Networking
2005

The Fourth IFIP-TC6
Networking Conference

May 2-6 • 2005
University of Waterloo
Waterloo, Ontario, Canada

http://www.cs.uwaterloo.ca/Networking2005

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Conference Sponsors

INTERNET ACCESS

Wireless – All delegates have been given userids and passwords to the UW internet as part of their registration package. These can be used in the Arts Lecture Hall (the conference venue), as well as any other campus wireless cells.

Wired in AL 209/210 – Delegates may use the clients on the second floor of the building to access the Internet. There are also a number of wired Ethernet ports; use the same credentials and instructions as for the wireless network.

MEALS

May 2 – Meals on your own; coffee breaks provided in AL during the tutorials

May 3–6 – Breakfast, AL/Lunch, SCH
SCH is a very short walk past the new Tatham Centre building to the east of AL. For bad weather, there is a tunnel; directions are posted in AL.

RECEPTION & POSTER SESSION – **EIT, Tuesday, May 3, 17:30**

Display area – 58'' wide X 46.5'' tall (147 cm X 118 cm) Push pins will be provided

Posters may be placed on their allocated display, in the EIT atrium, from 10:00 Tuesday; supervision of the area will be provided. Posters should be removed that evening.

Your poster number is on the conference program (in alphabetical order by title), see pages 20-23.

Dinner, Wednesday, May 4, 19:00
Centre for International Governance Innovation
Seagram Building, 57 Erb Street W., Waterloo.
The Seagram Building is on the site of the original Seagram distillery, and contained, for a time, the Seagram Museum. A number of the displays are still in place, although the building has been completely renovated since the museum closed. Dinner will be in the atrium, with cocktails at 19:00, dinner at 19:45. Live jazz music provided by the Andriy Tykhonov trio.

On foot from UW: From the main UW entrance at University Avenue and Seagram Drive, follow Seagram drive to the train tracks, and turn right along the path on the east side of the tracks. Follow the path through Waterloo Park, then enter the CIGI building at the door just to the left of the large stack of barrels at 57 Erb Street W.

By car from UW: Leaving the UW campus at University Avenue and Seagram Drive, turn right (west) on University, then take the first left (south) onto Westmount Road, and the first left (east) onto Father David Bauer Drive. Take the first left onto Erb Street, then immediately right into the parking lot behind the stack of barrels at 57 Erb Street W.

ROOM ASSIGNMENTS

Tutorials: AL 105, 124, 211
Plenary sessions & keynotes: AL 116
Sessions 0 mod 3: AL 105
Sessions 1 mod 3: AL 124
Sessions 2 mod 3: AL 211
Workshops: AL 105, 124, 211

Full-day Tutorial

8:30 – 17:00

#1   **Wireless Sensor Networks**

Dr. Ian F. Akyildiz, Georgia Institute of Technology, USA

Abstract: The technological advances in the micro-electro-mechanical systems and the wireless communications have enabled the deployment of the small intelligent sensor nodes at homes, in workplaces, supermarkets, plantations, oceans, streets, and highways to monitor the environment. The realization of smart environments to improve the efficiency of nearly every aspect of our daily lives by enhancing the human-to-physical world interaction is one of the most exciting potential sensor network applications utilizing these intelligent sensor nodes. However, this objective necessitates the efficient and application specific communication protocols to assure the reliable communication of the sensed event features and hence enable the required actions to be taken by the actors in the smart environment. In this tutorial, the challenges and the existing solutions for the design and development of sensor/actor network communication protocols are presented. More specifically, application layer, transport layer, network layer, data link layer, in particular, error control and MAC protocols, and physical layer issues as well as the localization protocols and the time synchronization algorithms are explained in detail. Open research issues for the realization of sensor and actor networks are also discussed. The overall objective of this tutorial is to provide a global and detailed view at the current state-of-the-art in WSNs/WSANs and present the still-open research issues in this field. The topics covered include:

Biography of presenter: Ian F. Akyildiz received his BS, MS, and PhD degrees in Computer Engineering from the University of Erlangen-Nuernberg, Germany, in 1978, 1981 and 1984, respectively. Currently, he is the Ken Byers Distinguished Chair Professor with the School of Electrical and Computer Engineering, Georgia Institute of Technology and Director of Broadband and Wireless Networking Laboratory. He is an Editor-in-Chief of Computer Networks (Elsevier) and of Ad Hoc Networks (Elsevier) Journal. Dr. Akyildiz is an IEEE fellow (1995), an ACM fellow (1996). He served as a National Lecturer for ACM from 1989 until 1998 and received the ACM Outstanding Distinguished Lecturer Award for 1994. Dr. Akyildiz received the 1997 IEEE Leonard G. Abraham Prize award (IEEE Communications Society) for his paper entitled "Multimedia Group Synchronization Protocols for Integrated Services Architectures" published in the IEEE Journal of Selected Areas in Communications (JSAC) in January 1996; the 2002 IEEE Harry M. Goode Memorial award (IEEE Computer Society) with the citation "for significant and pioneering contributions to advanced architectures and

protocols for wireless and satellite networking"; the 2003 IEEE Best Tutorial Award (IEEE Communicaton Society) for his paper entitled "A Survey on Sensor Networks", published in IEEE Communication Magazine, in August 2002; and the 2003 ACM SIGMOBILE award for his significant contributions to mobile computing and wireless networking. His current research interests are in Sensor Networks, InterPlaNetary Internet, and Wireless Networks.

Half day Tutorials

13:30 – 17:30

#6   On the Building Blocks of Quality of Service in Heterogeneous IP Networks

Dr. George Kormentzas, University of the Aegean, Greece

Abstract: After more than a decade of active research on Quality of Service in IP networks and the Internet, the majority of IP traffic relies on the conventional best effort IP service model. Nevertheless, some QoS mechanisms are deployed in current networking infrastructures, while emerging applications pose QoS challenges. This tutorial brings into the foreground a broad range of research results on Quality of Service in IP-based networks. First, a justification of the need for QoS is provided, along with challenges stemming from the convergence of IP and wireless networks and the proliferation of QoS demanding IP applications (such as VoIP). It is also emphasized that a global uniform end-to-end IP QoS solution is not realistic. Based on this remark, packet-level QoS mechanisms are classified as certain building blocks, each one fulfilling different objectives in certain parts of a heterogeneous IP network. This taxonomy, being in line with the ITU-T initiative towards a QoS architectural framework for IP networks, gives rise to a thorough presentation of QoS "building blocks", as well as of their associated mechanisms. This presentation is followed by an illustration of how the various building blocks are combined in the scope of modern IP networks. Offering QoS in a large scale IP-based network demands however that additional (i.e. non-packet-level) QoS mechanisms are deployed in some parts. Therefore, the tutorial also presents prominent technologies and mechanisms devised to augment the QoS capabilities of access, wireless and optical networks. It illustrates how these mechanisms boost end-to-end QoS solutions and reveal interworking issues with packet-level mechanisms.

