

Comp 4985 Computer Systems Technology January 2016

Data Communication Option

Assignment #2

Due Date: February 10, 0900 hrs. This is an individual assignment.

Objective: To become familiar with the **Windows Sockets API** and **Advanced socket I/O**.

Assignment:

You are required to design and implement **Windows** program, which will be able to generate **TCP** and **UDP** datagrams and transfer the data using the **TCP/IP** protocol suite between two Windows workstations. In addition you will collect and analyze some statistics on the transfer. Your program must implement the following **minimum** features:

- (c). The workstation running your program must be able to specify its behavior as a menu item within a **GUI**. For example, if it is the **client** it will specify that intent on a menu item. Allow the user to specify the ports and the protocol to be used (**UDP** and **TCP**) the same way.
 - (b). Each machine will specify an IP address or the name of its peer via a menu item.
 - (c). Allow the user to specify the amount of data to send (**packet size**) and the **number of times** to send it. You might also want to have default values for these in case the user does specify these parameters.
 - (d). Finally, allow the user to send data from a **file** on disk and save incoming data to a file.
- Note that in this application the server is simply a receiver which will receive the packets and store them to a file on disk. It will print out the packet size received and the number of packets.

Analysis and Constraints:

- (1). As part of your testing you are required to collect the transfer **statistics** for each protocol type. Test your program using **UDP** and **TCP** for varying packet sizes e.g., **1024 Bytes, 4096 Bytes, 20 KBytes, 60 Kbytes**, and higher. Send each packet type **10** and **100** times.
- (2). For each protocol type collect statistics such as the total transfer time, total data transferred, total packets lost, etc.
- (3). Present your data in tabular and graphical form. Provide a brief analysis of your data and summarize the results as part of your conclusion. Draw some conclusions as to the suitability of each protocol to different applications.
- (4). The **connect**, **accept**, **read** and **write** operations must be done **Asynchronously**. Use one of the socket I/O models presented in class.

To be Submitted:

- Hand in complete and well-documented **design work**, **listings** and an **executable**.
- Ensure that you clearly explain the testing procedures for your programs and provide test data as necessary.
- Submit a **zip** file containing all the code and documents as described below in the sharein folder for this course under “**Assignment #2**”.
- A clear and concise **technical report** as specified above summarizing your results.
- In addition you will be required to demonstrate the working of your program in the **SE 12-323 lab** on the Wednesday the assignment is due.

Evaluation

(1). Design Work:	/ 15
(2). Code Quality:	/ 5
(3). Working Programs:	
TCP:	/ 30
UDP:	/ 25
(4). Analysis & Report:	/ 25
Total:	/ 100