

## OPNET Assignment, ECE 158B, Spring 2000

Due before the final exam.

For this lab, you should first familiarize yourself with OPNET by going through the following tutorials: Introduction, M/M/1, and Basic Process.

The task is to modify the process model “acb\_fifo” so that it implements the “lazy server” as investigated in problem 4 of homework set 2. In particular, when a customer (packet) arrives to an empty system, that customer will not start being served until another customer arrives. Otherwise, the system behaves as a standard M/M/1 queueing system.

After you have constructed and tested your model appropriately, run your simulation for the same parameters (arrival rate, mean packet size, service capacity) as given in the M/M/1 tutorial. You may wish to run the simulation longer to get more accurate results. Determine the mean delay and the time average of the number of packets in the system. Compare these results with the corresponding theoretical values using the results from problem 4 on homework 2.

Repeat your simulation experiment for two additional values of the arrival rate, and compare the mean delay and mean number of packets in the system to the theoretical values.

Your lab report should clearly document the modified process model (OPNET can automatically generate reports of a process model for this purpose), as well as a textual description of the modifications you made to the original “acb\_fifo” process model. Your report should also include the calculations of the theoretical predictions of the quantities measured in your simulation. Discuss your results.