



# THE CHINESE UNIVERSITY OF HONG KONG

Department of Information Engineering and  
Shun Hing Institute of Advanced Engineering  
Joint Seminar

## **New Directions In Internet Congestion Control: Quality-of-Service (QoS), Uncooperative Users, Large Bandwidth-Delay and Lossy Networks**

by

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**Date : 4th August, 2006 (Fri.)  
Time : 11:00am - 12:00noon  
Venue : Rm 833, Ho Sin Hang Engineering Building  
The Chinese University of Hong Kong**

### Abstract

This talk will overview non-traditional directions in Internet traffic management and congestion control:

- ◆ First, we explore how closed loop control frameworks can be used to engineer Quality-of-Service (QoS) expectations over best-effort networks (overlay QoS). Specifically, we show how the parameters of a class of "accumulation-based" congestion control techniques can be modified to support QoS expectations as an extension of "fairness" ideas.
- ◆ Second, we discuss an edge-based framework for handling non-cooperative users who modify their congestion control algorithms to be more aggressive. This avoids the need for "penalty-box" mechanisms at every router in the Internet.
- ◆ Third, we examine the value of an extra bit of congestion feedback in the context of large bandwidth-delay product networks. We show that with one more feedback bit, we can approximate the performance of explicit rate feedback schemes.
- ◆ Fourth, we show how to improve TCP performance over highly lossy networks (upto 50% loss rates). The talk will conclude with general comments on interesting future directions in this area.

### Biography

Shivkumar Kalyanaraman is a Full Professor at the Department of Electrical, Computer and Systems Engineering at Rensselaer Polytechnic Institute in Troy, NY. He received a B.Tech degree from the Indian Institute of Technology, Madras, India in July 1993, followed by M.S. and Ph.D. degrees in Computer and Information Sciences at the Ohio State University in 1994 and 1997 respectively. He also holds an Executive M.B.A. (EMBA) degree from Rensselaer Polytechnic Institute (2005). His research is in topics such as congestion control architectures, quality of service (QoS), last-mile community wireless and free-space optical networks, network management, multimedia networking, and performance analysis. His special interest lies in developing the inter-disciplinary areas overlapping with networking, including control theory, economics, databases, scalable simulation technologies, video compression and optoelectronics. He was selected by MIT's Technology Review Magazine in 1999 as one of the top 100 young innovators for the new millenium. He is an associate member of the IEEE and a member of ACM. He is on the editorial board of ACM/Springer Wireless Network Journal and was till recently an area editor of ACM Computer Communication Review (CCR).

**\*\* ALL ARE WELCOME \*\***

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