



Linnéuniversitetet

Kalmar Vaxjö

Report

Assignment 3

IDV701



Author: Sirwan Rasoul
Semester: Spring 2020
Email sr222qn

Contents

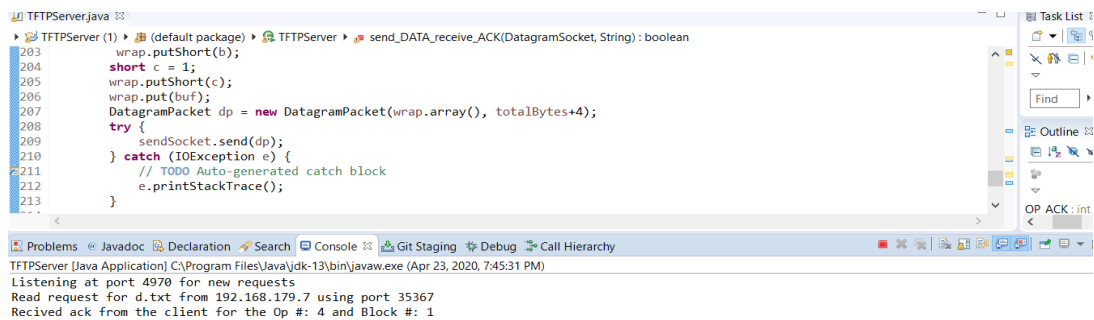
1 Problem 1	I
1.1 Discussion	II
2 Problem 2	III
2.1 Discussion	V
2.2 VG 1	V
2.2.1 Discussion	V
3 Problem 3	VI
3.1 Discussion	X
3.2 VG 2	X
3.2.1 Discussion	X

1 Problem 1

The following screenshots show the TFTP server on my windows laptop and build in client on ubuntu on my virtual machine.

In the first screenshot, it shows that the server successfully read the client request and sent the data that is requested.

In the second screenshot, it shows the client successfully received the file it requested.



```
TFTPServer.java
TFTPServer (1) ▶ (default package) ▶ TFTPServer ▶ send_DATA_receive_ACK(DatagramSocket, String) : boolean
203     wrap.putShort(b);
204     short c = 1;
205     wrap.putShort(c);
206     wrap.put(buf);
207     DatagramPacket dp = new DatagramPacket(wrap.array(), totalBytes+4);
208     try {
209         sendSocket.send(dp);
210     } catch (IOException e) {
211         // TODO Auto-generated catch block
212         e.printStackTrace();
213     }
214 }
```

