CS420 Computer Communication and Networks
Assignment I
Assigned: 9/4/15
Due: 9/10/15 11:59 PM

1. Open a command prompt window. Type the following command.

    ipconfig /all

    Locate the wired LAN adapter for your computer (usually called Ethernet Adapter Local Area Connection). Record the following:

    Physical address:

    IPv4 address:

    To which layer of the OSI model do these addresses belong to? Why does the adapter need two addresses?   (3 pts)

2. Open a command prompt window. Type the following command.

    ping toolman.wiu.edu –l 64 –f *

    The –l option specifies the packet size which is sent out and the –f option forces the packet to be not split up into multiple fragments but sent out as one single packet. Try the ping command with different packet sizes.

    i)   Does the delay change when packet sizes are changed? Why?
    ii) Determine the maximum packet size that can be sent out using your network card by trial and error.   (3 pts)

3. Open a command prompt window. Type the following command:

    tracert toolman.wiu.edu (on a linux machine, use traceroute instead)

    Attach a screenshot of your command result.

    What do you see when the command is run? How is this utility helpful?   (3 pts)

4. Question R12 from the Chapter 1 of the required textbook.   (3 pts)

5. A client wants to send a large file to a server. The path from the client to the server has three links of rates 1 Mbps, 10 Mbps and 5 Mbps respectively. How long does it take to transfer the file whose size is 100 Megabits? Ignore propagation delays.   (3 pts)

6. Question P3 from Chapter 1 of the required textbook.   (6 pts)

7. Question P24 from Chapter 1 of the required textbook.   (3 pts)

8. A 100 Mbit (M = 10^6) file is to be transferred from a client to a server over a network in which there are two intermediate switches. All devices operate at 10 Mbps, and each link distance is 2000 m. How long will it take the file to be transferred:

    a. If the file is not segmented into packets (i.e., sent as a whole)?
    b. If the file is segmented into 10 Kbit (K=1000) packets?

    All switches use store-and-forward processing, and you can ignore processing and queuing delays at all devices, as well as header overheads. Assume that the speed of light is $2x10^8$ m/sec.   (6 pts)

*If you are using a computer outside the campus network, use the VPN client at https://vpn.wiu.edu/ to answer questions that require interaction with toolman.wiu.edu