Application Note
FTP_Server Example

Version 1.0.0

For more information, visit our website at http://www.wiznet.io

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This Application Note covers the implementation of FTP Server on WIZnet's TOE Chip.

2 Github Link

https://github.com/WIZnet-ioNIC/WIZnet-PICO-C/tree/main/examples/ftp/server

3 Applicable products

Raspberry Pi Pico & WIZnet Ethernet HAT
W5100S-EVB-Pico
W5500-EVB-Pico
W55RP20-EVB-Pico
W5100S-EVB-Pico2
W5500-EVB-Pico2

4 How to Test FTP Server Example

4.1 Step 1: Prepare software

The following serial terminal program and FTP client are required for FTP Server example test, download and install from below links.

- **Tera Term**
- **WinSCP**

4.2 Step 2: Prepare hardware

If you are using W5100S-EVB-Pico, W5500-EVB-Pico, W55RP20-EVB-Pico, W5100S-EVB-Pico2 or W5500-EVB-Pico2, you can skip '1. Combine...'

1. Combine WIZnet Ethernet HAT with Raspberry Pi Pico.
2. Connect ethernet cable to WIZnet Ethernet HAT, W5100S-EVB-Pico, W5500-EVB-Pico, W55RP20-EVB-Pico, W5100S-EVB-Pico2 or W5500-EVB-Pico2 ethernet port.
3. Connect Raspberry Pi Pico, W5100S-EVB-Pico or W5500-EVB-Pico to desktop or laptop using 5 pin micro USB cable. W55RP20-EVB-Pico, W5100S-EVB-Pico2 or W5500-EVB-Pico2 require a USB Type-C cable.

4.3 Step 3: Setup FTP Server Example

To test the FTP Server example, minor settings shall be done in code.

1. Setup SPI port and pin in 'w5x00_spi.h' in 'WIZnet-PICO-C/port/ioLibrary_Driver/' directory.

Setup the SPI interface you use.

- If you use the W5100S-EVB-Pico, W5500-EVB-Pico, W5100S-EVB-Pico2 or W5500-EVB-Pico2,

```
/* SPI */
#define SPI_PORT spi0

#define PIN_SCK 18
#define PIN_MOSI 19
#define PIN_MISO 16
#define PIN_CS 17
#define PIN_RST 20
```

- If you want to test with the FTP Server example using SPI DMA, uncomment USE_SPI_DMA.

```
/* Use SPI DMA */
//#define USE_SPI_DMA // if you want to use SPI DMA, uncomment.
```

- If you use the W55RP20-EVB-Pico,

```
/* SPI */
#define USE_SPI_PIO

#define PIN_SCK 21
#define PIN_MOSI 23
#define PIN_MISO 22
#define PIN_CS 20
#define PIN_RST 25
```

2. Setup network configuration such as IP in ' w5x00_ftp_server.c', which is the FTP Server example in 'WIZnet-PICO-C/examples/ftp/server' directory.

- Setup IP, other network settings to suit your network environment.

```
/* Network */
static wiz_NetInfo g_net_info =
    {
        .mac = {0x00, 0x08, 0xDC, 0x12, 0x34, 0x56}, // MAC address
        .ip = {192, 168, 11, 2},                     // IP address
        .sn = {255, 255, 255, 0},                    // Subnet Mask
        .gw = {192, 168, 11, 1},                     // Gateway
        .dns = {8, 8, 8, 8},                         // DNS server
```

```
        .dhcp = NETINFO_STATIC          // DHCP enable/disable
};
```

3. Setup FTP Server configuration in 'ftpd.h' in 'WIZnet-PICO-C/libraries/ioLibrary_Driver/Internet/FTPServer' directory.

```
#define IPPORT_FTP  21  /* FTP Control port */
```

4.4 Step 4: Build

1. After completing the FTP Server example configuration, click 'build' in the status bar at the bottom of Visual Studio Code or press the 'F7' button on the keyboard to build.
2. When the build is completed, 'w5x00_ftp_server.uf2' is generated in 'WIZnet-PICO-C/build/examples/ftp/server' directory.

4.5 Step 5: Upload and Run

1. While pressing the BOOTSEL button of Raspberry Pi Pico, W5100S-EVB-Pico, W5500-EVB-Pico, W55RP20-EVB-Pico, W5100S-EVB-Pico2 or W5500-EVB-Pico2 power on the board, the USB mass storage 'RPI-RP2' is automatically mounted.

