

Quiz

CSC317 Computer Networks

08 October 2014

1. The authors tell us that rdt3.0 is a functionally correct protocol, but...
What is the “but?”
2. The distance between the New York City’s LaGuardia Airport and Los Angeles International Airport is a little less than 4000 kilometers. The speed of light is approximately $3 \cdot 10^8$ meters per second.
 - (a) If a signal travels at the speed of light from New York to Los Angeles and back, how long does the trip take?
 - (b) Look an the Web for an estimate of the speed of light in a fiber optic cable. How long does the signal’s roundtrip take when adjust for the fact that light travels slower in a fiber optic cable than it does in a vacuum?
3. Let RTT be the time for the roundtrip that you calculated for the previous question. Let L be the size of the packets that you want to send (measured in bits/packet). Let R be the rate at which you can transmit (measured in bits/second).

Here is an expression for the utilization of our transcontinental fiber optic cable. We are assuming that the first packet has to arrive in Los Angeles and the acknowledgement from Los Angeles has to arrive back in New York before the transmitter in New York can send the second packet.

$$U_{sender} = \frac{L/R}{RTT + L/R}$$

This expression gives us the fraction of time that bits are travelling through the cable.

Let’s use the authors’ figures for L and R : $L = 8000\text{bits/packet}$ and $R = 10^9\text{bits/second}$. Let’s use our own (better) estimate of RTT .

What value does your calculation yield?

4. What are some of the details we left of our simple model of utilization?

5. What additional parameters do we have to add to our previous rdt algorithms for the pipelined algorithms?
6. The authors use something that looks like a finite state machine to model the pipelined algorithms. What have they added to notation?
7. What advantage does the Selective Repeat algorithm have over the Go-Back-N algorithm?
8. In the words of the authors of our textbook, “Flow control is thus a speed-matching service. . .”
Flow control is an effort to match the speed of which two activities?