnostic Speed 1.00 Gbps Full Duplex (EEE: Active) Speed and Duplex: Diagnostic Auto Negotiation Identify Ada 100 Mbps Full Duplex default, Intel® adapters at to automatically detect and net 7b e speed and duplex set if the adapter fails to connect, you can set the speed and or settings to match those of the link partner. Image: Information icon This icon is displayed when the device is not linked at its |

Figure 2-4 Set link speed = 1 Gbps



2.2 Power Option Setting



- 1) Open Control Panel and select Power Options.
- 2) Select High performance plan.



2.3 FileZilla Setting

The reference design supports only one connection for transferring data through 1 Gb Ethernet. So, FileZilla must be configured to transfer data by using one connection as shown in Figure 2-6.

- 1) On FileZilla application, select Edit -> Settings.
- 2) In Transfers page, set "Maximum simultaneous transfer" = 1 (Default value is 2) and click "OK" button to confirm the setting.

| E | FileZilla | |
|---------------------------------------|--|---|
| Eile | Edit View Transfer Server Bookmarks Help | |
| 111 | Network configuration wizard | |
| | Clear private data | |
| Host | Settings | |
| | | |
| Settings | | × |
| Select gage: | Concurrent transfers2b | |
| - Connection | Maximum simultaneous <u>t</u> ransfers: 1 (1-10) | |
| E- FTP | Limit for concurrent <u>d</u> ownloads: | |
| | Limit for concurrent <u>uploads</u> : 0 (0 for no limit) | |
| SFTP | Speed limits | |
| Gene 2a ky | Enable speed limits | |
| Transfers, | Download limit: 1000 (in KiB/s) | |
| FTP: File Types File exists action | Ugload limit: 100 (in KiB/s) | |
| - Interface | <u>Burst tolerance</u> : Normal | |
| Themes | Filter invalid characters in filenames | |
| Date/time format | Enable invalid character filtering | |
| Filesize format File lists | When enabled, characters that are not supported by the local operating system in filenames are replaced if downloading such a file. | |
| Language | Replace invalid characters with: | |
| File editing | The following characters will be replaced: $\backslash / : * ? " < > $ | |
| Updates | Preallocation | |
| Logging Debug | Preallocate space before downloading | |
| ОК | 2c) | |
| <u>C</u> ancel | | |

Figure 2-6 FileZilla Setting



3 FPGA board setup

- 1) Turn off power switch and connect power supply to FPGA board.
- 2) Connect micro USB cable from FPGA board to PC.
- 3) Connect Ethernet cable (CAT5e or CAT6) between RJ45 on FPGA board to PC.



Figure 3-1 Power, Ethernet, and micro USB cable connection

- 4) Connect SATA-III device to AB09 and then connect AB09 to FPGA, as shown in Figure 3-2.
 - a. Connect AB09-FMCRAID board to FMC-HPC connector on FPGA board.
 - b. Connect SATA-III device to CN0 on AB09-FMCRAID board.
 - c. Connect ATX power to power connector on AB09-FMCRAID board.



Figure 3-2 AB09-FMCRAID connection



- 5) Open QuartusII Programmer to program FPGA through USB-1 by following step.
 - a. Click "Hardware Setup..." to select USB-BlasterII[USB-1].
 - b. Click "Auto Detect" and select FPGA (10CX220Y).
 - c. Select 10CX device icon.
 - d. Click "Change File" button, select SOF file in pop-up window, and click "open" button.
 - e. Check "program".
 - f. Click "Start" button to program FPGA.
 - g. Wait until Progress status is equal to 100%.

| 😃 Quartus Prime Pro | ogrammer Pro Edition - [Chain1 | .cdf]* | | | | | - | | × |
|--------------------------|--------------------------------|--------------------|------------|-----------|-----------------------|----------|-----------------|------------|---|
| <u>Eile Edit V</u> iew P | a) Click Hardware S | Setup -> USB-1 | | g) Wa | ait until Pr | ogress | s = 100% | A | • |
| Hardware Setup. | a USB-Blasterii [USB-1] | Mode: | JTAG | • | Progres | g is: | 100% (St | iccessful) | |
| Enable real-time I | SP to allow background progra | mming when availab | ole | | | | | | |
| F™Start | File | Device | Checksum | Usercode | Program/ Configure | Verify | Blank- Check | Examin | e |
| Stop | b) Select 10CX220YF | 780 ^{3SA} | 00000000 | 00000000 | | | | | |
| 💏 Auto Detect | D:/Demo/FTPCPUTest.sof | 10CX220YF780 | 097247F0 | 097247F0 | | | | | |
| X Delete | | | | | | e) Che | ck "Pro | gram" | |
| Add File. | d) Click "Change File | " button -> Sel | ect TenGL | BackTest. | sof | | | | |
| Change File | 4 | | | | | | | | Þ |
| | | | | | | | | | |
| Add Device | 2*CFI_1Gb | | | | | | | | |
| ք≌ υթ ֈ™Down | | c) Selection | ct Cyclone | 10 Device | | | | | |
| | | Figure 3-3 F | PGA Pro | arammer | | | | | |



