Chapter 1 Problems – Sep 6

1. Why do we use **packets** in the network, and what is a packet **header**?
2. Explain each role of the **Link layer** and **Network layer**.
3. Suppose users share a 2 Mbps link. Also suppose each user transmits continuously at 1 Mbps when transmitting, but each user transmits only 20 percent of the time.
   A. When circuit switching is used, how many users can be supported?
   B. Suppose now there are three users. Find the probability that at any given time, all three users are transmitting simultaneously.
4. Consider the link between A and B as shown below. Host A wants to send a 1000-bit packet to B. What is the transmission delay and propagation delay? Assume that the bit propagation speed is 10^6 m/s.
5. Explain each role of Tier-1, Regional and Access ISP.

100m

A — B

1Mbps