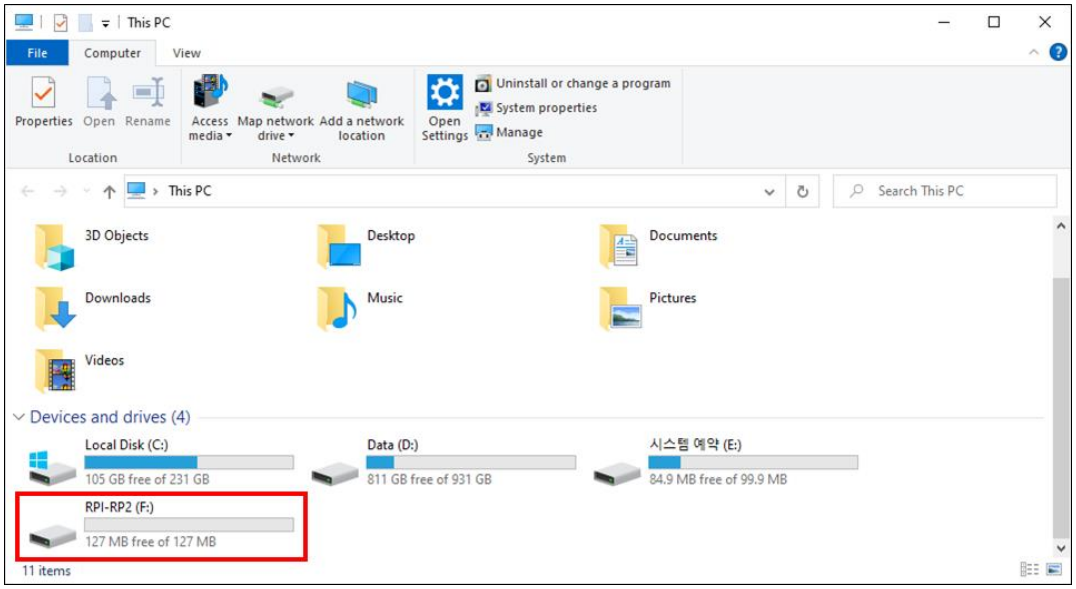

Figure 1. USB mass storage

2. Drag and drop ' w5x00_ftp_server.uf2' onto the USB mass storage device 'RPI-RP2'.

3. Connect to the serial COM port of Raspberry Pi Pico, W5100S-EVB-Pico, W5500-EVB-Pico, W55RP20-EVB-Pico, W5100S-EVB-Pico2 or W5500-EVB-Pico2 with Tera Term

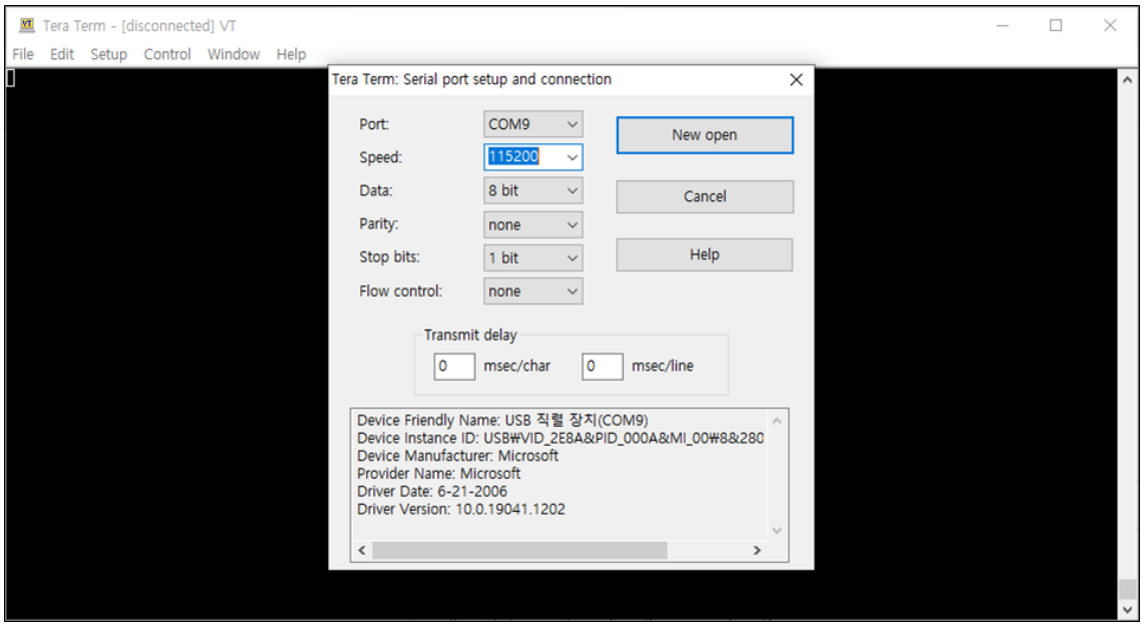

Figure 2. Tera Term

4. Reset your board.
5. If the FTP Server example works normally on Raspberry Pi Pico, W5100S-EVB-Pico, W5500-EVB-Pico, W55RP20-EVB-Pico, W5100S-EVB-Pico2 or W5500-EVB-Pico2, you can see the network information of Raspberry Pi Pico, W5100S-EVB-Pico, W5500-EVB-Pico, W55RP20-EVB-Pico, W5100S-EVB-Pico2 or W5500-EVB-Pico2 and the FTP server is open.