Problems Javadoc Declaration Search Console Git Staging Debug Call Hierarchy

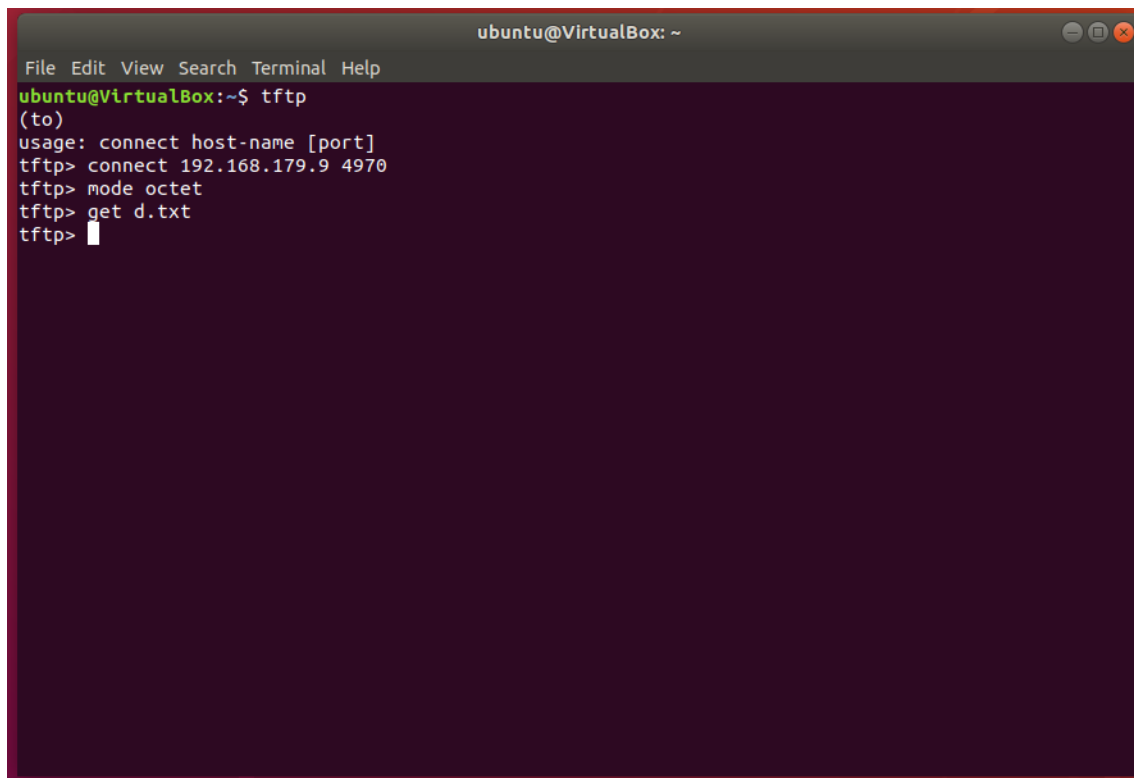
TFTPServer [Java Application] C:\Program Files\Java\jdk-13\bin\javaw.exe (Apr 23, 2020, 7:45:31 PM)

Listening at port 4970 for new requests

Read request for d.txt from 192.168.179.7 using port 35367

Recived ack from the client for the Op #: 4 and Block #: 1

TFTP Server Screenshot

A screenshot of a terminal window titled 'ubuntu@VirtualBox: ~'. The terminal shows the execution of the 'tftp' command. The prompt is 'ubuntu@VirtualBox:~\$ tftp', followed by '(to)'. Then, the user enters 'tftp> connect 192.168.179.9 4970', 'tftp> mode octet', 'tftp> get d.txt', and finally 'tftp>' with a cursor. The terminal has a dark purple background and a menu bar at the top with 'File Edit View Search Terminal Help'.

```
ubuntu@VirtualBox: ~
File Edit View Search Terminal Help
ubuntu@VirtualBox:~$ tftp
(to)
usage: connect host-name [port]
tftp> connect 192.168.179.9 4970
tftp> mode octet
tftp> get d.txt
tftp>
```

TFTP Client Screenshot

1.1 Discussion

The first socket is only to receive connections from the clients and it will always be ready for new connections.

The sendSocket is a thread and for each client, the main thread will assign a new thread with sendSocket for that client. Therefore the server can serve concurrent clients without a problem.