Biography of presenter: George Kormentzas is currently lecturer in the University of the Aegean, Department of Information and Communication Systems Engineering. He was born in Athens, Greece on 1973. He received the Diploma in Electrical and Computer Engineering and the Ph.D. in Computer Science both from the National Technical University of Athens

(NTUA), Greece, in 1995 and 2000, respectively. From 2000 to 2002, he was a research associate with the Institute of Informatics & Telecommunications of the Greek National Center for Scientific Research "Demokritos". His research interests are in the fields of traffic analysis, network control, resource management and quality of service in broadband networks. He has published extensively in the fields above, in international scientific journals, edited books and conference proceedings. He is a member of pronounced professional societies, an active reviewer and guest editor for several journals and conferences and EU-evaluator for Marie Curie Actions. George Kormentzas has participated in a number of national and international research projects, serving in some instances as the project's technical representative for University of Aegean and/or as WP leader and/or as the project's Technical Manager.

#7 High Speed Cellular Networks, Architecture and Protocols
Cedric Westphal, Nokia Research Center, USA

Abstract: Operators have started to roll out third generation cellular communication networks. These networks have different names and acronyms: GPRS, W-CDMA, CDMA-EVDO, etc., but they all set to provide the user with broadband wireless access over cellular, so that users can replicate their internet usage everywhere they are.

This tutorial will describe the different architectures and protocols for the new data networks over cellular. As cellular networks with high speed data capability become ubiquitous, it is useful to take a long look at the underlying architectures and protocols. Since there are competing cellular architectures and design choices, it is interesting to know the basic differences between them, and if these differences are irreconcilable. Other non-cellular architectures, such as WLAN or WiMax are also competing to provide high speed bandwidth to the mobile handset. The tutorial will see how to integrate and interoperate these architecture with the cellular ones.

Biography of presenter: Cedric Westphal received his PhD in Electrical Engineering from UCLA in 2000. He has been a visiting researcher at Stanford University from 1997-2000. Since then, he has worked on protocols for mobility in IP networks with Nokia Research Center in Mountain View, California. He currently is one of the designers within Nokia for the MAC/RLP protocol for cdma2000 release E. He has applied for multiple patents and published papers on link layer scheduling for high data rate networks from which he will draw for this tutorial. The tutorial will feed both from his industry expertise and his academic research work.

Tuesday, 3 May 2005

10:30 – 12:10

TECHNICAL SESSION 1: Peer-to-Peer Networks

Chair: Mostafa Ammar, Georgia Institute of Technology, USA

Topology-Aware Peer-to-Peer On-Demand Streaming
> Rongmei Zhang, Ali R. Butt, Y. Charlie Hu (Purdue University, USA)

The Scalability of Swarming Peer-to-Peer Content Delivery
> Dan Stutzbach (University of Oregon, USA), Daniel Zappala (Brigham Young University, USA), Reza Rejaie (University of Oregon, USA)

Leopard: A Locality Aware Peer-To-Peer System with No Hot Spot
> Yinzhe Yu, Sanghwan Lee, Zhi-Li Zhang (University of Minnesota, USA)

PeerMint: Decentralized and Secure Accounting for Peer-to-Peer Applications
> David Hausheer, Burkhard Stiller (ETHZ, Switzerland)

TECHNICAL SESSION 2: Performance of Internet Protocols I

Chair: Guy Pujolle, University Pierre et Marie Curie, France

Highly Responsive and Efficient QoS Routing Using Pre- and On-demand Computations along with a New Normal Measure
> Yanxing Zheng (National University of Defense Technology, China), Turgay Korkmaz, Wenhua Don (University of Texas at San Antonio, USA)

An Architecture for Software-based iSCSI: Experiences and Analyses
> Annie Foong, Gary McAlpine, Dave Minturn, Greg Regnier, Vikram Saletore (Intel Corp, USA)

Reorder Density (RD): A Formal, Comprehensive Metric for Packet Reordering
> Nischal M. Piratla, Anura P. Jayasumana, Abhijit A. Bare (Colorado State University, USA)

Batch Scheduling Algorithms for Optical Burst Switching Networks
> Ayman Kaheel, Hussein Alnuweiri (University of British Columbia, Canada)

TECHNICAL SESSION 3: Wireless Security

Chair: Theodore L. Willke, Intel, USA

ECC Based Threshold Cryptography for secure data forwarding and secure key exchange in MANET (I)

Levent Ertaul, Weimin Lu (California State University, Hayward, USA)

Mutual Authentication and Key Exchange Protocols with Anonymity Property for Roaming Services

Yixin Jiang, Chuang Lin (Tsinghua University, China), Xuemin Shen, Minghui Shi (University of Waterloo, Canada)

An Energy-Efficient Image Representation for Secure Mobile Systems

Tim Woo, Catherine Gebotys, Kshirasagar Naik (University of Waterloo, Canada)

Efficient Clustering for Multicast Key Distribution in MANETs

Mohamed Salah Bouassida, Isabelle Chrisment, Olivier Festor (LORIA - INRIA, France)

13:30 – 15:10

TECHNICAL SESSION 4: Network Security

Chair: Erwin P. Rathgeb, University of Essen, Germany

Using Secure Coprocessors to Protect Access to Enterprise Networks

Haidong Xia, Jayashree Kanchana, José Carlos Brustoloni (University of Pittsburgh, USA)

Trusted Security Devices for Bandwidth Conservation in IPSec Environments

C.D. Mano, A. Striegel (University of Notre Dame, USA)

LIPS: Lightweight Internet Permit System for Stopping Unwanted Packets

Changho Choi, Yingfei Dong, Zhi-Li Zhang (University of Minnesota, USA)

Victim-Assisted Mitigation Technique for TCP-Based Reflector DDoS Attacks

Basheer Al-Duwairi, G. Manimaran (Iowa State University, USA)

TECHNICAL SESSION 5: Wireless Performance

Chair: Hossam Hassanein, Queens University, Canada

Performance Analysis of the Uplink of a CDMA Cell Supporting Elastic Services

Gábor Fodor (Ericsson Research, Sweden), Miklós Telek (Technical University of Budapest, Hungary)

Queue Analysis for Wireless Packet Data Traffic

Shahram Teymori, Weihua Zhuang (University of Waterloo, Canada)

Modeling a Beacon Enabled IEEE 802.15.4 Cluster with Bi-Directional Traffic

Jelena Misic, Shairmina Shafi, Vojislav Misic (University of Manitoba, Canada)

Analysis of Windowing and Peering Schemes for Cache Coherency in Mobile Devices

Sandhya Narayan, Julee Pandya, Prasant Mohapatra, Dipak Ghosal (University of California, Davis, USA)

TECHNICAL SESSION 6: Network Modeling and Simulations

Chair: Nidal Nasser, University of Guelph, Canada

Inferring Traffic Burstiness by Sampling the Buffer Occupancy

Michel Mandjes (CWI, Netherlands), Remco van de Meent (University of Twente, Netherlands)

Modeling Available Bandwidth for an Efficient QoS Characterization of a Network Path

Alexander Chobanyan, Matt W. Mutka, V. S. Mandrekar, Ning Xi (Michigan State University, USA)

Reducing Large Internet Topologies for Faster Simulations

V. Krishnamurthy, M. Faloutsos, M. Chrobak (University of California Riverside, USA), L. Lao (UCLA, USA), J.-H. Cui (University of Connecticut, USA), A.G. Percus (Los Alamos National Laboratory, USA)

Dimensioning the Contention Channel of DOCSIS Cable Modem Networks

Joke Lambert, Benny Van Houdt, Chris Blondia (University of Antwerp, Belgium)