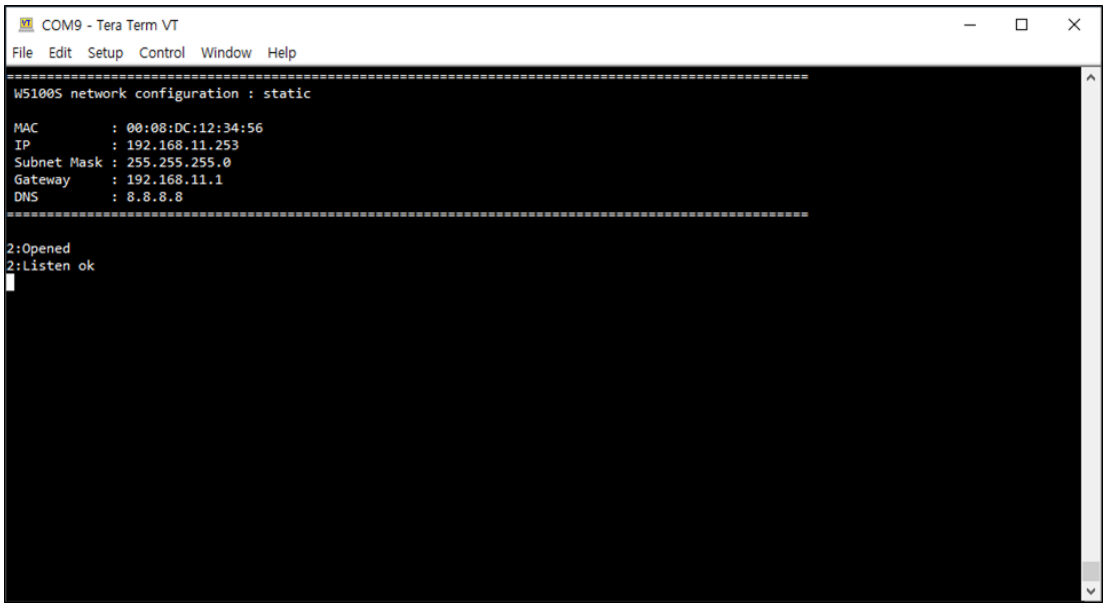

Figure 3. Network Information

6. Run WinSCP to be used as the FTP client.

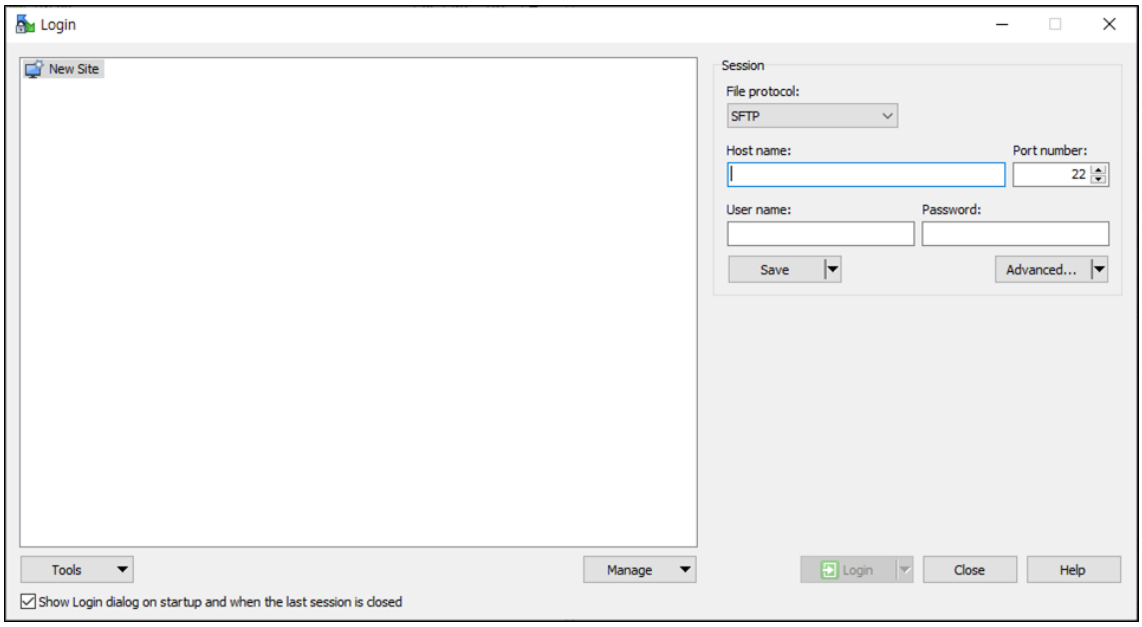

Figure 4. Run WinSCP

7. Connect to the open FTP server using WinSCP. When connecting to the FTP server, you need to select FTP from the 'File protocol' session and enter IP that was configured in Step 3, the port is 21 by default. After completing the setup, click the 'Login' button.

