



THE ELECTRICAL & COMPUTER ENGINEERING PROGRAM PRESENTS

Next Generation Optical Internet: Opportunities and Challenges

Prof. Mounir Hamdi

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12:00 – 1:00 p.m. followed by light lunch

Lecture Hall 238 / 2nd Floor

Broadband access technologies, such as DSL, cable modems, gigabit Ethernet, WiMax, and WLANs are providing affordable and flexible high-speed access to the Internet from the home and the enterprise. On the other hand advances in fiber optic bandwidth has created huge supply of wide-area network bandwidth. The net result of this trend is the constant growth of Internet traffic and the associated applications. This, in turn, is requiring the design of high-performance core switches/routers with high-speed interfaces (e.g., OC-192 or OC-768) and large switching capacity (e.g., a few tens of terabit/s). In addition, the convergence of video (television), voice (telephone) and data (Internet access and managed data services) into triple play service bundles is becoming a key business strategy for many service providers and is putting a big burden on them to provide a scalable easy-to-use service differentiation. In this talk, we will address the evolution and transition of Internet access and architecture in terms of equipment, protocols standards adopted, and applications (e.g., triple play). We will survey the big industry players in this area as well as current academic research efforts. Then, we detail the key challenges and potential successes of building core routers/routers that can scale with this huge Internet traffic. In particular, we will detail the prevalent base technologies for this Internet transition which are already in place: IP has established itself as a technology of choice for consumer and business services, while Dense Wavelength Division Multiplexing (DWDM) optical technology is now the established transport technology for high speed connections.

Mounir Hamdi received the B.S. degree in Computer Engineering (with distinction) from the University of Louisiana in 1985, and the MS and the PhD degrees in Electrical Engineering from the University of Pittsburgh in 1987 and 1991, respectively. From 1985 to 1991, he was a teaching/research fellow at the Department of Electrical Engineering, University of Pittsburgh where he was involved in major research projects as well as teaching undergraduate courses.

Prof. Hamdi is now Full professor and Head of Department of Computer Science and Engineering at the Hong Kong University of Science and Technology, a member of the University Senate and Council, Director of the Master of Science in Information Technology, and Director of the Computer Engineering and Networking Lab. In 1999 to 2000 he held visiting professor positions at Stanford University, USA, and the Swiss Federal Institute of Technology, Lausanne, Switzerland. His general areas of research is in high-speed wired/wireless networking in which he has published more than 300 research publications, received numerous research grants, and graduated more 30 postgraduate students. In addition, he has frequently consulted for companies in the USA, Europe and Asia on high-performance Internet routers and switches as well as high-speed wireless LANs. Currently, he is working on the design, analysis, scheduling, and management of high-performance Internet switches/routers, algorithm/architecture co-design, wavelength division multiplexing (WDM) networks/switches, and high-speed wireless networks. In particular, he is leading a research team at the Hong Kong University of Science and Technology that is designing one the highest capacity chip sets for Terabit switches/routers in the world. This chip set is targeted towards a 256 x 256 OC-192 Internet switches, and includes a crossbar fabric chip, a scheduler/arbitrator chip, and a traffic management chip.

Dr. Hamdi is/was on the Editorial Board of IEEE Transactions on Communications, IEEE Communication Magazine, Computer Networks, Wireless Communications and Mobile Computing, and Parallel Computing, and has been on the program committees of more than 100 international conferences and workshops. He was a guest editor of three IEEE Communications Magazine special issues, guest editor-in-chief of two special issues of IEEE Journal on Selected Areas of Communications, and a guest editor of Optical Networks Magazine, and has chaired more than 11 international conferences and workshops.



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