2 Problem 2

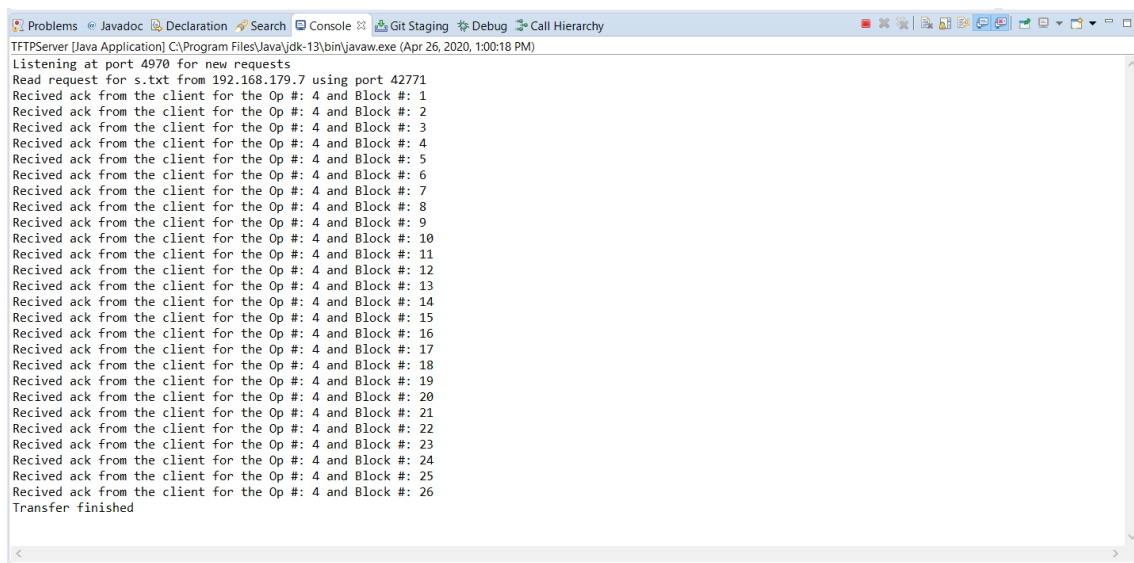
In the following screenshots, the server receives both read and write requests from the client and the file size is bigger than 516 bytes in both cases.

The first screenshot shows what happens when the client sends a read request for a file larger than 516 bytes, the server sends all data and Ack packets for each data packet.

The second screenshot shows that the client received the file successfully

The third screenshot shows a write request from the client for a file larger than 516 bytes and the server received data packets and sent Ack packets for each data packets.

The fourth screenshot shows the client successfully made a writ request.

A screenshot of a Java IDE's console window. The title bar shows 'Problems', 'Javadoc', 'Declaration', 'Search', 'Console', 'Git Staging', 'Debug', and 'Call Hierarchy'. The console text shows the TFTP server listening on port 4970, receiving a read request for 's.txt' from IP 192.168.179.7, and then sending 26 acknowledgment packets for blocks 1 through 26. The log ends with 'Transfer finished'.

```
TFTPServer [Java Application] C:\Program Files\Java\jdk-13\bin\javaw.exe (Apr 26, 2020, 1:00:18 PM)
Listening at port 4970 for new requests
Read request for s.txt from 192.168.179.7 using port 42771
Recived ack from the client for the Op #: 4 and Block #: 1
Recived ack from the client for the Op #: 4 and Block #: 2
Recived ack from the client for the Op #: 4 and Block #: 3
Recived ack from the client for the Op #: 4 and Block #: 4
Recived ack from the client for the Op #: 4 and Block #: 5
Recived ack from the client for the Op #: 4 and Block #: 6
Recived ack from the client for the Op #: 4 and Block #: 7
Recived ack from the client for the Op #: 4 and Block #: 8
Recived ack from the client for the Op #: 4 and Block #: 9
Recived ack from the client for the Op #: 4 and Block #: 10
Recived ack from the client for the Op #: 4 and Block #: 11
Recived ack from the client for the Op #: 4 and Block #: 12
Recived ack from the client for the Op #: 4 and Block #: 13
Recived ack from the client for the Op #: 4 and Block #: 14
Recived ack from the client for the Op #: 4 and Block #: 15
Recived ack from the client for the Op #: 4 and Block #: 16
Recived ack from the client for the Op #: 4 and Block #: 17
Recived ack from the client for the Op #: 4 and Block #: 18
Recived ack from the client for the Op #: 4 and Block #: 19
Recived ack from the client for the Op #: 4 and Block #: 20
Recived ack from the client for the Op #: 4 and Block #: 21
Recived ack from the client for the Op #: 4 and Block #: 22
Recived ack from the client for the Op #: 4 and Block #: 23
Recived ack from the client for the Op #: 4 and Block #: 24
Recived ack from the client for the Op #: 4 and Block #: 25
Recived ack from the client for the Op #: 4 and Block #: 26
Transfer finished
```