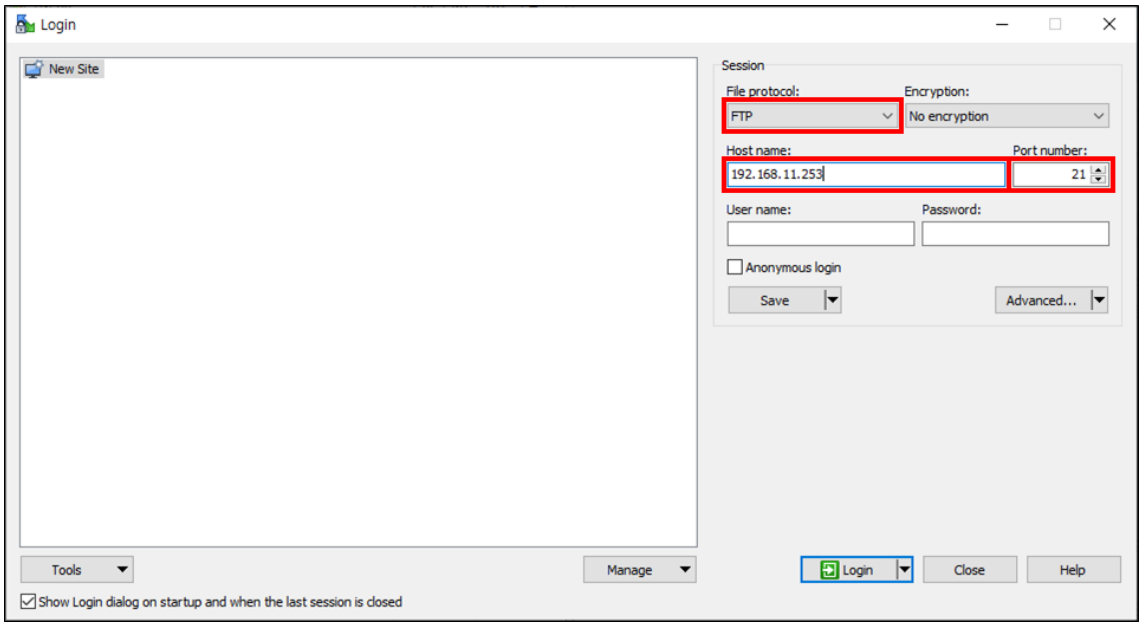

Figure 5. Enter FTP server IP or HOST name and Port

8. Click 'OK' button without entering the user name and password.

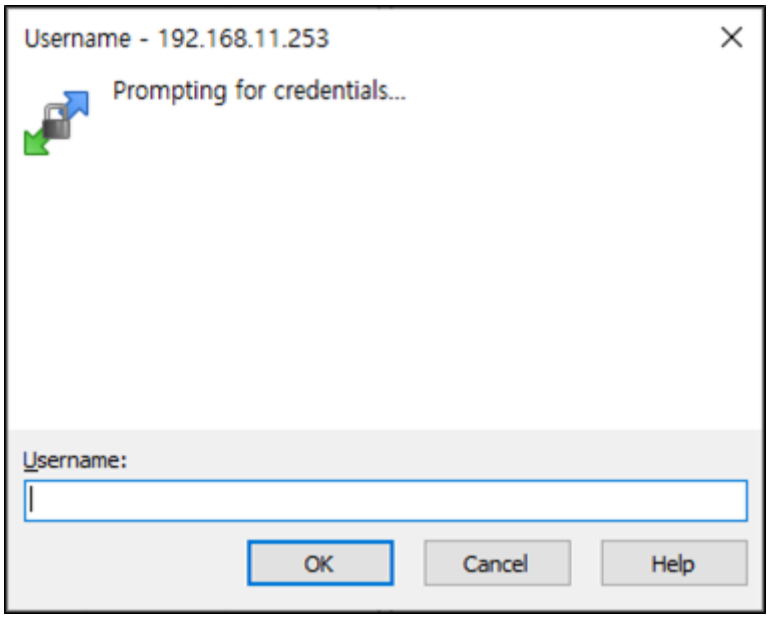

Figure 7. Enter User name