15:40 – 17:20

TECHNICAL SESSION 7: Network Service Support
Chair: Kevin Almeroth, University of California at Santa Barbara, USA

Fast Scalable Robust Node Enumeration
> Richard Black, Austin Donnelly (Microsoft Research Ltd, United Kingdom),
> Alexandru Gavrilescu, Dave Thaler (Microsoft, USA)

gTrace: Simple Mechanisms for Monitoring of Multicast Sessions
> Gisli Hjalmtysson, Olafur Helgason, Bjorn Brynjulfsson (Reykjavik University,
> Iceland)

Toward Feasibility and Scalability of Session Initiation and Dynamic QoS Provisioning in Policy-Enabled Networks
> Kamel Haddadou, Yacine M. Ghamri-Doudane, Marc Girod-Genet, Ahmed
> Meddahi, Laurent Bernard, Gilles Vanwormhoudt, Hossam Afifi, Nazim
> Agoulmine (University of Paris 6, France)

Modeling Soft State Protocols with SDL
> Xiaoming Fu, Dieter Hogrefe (University of Goettingen, Germany)

TECHNICAL SESSION 9: Wireless LANs
Chair: Sagar Naik, University of Waterloo, Canada

CONTI: Constant-Time Contention Resolution for WLAN Access
> Zakhia G. Abichar, J. Morris Chang (Iowa State University, USA)

Efficient 3G/WLAN Interworking Techniques for Seamless Roaming Services with Location-Aware Authentication
> Minsoo Lee, Gwanyeon Kim, Sehyun Park (Chung-Ang University, Korea), Sungik
> Jun, Jaehoon Nah (Electronics and Telecommunications Research Institute,
> Korea), Ohyoung Song (Chung-Ang University, Korea)

A New per-Class Flow Fixed Proportional Differentiated Service for Multi-Service Wireless LAN
> Meng Chang Chen (Academia Sinica, Taiwan), Li-Ping Tung, Yeali S. Sun, Wei-
> Kuan Shih (National Tsing Hua University, Taiwan)

Reservation and Grouping Stations for the IEEE 802.11 DCF
> Yang Xiao, Haizhon Li (The University of Memphis, USA), Kui Wu (University of
> Victoria, Canada), Kin K. Leung (Bell Labs, Lucent Technologies, USA), Qiang Ni
> (National University of Ireland at Maynooth, Ireland)

Wednesday, 4 May 2005

10:00 – 11:15

TECHNICAL SESSION 10: Optical Networking

Chair: Harry Perros, North Carolina State University, USA

Path Switching in OBS Networks

Li Yang, George N. Rouskas (North Carolina State University, USA)

A Priority-Aware Protection Technique for Quality of Service Enabled WDM Networks

W. Fawaz (University of Paris 13, France), F. Martignon (University of Bergamo, Italy), K. Chen (University of Paris 13, France), G. Pujolle (University of Paris 6, France)

Wavelength Rerouting in Survivable WDM Networks

Yingyu Wan, Weifa Liang (Australian National University, Australia)

TECHNICAL SESSION 11: Performance of Internet & web applications

Chair: Michalis Faloustos, University California Riverside, USA

Performance of Server Selection Algorithms for Content Replication Networks

David Starobinski (Boston University, USA), Tao Wu (Nokia, USA)

Local Utility Aware Content Replication

Nikolaos Laoutaris, Orestis Telelis, Vassilios Zissimopoulos, Ioannis Stavrakakis (University of Athens, Greece)

Improving Network Convergence Time and Network Stability of an OSPF-Routed IP Network

Amir Siddiqi (Nortel Networks, Canada), Biswajit Nandy (Solana Networks, Canada)

TECHNICAL SESSION 12: Ad Hoc Networks I

Chair: Jelena Misic, University of Manitoba, Canada

Non-cooperative Forwarding in Ad-hoc Networks

Eitan Altman, Arzad A. Kherani (INRIA, France), Pietro Michiardi, Refik Molva (Insitut Eurecom, France)

Efficient Broadcasting in Ad Hoc Networks Using Directional Antennas
> Fei Dai, Jie Wu (Florida Atlantic University, USA)

Trellis-Based Virtual Regular Addressing Structures in Self-Organized Networks
> Julien Ridoux (Universite Pierre et Marie Curie, France), Anne Fladenmuller,
> Yannis Viniotis (North Carolina State University, USA), Kavé Salamatian
> (University Paris 6, France)

11:25 – 12:40

TECHNICAL SESSION 13: Adaptive Networking
Chair: Ioanis Nikolaidis, University of Alberta, Canada

Network of Shortcuts: An Adaptive Data Structure for Tree-Based Search Methods
> Andrea Bergamini (EPFL, Lausanne, Switzerland), Lukas Kencl (Intel Research,
> Cambridge, United Kingdom)

Multipath Routing Algorithms for Congestion Minimization
> Ron Banner, Ariel Orda (Technion, Israel)

Improving TCP in Wireless Networks with an Adaptive Machine-Learnt Classifier of Packet Loss Causes
> Ibtissam El Khayat, Pierre Geurts, Guy Leduc (University of Liège, Belgium)

TECHNICAL SESSION 14: Performance of Internet Protocols II
Chair: Jelena Misic, University of Manitoba, Canada

A Multiple Time-Scale Model for TCP Bandwidth Sharing under User Heterogeneity
> Dirk Abendroth (Bayrische Motor Werke (BMW), Germany), Hans van den Berg
> (TNO Telecom, Netherlands), Michel Mandjes (CWI, Netherlands)

A Multizone Pipeline Cache for IP Routing
> Soraya Kasnavi, Paul Berube, Vincent Gaudet, José Nelson Amaral (University of
> Alberta, Canada)

Aggregated Aggressiveness Control on Groups of TCP Flows
> Soohyun Cho, Riccardo Bettati (Texas A&M University, USA)

TECHNICAL SESSION 15: Radio Resource Management

Chair: Ahmed M. Safwat, Queens University, Canada

Multi-Level Dynamic Guard Channels for Priority Access in Cellular Systems

Tung Chong Wong (Institute for Infocomm Research, Singapore), Jon W. Mark (University of Waterloo, Canada), Kee Chaing Chua (National University of Singapore, Singapore)

Slotted Aloha with Priorities and Random Power

E. Altman (INRIA, France), D. Barman (Boston University, USA), A. Benslimane, R. El Azouzi (University of Avignon, France)

Downlink Packet Scheduling with Minimum Throughput Guarantee in TDD-OFDMA Cellular Network

Young Min Ki, Eun Sun Kim, Sung Il Woo, Dong Ku Kim (Yonsei University, Korea)

14:00 – 15:40

TECHNICAL SESSION 16: Internet Routing

Chair: Manimaran Govindarasu, Iowa State University, USA

Making IGP Routing Robust to Link Failures

Ashwin Sridharan (Sprint ATL, USA), Roch Guérin (University of Pennsylvania, USA)

Interdomain Ingress Traffic Engineering through Optimized AS-Path Prepending

Ruomei Gao, Constantinos Dovrolis, Ellen W. Zegura (Georgia Institute of Technology, USA)

Describing and Simulating Internet Routes

Jérémie Leguay, Matthieu Latapy, Timur Friedman, Kavé Salamatian (University Paris 6, France)

A Growth-Based Address Allocation Scheme for IPv6

Mei Wang (Stanford University, USA)

TECHNICAL SESSION 17: Queuing Models

Chair: Ramon Puigjaner, Universitat de les Illes Balears, Spain

Are Multiple Descriptions Better than One?

