Iteration Test Plan

This document contains the test plan used to ensure compliance with the TFTP standard (RFC 1350). A description of the command line arguments and CLI commands available to each component is also included.

**Description of Command Line Arguments and CLI commands**

**Client command line arguments**

-t Enable test mode (transfers pass through the error simulator)

-q Enable quiet logging mode

**Client CLI commands**

help Prints this message

read <file> [destination] Reads a file from a tftp server to the current working directory.

Optionally, the local destination file path may be specified.

write <file> Writes a file from the current working directory to a tftp server

shutdown Exits the client

**Server CLI commands**

help Prints this message

shutdown Exits the server

destination set the folder for the server to write files to

**Error Simulator CLI commands**

|  |  |
| --- | --- |
| help | Prints a help message |
| shutdown | Exits the simulator |
| norm | Forward packets through without alteration |
| rend | Removes the end byte of the next request packet. Ie Removes the 0 Byte after Mode |
| rrs | Removes the Request Seperator of the next request packet. ie Removes 0 Byte after Filename |
| mode <mode> | Changes the mode of the next request packet, <mode> should be a string to use as a replacement |
| csa <type> <packetNum> | Changes the sender TID of a specified packet |
| op <type> <packetNum> <opCode> | Changes the opcode of the specified packet |
| cl <type> <packetNum> <packetLen> | Changes the length of a specified packet |
| delay <type> <packetNum> <numTimeouts> | Delays the specified packet by a number of  timeouts |
| duplicate <type> <packetNum> | Sends a duplicate of the specified packet |
| drop <type> <packetNum> | Drops the specified packet |

**Basic Transfer Tests (Iteration 1)**

File Sizes:

0 byte

200 byte

512 byte

2048 byte

100 000 byte

After each transfer the following checks will be performed:

1.Ensure that the MD5 checksum of the file at the source and destination match

2.Attempt to move the file out of the source and destination directories to ensure the file is not in use

**Test Set Up**

Ensure that the server and client run in different directories. This is the case in Eclipse by default

1. Start the server

2. Start the client

3. Create a file in the server directory corresponding to each of the file sizes listed below

**Test Steps**

For each file:

1. Read the file using the client.

2. Write the file using the client.

**Concurrent Connections Tests**

The following will be repeated for both read and write

1. Start the server

2. Start one instance of the client

3. Start a second instance of the client

4. Start the transfer of a 1 MB file using the first client instance

5. Start the transfer of a small (200 byte) file using the second client instance while the first client is still running the transfer

6. Ensure that both transfers run to completion

**Independent Implementation Tests**

The purpose of these tests is to verify that the TFTP specification is followed by reading and writing files using an independent TFTP client and server

**Server**

1. Using an independent TFTP client, read a 2048 byte file

2. Using an independent TFTP client, write a 2048 byte file

**Client**

1. Using an independent TFTP server, read a 2048 byte file

2. Using an independent TFTP server, write a 2048 byte file

**Iteration 2**

1. Start the server

2. Start the error simulator

3. Start the client, providing it the -t command line option

4. Use the client to write a 2048 byte file

5. Use the client to read a 2048 byte file

6. Start the transfer of a file with the 'rend' command enabled

7. Start the transfer of a file with the 'norm' command enabled

8. Start the transfer of a file with the 'rrs' command enabled

9. For transfers with the 'mode' command enabled

1. Set the mode to '.'

2. Set the mode to 'netascii'

10. For transfers the 'csa' command enabled, set the packet number to:

1. 0

2. n = 1

2. n < 1

3. n < 0

4. n = 65536

11. For transfers with the 'op' command enabled:

1. Repeat packet number tests from step 9.

Set the op code to:

2. 255

3. 266

4. 32728

5. -32727

6. 32729

7. -32728

12. For transfers with the 'cl' flag enabled:

1. Repeat the packet number tests from step 9.

Set the packet length to:

2. 0

3. length < 0

4. length > 0

Perform the Concurrent Connections test with the –t option passed to both client

**Iteration 4**

**Error Code 1 Scenarios - File not Found**

**Case 1 - WRQ File not present in client directory**

1. Start the server
2. Start the client
3. Attempt to write a file from the client which does not exist in the client’s working directory
4. Ensure that the client CLI displays a message informing the user that the file could not be found
5. Ensure that the server did not receive a WRQ from the client

