CS544 -- Computer Networks
Spring 2011-2012
Professor Mike Kain

Term Paper # 2 -- Network Protocol Design (1st submission)
Due Date: Monday, May 7th, 2012 at 11:59pm EDT

This is a group assignment.

Your assignment is to build on what you learned in the protocol analysis paper and define a network protocol (most likely a session layer). Its goal is to provide a service which could be useful in the real-world.

The definition ***must*** include:

- A description of the service (e.g. a file transfer service, peer to peer application, etc.) that your protocol and server will provide. Describe the basic service as well as any options / conditions that the protocol can do.
- Define how the messages will be delineated, as well as the messages (both control and data) that your protocol will use. This should be detailed enough to show all of the pieces of the message as well as data types, enumerations, etc.
- Define and show the deterministic finite automata (DFA) that your protocol will use***. It must be a stateful protocol (not a stateful application).*** We've reviewed in class the differences between protocol (conversation) state and application state.
- Describe how the protocol has been designed to allow extensions in the future (e.g. version information, handshake negotiation).
- Describe the security of your service (how you will ensure that the right people can use it) – or do you allow everyone? What authentication mechanisms will your protocol use? (NOTE: The implementation does not have to implement all authentication mechanisms; it can be hardcoded for the implementation to show the functionality at that time, like "bob" and "admin" are the only usercodes that work). How do you ensure that the protocol is always working correctly?

Your DFA ***must*** have a total of least 4 states and have at least 10 different messages (and only 2 of them can be error messages).

IMPORTANT: To be a complete definition, it must contain enough information for someone to write a client program to talk to your version of the server using only the final specification. It must also address security, performance, and extensibility.

This project can be handed in early if you feel that you're done. You may ask for preliminary analysis of your protocol to see that you're on the right track. We don't expect perfection for the first submission; but we will be grading on how well you satisfy the major points of the assignment. This is worth 10% of your semester grade. In addition to your grade, we will also suggest some possible improvements to your protocol before you implement it. The term project

will be to implement this protocol (both a client and server) and resubmit your design with the implementation. You should submit your assignment electronically through BBVista/WebCT with your group number somewhere in the filename (e.g. Group1Protocol.pdf).

A Chat room and group discussion areas will be put in BBVista/WebCT for you to use. Ann Marie and I will be in every group to help guide you through this process and give you direction. If you choose another collaboration medium, then it's up to you to email Ann Marie and me with any questions and/or problems.