6) Open NiosII command shell and type "nios2-terminal". The message is displayed to show current status as follows



Figure 3-4 Message after system boot-up

- "Waiting exFAT-IP initialization" is displayed during running initialization.
- "exFAT-IP initialization complete" is displayed when finishing initialization and IP is idle.
- "The disk must be formatted by exFAT-IP" is displayed. User press 'y' to format the disk when the disk is the new disk which has never been formatted by exFAT-IP. Also, format the disk can be used to clear the data from the disk. The example to run Format command is shown in Figure 3-5. The user needs to set file size for storing in SATA device. This file size must be matched to the file in Test PC when the user loads the new file to SATA device through FTP client. User press other keys (not 'y') to skip Format operation.

| Format without modifying time creat | ed |
|--|--|
| /cygdrive/e/Altera/18.0 | |
| The disk must be formatted by exFAT-IP Press 'y' to confirm format disk => | a) 'Y' to confirm to format disk |
| Current time created : 11/11/2019, 14:00 Press 'y' to change time created => | <u>2:08</u> |
| Enter FileSize [0]:32 MB | b) Other keys ('n') to use default created time and date |
| [1]:128 MB [2]:512 MB [3]:2 GB [4]:0 GP | |
| [5]:32 GB =>3 c) Select file size = 32 MB | |
| Format Disk complete. d) syst is upda | em information Ited |
| File size in disk : 2.147 [GB] Maximum file in disk : 118 File Total file in disk : 0 File | |

Figure 3-5 Format the disk



- "Current time created" is displayed to show default time. User can press 'y' to change time created or press other keys (not 'y') to use the default value. Figure 3-5 shows the example when the system is initialized by using default time created (11-Nov-2019, 14:02). Figure 3-6 shows the example to set time created. There are six parameters for setting created date and time for empty directory.
 - a) Year –Year of created date. Valid range is 1980 2107.
 - b) Month Month of created date. Valid range is 1 12.
 - c) Date Date of created date. Valid range is 1 31.
 - d) Hour Hour of created time. Valid range is 0 23.
 - e) Minute Minute of created time. Valid range is 0 59.
 - f) Second -x2 second of created time. Valid range is 0 29.

Input is received as decimal unit. User can add "0x" as a prefix for hexadecimal input. When the input is invalid, the parameter is not updated and the same value is used. After setting the new created date and time, "Date and Time changed" with the updated value are displayed on the console.





<u>Note</u>: Time created value is applied for two functions.

First, the new file which is loaded from Test PC to SATA device by using FTP client software uses this created time/date as created time/date of the file in the SATA device.

Second, when user reads the file list in SATA device through FTP client software, the created time/date of all files in the disk is equal to this set time. So, if some files in the disk is the old file, created from the previous test, the created time/date displayed on FTP client software may not be matched to the created time/date in the disk, as shown in Figure 3-7.



Figure 3-7 Time created comparison on real SATA device and on FTP client

7) After finishing date and time setting, default TOE1GIP parameter is displayed on the console. Figure 3-8 shows the example when the system is booted with some available files in the SATA device.

| DG_exFAT (F:) > DIR000 | ✓ ⁰ | Search DIR000 | م |) | The disk must be formatted by exFAT- Press 'y' to confirm format disk | IP => [n] |
|------------------------|--|---------------|--------------|---|---|--|
| Name | Date modified | Туре | Size | | Cancel format disk | Input other keys('n') to skip format operation |
| 0000000.BIN | 9/24/2018 5:35 PM 9/24/2018 5:35 PM | BIN File | 2,097,152 KB | | File size in disk : 2.147 [GB] Maximum file in disk : 118 File Total file in disk : 2 File | rrent system information |
| | | | |] | Current time created : 11/11/2019, 1 Press 'y' to change time created Default TOEIGIP Parameter Window Update Gap = 0 FPGA MAC address = 0x000102030405 Target IP = 192.168.11.25 FPGA IP = 192.168.11.42 Target port number = 60001 FPG9 port number = 60001 | 4:02:08 Input other keys('n') to use default created time and da Default network parameters displayed after finishing setting date and time |

Figure 3-8 Initialization without format operation and time created updating

D•G

dg_ftp_server_instruction_intel_en.doc



Figure 3-9 Set TOE1G-IP parameter before running demo

8) Input 'x' to skip parameter setting and use default parameters for system initialization. Otherwise, input other keys to change parameters. Seven parameters can be changed by the user.