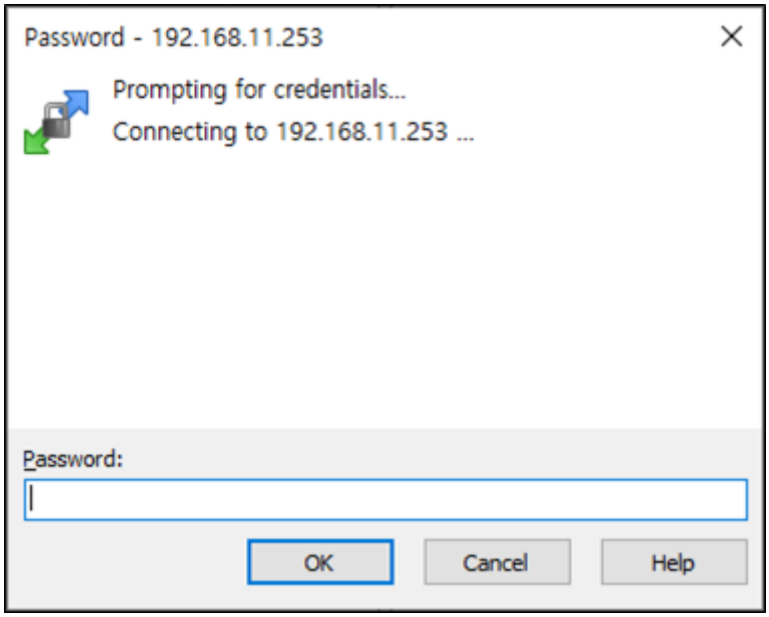

Figure 6. Enter Password

9. After all actions are completed, you should be able to connect to FTP server.

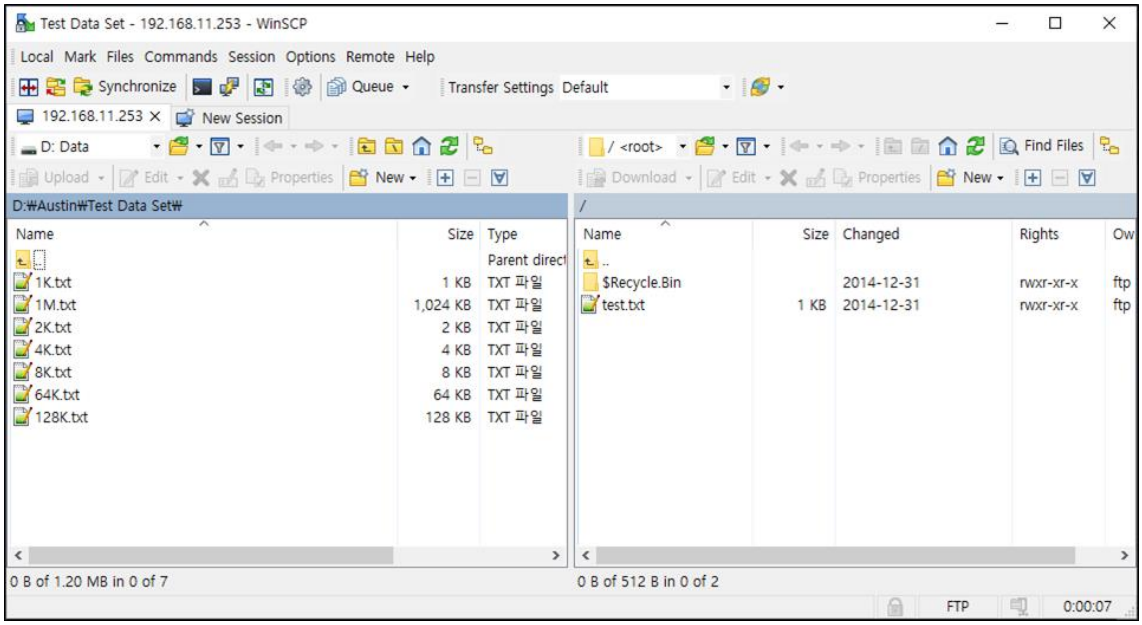

Figure 8. Connect to FTP Server 1

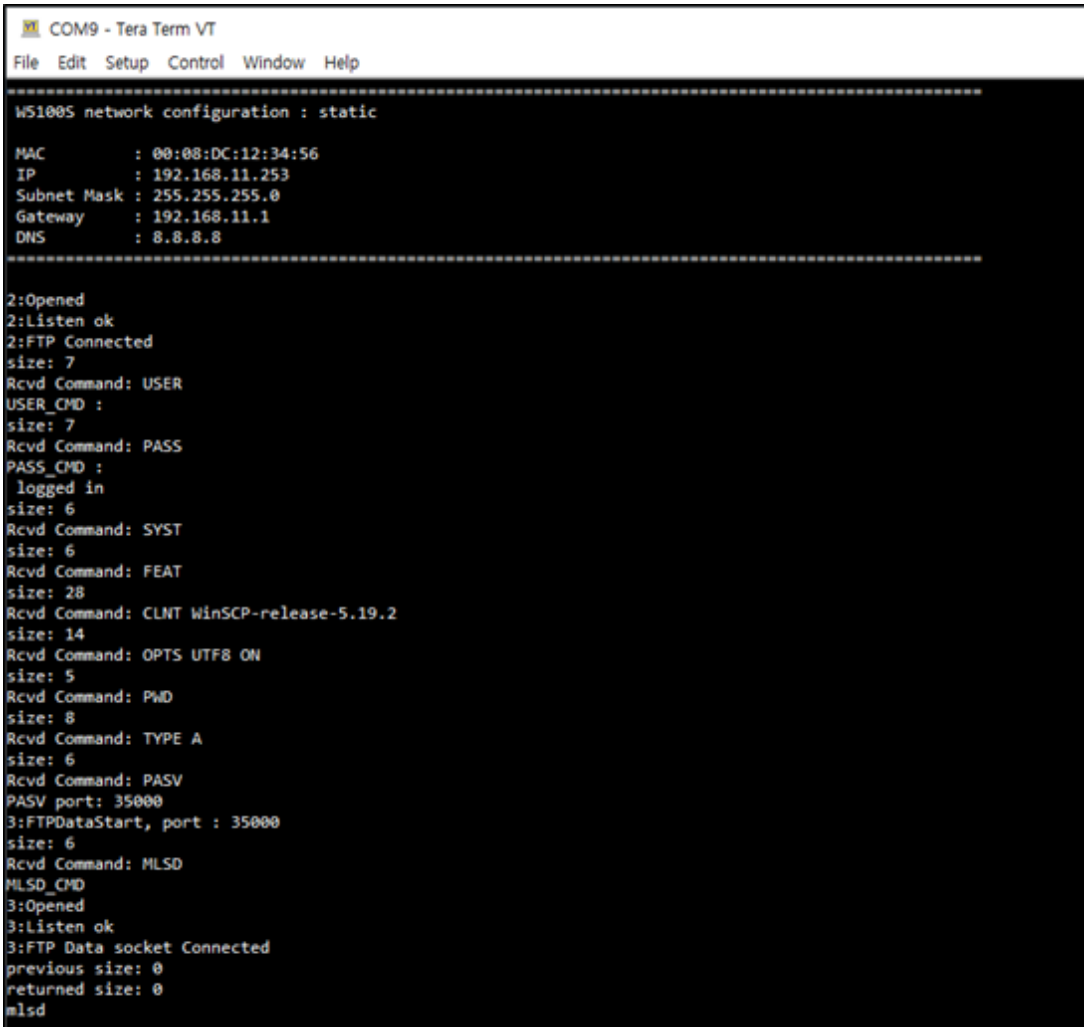

