

## CECS 572 Advanced Computer Networking

### Assignment 7 -- Delay in Computer Networks

Due Friday, May 4, 2018 @ 11:59PM

Consider a 5 hop network built with 6 routers. Routers 1, 2 and 3 are configured as a circuit-switched network. Routers 3 to 6 are configured to store and forward packets with QoS priority and vlan tagging. The link from router 3 to 4 is configured to use a 1500bytes MTU. The link from router 4 to 5 the MTU is 1000bytes; and the link from router 5 to 6 the MTU is 500bytes. Processing delay in each router is 500 microseconds. The distance between routers are as follows: 1 -> 2 is 750km, 2 -> 3 is 550km, 3 -> 4 is 200km, 4 -> 5 is 650km, and 5 -> 6 is 1100km. For the circuit-switched network consider setup and confirmation messages of 80bytes each (no teardown message). Propagation speed is  $2.5 \times 10^8$  m/s. Find out the time that it takes a message of 128000bits to be processed and transmitted from router 1 to router 6 provided that the bandwidth in the system is as follows: circuit-switched network speed is 2Mbps and packet-switched network speed is 1Mbps. Include the setup time for the circuit-switched network.