During changing parameter, user can set the invalid value such as 'n' to the parameter for using the same value. After finishing parameter setting, TOE1G-IP is reset and begins initialization process. More details of each parameter are described as follows.

- Window Update Gap: Set threshold value to transmit window update packet. Valid value is 0x00 0x3F (0-63). The unit size of threshold value is 1 Kbyte. Default value is 0 (disable window update feature).
- FPGA MAC address: Input 12-digit of hex value. Add "0x" as a prefix for hexadecimal input.
- FPGA IP address: A set of four decimal digits is separated by ".". The valid range of each decimal digit is 0-255.
- FPGA port number: Valid range is 0-65535, except 21 which is control port number.
- Target IP address: A set of four decimals like FPGA IP address. This value is IP address of Test PC.
- Target port number: Valid range is 0-65535, except 21 which is control port number.



After finishing system initialization, three parameters for setting in FTP client application, i.e. Host IP, User name, and password are displayed. Now the user can open FTP client application on Test PC to connect with FTP server hardware.



4 FTP Client

4.1 Login FTP Server

To login FTP Server by FileZilla, the step is as follows.

- 1. Input server parameters following parameter recommended on the console.
 - a. Host IP : FPGA IP, set during initialization. Default value is 192.168.11.42.
 - b. Username : dgftp
 - c. Password : admin
- 2. Click "Quickconnect" button.

| 1a. Input Host IP = FPGA IP, displayed on the console | | | | | | | | | | |
|---|---|-------------------|--|--|--|--|--|--|--|--|
| dgftp@192.168.11.42 - FileZil File Edit View Transfer Se | Image: Construction of the second state of the second s | | | | | | | | | |
| |) 🕸 🛛 🛔 | 1 🗐 🖉 🍳 🔍 | | | | | | | | |
| <u>H</u> ost: 192.168.11.42 <u>U</u> ser | name: dgftp | Pass <u>w</u> ord | : ••••• Port: Quickconnect V | | | | | | | |
| Status: Connecting to 192.16 | 8.11.42:21 | | ^ | | | | | | | |
| Status: Connection establish | ed, waiting for we | Icome message | | | | | | | | |
| Status: Insecure server, it does Status: Server does not support | ort non-ASCII cha | racters. | File size in disk • 2 147 [CR] | | | | | | | |
| Status: Logged in | | | Maximum file in disk : 118 File | | | | | | | |
| Status: Retrieving directory li | sting | | Total file in disk : 2 File | | | | | | | |
| Status: Directory listing of "/ | F002GB" successfu | | | | | | | | | |
| | | Login Success | | | | | | | | |
| | | | Current directory name is file | | | | | | | |
| Local site: D:\Temp\ | | ~ | Remote site: /F002GB SIZE IN FTP Server storage | | | | | | | |
| 😥 🔒 🔒 Refdesign | | ^ | ······································ | | | | | | | |
| | | | F002GB | | | | | | | |
| System Volume | Information | | | | | | | | | |
| Temp | | ~ | Display files in | | | | | | | |
| | in Clatera | Last an ell'Card | FIP Server storage | | | | | | | |
| Filename Files | ize Filetype | Last modified | Filename Filesize Filetype Last modified | | | | | | | |
| | | | | | | | | | | |
| 0000000.BIN 2,147,483, | 6 BIN File | 1/16/2020 11:21 | 0000000.BIN 2,147,483,648 BIN File 11/11/2019 9:02:08 PM | | | | | | | |
| 0000001.BIN 2,147,483, | 6 BIN File | 1/16/2020 11:26 | 0000001.BIN 2,147,483,648 BIN File 11/11/2019 9:02:08 PM | | | | | | | |
| 0000002.BIN 2,147,483, | 6 BIN File | 1/16/2020 11:26 | | | | | | | | |
| 0000003.BIN 2,147,483, | 6 BIN File | 1/16/2020 11:27 | | | | | | | | |
| 0000004.BIN 2,147,483, | 6 BIN File | 1/16/2020 11:36 | | | | | | | | |
| 0000005.BIN 2,147,483, | 6 BIN File | 1/16/2020 11:47 | Current time created : 11/11/2019, 14:02:08 | | | | | | | |
| < | | > | Press 'y' to change time created => n | | | | | | | |
| 6 files. Total size: 12 004 001 000 b | ter | | 2 files. Tetal size: 4 204 067 206 butes | | | | | | | |
| o files. Total size: 12,884,901,888 b | rtes | | 2 Tiles. Total size: 4,294,907,290 bytes | | | | | | | |
| - | | | | | | | | | | |