> György Dán, Viktória Fodor, Gunnar Karlsson (Royal Institute of Technology, Sweden)

An Approximate Queueing Model for Limited-Range Wavelength Conversion in an OBS Switch

> Vishwas S. Puttasubbappa, Harry G. Perros (North Carolina State University, USA)

On Fairness, Optimal Download Performance and Proportional Replication in Peer-to-Peer Networks

> Saurabh Tewari (UCLA, USA), Leonard Kleinrock (Nomadix Inc., USA)

A Novel Direct Upper Approximation for Workload Loss Ratio in General Buffered Systems

> József Bíró, András Gulyás, Zalán Heszberger (Budapest University of Technology and Economics, Hungary)

TECHNICAL SESSION 18: Panel 1

Autonomic Networks: New Ideas and Challenges for the Research Community

> *Moderator:* Erol Gelenbe (Imperial College)
> *Panelists:* Alberto Leon-Garcia (U of Toronto), Guy Pujolle (U Pierre & Marie Curie), Ioannis Stavrakakis (U Athens)

16:10 – 17:50

TECHNICAL SESSION 19: Network Monitoring, Measurement and Profiling

Chair: Aaron Striegel, University of Notre Dame, USA

PISA: Automatic Extraction of Packet Signatures

> Parminder Chhabra (Rutgers University, USA), Ajita John (Avaya Labs Research, USA), Huzur Saran (Indian Institute of Technology, India)

FPL-3: Towards Language Support for Distributed Packet Processing

> Mihai Lucian Cristea (Leiden Institute of Advanced Computer Science, Netherlands), Willem de Bruijn, Herbert Bos (Vrije Universiteit, Netherlands)

Efficient deployment of honeynets for statistical and forensic analysis of attacks from the Internet

Stephan Riebach, Erwin P. Rathgeb, Birger Toedtmann (University Duisburg-Essen, Germany)

Measuring Round Trip Times to Determine the Distance between WLAN Nodes

André Günther, Christian Hoene (TU-Berlin, Germany)

TECHNICAL SESSION 20: Network Management Systems

Chair: Youssef Iraqi, University of Waterloo, Canada

End-to-end Asymmetric Link Capacity Estimation

Ling-Jyh Chen, Tony Sun, Guang Yang, M.Y. Sanadidi, Mario Gerla (UCLA, USA)

Impact of Resource Sharability on Dual Failure Restorability in Optical Mesh Networks

Chadi Assi, Wei Huo (Concordia University, Canada), Abdallah Shami (The University of Western Ontario, Canada)

Efficient Distributed Solutions for MPLS Fast Reroute

Dongmei Wang, Guangzhi Li (AT&T Labs - Research, USA)

Pricing for Heterogeneous Services at a Discriminatory Processor Sharing Queue

Yezekael Hayel, Bruno Tuffin (IRISA, France)

TECHNICAL SESSION 21: Sensor and Ad Hoc Networks

Chair: Mihail L. Sichitia, North Carolina State University, USA

Joint Sensor Selection and Data Routing in Sensor Networks

Ozgur Ercetin (Sabanci University, Turkey), Ozgur Gurbuz (Sabanci University, Turkey), Kerem Bulbul, Aylin Aksu (Sabanci University, Turkey)

Peer Collaboration in Wireless Ad Hoc Networks

Lin Cai (University of Waterloo, Canada), Jianping Pan (NTT MCL, USA), Xuemin Shen, Jon W. Mark (University of Waterloo, Canada)

Fireworks: An Adaptive Group Communications Protocol for Mobile Ad Hoc Networks

Lap Kong Law, Srikanth Y. Krishnamurthy, Michalis Faloutsos (University of California Riverside, USA)

An Optimized TCP for Internet Access of Vehicular Ad Hoc Networks

Marc Bechler, Sven Jaap, Lars Wolf (Technical University of Braunschweig, Germany

Thursday, 5 May 2005

10:00 – 11:15

TECHNICAL SESSION 22: Overlay Multicast
Chair: Daniel Zappala, University of Oregon, USA

Cooperative Failure Detection in Overlay Multicast
Mengkun Yang, Zongming Fei (University of Kentucky, USA)

Eliminating Bottlenecks in Overlay Multicast
Min Sik Kim, Yi Li, Simon S. Lam (University of Texas at Austin, USA)

TOMA: A Viable Solution for Large-Scale Multicast Service Support
Li Lao (UCLA, USA), Jun-Hong Cui (University of Connecticut, USA), Mario Gerla
(UCLA, USA)

TECHNICAL SESSION 23: Quality of Service
Chair: Edmundo Monteiro, University of Coimbra, Portugal

The Burstiness Behavior of Regulated Flows in Networks
Yu Ying, Ravi Mazumdar, Catherine Rosenberg (Purdue University, USA), Fabrice
Guillemin (France Telecom R&D, France)

**A Credit-based Active Queue Management (AQM) Mechanism to Achieve Fairness in the
Internet**
Gwyn Chatranon (University of Pittsburgh, USA), Miguel A. Labrador (University
of South Florida, USA), Sujata Banerjee (Hewlett-Packard Laboratories, USA)

Optimizing End-to-End Throughput for Data Transfers on an Overlay-TCP Path
Pradnya Karbhari, Mostafa Ammar, Ellen Zegura (Georgia Institute of
Technology, USA)

TECHNICAL SESSION 24: Wireless Scheduling
Chair: Weihua Zhuang, University of Waterloo, Canada

Randomized Coverage-Preserving Scheduling Schemes for Wireless Sensor Networks
Chong Liu, Kui Wu, Valerie King (University of Victoria, Canada)

Dynamic Scheduling for Scalable Media Transmission over cdma2000 1xEV-DO Broadcast and Multicast Networks
Kyungtae Kang, Jinsung Cho, Yongwoo Cho, Heonshik Shin (Seoul National University, Korea)

Proxy-Assisted Scheduling for Energy-Efficient Multimedia Streaming over Wireless LAN
Fan Zhang, Samuel T. Chanson (The Hong Kong University of Science and Technology, Hong Kong)

11:25 – 12:40

TECHNICAL SESSION 25: Improving Multicast Communication
Chair: Jun-Hong Cui, University of Connecticut, USA

Encodings of Multicast Trees
Vijay Arya (INRIA Sophia Antipolis, France), Thierry Turletti (INRIA, France), Shivkumar Kalyanaraman (RPI, USA)

Efficient Bandwidth Guaranteed Restoration Algorithms for Multicast Connections
William Lau, Sanjay Jha (University of NSW, Australia), Suman Banerjee (University of Wisconsin–Madison, USA)

Scheduling Uplink Bandwidth in Application-layer Multicast Trees
Sridhar Srinivasan, Ellen Zegura (Georgia Institute of Technology, USA)

TECHNICAL SESSION 26: Traffic Management and Engineering I
Chair: Muhammad Jaseemuddin, Ryerson University, Canada

A Novel Packet Marking Function for Real-Time Interactive MPEG-4 Video Applications in a Differentiated Services Network
Shane O'Neill, Alan Marshall, Roger Woods (Queens University Belfast, United Kingdom)

