

Service Awareness, Virtual Collaboration, and Traffic Implications on Network Architecture

A Virtual Lecture by

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Time: Tuesday June 9, 2009, at 4:30 pm Eastern Daylight Time

Location (only Java-enabled browser required; check at <http://illuminate.com> for system requirements and audio configuration):

http://slms.delta.ncsu.edu:80/join_meeting.html?meetingId=1243871197673

Graduate Assistants: Michalis Kallitsis and Ioannis Papapanagiotou, PhD candidates

Abstract

As Next Generation Networks evolve in size and in the number of users, one of the most challenging considerations network and system designers encounter is how to allocate the available network and computing resources in an efficient and fair manner. Next Generation Networks provide services that have emerged via Service Oriented Network (SON) architectures, the evolution of Internet towards the collaborative “Web 3.0” paradigm and online social networks, as well as services offered through Triple Play architectures. Examples include e-commerce web services, instant messaging services with user presence information, virtual collaboration environments in science and education, and applications like voice over IP, IPTV and High Speed Internet services.

Under the Communications Society Distinguished Lecturer program, we provide an overview of our efforts at North Carolina State University’s Department of Electrical and Computer Engineering, in collaboration with IBM, Cisco and Nortel Corporations, to develop frameworks and algorithms for modeling of emerging next generation network-based services, predictive and dynamic resource allocation, traffic modeling and aggregation architecture optimization.

In this virtual seminar we continue to discuss optimization frameworks that ensure efficient performance and price-based utility maximization in such networks. We focus in particular on a system that optimally allocates the computing resources of a cloud that hosts virtual collaboration environments. Our mathematical model considers the degree of social interaction

among the virtual world participants as a pricing input. We also discuss our work on traffic measurement and on optimizing high-speed aggregation network designs, taking into account emerging network traffic patterns that include social networks and peer-to-peer traffic.

Biography

Michael Devetsikiotis was born in Thessaloniki, Greece. He received the Diploma Ingenieur (Dip.l Ing.) degree in electrical engineering from the Aristotle University of Thessaloniki in 1988, and the M.S. and Ph.D. degrees in electrical engineering from North Carolina State University, Raleigh, in 1990 and 1993, respectively.

As a student, he received scholarships from the National Scholarship Foundation of Greece, the National Technical Chamber of Greece, and the Phi Kappa Phi Academic Achievement Award for a Doctoral Candidate at North Carolina State University. He is a Senior Member of IEEE and a member of the honor societies of Eta Kappa Nu, Sigma Xi, and Phi Kappa Phi.

In October 1993, Dr. Devetsikiotis joined the Broadband Networks Laboratory at Carleton University, Ottawa, Canada, as a post-doctoral fellow and research associate. He later became an adjunct research professor in the Department of Systems and Computer Engineering at Carleton University, in April 1995, an Assistant Professor in July 1996, and an Associate Professor in July 1999. He joined the Department of Electrical and Computer Engineering at NC State as an Associate Professor in October 2000, and became a Professor in July 2006. He remains an Adjunct Research Professor in the SCE Department, Carleton University. He is also an active member of the Operations Research faculty, and an associate member of the faculty of Computer Science at NCSU.

Dr. Devetsikiotis served as Chair of the IEEE COMSOC Technical Committee on Communication Systems Integration and Modeling and is now a member of the COMSOC's Education Board. He has served as an Associate Editor of the IEEE Communications Letters, and is currently an Area Editor of the Association Computing Machinery (ACM) Transactions on Modeling and Computer Simulation and a member of the editorial boards of the International Journal of Simulation and Process Modeling, the IEEE Communications Surveys and Tutorials, and the Journal of Internet Engineering.

He has co-chaired the following IEEE International Conference on Communications (ICC) events and Global Communications Conference (GLOBECOM): 2002 ICC Next Generation Internet; 2004 ICC High-Speed Networks; 2006, ICC: Quality, Reliability and Performance Modeling (QRPM); 2006, GLOBECOM: Quality, Reliability and Performance for Emerging Network Services. In addition, he served as Workshops Chair for IEEE GLOBECOM 2008 in New Orleans, and will co-chair the QRPM Symposium 2010 IEEE GLOBECOM.