Figure 9.Connect FTP Server 2

10. Let's try to download file from FTP server to FTP client, you should be able to get results similar to below.

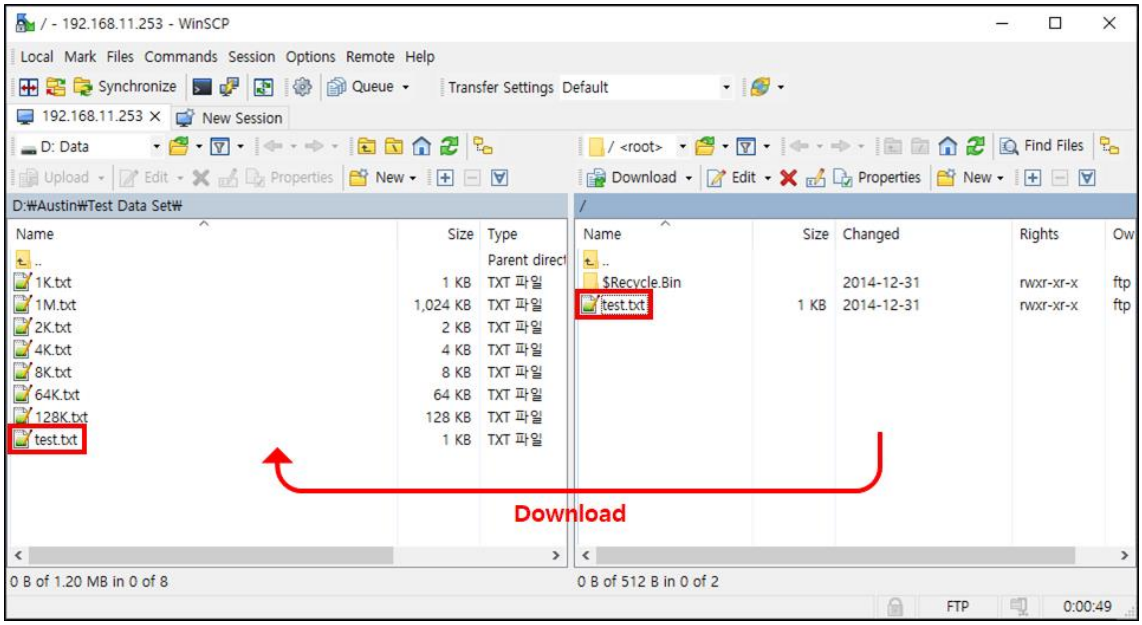

Figure 10. Download selected remote file to local directory 1

