

ECE697AA – Computer Networks

Fall 2008 – Lab 3

Prof. Wolf

Please answer the following questions and submit your lab report electronically on SPARK by December 5, 2008 11:59 p.m. Grading will be based on the rubric posted on the course website.

Lab Assignment

In this lab you will design several experiments to explore packet classification and scheduling.

Background

ONL uses “filters” to classify traffic. Once traffic has been classified, it can be directed into different egress queues. For example:

Set up two output queues on port X. On the ONL interface, click on port X “Egress Filters” and add a general match filter under the edit command. In the filter, specify “192.168.1.32/32 as the source address/mask” (or whatever IP address you like), any protocol and the queue id (qid) as 300. Add another general match filter with the same settings, except “192.168.1.48/32” as source address/mask (or whatever IP address you like), any protocol and 301 as queue id. Click on port 3 “Queue Tables,” add an egress queue, and set the queue id to 300. Add another and set the queue id to 301. Commit. To monitor the queues, switch to monitoring mode, click on port 3, Egress, QLength and set the qid to 300. Repeat for qid 301. ONL uses deficit round-robin scheduling. You can set the quantum allocated to a queue in the “Queue Table” (as well as a lower link output bandwidth, which may simply experimentation).

Experiments

Design the following three experiments, present measurement results (e.g., screen shots of monitoring window (just that window – please not the entire desktop)), and your interpretation of your results.

1. Set up two connections – one using UDP and one using TCP. Show that if they share a queue, UDP can get an unfair share of the bandwidth. Show that if you use separate queues, they each get the fair share. Discuss your results.
2. Set up two UDP connections – one using 100-byte packets and one using 1000-byte packets. Evaluate the fairness achieved between these two flows when using a single queue or two separate queues. Discuss your results.
3. Set up two UDP connections (with the same packet size). Show that by changing the scheduling quantum one connection can receive a larger share of the bottleneck bandwidth. Discuss your results.

Lab Report

The lab report that you submit should contain a detailed description of your, your results, and (most importantly) a discussion of your results.

Help!

The ONL web site has documentation on the queue setup process. If you need any other help, email me.