# SEMINAR NOTICE

Department of Electrical and Systems Engineering

**Scheduling Algorithms**
**FOR**
**High-Speed Packet Switches**

by

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Scheduling is an important part of communication networking, which ensures the performance and integrity of applications. In spite of intense research activities for the past decade, the scheduling algorithms suggested thus far lack certain key features. Some are too complicated to implement efficiently, and some do not perform well. For example, while good in performance, most time stamp-based schedulers (such as WFQ) have the complexity $O(\log_2 n)$ with respect to the number of flows, $n$, that can grow exponentially as the network scales. On the other hand, while efficient in implementation, the round robin schedulers such as DRR generate bursty output traffic that affects the performance of downstream switches and routers. A major problem with most round robin schedulers is that they serve a large amount of traffic from each flow in one service opportunity in order to accommodate the scheduling of maximum size packets, when a significant portion of the Internet packets are small in size. As a result, the inter-service delay of round robin schedulers is considerably high.

In this dissertation, we propose an efficient round robin scheduler that reduces the latency and burstiness of flows, by staging service in multiple phases. Next, we focus on the crossbar scheduling algorithms used in the CIOQ (Combined Input and Output Queued) switches for their desirable characteristics such as the simplicity and performance. For example, unlike the Output-Queued switches, the CIOQ switches do not require the memories to operate much faster than the line rate. So far in the literature, the CIOQ switches with the practical buffer requirements lack an efficient scheduling algorithm for handling variable-length packets. In this dissertation, we develop a new scheduling algorithm for handling variable-length packets in unbuffered crossbars using the core speedup of two. The proposed algorithm is an efficient (and thus easily implementable) scheduling algorithm that yields outstanding performance for a variety of traffic types.

DATE: Tuesday, March 7, 2006
TIME: 10:00 a.m.
PLACE: Bryan Hall, Room 305

Research Advisor:
Paul S. Min

This seminar is in partial fulfillment
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Washington University in St. Louis
SCHOOL OF ENGINEERING & APPLIED SCIENCE