On Multipath Routing with Transit Hubs
A. Sen, B. Hao, B.H. Shen, S. Murthy (Arizona State University, USA), S. Ganguly (NEC Laboratories America, USA)

Comparison of Border-to-Border Budget Based Network Admission Control and Capacity Overprovisioning
Ruediger Martin, Michael Menth (University of Wuerzburg, Germany), Joachim Charzinski (Siemens AG, Germany)

TECHNICAL SESSION 27: Ad Hoc Networks II

Chair: Guy Pujolle, University Pierre et Marie Curie, France

RIDA: Robust Intrusion Detection in Ad Hoc Networks

Dhanant Subhadrabandhu, Saswati Sarkar (University of Pennsylvania, USA), Farroq Anjum (Telcordia Tech., USA)

Self-Configurable Key Pre-distribution in Mobile Ad-Hoc Networks

Claude Castelluccia (INRIA, France), Nitesh Saxena, Jeong Hyun Yi (UC Irvine, USA)

Efficient Use Of Route Requests for Loop-free On-demand Routing in Ad hoc Networks

Hari Rangarajan, J.J. Garcia-Luna-Aceves (University of California at Santa Cruz, USA)

14:00 – 15:40

TECHNICAL SESSION 28: Traffic Management and Engineering II

Chair: Srinivasan Keshav, University of Waterloo, Canada

Penalty Shaper to Enforce Assured Service for TCP Flows

Emmanuel Lochin (CNRS-University of Paris 6, France), Pascal Anelli (IREMIA -- Université de la Réunion, France), Serge Fdida (University Pierre & Marie Curie, France)

QoS Dynamic Routing in Content Delivery Networks

Krzysztof Walkowiak (Wroclaw University of Technology, Poland)

Exploiting Traffic Localities for Efficient Flow State Lookup

Tao Peng, Christopher Leckie, Kotagiri Ramamohanarao (University of Melbourne, Australia)

The Interaction of Forward Error Correction and Active Queue Management

Tigist Alemu, Yvan Calas (University of Montpellier II, France), Alain Jean-Marie (INRIA-University of Montpellier II, France)

TECHNICAL SESSION 29: Mobility Management

Chair: Aladdin O.M. Saleh, Bell, Canada

ELIP: Embedded Location Information Protocol

Farid Benbadis, Marcelo Dias de Amorim, Serge Fdida (University Pierre & Marie Curie, France)

Coordinated Interaction Using Reliable Broadcast in Mobile Wireless Networks

Theodore L. Willke, Nicholas F. Maxemchuk (Columbia University, USA)

Delay Tolerant Mobile Networks (DTMNs): Controlled Flooding in Sparse Mobile Networks

Khaled A. Harras, Kevin C. Almeroth, Elizabeth M. Belding-Royer (University of California Santa Barbara, USA)

Application Signal Threshold Adaptation for Vertical Handoff in Heterogeneous Wireless Networks

Ben Liang, Ahmed H. Zahran (University of Toronto, Canada), Aladdin O.M. Saleh (Bell Canada, Canada)

TECHNICAL SESSION 30: Panel 2

Cross-Layer Integration in Wireless Networks: a Necessity or a Gimmick?

Moderator: C. Rosenberg (U. of Waterloo)

Panelists: G. Kesidis (U. Penn), P.R. Kumar (UIUC), N. Shroff (Purdue)

16:10 – 17:25

TECHNICAL SESSION 31: Bandwidth Management

Chair: Peter Marbach, University of Toronto, Canada

Justice: Flexible and Enforceable Per-Source Bandwidth Allocation

Jakob Eriksson, Michalis Faloutsos, Srikanth Krishnamurthy (University of California, Riverside, USA)

A Novel Approach for Transparent Bandwidth Conservation

David Salyers, Aaron Striegel (University of Notre Dame, USA)

Efficient Bandwidth Sharing in Bus-Based Optical Access Networks

André-Luc Beylot, Nizar Bouabdallah, Guy Pujolle (Alcatel Research & Innovation and University of Paris 6, France)

TECHNICAL SESSION 32: CDMA

Chair: Mahnhoon Lee, University College of the Cariboo, Canada

Cross-Layer Radio Resource Allocation in Packet CDMA Wireless Mobile Networks with LMMSE Receivers

Fei Yu, Vikram Krishnamurthy (University of British Columbia, Canada)

Stabilization of Contention-Based CDMA Ranging Channel in Wireless Metropolitan Area Networks

Jeong-Jae Won (The University of British Columbia, Canada), Choong-Ho Cho, Hyong-Woo Lee (Korea University, Korea), Victor C.M. Leung (The University of British Columbia, Canada)

Load Balancing and Relaying Framework in TDD W-CDMA Multi-hop Cellular Networks

Y. Hung Tam, Ahmed M. Safwat, Hossam S. Hassanein (Queens University, Canada)

TECHNICAL SESSION 33: Wireless Resource Management

Chair: Kui Wu, University of Victoria, Canada

Stochastic Decision-based Analysis of Admission Control Policy in Multimedia Wireless Networks

Nidal Nasser (Queen's University, Canada)

Improving the Performance of Rate Adaptation Schemes in Heterogeneous Wireless Networks

P. Stathopoulos, L. Sarakis, N. Mitrou (National Technical University of Athens, Greece)

Stochastic Admission Control for Quality of Service in Wireless Packet Networks

Majid Ghaderi, Raouf Boutaba (University of Waterloo, Canada), Gary W. Kenward (Nortel Networks, Canada)

Tuesday, 3 May 2005

17:30 – 19:30

1 **802.11 Link Interference: A Simple Model and A Performance Enhancement**
Hoon Chang, Vishal Misra (Columbia University, USA)

2 **A Backup Tree Algorithm for Multicast Overlay Networks**
Torsten Braun (University of Berne, Switzerland), Vijay Arya, Thierry Turletti (INRIA Sophia Antipolis, France)

3 **A Hierarchical Secure Ring-Oriented Multicast Protocol over Mobile Ad Hoc Sensor Network**
Choong Seon Hong, Yubai Yang (Kyung Hee University, Korea)

4 **A new TCP-friendly Rate Control Algorithm for Scalable Video Streams**
Jinyao Yan, Martin May, Kostas Katrinis, Bernhard Plattner (ETH Zurich, Switzerland)

5 **A Node Cooperative ARQ Scheme for Wireless Ad-Hoc Networks**
Mehrdad Dianati, Xinhua Ling, Sagar Naik, Xuemin Shen (University of Waterloo, Canada)

6 **A Novel Extension for On-Demand Routing Protocol in Event-Driven Sensor Networks**
Dong-Hyun Chae, Kyu-Ho Han, Kyung-Soo Lim, Sun-Shin An (University of Korea, Korea)

7 **A Novel Method for SCTP Load Sharing**
Andreas Jungmaier (University of Duisburg-Essen, Germany), Erwin P. Rathgeb (University of Essen, Germany)

8 **A Rule-Based Approach for Consistent Proportional Delay Differentiation**
Jianbin Wei, Cheng-Zhong Xu (Wayne State University, USA)

9 **A Self-organizing Routing Scheme for Random Networks**
Thomas Fuhrmann (University of Karlsruhe, Germany)

10 **A Simple and Fast Algorithm for Bluetooth Network Formation**
Yuh-Jzer Joung, Geng-Dian Hwang (National Taiwan University, Republic of China)

