

CSC 469 HOMEWORK 1

NAME: _____

You will be graded on both accuracy of information and on neatness, clarity, and quality of writing. Provide justification for every answer, showing the reasoning steps used to arrive at an answer where appropriate.

Answers are to be submitted as a PDF document.

Homework 1 is due Friday at the end of week 3.

1. Name three different types of home access networks that ISP residential customers use to connect to the Internet.

For each access network, indicate whether the bandwidth to the ISP's end office is dedicated to the customer, or shared with the neighborhood.

2. Name two different kinds of broadcast media that are often used to implement links in computer networks.

3. Consider sending a packet from a source host to a destination host over a fixed route. List the delay components in the end-to-end delay. Which of these delays are constant and which are variable?

4. Suppose there is a exactly one packet switch between a sending host and a receiving host. The transmission rates between the sending host and the receiving host are R_1 and R_2 respectively. Assuming that the switch uses store-and-forward packet switching, what is the total end-to-end delay to send a packet of length L ? (Ignore queuing, propagation, and processing delays).

5. Consider a packet of length L that begins at an end system A and travels over three links to a destination end system. These three links are connected by two packet switches. Let d_i , s_i , and R_i denote the length, propagation speed, and transmission rates of link i , for $i = 1, 2, 3$. The packet switches delay each packet by d_{proc} . Assuming no queuing delays, what is the total end-to-end delay for the packet? You should assume the network uses store-and-forward packet switches.

6. In problem 5, assume that the packet switches do not store-and-forward packets but instead immediately transmit each bit they receive without waiting for the entire packet to arrive. Assume further that $d_{\text{proc}} = 0$. What is the end-to-end delay for a packet of length L ?