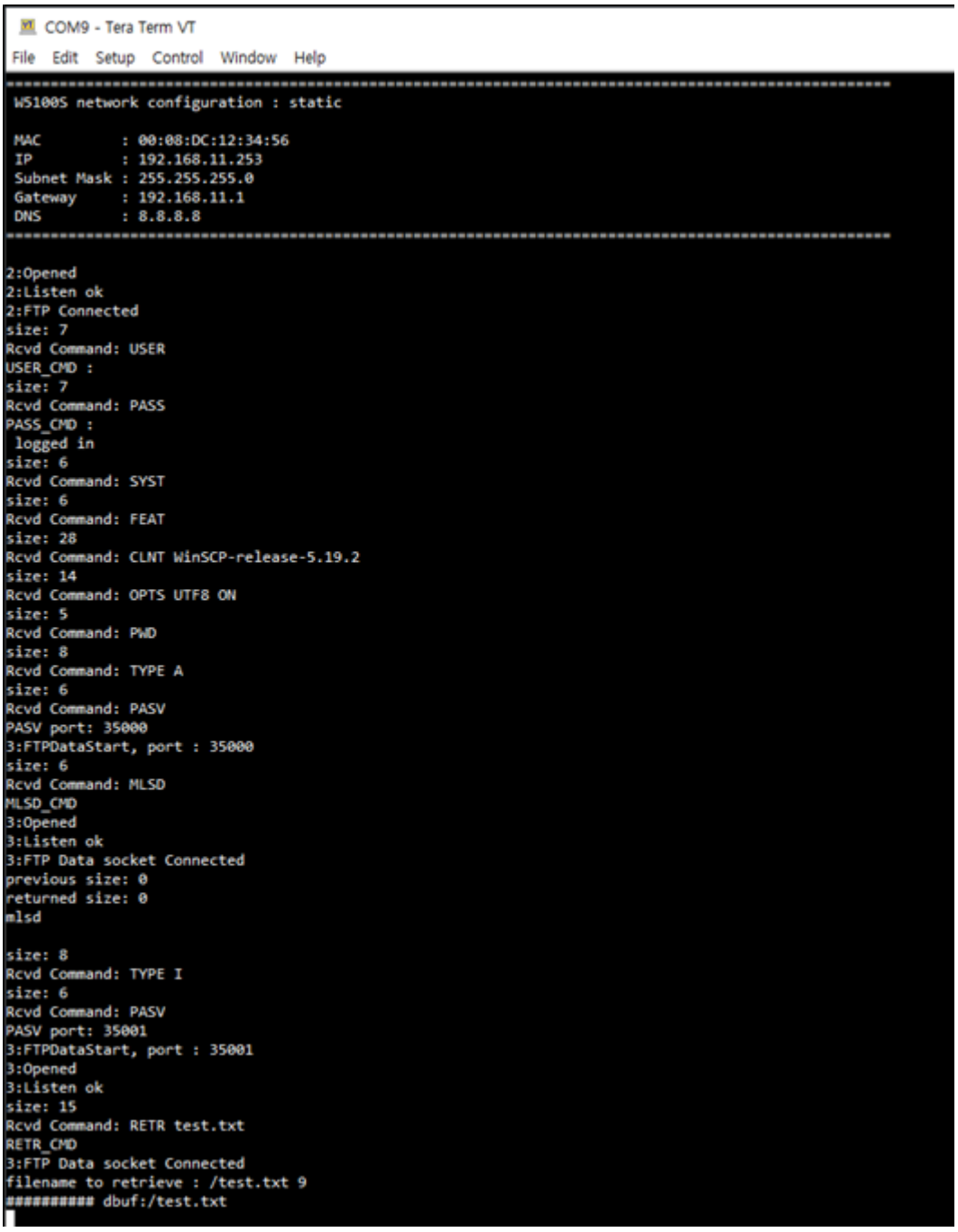

Figure 11. Download selected remote file to local directory 2

11. Now, let's try to upload file from FTP client to FTP server, you should be able to see the contents of the uploaded file printed in terminal.