11 **Achieving Stability and Fairness in Mobile Ad Hoc Networks**
Ahmed M. Mahdy, Jitender S. Deogun, Jun Wang (University of Nebraska-Lincoln, USA)

12 **An UNA-Based Approach to Support Mobility in the Internet**
Mahnhoon Lee (University College of the Cariboo, Canada), Yongik Yoon (Sookmyung Women's University, Republic of Korea)

13 **Applying the DiffServ Model to a Resilient Packet Ring Network**
Fredrik Davik (Ericsson Research, University of Oslo, Norway), Stein Gjessing (Simula Research Laboratory, Norway)

14 **Attaining VoIP-grade QoS via Deflection: A Buffer Space Tradeoff Study**
André Muezerie (University of São Paulo, Brazil), Ioanis Nikolaidis, Pawel Gburzynski (University of Alberta, Canada)

15 **Bandwidth Sharing of Low Priority Services for Efficient Call Admission Control in Cellular Networks**
Kyungkoo Jun, Seokhoon Kang (University of Incheon, Republic of Korea)

16 **Benefits of Multiple Battery Levels for the Lifetime of Large Wireless Sensor Networks**
Mihail Sichitiu, Rudra Dutta (North Carolina State University, USA)

17 **Control and Forwarding Plane Interaction in Distributed Routers**
Markus Hidell, Peter Sjödin, Olof Hagsand (KTH - Royal Institute of Technology, Sweden)

18 **COPACC: A Cooperative Proxy-Client Caching System for On-Demand Media Streaming**
Alan T.S. Ip (The Chinese University of Hong Kong, Hong Kong), Jiangchuan Liu (Simon Fraser University, Canada), John C.S. Lui (The Chinese University of Hong Kong, Hong Kong)

19 **Design and Performance Evaluation of WDM/TDMA-Based MAC Protocol in AWG-Based WDM-PON**
Kyeong-Eun Han, Yang He, Seung-Hyun Lee, Biswanath Mukherjee, Young-Chon Kim (Chonbuk National University, Republic of Korea)

20 **Enhanced Data Services in GPRS Networks via Auction-based Prices for Admission**
Saravut Yaipairoj, Fotios C. Harmantzis (Stevens Institute of Technology, USA)

21 **Equivalent Gibbs-Duhem Law in Network Queue**
Sandeep Sudeep, Joseph Y. Hui (Arizona state univesity, USA)

22 **Extended Dominating Set in Ad Hoc Networks Using Cooperative Communication**
Jie Wu, Mihaela Cardei, Fei Dai, Shuhui Yang (Florida Atlantic University, USA)

23 **Extending the Birkhoff-von Neumann Switching Strategy to Multicast Switches**
Jay Kumar Sundararajan, Supratim Deb (MIT, USA), Muriel Médard (MIT, USA)

24 **Impact of Routing lags on Internet Routing Failures**
Feng Wang, Lixin Gao (University of Massachusetts, Amherst, USA)

25 **INTERMON: An Architecture for Inter-domain Monitoring, Modelling and Simulation**
Elisa Boschi (Fraunhofer FOKUS, Germany), Salvatore D'Antonio (Consorzio Interuniversitario Nazionale per l'Informatica, Italy), Paul Malone (WIT, Ireland), Carsten Schmoll (Fraunhofer FOKUS, Germany)

26 **Maximizing the Number of Connections in Multifiber WDM chain, ring and star networks**
Katerina Potika (National Technical University of Athens, Greece)

27 **Measurement of Rain Attenuation of Microwaves at 12.25GHz in Korea**
Dong You Choi (Chosun University, Korea)

28 **On the Efficient Resource Allocation for High Quality Video streams and FTP traffic over Next Generation Wireless Networks**
Polychronis Koutsakis, Spyros Psychis (Technical University of Crete, Greece)

29 **Performance Analysis of 802.11 WLANs under Sporadic Traffic**
M. Garetto, C.-F. Chiasserini (Politecnico di Torino, Italy)

30 **Performance Analysis of a Multimedia CDMA System Using Dynamic Rate Control**
Seung Sik Choi (University of Incheon, Republic of Korea)

31 **QoS Scalable Tree Aggregation**
Joanna Moulierac, Alexandre Guitton (IRISA / University of Rennes I, France)

32 **Scalable Route Selection for IPv6 Multihomed Sites**
Cédric de Launois, Steve Uhlig, Olivier Bonaventure (Université Catholique de Louvain, Belgium)

33   **Supermedia Transport for Teleoperations over Overlay Networks**
Zhiwei Cen, Matt Mutka, Danyu Zhu, Ning Xi (Michigan State University, USA)

34   **SWATCH: a StepWise AdapTive Clustering Hierarchy in Wireless Sensor Networks**
Quanhong Wang, Kenan Xu, Hossam Hassanein, Glen Takahara (Queen's University, Canada)

35   **Trade-offs for Web Communications Fast Analysis**
Olivier Paul, Jean-Etienne Kiba (GET/INT, France)

36   **Virtual Multi-Homing: On the Feasibility of Combining Overlay Routing with BGP Routing**
Zhi Li, Prasant Mohapatra, Chen-Nee Chuah (University of California, Davis, USA)

Friday May 6, 2005

Mathematical Modeling and Analysis of Computer Networks

8:15 – 8:30
Welcome and Information

8:30-10:30
Implications to Network Utility Through Physical and Medium Access Layer Innovations
Jang-Won Lee, Princeton University

The Price of Anarchy in Min-Cost Multicast with Network Coding
Sanjay Shakkottai, University of Texas at Austin

Spectrum Sharing Games
Randy Berry, Northwestern University

Competition and Efficiency in Communication Networks
Asuman Ozdaglar, Massachusetts Institute of Technology

10:45 – 12:15
Stochastic Control Problems in MAC Layer Wireless Multicast
Saswati Sarkar, University of Pennsylvania

Optimal Scheduling of Data Transmission in Wireless Networks
Roland Malhame, Ecole Polytechnique Montreal

Power Control, Rate Allocation, and Routing in Stochastic Wireless Networks
Edmund Yeh, Yale University

13:30 – 15:00

Coupled Kermack-McKendrick Models for Randomly Scanning and Bandwith-Saturating Internet Worms

George Kesidis, Penn State University

Providing Guaranteed Packet Loss Rate in Wireless Networks in the Presence of Random Interference

Richard La, University of Maryland

Scheduling in Multihop Wireless Networks

R. Srikant, University of Illinois at Urbana Champagne

15:30 – 17:00

QoS Provisioning in Wireless Ad-Hoc Networks

K. S. Srisankar, Motorola

Random Mobility Models in Ad Hoc Networks: Capacity and Delay Issues

Ravi Mazumdar, Waterloo University

Stochastic Control of Ad-Hoc Networks: Delay, Energy, Fairness

Michael Neely, University of Southern California

FIELDS

Sponsored by the Fields Institute for Research in the Mathematical Sciences.