Figure 4-1 Login FTP server

After finishing to set server parameter, the console shows logged in successful. Directory name shows file size set in the storage. In the example, File size is 2 GB, so directory name is F002GB. If FTP storage is not empty, file lists in the storage are displayed. The modified date and time of the file is equal to time created, set during initialization phase.

<u>Note</u>: FTP client reads time zone from FTP server as UTC+0 time zone, but the time displayed on FTP client is adjusted to user's time zone. In the example, when created time in initialization is 14:02, modified time on FTP client is 21:02 (user's time zone is UTC+7).



4.2 Upload file

To upload file to FTP Server from Test PC by using FileZilla, user must prepare the uploaded file on Test PC. The status during uploading can be monitored on FileZilla for FTP client side and NiosII command shell for FTP server side. The step for uploading file is as follows.

- 1. Select the uploaded file in Test PC. The limitation of the uploaded file is as follows.
 - a. File name is XXXXXX.BIN (X is hex value). The value of uploaded file name must be equal or less than the next value of the latest file in FTP server storage. In Figure 4-2, the latest file is 0000001.BIN, so, the uploaded file must be 0000002.BIN or less.
 - b. File size of the uploaded file name must be equal to FTP server directory name. In the example, F002GB supports only 2 GiB (1024x1024x1024 byte) file.
 - <u>Note:</u> (1) File size can be changed by format operation only.
 - (2) For the new disk, the 1st file name must be 0000000.BIN.
- 2. Right-click on the selected file and select "Upload", as shown in Figure 4-2.

User can select multiple files on Test PC to upload to FTP server.

| Local site: D:\Temp\ | | ~ | Remote site: | /F002GB | ~ |
|---|---|--|---|---|---|
| ···· <mark>··</mark> Temp ⊕··· <mark>··</mark> Temp_PH ⊕··· <mark>··</mark> Test13_4 ⊕··· <mark>··</mark> testccode | Ŷ | ^ ~ | |)02GB | |
| Filename Selection 0000000.BIN to F 00000001.BIN 1 00000002.BIN 2,147 00000003.BIN 2,147 00000004.BIN 2,147 0000005.BIN 2,147 | Filesize Filetype Filesize File to upload TP server 7,483,6 BIN File 7,483,6 BIN File 7,483,6 BIN File 7,483,6 BIN File 7,483,6 BIN File | Last modified 1/16/2020 11:21 1/16/2020 11:26 1/16/2020 11:26 Upload Add files to queue Open | Filename 0000000.Bl 0000001.Bl 2 Click Uplo | The latest file is 0000001.BIN, so the next file must be 0000002.BIN which has 2 GB size. IIN 2,147,483,648 BIN File 11/11/2019 9:02:08 PM IIN 2,147,483,648 BIN File 11/11/2019 9:02:08 PM | |
| Selected 1 file. Total size: 2,14 | 47,483,648 bytes | Edit | | ,294,967,296 bytes | > |
| Server/Local file | Direction R | Create directory Create directory and Refresh Delete Rename | d enter it | Priority Status | |
| Queued files Failed tran | sfers Successful trans | fers | | A Queue empty | |
| | | A | | Queue. empty | |

Figure 4-2 Upload file



During uploading process, user can monitor the progress on FileZilla or NiosII command shell.

