ECE 466 - Computer Networks II Winter 2008

Problem Set #6: More on Scheduling

1. Consider a service discipline NFQ (Not Fair Queueing) which services packets according to the priority index

$$F_k^{(j)} = V(a_k^{(j)}) + L_k^{(j)}/\phi_j$$

NFQ is inferior to WFQ (or PGPS) in emulating GPS and satisfying the weighted fairness property in the definition of GPS.

- (a) Describe in words *why* NFQ is inferior to WFQ: what property (or properties) should it possess that it does not?
- (b) Construct a numerical example with two flows to illustrate WFQ's superiority to NFQ.
- 2. Consider two flows. The first with packets of size 2 and 2 arriving at times 3 and 5, and the second with packets of size 1, and 3 arriving at times 0 and 2. Further, let $\phi_1 = 2\phi_2$.
 - (a) Sketch the arrival and service curves for GPS and WFQ for C = 1
 - (b) Sketch the virtual time V(t) (Set V(0) = 0).
 - (c) Fill in the table of finishing times below. Briefly comment on the table.

	Session 1		Session 2	
pkt arr	3	5	0	2
GPS	6	9	1	9
WFQ	7	9	1	5
FCFS	7	9	1	5

3. Suppose flows A, B, C have average packet sizes of 50, 500, and 1500 bytes, and weights 0.5, 0.75, and 1.0. How many packet from each flow should a weighted round robin (WRR) scheduler transmit in each round?