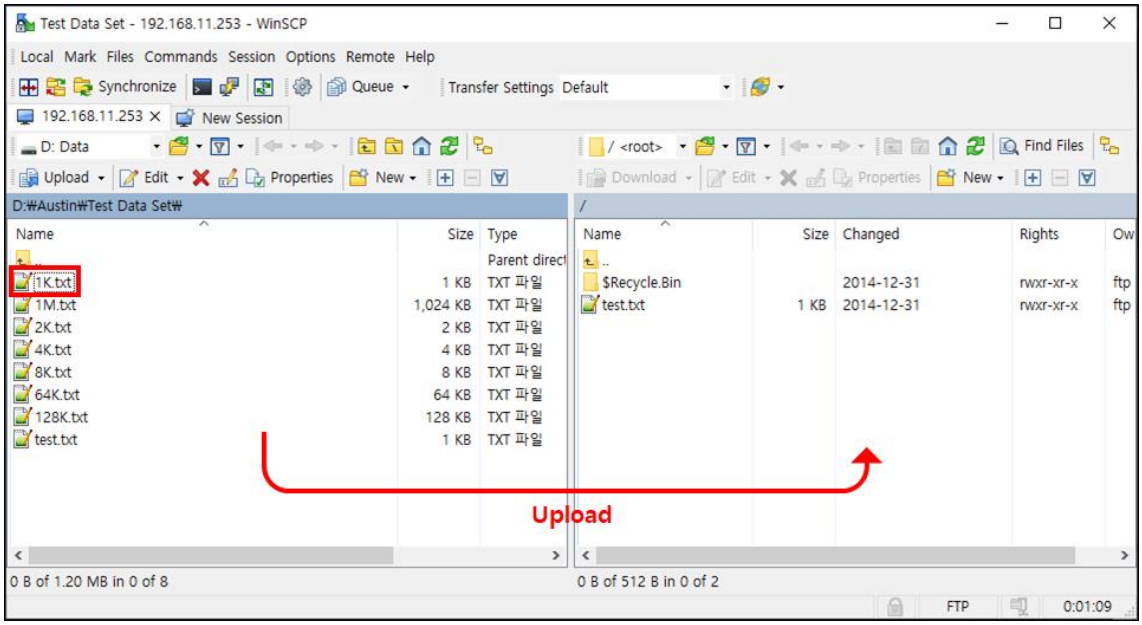

Figure 12. Upload selected local file to remote directory 1

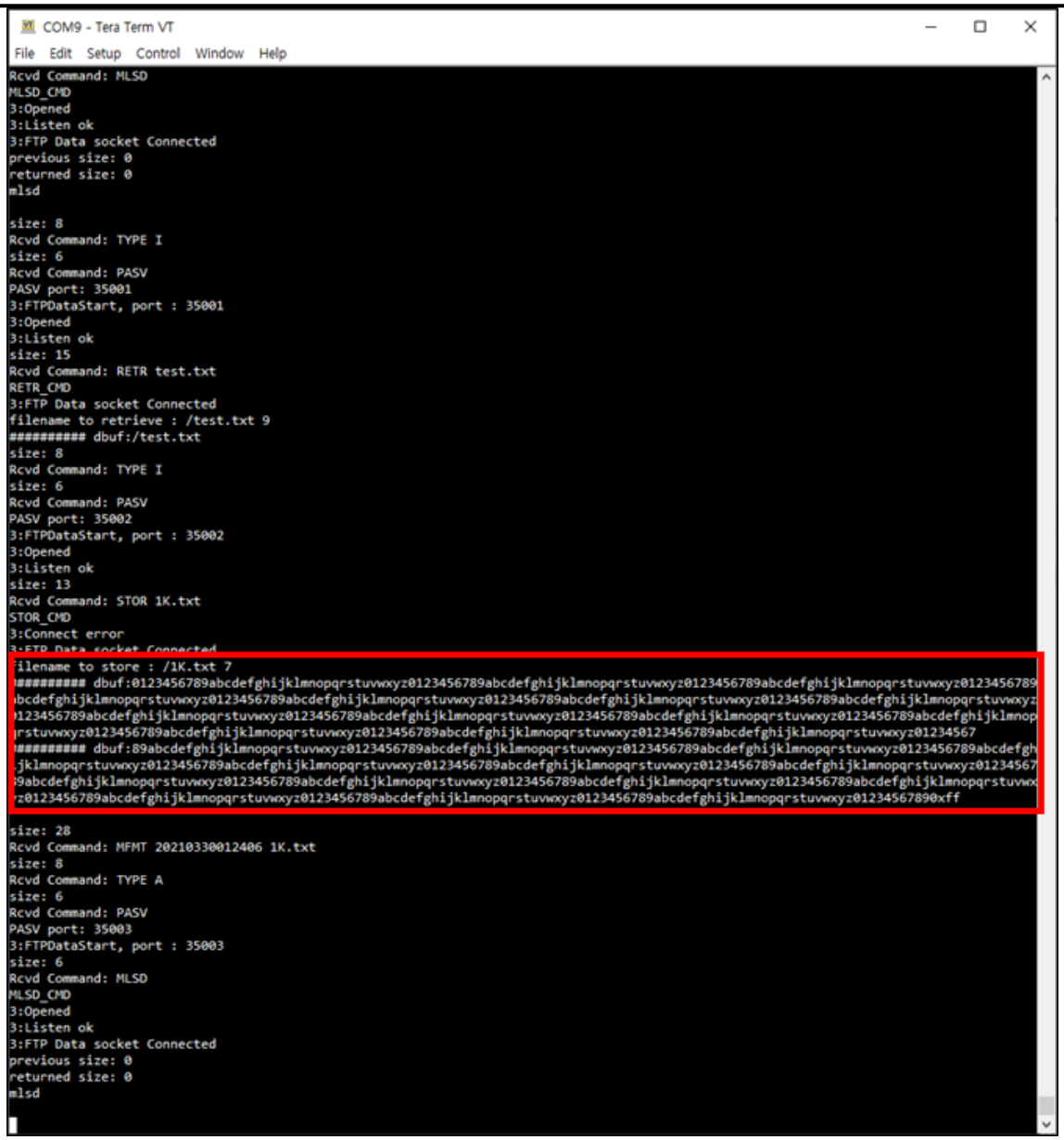

Figure 13. Upload selected local file to remote directory 2

Revision history

Version	Date	Descriptions
Ver. 1.0.0	Nov, 2024	Initial release.

Table 1. Revision history

Technical Support: https://forum.wiznet.io/

Sales & Distribution: sales@wiznet.io

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