Sample Network Performance Problems
1. What is the end-to-end packet latency in this store-and-forward subnet from router 1 to router 6?

Assume: All links: 2.5 km; C = 100Mbps; propagation speed = 200m/microsec. queuing delay = processing delay = 0; packet size = 1000 bytes

Solution:

end-to-end packet delay = 4 (equal hops) x link delay

link delay = PROC + QD + TRANS + PROP = 0 + 0 + transmission time + propagation delay

transmission time = \( \frac{1000 \text{ bytes}}{8 \times 10^3 \text{ bits}} \) = \( \frac{100 \text{ Mbps}}{10^8 \text{ bps}} \) = 80 microseconds.

prop delay = \( \frac{2500 \text{ m}}{200 \text{ m/ microsec}} \) = 12.5 microseconds

link delay = 92.5 microseconds

end-to-end subnet delay = 4 x 92.5 = 370 microseconds
2. What is the end-to-end packet delay in this store-and-forward subnet from router 1 to router 6 under the scenario that when a packet from router 1 arrives at router 15 there are three packets enqueued for the link to router 17?
3. How does the end-to-end packet delay determination change when we send a packet from Host E to wireless Host W1?

4. How does the end-to-end packet delay determination change when we send a packet from Host F to Host Z that is on the Ethernet LAN?