Next Generation Networking Middleware

8:30 - 09:00
Welcome – Workshop Goals
G. Kormentzas

9:00 - 09:30
Designing a Scalable, Self-Organizing Middleware for Server Clusters
C. Adam, R. Stadler

9:30 - 10:00
OSDA: Open Service Discovery Architecture for Cross-domain Service Discovery
N. Limam, J. Ziembicki, R. Ahmed, Y. Iraqi, D. T. Li, R. Boutaba, F. Cuervo

10:00 - 10:30
Requirements and Design for XML Messaging in the Mobile Environment
J. Kangasharju, T. Lindholm, S. Tarkoma

11:00 - 11:30
Inter-Provider QoS Peering for IP Service Offering Across Multiple Domains
A. Asgari, M. Boucadair, R. Egan, P. Morand, D. Griffin, J. Griem, P. Georgatsos, J. Spencer, G. Pavlou, M. Howarth

11:30 - 12:00
Inter-domain QoS Monitoring System for Supporting Service Assurance and Resource Management across Heterogeneous Networks
A. Mehaoua, T. Ahmed, A. H. Asgari, G. Kormentzas, G. Xilouris

12:00 - 12:30
Evaluation of a Location-Based Multimedia Content Delivery System for Monitoring Purposes
P. Kalliaras, A. D. Sotiriou, P. Stathopoulos, N. Mitrou

14:00 - 15:00
Keynote Speech: "Towards Autonomic Networking Middleware"
Alexander Keller - IBM T.J. Watson Research Center

15:30 - 16:00
Performance Evaluation of a P2P Overlay Brokerage Network
N. Dellas, S. Kapellaki, E. Koutsoloukas, G. Prezerakos, I. Venieris

16:00 - 16:30
Middleware for In-door Ambient Intelligence: The PolyOmaton System
S. Azodolmolky, N. Dimakis, V. Mylonakis, G. Souretis, J. Soldatos, A. Pnevmatikakis, L. Polymenakos

16:30 - 17:00
Middleware Platform for the Support of Charging Reconfiguration Actions
M. Koutsopoulou, S. Panagiotakis, A. Alonistioti, A. Kaloxylos

17:00 - 17:30
Workshop Concluding Remarks

World Class Events: Telecommunications Challenges

Throughout the telecommunications industry, organizing world class events presents unique challenges and drives explosive changes in service offerings, network infrastructures, and product technologies. The host city's or country's reputation on being able to organize such world class events may depend on the mastery of providing a "Perfect Network".

This workshop is a unique gathering opportunity for select industry executives, seasoned managers, expert researchers and senior subject matter experts from sponsor organizations of world class events, telecommunication companies, and government officials of host cities/countries to discuss the requirements and steps necessary to build and operate a "Perfect Network" for such events. They will share experiences, plans, "do lists", and their vision to ensure a "Perfect Network". An intense day of selected presentations and possible refreshing panel discussions will focus on how to avoid "re-inventing the wheel" every time that a city or country becomes a candidate/host for such world class events.

Confirmed Key Speakers of the industrial track:

> **Delivering an Olympic Class Network in 2010**, Justin Webb, *Vice President Olympic Solutions, Bell Canada*
> **Telecommunication Challenges for the Olympic Games**, Spilios Makris, *Director Olympic Program, Telcordia*
> **Telecommunications at the Athens 2004 Summer Olympics**, Yiannis Antoniadis, *Olympic Games Telecommunications Command & Control Deputy Manager, OTE*
> **World Class Events - Telecommunication Challenges**, Alex Iliadis, *Athens 2004 Telecom Manager*

Chair: Raouf Boutaba, University of Waterloo, Canada

Special Track for Networking Technologies, Services and Protocols

Chair: Kevin Almeroth, UCSB, USA

Mostafa Ammar, Georgia Tech, USA
Samrat Bhattacharjee, University of Maryland, USA
Andrea Bianco, Politecnico di Torino, Italy
Milind Buddhikot, Bell Labs, USA
Claudio Casetti, Politecnico di Torino, Italy
Jun-Hong Cui, University of Connecticut, USA
Jordi Domingo-Pascual, University of Catalunya, Spain
Sonia Fahmy, Purdue University, USA
Wu-chi Feng, Oregon Graduate Institute, USA
Maurice Gagnaire, ENST, France
Manimaran Govindarasu, Iowa State University, USA
David Hutchison, Lancaster University, UK
Gianluca Iannaccone, Intel Research Cambridge, USA
Shivkumar Kalyanaram, RPI, USA
Kimon Kontovasilis, Demokritos Research Center, Greece
Guy Leduc, University of Liege, Belgium
Jorg Liebeherr, University of Virginia, USA
Peter Marbach, University of Toronto, Canada
Lorne Mason, McGill University, Canada
Ketan Mayer-Patel, University of North Carolina, USA
Michael Menth, University of Wuerzburg, Germany
Vishal Misra, Columbia University, USA
Prasant Mohapatra, UC Davis, USA
Ioanis Nikolaidis, University of Alberta, USA
Peng Ning, North Carolina State University, USA
Jaudelice de Oliveira, Drexel University, USA
Christos Papadopoulos, University of Southern California, USA
Symeon Papavassiliou, NJIT, USA
Erwin Rathgeb, University of Essen, Germany
Reza Rejaie, Univ of Oregon, USA
George Rouskas, NC State University, USA

Saswati Sarkar, University of Pennsylvania, USA
Stefan Saroiu, University of Toronto, Canada
Ashwin Sridharan, Sprint ATL, USA
Aaron Striegel, University of Notre Dame, USA
Lars Wolf, Braunschweig University of Technology, Germany
Richard Yang, Yale University, USA
Daniel Zappala, University of Oregon, USA
Ben Zhao, UCSB, USA

Special Track for Performance of Computer and Communication Networks

Chair: Ramon Puigjaner, Universitat de les Illes Balear, Spain

Ron Addie, University of Southern Queensland, Australia
Eitan Altman, INRIA, France
Miltiades Anagnostou, National Technical University of Athens, Greece
Andrea Baiocchi, University "La Sapienza" Rome, Italy
Chris Blondia, University of Antwerp, Belgium
Tosten Braun, University of Berne, Switzerland
Herwig Bruneel, University of Ghent, Belgium
Mariacarla Calzarossa, University of Pavia, Italy
Constantinos Courcoubetis, Athens University of Economics and Business, Greece
Khaled Elsayed, Cairo University, Egypt
Sebastià Galmés, Universitat de les Illes Balears, Spain
Jorge García, Universitat Politècnica de Catalunya, Spain
Guenter Haring, University of Vienna , Austria
Peter Harrison, Imperial College, UK
Ilias Iliadis, IBM Research, Switzerland
Farouk Kamoun, Université de la Manouba, Tunisia
Krishna Kant, Intel Corporation, USA
Peter Key, Microsoft Research Ltd, Cambridge, UK
Willian Knottenbelt, Imperial College, UK
Demetres Kouvatsos, University of Bradford, UK
Pieter Kritzinger, University of Cape Town, RSA
Emilio Leonardi, Politecnico di Torino, Italy

