CS2911 Exercise:  
Trivial File Transfer Protocol (TFTP)

This exercise is intended to prepare you for lab 7. The answers should be completed by you and your lab partner and turned in with your lab.  
  
You may find it helpful to consult the TFTP specifications, RFC 1350  
<https://tools.ietf.org/html/rfc1350>

# TFTP Message Types

1. The TFTP protocol makes use of 5 message types. Search the RFC for the message types and fill in the following table (the first one has been done for you):

|  |  |  |
| --- | --- | --- |
| **TFTP Message Type** | **Op Code** | **Other Values in the Message** |
| Read Request (RRQ) | 1 | File name and Mode |
| Write Request (WRQ) | 2 | File name and Mode |
| Data (DATA) | 3 | Data |
| Acknowledgement (ACK) | 4 |  |
| Error (ERROR) | 5 | Error Message |

1. Write in hexadecimal shorthand a TFTP read request message for the file “myfile.txt” that is to be transferred in octet (binary) mode:  
     
   00 01 6D 79 66 69 6C 65 2E 74 78 74 00 6F 63 74 65 74 00
2. Write in hexadecimal shorthand a TFTP acknowledgement message for block 4 of a file transfer:  
     
   0004 0004 46 69 6c 65 20 6e 6f 74 20 66 6f 75 6e 64 2e 00
3. Write in hexadecimal shorthand a TFTP error message indicating that a file was not found. Choose your own appropriate error string:

0005 0001

# TFTP Transfer Modes

Using the TFTP RFC find the description of the transfer modes supported by TFTP and give a description of each. Give an example of when you’d use each transfer mode. You might need to   
search the internet for a more detailed explanation.  
  
Netascii is a modified version of ascii that allows for more characters. This gives users send and receive messages that a normal human can read without an interpreter.

Octet allows for the transfer of arbitrary raw 8-bit bytes, with the received file resulting byte-per-byte identical to the one sent. Some examples include images and videos.

Mail transfer mode uses Netascii transfer, but the file is sent to an email recipient by specifying that recipient's email address as the file name. RFC 1350 declared this mode of transfer obsolete.  
  
  
  
TFTP Connections and Guarantees

1. What transport protocol and port does TFTP use?  
   UDP, Port 69
2. Given the transport protocol what guarantees does TFTP provide?  
   The transport protocol contains two services host-to-host data delivery and error checking, it does not provide any guarantees.

# TFTP Error Messages

Search the TFTP RFC for the description of error messages.

1. Give a couple examples of errors that a TFTP client or server might send/receive:  
     
    Value Meaning

0 Not defined, see error message (if any).

1 File not found.

2 Access violation.

3 Disk full or allocation exceeded.

4 Illegal TFTP operation.

5 Unknown transfer ID.

6 File already exists.

7 No such user.

1. How does the TFTP RFC describe what should be done when an error message is received?

“Premature Termination

If a request can not be granted, or some error occurs during the

transfer, then an ERROR packet (opcode 5) is sent. This is only a

courtesy since it will not be retransmitted or acknowledged, so it

may never be received. Timeouts must also be used to detect errors.” – RFC1350