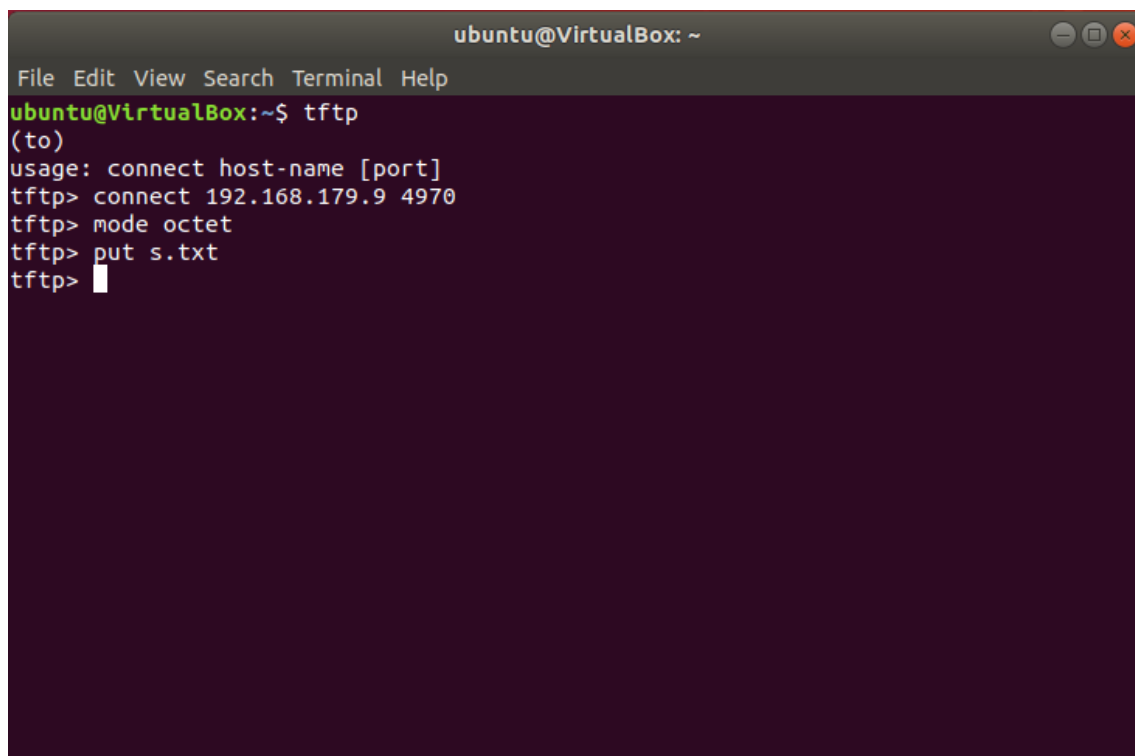
TFTP Server Read Request

```
ubuntu@VirtualBox: ~  
File Edit View Search Terminal Help  
ubuntu@VirtualBox:~$ tftp  
(to)  
usage: connect host-name [port]  
tftp> connect 192.168.179.9 4970  
tftp> mode octet  
tftp> get s.txt  
tftp> 
```

