**Nicholas Shari - Worksheet 2 - CSE422**

1. Packet length *L* = 1000 bytes, link distance *d* = 2500km, propagation speed *s* = 2.5 ∙ 108 m/s, transmission rate *R* = 2Mbps. Calculate propagation delay and transmission delay.

Propagation delay = d/s = 2500km/(2.5 ∙ 108 m/s) = .01sec

Transmission delay = L/R = 1000bytes / 2Mbps =

1000bytes/ 250000bytes/sec = .004sec

2. Host A wants to send a large file to Host B. The path from A to B has three links: *R1* = 500kbps, *R2* = 2Mbps *R3* = 1Mbps.

a. No other traffic in the network, what is the throughout for the file transfer?

Throughput = rate (bits/time unit) = min(.5\*2\*.1)/3 = .1666Mbps

b. File size is 4 million bytes, how long will it take to transfer the file to B.

Time = 4,000,000 bytes / (.1666Mbps)\*1,000,000 = 24.009sec

c. Repeat a and b with *R2* = 100kbps

1. .1 / 3 = .03333
2. 4,000,000 / (.03333)\*1,000,000 = 120sec

3. What are the five layers in the Internet protocol stack? What are the principle responsibilities of each of these layers? What is the name of the packet in each layer?

Application

1. Communicates between applications running on two different systems.
2. Packet name: message.

Transportation

1. Collects the information from the application layer and transfers it to the network layer. The transport layer passes a segment and destination to the network layer.
2. Packet name:UDP,TCP

Network

1. Transfers data from one system to another on a network. The network layer transfers the data to the destination end-system over the network.
2. Packet name:IP(internet protocol)

Link

1. Handles communication between one device and its neighboring device.
2. Packet name:Frame

Physical

1. Breaks the data frame into bits and coverts it into a form that can be transmitted over a communication line.
2. Packet name: bits

4. What is the difference between a virus and a worm?

Virus - Activated by interaction with host.

Worm - Will spread and propagate on its own.

5. Explain DOS attack, sniffing, IP Spoofing.

DOS attack - An attack makes resources(sever, bandwidth) unavailable to legitimate traffic by overhauling resources with bogus traffic.

* Rapid send data/queries to back up traffic.

Sniffing - Read and record all data/packets passing by.

IP Spoofing - sending a packet with a false source address.