

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**. (30%)
 - (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. (30%)
 - (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?