TFTP Client Read Request

```
Problems Javadoc Declaration Search Console Git Staging Debug Call Hierarchy  
TFTPServer [Java Application] C:\Program Files\Java\jdk-13\bin\javaw.exe (Apr 26, 2020, 1:02:08 PM)  
Listening at port 4970 for new requests  
Write request for s.txt from 192.168.179.7 using port 53860  
Sent ack for the client of the Op #: 4 and Block #: 0  
Sent ack for the client of the Op #: 4 and Block #: 1  
Sent ack for the client of the Op #: 4 and Block #: 2  
Sent ack for the client of the Op #: 4 and Block #: 3  
Sent ack for the client of the Op #: 4 and Block #: 4  
Sent ack for the client of the Op #: 4 and Block #: 5  
Sent ack for the client of the Op #: 4 and Block #: 6  
Sent ack for the client of the Op #: 4 and Block #: 7  
Sent ack for the client of the Op #: 4 and Block #: 8  
Sent ack for the client of the Op #: 4 and Block #: 9  
Sent ack for the client of the Op #: 4 and Block #: 10  
Sent ack for the client of the Op #: 4 and Block #: 11  
Sent ack for the client of the Op #: 4 and Block #: 12  
Sent ack for the client of the Op #: 4 and Block #: 13  
Sent ack for the client of the Op #: 4 and Block #: 14  
Sent ack for the client of the Op #: 4 and Block #: 15  
Sent ack for the client of the Op #: 4 and Block #: 16  
Sent ack for the client of the Op #: 4 and Block #: 17  
Sent ack for the client of the Op #: 4 and Block #: 18  
Sent ack for the client of the Op #: 4 and Block #: 19  
Sent ack for the client of the Op #: 4 and Block #: 20  
Sent ack for the client of the Op #: 4 and Block #: 21  
Sent ack for the client of the Op #: 4 and Block #: 22  
Sent ack for the client of the Op #: 4 and Block #: 23  
Sent ack for the client of the Op #: 4 and Block #: 24  
Sent ack for the client of the Op #: 4 and Block #: 25  
Sent ack for the client of the Op #: 4 and Block #: 26  
Sent ack for the client of the Op #: 4 and Block #: 27
```

TFTP Server Write Request

A screenshot of a terminal window titled 'ubuntu@VirtualBox: ~'. The window has a menu bar with 'File', 'Edit', 'View', 'Search', 'Terminal', and 'Help'. The terminal shows the following commands and output:

```
ubuntu@VirtualBox:~$ tftp
(to)
usage: connect host-name [port]
tftp> connect 192.168.179.9 4970
tftp> mode octet
tftp> put s.txt
tftp> 
```

TFTP Client Write Request

2.1 Discussion

I tested timeout and retransmission by setting the setSoTimeout to 1 millisecond, by doing that retransmission happened.

2.2 VG 1

Place your screenshots here

2.2.1 Discussion

3 Problem 3

Error Code 0 Not defined, see error message (if any):