- a. Current transfer size of each file is displayed on NiosII command shell every second.
- b. After finishing uploading file, transfer speed is displayed on NiosII command shell.
- c. On Filezilla, total time and successful message are displayed as status.
- d. The new uploaded file is available on FTP server storage. In the example, 0000002.BIN is available in the storage.

| | г | | | | | – Nios | ll commai | nd shell | | |
|---|---|--|---|---|---|----------------------------------|---|--|-------------------------------------|--------|
| 🔁 dgftp@192.168.1 | 1.42 - FileZilla | FileZilla | | /cygdrive/e/ | Altera/18.0 | L | | | 1 | - |
| <u>File E</u> dit <u>V</u> iew <u>T</u> r 1111 ▼ 💽 🎦 🗂 | ransfer <u>S</u> erver | Bookmarks H | elp <u>N</u> ew version a | [STOR] File [STOR] File [STOR] File | 0000002.BIN 0000002.BIN 0000002.BIN | <2.147 <2.147 <2.147 | [GB]> : [GB]> : [GB]> : | 71.225 [186.442 304.012 | MB] [MB] [MB] Display tra | ansfer |
| Host: 192.168.11.42 | <u>U</u> sernan | ne: dgftp | Pass <u>w</u> ord: | [STOR] File [STOR] File [STOR] File | 0000002.BIN 0000002.BIN 0000002.BIN | <2.147 <2.147 <2.147 | [GB]> : [GB]> : [GB]> : | 1.916 [G 2.032 [G 2.137 [G | B1 a B1 a B1 a | second |
| Status: Connection Status: Insecure s Status: Server do | on established, s erver, it does no es not support r | waiting for welcon ot support FTP ove oon-ASCII characte | ne message er TLS. ers. | [STOR] File Fotal = 2.14 | 0000002.BIN 7 [GB] , Ti | Comple me = 19 | te 082[ms], | Transfer | • speed = 112[M] | 8∕s] |
| Status: Logged in Status: Starting u Status: File transf Status: Retrieving Status: Directory | n pload of D:\Ten fer successful, tr g directory listin listing of "/F002 | np\0000002.BIN ansferred 2,147,48 g of "/F002GB" GB" successful | 3,648 bytes in 23 se | conds C FileZ | illa message | | | Display p finishing | performance after file transferring | |
| Local site: D:\Temp\ | | | ~ | Remote site: /F0 | 02GB | | | | × | |
| termine the second sec | design ire tem Volume Inf np | ormation | ^ ~ | | В | | | | | |
| Filename | Filesize | Filetype | Last modified | Filename | Filesize | Filetype | Last modifie | d | | |
| | 2,147,483,6 2,147,483,6 2,147,483,6 2,147,483,6 2,147,483,6 | BIN File BIN File BIN File BIN File BIN File | 1/16/2020 11:21 1/16/2020 11:26 1/16/2020 11:26 1/16/2020 11:27 1/16/2020 11:36 | 0000000.BIN 0000001.BIN 0000002.BIN | 2,147,483,648 2,147,483,648 2,147,483,648 | BIN File BIN File BIN File | 11/11/2019 9 11/11/2019 9 11/11/2019 9 d | 0:02:08 PM 0:02:08 PM 0:02:08 PM | | |
| 0000005.BIN | 2,147,483,6 | BIN File | 1/16/2020 11:47 | | 000002.8 | in is upit | | letely | | |
| < | | | > | < | | | | | > | |
| Selected 1 file. Total si | ze: 2,147,483,64 | 3 bytes | | 3 files. Total size: 6 | 5,442,450,944 byte | s | | | _ | |
| | | | | | | | | | | |

Figure 4-3 Status message during uploading file

e. As shown in Figure 4-4, when directly connecting SATA device which is FTP server storage to the PC, the new file shows modified date similar to time created of the demo.

| Gurrent Press ' | time created y' to change t | : <u>11/11/2019,</u> ime created | 14:02:08 > n | |
|------------------------|---|--|-------------------------|----|
| Organize | New | Open | Select | |
| > DG_exFAT (F:) > DIR0 | 00 | マ ひ Search D | IR000 | Ą |
| Name | Date modified | Туре | Size | |
| 0000000.BIN | 9/24/2018 5:35 P | M BIN File | 2,097,152 | KB |
| 0000001.BIN | 9/24/2018 5:35 P | BIN File | 2,097,152 | KB |
| 0000002.BIN | 11/11/2019 2:02 | PM BIN File | 2,097,152 | KB |
| F | ile is stored comp qual to time create | letely and modifie ed, set during initi | ed date is alization | |
| Figure | 4-4 Uploade | ed File in SA | TA device | |



4.3 Download file

To download file from FTP Server to Test PC, user selects the downloaded file on FTP server through FileZilla for storing the file to the destination folder on Test PC. The step for downloading file is as follows.

- 1. Select the downloaded file from FTP Server storage.
- 2. Right-click on the selected file and select "Download", as shown in Figure 4-5.

