CS1356 Introduction to Information Engineering

Homework 6

Due: Jan 6, 2010 in class
Remember to write your name and student ID

1. Read textbook 4.4 about the Internet protocols, and answer the following questions **briefly**. (3**0%**)
   (a) Compare and contrast the layered approach and the analogy made in the textbook.
   (b) Why should the messages be segmented? And why should the message segmentation be done in the transport layer? How can the receiver assemble the segmented messages?
   (c) Use the analogy in the textbook to explain the routing process, and to explain why a router needs to take care of the works in the network, not just in the link layer.

2. Read textbook 4.1 for CSMA/CD and CSMA/CA and answer the following questions **briefly**. (**20%**)
   (a) How does CSMA/CD handle collisions? And why cannot CSMA/CD be used in the wireless star network?
   (b) Describe the steps followed by a machine that wants to transmit a message in a wireless star network using the CSMA/CA protocol.

3. In Windows, there is a command called "`tracert`" (In Linux/Unix, it is called "`traceroute`" or "`tracepath`"). You can execute it in a command window. (3**0%**)
   (a) What is the output of "`tracert` 72.14.203.99"? What is the meaning of the listed names or IP addresses? And what is this command used for?
   (b) Should the results be all the same every time you execute it? Why or why not?
   (c) Use search engines to find out how `tracert` is implemented and brief how it works. From which websites do you find the answer?

4. **Skype** is a software application to make voice calls over the Internet. It also provides the function of conference call, which allows more than two persons talk at the same time. (**20%**)
   (a) Why cannot the traditional telephone service provide conference calls? What is the fundamental difference between the traditional telephone line and the Internet?
   (b) **Skype** operates on a peer-to-peer model, rather than the more usual client-server model used by other Internet phone services. What are the advantages of the peer-to-peer model comparing to the client-server model for telephonic services? And what are the difficulties of using peer-to-peer model for conference calls, comparing to the client-server model?