Comp 7005 - Data Communication Principles

Final Project

Due: December 1, 2009 at 1730 hrs. Late submissions will not be accepted.

Objective

The objective of this project is to analyze, test, and gain an in-depth understanding of currently used protocols in industry. You may chose one or more of the protocols in the TCP/IP protocol suite for example:

- TCP/IP
- UDP/IP
- ICMP
- IGMP
- 802.11
- Bluetooth
- Zigbee

Your Mission

You may use any tool of your choice (tcpdump, Wireshark, etc) that will capture and display live packets on a network. Design and implement an experiment that will capture live sessions of your protocol. The idea here is to analyze all aspects of a protocol in operation. For example, if you were analyzing TCP, then you would create sessions between two machines and capture packets that describe the functionality of the protocol. These would be basic protocol functions such as establishing a connection, data exchange, and connection termination. Then analyze advanced functions such as error handling, flow control, congestion, etc. Graphs and tables will be very useful in explaining and analyzing the protocol.

Each protocol function analyzed must be accompanied by a datagram (hex) dump. You will then highlight and explain **fields of interest in the headers** related to the particular function under analysis. Note that in most cases you will have to analyze more than protocol to describe the relationship between protocols. For example, TCP, IP, ARP and Ethernet would all be involved in a particular session.

Constraints

- Only submit those captures that are relevant to the particular function you are analyzing and describing. In other words do not submit printouts of all packets of your session.

- Design your experiment with clear goals to be achieved and functions to be analyzed. For example, at the outset you might want to look at the protocol issues that we have discussed in the course such as error handling, flow control, congestion control, etc., and then logically step through each one.

- Your report must clearly describe your experiment and show all the components of your test bed. If your use programs written by other parties in your experiment make sure you indicate copies of those. A good source for these programs are the textbooks written by W. Richard Stevens. "TCP/IP Illustrated – Volume 1" in particular presents a very useful program that you can use to set and customize sessions for the Internet Protocol Suite.

To Be Submitted:

- A disk containing a soft copy of your report, test programs that you used, and copies of your packet dumps. You need not submit copies of your test tools if those are widely available (For example, Ethereal, tcpdump, etc).

Marking Guide:

Experiment Design:	15
Essential functions tested:	15
Analysis:	60
Report Format:	10
Total:	100