Alberto Leon-Garcia, University of Toronto, Canada

Michela Meo, Politecnico di Torino, Italy

Edmundo Monteiro, University of Coimbra, Portugal

Ilkka Norros, VTT, Finland

Luis Orozco, Universidad de Castilla-La Mancha, Spain

Harry Perros, North Carolina State University, USA

Andreas Pitsillides, University of Cyprus, Cyprus

Ana Pont, Universitat Politècnica de València, Spain

Otto Spaniol, Rheinisch-Westfälische Technische
Hochschule Aachen, Germany

Yutaka Takahashi, University of Kyoto, Japan

Yannis Viniotis, North Carolina State University, USA

**Special Track for Mobile and Wireless Communications
Systems**

Chair: Sherman Shen, University of Waterloo, Canada

Ozgur Akan, Middle Easten Technical University

Eitan Altman, INRIA, France

Luciano Bononi, University of Bologna, Italy

Hsiao-Hwa Chen, National Sun Yat-sen University, Taiwan

Marco Conti, National Research Council, Italy

Christina Czernuszka, Telus, Canada

Eylem Ekici, Ohio State University, USA

Laura Feeney, SICS, Sweden

Joe Finney, Lancaster University, UK

Gabor Fodor, Ericsson, Sweden

Jerome Galtier, France Telecom R&D and INRIA, France

Silvia Giordano, ICA-DSC-SUPSI, Switzerland

Enrico Gregori, National Research Councìl, Italy

Ekram Hossain, University of Manitoba, Canada

Youssef Iraqi, University of Waterloo, Canada

Robin Kravets, UIUC , USA

Thomas Kunz, Carleton University, Canada

Victor Leung, University of British Columbia, Canada

Chuang Lin, Tsinghua University, China

Gerald Maguire, Royal Institute of Technology, Sweden

Jelena Misic, University of Manitoba, Canada

Zhisheng, Niu, Tsinghua University, China

Stephan Olariu, Old Dominion University, USA

Sergio Palazzo, University of Catania, Italy

Jianping Pan, NTT, USA

Nikos Passas, University of Athens, Greece

George Polyzos, Athens University of Economics and
Business, Greece

Guy Pujolle, Universite Pierre et Marie Curie (Paris 6),
France

Kimmo Raatikainen, University of Helsinki, Finland

Aladdin O. M. Saleh, Bell Mobility, Canada

Ivan Stojmenovic, University of Ottawa, Canada

Violet Syrotiuk, Arizona State University, USA

Shahrokh Valaee, University of Toronto, Canada

Andras Valko, Ericsson, Sweden

Bernhard Walke, Aachen University, Germany

Lichun Wang, National Chiao Tung University, Taiwan

Gualiang (Larry) Xue, Arizona State University, USA

Richard Yao, Microsoft Research Asia, China

Xiaohu You, Southeast University, China

Ping Zhang, Beijing University of Post and
Telecommunications, China

Qian Zhang, Microsoft Research Asia, China

Yongbing Zhang, University of Tsukuba, Japan

Dongmei Zhao, McMaster University, Canada

General Chair

Jay Black, University of Waterloo, Canada

Technical Program Chair

Raouf Boutaba, University of Waterloo, Canada

Chair, Special Track for Networking Technologies, Services and Protocols

Kevin Almeroth, University of California, Santa Barbara, USA

Chair, Special Track for Performance of Computer & Communication Networks

Ramon Puigjaner, Universitat de les Illes Balear, Spain

Chair, Special Track for Mobile and Wireless Communications

Sherman Shen, University of Waterloo, Canada

Keynote and Panel Co-Chairs

Edmundo Monteiro, University of Coimbra, Portugal

Catherine Rosenberg, University of Waterloo, Canada

Tutorial and Workshop Co-Chairs

Lorne Mason, McGill University, Canada

Alex Lopez-Ortiz, University of Waterloo, Canada

Publicity Co-Chairs

Guy Omidyar, Sultan Qaboos University, Oman

Paul Ward, University of Waterloo, Canada

Publication Chair

Thomas Kunz, Carleton University, Canada

Industrial Relations Chair

Vic Diciccio, University of Waterloo, Canada

Local Arrangements

Wendy Rush, University of Waterloo, Canada

Jean Webster, University of Waterloo, Canada

Steering Committee:

Harry Perros (Chair), NCSU, USA

Augusto Casaca, IST/INESC, Portugal

Guy Omidyar, Sultan Qaboos University, Oman

Guy Pujolle, University of Paris 6, France

Otto Spaniol, Aachen University, Germany

Ioannis Stavrakakis, University of Athens, Greece

Networking 2005 Program at a Glance

Monday • 2 May • Tutorials

8:30 – 12:30
Wireless Sensor Networks (1)

12:00 – 13:30 LUNCH (on your own)

13:30 – 17:30
Building Blocks of QoS

Wireless Sensor Networks (2)

High Speed Cellular Networks

Tuesday • 3 May

7:30 – 9:30 BREAKFAST & REGISTRATION

8:30 – 9:00 WELCOME ADDRESS

9:00 – 10:00 KEYNOTE SPEECH
Prof. Erol Gelenbe
Imperial College, London,
"User Cooperation and Autonomy in Autonomic Networks"

10:00 – 10:30 BREAK

10:30 – 12:10
1. Peer-to-Peer Networks

2. Performance of Internet Protocols I

3. Wireless Security

12:10 – 13:30 LUNCH

13:30 – 15:10
4. Network Security

5. Wireless Performance

6. Network Modeling and Simulations

15:10 – 15:40 BREAK

15:40 – 17:20
7. Network Service Support

9. Wireless LANs

17:30 – 19:30 WELCOME RECEPTION & POSTER SESSION (CIT Building)

Wednesday • 4 May

7:30 – 8:30 BREAKFAST

8:30 – 9:30 KEYNOTE SPEECH
Dr. Peter Carbone
Nortel Networks
"Navigating the Turbulence"

9:30 – 10:00 BREAK

10:00 – 11:15
10. Optical Networking

11. Performance of Internet & Web Applications

12. Ad Hoc Networks I

11:25 – 12:40
13. Adaptive Networking

14. Performance of Internet Protocols II

15. Radio Resource Management

12:40 – 14:00 LUNCH

14:00 – 15:40
16. Internet Routing

17. Queuing Models

18. Panel 1: Autonomic Networks: New Ideas and Challenges for the Research Community

15:40 – 16:10 BREAK

16:10 – 17:50
19. Network Monitoring, Measurement and Profiling

20. Network Management Systems

21. Sensor and Ad Hoc Networks

19:00 – 22:00 SYMPOSIUM BANQUET (Seagram Building)

Thursday • 5 May

7:30 – 8:30 BREAKFAST

8:30 – 9:30 KEYNOTE SPEECH
Prof. P. R. Kumar, UIUC
"Organizing Principles in Networking"

9:30 – 10:00 BREAK

10:00 – 11:15
22. Overlay Multicast

23. Quality of Service

24. Wireless Scheduling

11:25 – 12:40
25. Improving Multicast Communication

26. Traffic Management and Engineering I

27. Ad Hoc Networks II

12:40 – 14:00 LUNCH

14:00 – 15:40
28. Traffic Management and Engineering II

29. Mobility Management

30. Panel 2: Cross-Layer Integration in Wireless Networks: a Necessity or a Gimmick?

15:40 – 16:10 BREAK

16:10 – 17:25
31. Bandwidth Management

32. CDMA

33. Wireless Resource Management

17:25 – 17:45 CLOSING REMARKS

Friday • 6 May • Workshops

8:30 – 17:00
World Class Events: Telecommunications Challenges

Next Generation Networking Middleware

Mathematical Modeling & Analysis of Computer Networks

10:30 – 11:30 BREAK

12:30 – 13:30 LUNCH

15:30 – 16:00 BREAK