

Indian Institute of Technology Bombay

Department of Electrical Engineering

Handout 29

Assignment 8 : 50 points

EE 706 Communication Networks

Due date: April 15th, 2010

This assignment requires the use of ns2 network simulator which can be downloaded from http://nslam.isi.edu/nslam/index.php/Main_Page. A tutorial can be found at <http://www.isi.edu/nslam/ns/tutorial/index.html>. The solution code should be uploaded to Moodle.

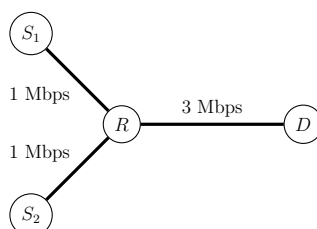
1. Install ns2 and run the script available at the following URL <http://www.ee.iitb.ac.in/~sarva/EE706/ns2/overflow.tcl>. You will notice that the queue at node 0 overflows after a while and packets are being dropped.

(a) What is the minimum value of the parameter `interval_` such that packets are not dropped? Upload a modified version of the script with this value. Note that the `packetSize_` parameter is given in bytes. Also the value 1 Mb in the line `$ns duplex-link $n0 $n1 1Mb 10ms DropTail` says that the bandwidth of the link is 10^6 bits per second. [5 points]

(b) Once the script is run using ns2 a trace file called `out.tr` is generated in the current working directory. The explanation of each line in the trace file can be found in the ns2 documentation. You can also look at <http://t-issariyakul.blogspot.com/2009/03/ns2-trace-format.html> for a quick explanation. A C program which processes the trace file to estimate the average delay experienced by a packet sent by node 0 to node 1 can be found at <http://www.ee.iitb.ac.in/~sarva/EE706/ns2/tracereader.c>. Compile this program and run it to estimate the average delay. Include the value as a comment in the file you upload for the previous question. Can you explain the value obtained. [5 points]

2. Write an OTcl script to simulate the network topology shown below where each link has a delay of 10 milliseconds. Sources S_1 and S_2 use TCP to communicate with the destination D . Each of the sources has an application which generates a constant bit rate traffic stream with 500 byte packets sent every 2 milliseconds. *Hint:* Use `Agent/TCP` and `Agent/TCPSink` described in the ns2 manual or elsewhere.

[20 points]



3. Modify the program `tracereader.c` to calculate the average packet delay between source S_1 and destination D for the topology in the previous question. Upload this modified C file. [20 points]