

## Packet Delay + Measurement

### Section 1

1. What is the average queuing delay experienced by the 1000-byte packets? **3.66 ms.**
2. What are reasonable estimates of transmission and propagation delays that will be experienced by a packet of size 600 bytes sent through the link K?  
**Transmission delay: 0.48 ms, Propagation delay: 2.0ms.**

### Section 2

1. See code.
2. Suppose one of the three `traceroute` delay values between the source and a given router hop turns out to be unusually high. What are two possible causes for this unusually high delay? **One possible cause could be that there is a surge in traffic, or network congestion, so the queue is backed up. A second one could be that there is a transmission delay, because that depends on the size of the incoming packet *and* the bandwidth of the outgoing link. If the bandwidth is significantly smaller than the packet size, there will be a large delay.**

### Section 3

1. See code.