I used this error code to happen when the client sends an invalid request to the server
The following screenshot shows the implementation of the error code.

```
private void HandleRQ(DatagramSocket sendSocket, String requestedFile, int opcode)
{
    if(opcode == OP_RRQ)
    {
        // See "TFTP Formats" in TFTP specification for the DATA and ACK packet contents

        boolean result = send_DATA_receive_ACK(sendSocket, requestedFile);

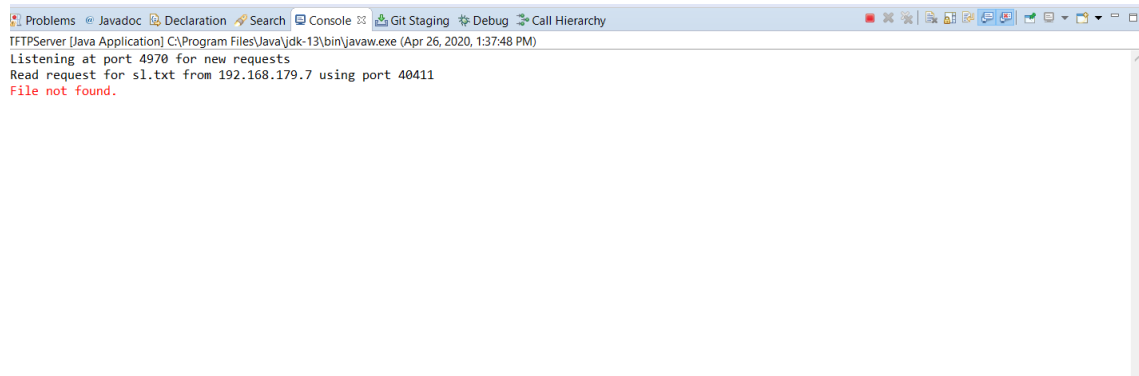
    }
    else if (opcode == OP_WRQ)
    {

        boolean result = receive_DATA_send_ACK(sendSocket, requestedFile);

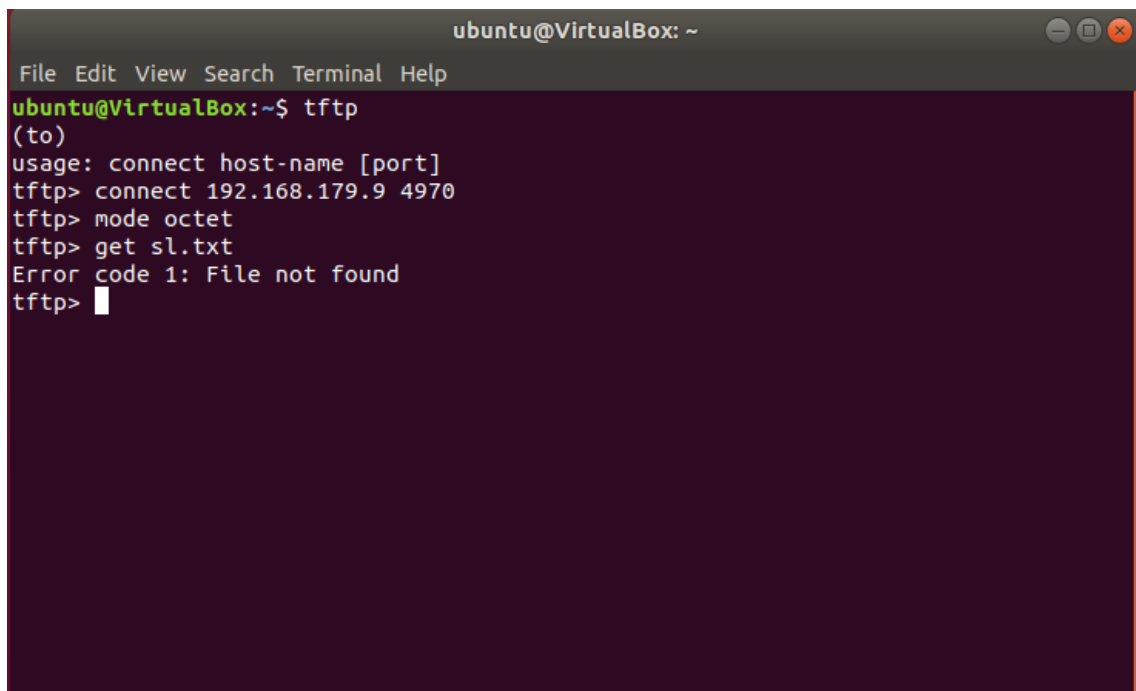
    }
    else
    {
        System.err.println("Invalid request. Sending an error packet.");
        // See "TFTP Formats" in TFTP specification for the ERROR packet contents
        String err = "Not defined, not valid request";
        send_ERR(sendSocket, 0, err);
        return;
    }
}
```


Error Code 1 File Not Found:

The following screenshots show that the client tries to make a read request for a file that not exist the server responds with an error packet of opcode 1.



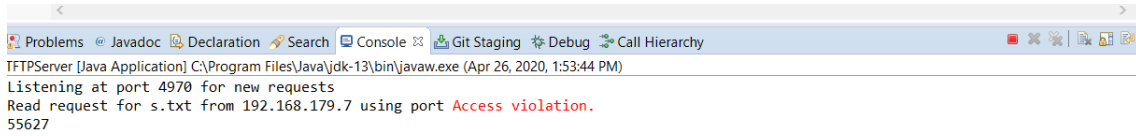
TFTP Server Sending Error Packet File Not Found



