CSE 160: HW1-4

1.14; c) What is the significance of the delay · x bandwidth product computed in (b)?

- Its important to know when we want to construct high performance networks and such. This corresponds to how many bits or how much data the sender must send before the first bit comes back at the reciever.

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d) - the size of the picture is 25MB

$$\text{Transmit delay} = \frac{25MB}{16Bps} = \frac{25 \cdot 10^6 \cdot 8 \text{ bits}}{1 \cdot 10^9 bps} = 200 \cdot 10^{-3} = 0.2sec$$

propagation delay + transmit delay + propagation delay (image)

$$1.28 + 0.2 + 1.28 = \boxed{2.76s}$$

1.17 Calculate the latency (from first bit sent to last bit recieved)

a)

$$\text{Transmission time} = \frac{\text{Packet size}}{\text{Band width}} = \frac{12000 \text{ bits}}{100Mbps} = \frac{12 \cdot 10^3 bits}{100 \cdot 10^6 bits/sec}$$

$$= \frac{12}{100 \cdot 10^{-3}} sec = 0.12 \cdot 10^3 sec = 120\mu s$$

* Propagation delay = 10 μs ; (2 · Transmission time) + (2 · Propagation time) ;

$$= (2 \cdot 120) + (2 \cdot 10) = \boxed{260\mu s}$$

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b) for 3 switches on path to destination requires 4 links be made

$$(4 \cdot \text{Transmission time}) + (4 \cdot \text{Propagation time}) = (4 \cdot 120) + (4 \cdot 10)\mu s$$

$$\boxed{= 520\mu s}$$

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c) *it can resend the packet after the first 200 bits have been recieved

$$\text{Delay time} = 200 \text{ bits} / 100Mbps \Rightarrow \frac{200 \text{ bits}}{100 \cdot 10^6 bps} = \frac{2 \cdot 10^2 bits}{2 \cdot 10^8 bits} = 2 \cdot 10^{-6} s$$

$$\boxed{= 2\mu s}$$

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