

## ECEN 602 Machine Problem 3

Test case 1: transfer a binary file of 2048 bytes and check that it matches the source file

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ ./server 1234
Socket created successfully.
Socket binding successful.
TFTP server listening for incoming connections...
Established connection with client having IP: (127.0.0.1)
Received data from client! Reading...
Parent
File to retrieve: {test1.bin}
Mode of Operation: {octet}
Handling Read Request!
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (1)
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (2)
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (3)
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (4)
Bytes read from file = (0)
Sending final data packet with block no: (5)!
ACK opcode = (4)
ACK Number = (5)
Bytes read from file = (0)
Sending final data packet with block no: (6)!
```

```
tftp> binary
tftp> get test1.bin
Received 2048 bytes in 0.0 seconds
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602$ cksum test1.bin
3133939865 2048 test1.bin
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602$ cksum test1.bin
3133939865 2048 test1.bin
```

Checksums match

Test case 2: transfer a binary file of 2047 bytes and check that it matches the source file

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ ./server 1234
Socket created successfully.
Socket binding successful.
TFTP server listening for incoming connections...
Established connection with client having IP: (127.0.0.1)
Received data from client! Reading...
Parent
File to retrieve: {test2.bin}
Mode of Operation: {octet}
Handling Read Request!
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (1)
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (2)
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (3)
Bytes read from file = (511)
Sending final data packet with block no: (4)!
ACK opcode = (4)
ACK Number = (4)
Bytes read from file = (0)
Sending final data packet with block no: (5)!
```

```
tftp> binary
tftp> get test2.bin
Received 2047 bytes in 0.0 seconds
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ cksum test2.bin
3892562195 2047 test2.bin
```

```
tftp> quit
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602$ cksum test2.bin
3892562195 2047 test2.bin
```

Test case 3: transfer a netascii file that includes two CR's and check that the resulting file matches the input file

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ ./server 1234
Socket created successfully.
Socket binding successful.
TFTP server listening for incoming connections...
Established connection with client having IP: (127.0.0.1)
Received data from client! Reading...
Parent
File to retrieve: {test3.bin}
Mode of Operation: {netascii}
Handling Read Request!
File not found in server! Error = (No such file or directory)
Reaped client handler: (29958)
Established connection with client having IP: (127.0.0.1)
Received data from client! Reading...
Parent
File to retrieve: {test3.txt}
Mode of Operation: {netascii}
Handling Read Request!
Reached EOF! Finished reading file.
Bytes read from file = (17)
Sending final data packet with block no: (1)!
ACK opcode = (4)
ACK Number = (1)
Reached EOF! Finished reading file.
Bytes read from file = (0)
Sending final data packet with block no: (2)!
```

```
tftp> get test3.txt
Received 17 bytes in 0.0 seconds
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602$ cksum test3.txt
1836882927 14 test3.txt
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ cksum test3.txt
1836882927 14 test3.txt
```

Test case 4: transfer a binary file of 34 MB and see if block number wrap-around works

These are the final packets received, with ack numbers within the allowed number. This shows the wrap-around works.

```
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (4096)
Bytes read from file = (0)
Sending final data packet with block no: (4097)!
ACK opcode = (4)
ACK Number = (4097)
Bytes read from file = (0)
Sending final data packet with block no: (4098)!
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ cksum test4.bin
2462200427 35651584 test4.bin
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602$ cksum test4.bin
2462200427 35651584 test4.bin
```

Test case 5: check that you receive an error message if you try to transfer a file that does not exist and that your server cleans up and the child process exits

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ ./server 1234
Socket created successfully.
Socket binding successfull.
TFTP server listening for incoming connections...
Established connection with client having IP: (127.0.0.1)
Received data from client! Reading...
Parent
File to retrieve: {test5.txt}
Mode of Operation: {netascii}
Handling Read Request!
File not found in server! Error = (No such file or directory)
Reaped client handler: (31700)
```

```
tftp> get test5.txt
Error code 1: No such file or directory
```

Test case 6: connect to the tftp server with three clients simultaneously and test that the transfers work correctly

```
tftp> get test6a.bin
Received 35651584 bytes in 3.9 seconds
```

```
tftp> get test6b.bin
Received 35651584 bytes in 4.3 seconds
```

```
tftp> get test6c.bin
Received 35651584 bytes in 3.3 seconds
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ cksum test6a.bin
2462200427 35651584 test6a.bin
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ cksum test6b.bin
2462200427 35651584 test6b.bin
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ cksum test6c.bin
2462200427 35651584 test6c.bin
```

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602$ cksum test6a.bin
2462200427 35651584 test6a.bin
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602$ cksum test6b.bin
2462200427 35651584 test6b.bin
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602$ cksum test6c.bin
2462200427 35651584 test6c.bin
```

Test case 7: terminate the tftp client in the middle of a transfer and see if your tftp server recognizes after 10 timeouts that the client is no longer there

```
ACK opcode = (4)
ACK Number = (12620)
Bytes read from file = (512)
ACK opcode = (4)
ACK Number = (12621)
Bytes read from file = (512)
Timeout occurred. Sending data packet (12622) again! Timeout number: (1)
Timeout occurred. Sending data packet (12622) again! Timeout number: (2)
Timeout occurred. Sending data packet (12622) again! Timeout number: (3)
Timeout occurred. Sending data packet (12622) again! Timeout number: (4)
Timeout occurred. Sending data packet (12622) again! Timeout number: (5)
Timeout occurred. Sending data packet (12622) again! Timeout number: (6)
Timeout occurred. Sending data packet (12622) again! Timeout number: (7)
Timeout occurred. Sending data packet (12622) again! Timeout number: (8)
Timeout occurred. Sending data packet (12622) again! Timeout number: (9)
Timeout occurred. Sending data packet (12622) again! Timeout number: (10)
10 timeouts occurred. Client not present. Disconnecting!
Reaped client handler: (35117)
```

```
tftp> binary
tftp> get test4.bin
^C
tftp>
```

Bonus test cases:

```
(base) ben@ben-Latitude-7420:~/Documents/School/Classes/ECEN602/MP3/repo/ECEN-602-Machine-Problems$ ./server 1234
Socket created successfully.
Socket binding successfull.
TFTP server listening for incoming connections...
Established connection with client having IP: (127.0.0.1)
Received data from client! Reading...
Parent
File Name is: (test1.bin)
File length is: (9)
Mode is: {octet}
17767
Data opcode = (3)
Data Number = (1)
Buff 0: 00
Buff 1: 04
Buff 2: 00
Buff 3: 01
Data opcode = (3)
Data Number = (2)
Buff 0: 00
Buff 1: 04
Buff 2: 00
Buff 3: 02
Data opcode = (3)
Data Number = (3)
Buff 0: 00
Buff 1: 04
Buff 2: 00
Buff 3: 03
Data opcode = (3)
Data Number = (4)
Buff 0: 00
Buff 1: 04
Buff 2: 00
Buff 3: 04
Data opcode = (3)
Data Number = (5)
Buff 0: 00
Buff 1: 04
Buff 2: 00
Buff 3: 05
tftp>
```

```
tftp> put test1.bin
Sent 2048 bytes in 0.0 seconds
tftp>
```