Instructions for JNW2 Project TRN2 – Reliable Transport Layer Slow Start

The purpose of this project is to understand the TCP "slow start" algorithm by programming and observing its analog in JNW2.

JNW2 includes a "slow start" concept. Your grade will depend on writing an appropriate updateCongestionWindowSize() in SendSegments.java (the same class you modified in TRN1.

The algorithm for JNW2 Slow Start is included in comments within updateCongestionWindowSize() in SendSegments.java. It is derived from TCP Slow Start. The solution requires about a page of code.

Test your work and examine the results by running the GUI as in WAN1, using main class JNW2.gui.GuiController, and selecting configuration file SlowStartWindow.txt. This includes a profile for testing slow start and uses an "email" file with 1000 bytes of data. Since the JNW2 "MTU" is 20 bytes, transferring this "email" will move enough segments that you can see slow start working.

When your solution works, the 1000 byte "email" will be delivered from node 1.1 to node 7.1, and the text output will display changes in the Congestion Window. (The configuration SlowStartWindow.txt is set to not show data units moving among stack layers, but you can change that by selecting for example Transport Layer in the lower left side of the GUI.) Submit your SendSegments.java (be sure to include your name in the code comment provided) and a copy of the output produced when you run the simulation with the SlowStartWindow.txt configuration. Include your answers to the questions below.

QUESTIONS TO BE ANSWERED AS PART OF TRN2 SUBMISSION

Include your answers at the end of output.txt.

- Run TRN2 with PrintAtSlowStart turned off (lower left of GUI). Compare the time to deliver the "email" under the default (3 segments in window) vs your solution with PrintAtSlowStart on. Why is there a difference?

- How does the progression of Congestion Window values compare with that shown for TCP in lecture slides or textbook?

- What benefit does Slow Start provide to the community of Internet users? That is, how does it make things better for everyone?

- Slow Start is good for the community. Is it the optimum solution for the individual? Suggest a different approach that would optimize individual throughput, though it might not be as good for the overall community.