User can select multiple files for downloading from FTP server.

| Local site: D:\Temp\ ~ | | | | Remote site: | /F002GB | ~ | | |
|---|--|----------------------------------|---|--|--|--|--|--|
| New folder PIC Program Files (x86) Project ✓ | | | | <mark>?</mark> / <mark>_</mark> F0 | 02GB | | | |
| Filename 0000000.BIN 0000001.BIN | Filesize 2,147,483,6 2,147,483,6 | Filetype BIN File BIN File | Last modified 1/16/2020 11:21 1/16/2020 11:26 | Filename 0000000.B 0000001.B | Filesi Select File from FTP s IN 1 47,483,6 IN 2,147,482 4 | ize Filetvoe Last modified to download erver to Test PC 19 9:02:08 PM 448 BIN File 11/11/2010 0:02:08 PM | | |
| < 2 files. Total size: 4, | 294,967,296 bytes | | > | < Selected 1 file | . Total size: 2,1 ² | Add files to queue 2 View/Edit Click Download Create directory Create directory and enter it | | |
| Server/Local file Direction Remote file | | | | | Size Priority | Create new file Refresh Delete Rename | | |
| Queued files | Failed transfers | Successful trans | sfers (1) | | | Copy URL(s) to clipboard File permissions U Queue: empty | | |

Figure 4-5 Download file



During downloading file, user can monitor the progress on FileZilla or NiosII command shell like uploading process.

- a. Current transfer size of each file is displayed on NiosII command shell every second.
- b. After finishing downloading file, transfer speed is displayed on NiosII command shell.
- c. On Filezilla, total time and successful message are displayed as status.
- d. The new downloaded file is available on Test PC. In the example, 0000002.BIN is the new file downloaded from FTP server.

| | Niosll command shell | | | | | | | |
|--|--|-----|--|--|--|--|--|--|
| FileZilla | /cygdrive/e/Altera/18.0 | _ | | | | | | |
| Eile Edit View Iransfer Server Bookmarks Help New vers III IIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII | [RETR] File 0000002.BIN <2.147 [GB]> : 117.646 [MB] [RETR] File 0000002.BIN <2.147 [GB]> : 235.152 [MB] [RETR] File 0000002.BIN <2.147 [GB]> : 353.757 [MB] | r] | | | | | | |
| Host: 192.168.11.42 Username: dgftp Passw | Image: Constraint of the system Image: Constred of the system Image: Constredo | nd | | | | | | |
| Status: Retrieving directory listing of "/F002GB" Status: Directory listing of "/F002GB" successful Status: Connecting to 192.168.11.42:21 Status: Connection established, waiting for welcome message | | | | | | | | |
| Status: Insecure server, it does not support FTP over TLS. Status: Server does not support non-ASCII characters. Status: Logged in | Display performance after finishing file transferring | | | | | | | |
| Status: Starting download of /F002GB/0000002.BIN Status: File transfer successful, transferred 2,147,483,648 bytes in 2 | 2 seconds | | | | | | | |
| Local site: D:\Temp\ | Remote site: /F002GB | | | | | | | |
| PIC PIC Program Files (x86) Project | ► 7 / F002GB | | | | | | | |
| Filename Filesize Filetype Last modifie | Filename Filesize Filetype Last modified | | | | | | | |
| 0000000.BIN 2,147,483,6 BIN File 1/16/2020 11 0000000.BIN 2,147,483,6 BIN File 1/16/2020 11 | 21 0000000.BIN 2,147,483,648 BIN File 11/11/2019 9:02:08 PM | | | | | | | |
| 0000001.BIN 2,147,483,0 BIN File 1/16/202011 | 20 0000001.BIN 2,147,483,048 BIN File 11/11/2019 9:02:08 PM | | | | | | | |
| (d) 0000002.BIN 2,147,483,6 BIN File 1/16/2020 5:: (d) 0000002.BIN is downloaded completely | 1: 0000002.BIN 2,147,483,648 BIN File 11/11/2019 9:02:08 PM | | | | | | | |
| 4 | | | | | | | | |
| 3 files. Total size: 6,442,450,944 bytes | Selected 1 file. Total size: 2,147,483,648 bytes | | | | | | | |
| Figure 4-6 Downloading File | | | | | | | | |



5 Revision History

| Revision | Date | Description | |
|----------|----------|-------------------------|--|
| 1.0 | 7-Feb-20 | Initial version release | |