COMP 5320 Term Project Report

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* We were tasked to create a tool to simulate the performance of a two-queue/two-server switch. There were two different packet assignment strategies that we simulated. First, random selection; and second, min-queue strategy.
* We developed this simulation tool in C. We were able to calculate the following key performance metrics, based on 10 runs of 10,000 packets per data point: Blocking Probability of an incoming packet, Average Queue Length, and Average Waiting Time.
* In order to calculate the blocking probability, we simply counted the number of dropped packets throughout the simulation and divided it by the number of packets going through the simulation.
* In order to calculate the average queue length, we counted the number of packets in an arbitrary queue at the time a packet is assigned to that queue and divided it by the number of packets going through the simulation.
* In order to calculate the average waiting time, we created a timestamp both before and after the simulation, and then we subtracted the start time from the finish time. We then divided this number by the number of packets that actually entered the system (number of packets arriving – number of dropped packets).
* In order to compile and run our simulation, use the make utility.
* $ make
* ./proj
* We then used the formulas we learned in class (expected queue length, little’s law, etc.) to calculate the theoretical data for this experiment, in order to compare with our simulated data.
* We plotted this data in accordance with the project instructions (using MATLAB).
* Below are the plots with titles and axes labeled in the image:

