TFTP Client Receiving Error Packet File Not Found

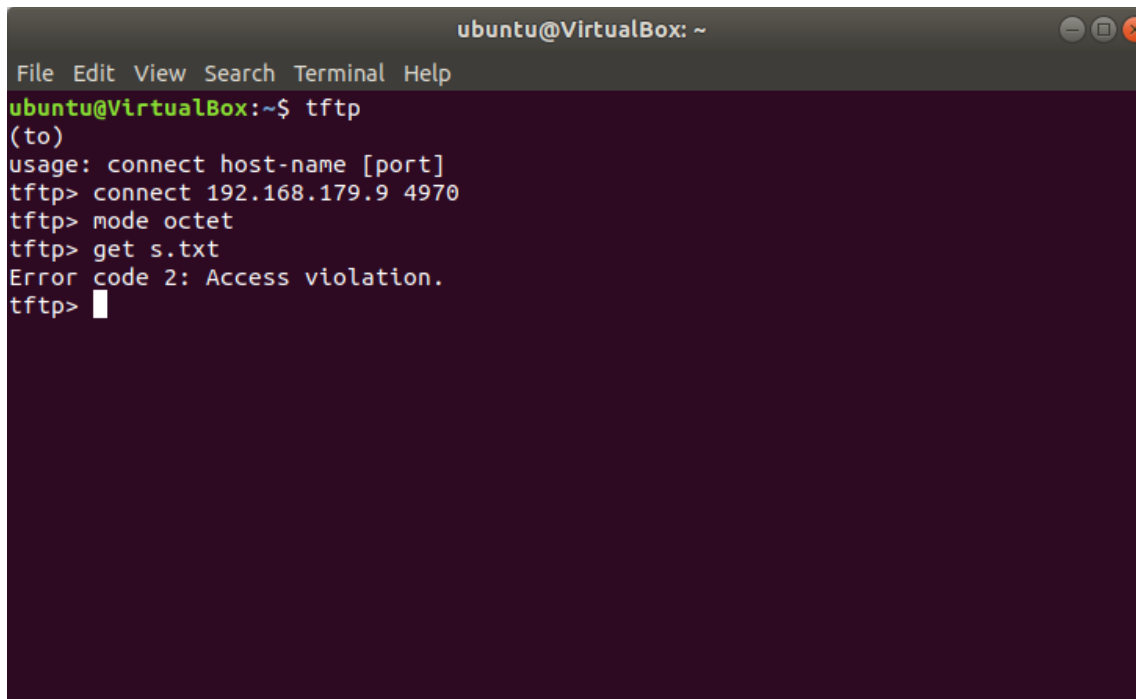
Error Code 2 Access Violation:

The following screenshots show that the client tries to make a read request for a file that has security issues(I changed the file's permissions), and the server responds with an error packet of opcode 2.



```
Problems Javadoc Declaration Search Console Git Staging Debug Call Hierarchy
TFTPServer [Java Application] C:\Program Files\Java\jdk-13\bin\javaw.exe (Apr 26, 2020, 1:53:44 PM)
Listening at port 4970 for new requests
Read request for s.txt from 192.168.179.7 using port Access violation.
55627
```

TFTP Server Sending Error Packet Access Violation

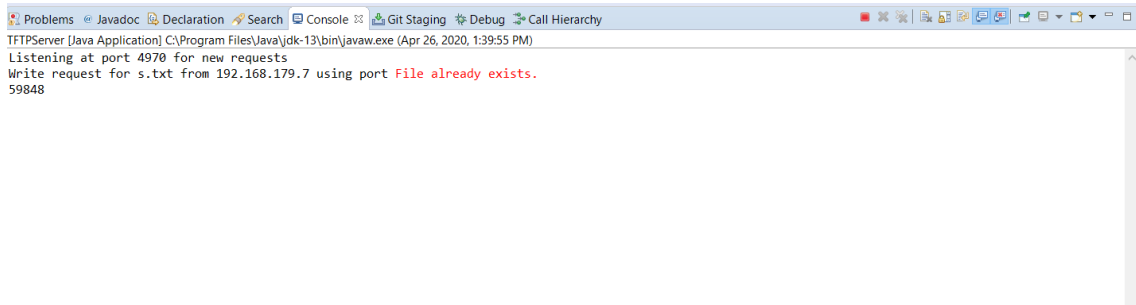


```
ubuntu@VirtualBox: ~
File Edit View Search Terminal Help
ubuntu@VirtualBox:~$ tftp
(to)
usage: connect host-name [port]
tftp> connect 192.168.179.9 4970
tftp> mode octet
tftp> get s.txt
Error code 2: Access violation.
tftp> 
```