**Case 2 - RRQ File not present in server directory**

1. Start the server
2. Start the client
3. Attempt to read a file which does not exist in the server’s working directory
4. Ensure that the client CLI displays an error message informing the user that the file could not be found
5. Check the client logs to ensure that an Error packet with code 1 was received by the client

**Error Code 2 Scenarios - Access Violation**

**Case 3 - WRQ Write to a read-only folder on server**

1. Start the server
2. Start the client
3. Set up a directory which the current user does not have permissions to write to
4. Start a write transfer from the client. In the CLI command to start this transfer, specify the a filename in the directory from step 3 as the destination file name.
5. Check the server log to ensure that the transfer has stopped.
6. Ensure that the client CLI displays an appropriate error message (Access violation)
7. Check the client logs to ensure that an Error packet with code 2 was received by the client

**Case 4 - WRQ Write from a client directory without read permission**

1. Start the server
2. Start the client
3. Set up a directory which the current user does not have permissions to read from
4. Start a read transfer from the client. In the CLI command to start this transfer, specify a filename in the directory from step 3 as the source file name.
5. Check the server log to ensure that the server did not receive a WRQ packet
6. Ensure that the client CLI displays an appropriate error message (Access violation)

**Case 5 - RRQ Read from server directory without read permission**

1. Start the server
2. Start the client
3. Set up a directory which the current user does not have permissions to read from
4. Start a read transfer from the client. Specify a file which is inside the directory from step 3.
5. Ensure that the transfer terminates on the server side
6. Ensure that the client displays an appropriate error message (Access violation)
7. Check the client log to ensure that an Error packet with code 2 was received by the client

**Case 6 - RRQ Read to client directory without write permission**

1. Start the server
2. Start the client
3. Set up a directory which the current user does not have permissions to write to
4. Star a read transfer from the client. Specify the directory created in step 3 as the destination file name.
5. Ensure that the client displays an appropriate error message (Access violation)
6. Check the server log to ensure that the server did not receive a RRQ packet

**Error Code 3 Scenarios - Disk full or allocation exceeded**

Each of the following scenarios require the use of a disk which has very little space remaining. Such a disk can be created quickly using a small USB stick. Use fsutil to create a large empty file to occupy most remaining space.

**Case 7 - WRQ disk full**

1. Start the server
2. Start the client
3. Use the server’s *destination* command to set the output directory to a disk which is full
4. Start a write transfer from the client
5. Check the server log to ensure that the transfer has terminated with an appropriate error message
6. Ensure that an appropriate error message is displayed by the client
7. Check the client logs to ensure that an Error packet with code 3 was received by the client
8. Ensure that no empty or incomplete file exists in the server’s output directory

**Case 8 - RRQ disk full**

1. Start the server
2. Start the client
3. Start a read transfer. In the client CLI read command, specify a filename on a disk which is full as the optional destination filename
4. Ensure that the transfer on the client side has terminated with an appropriate error message
5. Ensure that the transfer on the server side has terminated with an appropriate error message
6. Check the server logs to ensure that an Error packet with code 3 was received
7. Check the destination path of the Client to ensure that no empty or incomplete file exists there

**Error Code 6 Scenarios - File already exists**

**Case 9 - WRQ file already exists on server**

1. Start the server
2. Start the client
3. Start a write transfer. Specify a file which already exists in the server’s output directory.
4. Ensure that the transfer on the server side has terminated with an appropriate error message
5. Ensure that the transfer on the client side has terminated with an appropriate error message
6. Check the client log to ensure that the client received an error message with code 6

**Case 10 - RRQ file already exists on client**

1. Start the server
2. Start the client
3. Start a read transfer. Specify a file which already exists in the client’s working directory.
4. Ensure that the transfer on the server side has terminated with an appropriate error message.
5. Ensure that the transfer on the client side has terminated with an appropriate error message.
6. Check the server log to ensure that an Error packet with code 6 was received by the Server