Comp 4985 Computer Systems Technology January 2009.

Data Communication Option

Assignment #2

Due Date: February 18, 0930 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 **Win32** 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:

- Detailed design work showing all the implementation details of the program and printed listings of your code.
- A clear and concise **technical report** as specified above summarizing your results.
- Source and executable on a disk.
- 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