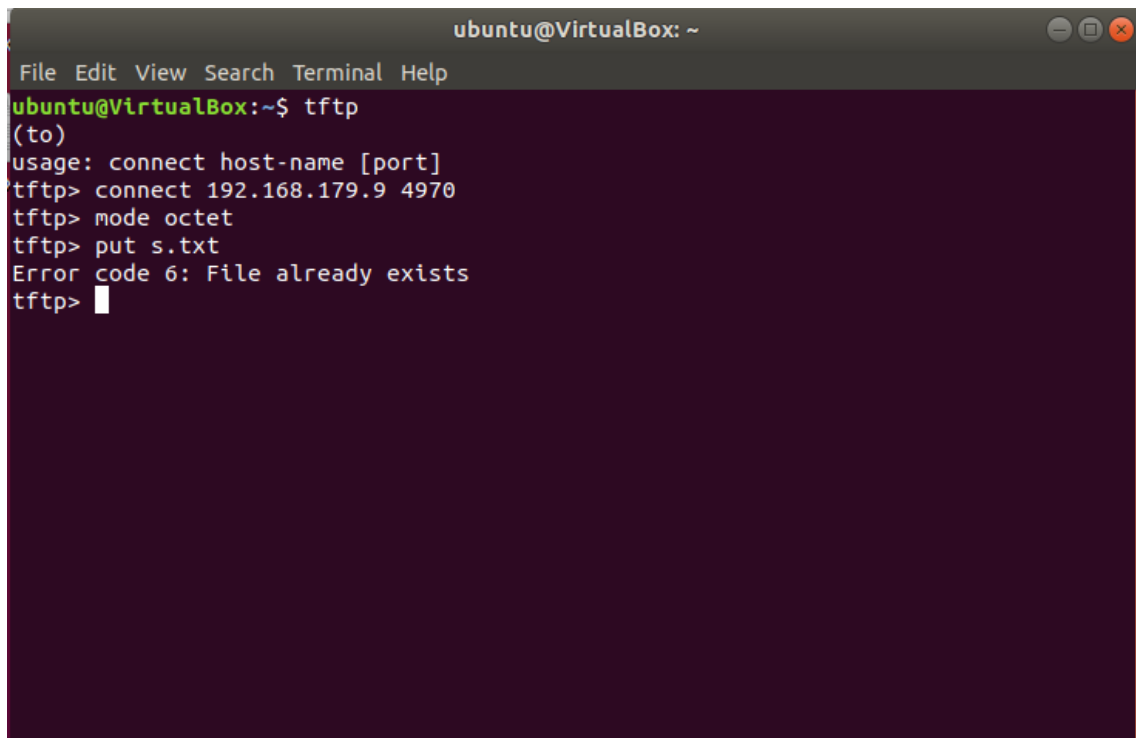
TFTP Client Receiving Error Packet Access Violation

Error Code 2 File Already Exists:

The following screenshots show that the client tries to make a write request for a file that already exists, and the server responds with an error packet of opcode 6.



TFTP Server Sending Error Packet File Already Exists



TFTP Client Receiving Error Packet File Already Exists

3.1 Discussion

3.2 VG 2

Place your screenshots here

3.2.1 Discussion