

Upload the following files F1, F2, F3, F4 for your group to Blackboard:

F1. GroupNameA1TCPClient.java

F2. GroupNameA1TCPServer.java

F3. GroupNameA1WS.pcap

F4. GroupNameA1WSAnswers.pdf

Only submit one copy of these files for your group. Please name all files exactly as indicated.

1. Write a Java TCP socket program consisting of one client C and one local server S (localhost). Code for the client and server should be separate and contained in the respective files F1 and F2 above. Modify and use the code in the files posted on Blackboard: TCPWebClient and TCPKRClient for the client C and TCPKRServer for the server S. Since we are testing behavior with no threads, the code should not have threads. Do not use System.exit() in your code. Submit your socket code in the files F1 and F2 (named as above). All the code needed should be in these two files.

The client C

- 1.1 asks the user to enter a web server W's name as a string www.name.suf (for example, www.towson.edu)
- 1.2 sends a request to the web server W
- 1.3 receives and prints W's page
- 1.4 prints the message "NUMBER OF BYTES" followed by the number of bytes nb in W's page
- 1.5 makes a TCP socket connection to the local server S listening on port 12222
- 1.6 sends W's name, W's IP address and the value of nb to S.

The local server S (localhost)

- 1.7 listens for and accepts the connection from C on port 12222
- 1.8 receives W's name, W's IP address and the value of nb sent by C
- 1.9 prints the string "WEB SERVER" followed by W's name, W's IP address and the value of nb received from C.

2. Run Wireshark (WS) and make a request to <https://www.3gpp.org>. Stop the WS capture and save it in a .pcap file named F3 that WS itself can open. Use the frame specified in 2.1 below to answer all the questions below (click on parts of packets in the frames to get more information if needed). Submit a file F4 (named as above) that has your answers.

2.1 Of the WS frames corresponding to the packets sent by the web server at <http://www.3gpp.org>, choose any (ONE) WS frame that WS has labeled with Protocol=TLSv1.2 and Info=Application Data.

2.1.1 Indicate the WS frame number, and the values of the source IP address and the source port in this frame.

Explain the significance of this specific IP address and this specific port number.

2.1.2 Indicate each protocol that appears in this frame and indicate the size of the header for each protocol.

2.1.3 According to WS, how many bytes are in the TCP payload? How many bytes are indicated as being Encrypted Application Data? Are these two values the same? Explain.

2.1.4 Name the field (or subfield) carried inside this frame that indicates it is a TLSv1.2 frame and give the actual hex values for this field (or subfield).