



# **BROADNETS 2006**

**Third International Conference on  
Broadband Communications, Networks, and Systems**

**October 1 - 5, 2006**

**San José, California, USA**

**Co-Sponsored by**

**IEEE Communications Society  
CREATE-NET International Research Center**

**Meeting Management Services by**

**International Communication Sciences and Technology Association (ICST)**



# BROADNETS 2006

Third International Conference on Broadband Communications, Networks, and Systems  
 October 1-5, 2006 ♦ San José, California, USA

**October 1, 2006 [Sunday]** BASENETS and GRIDNETS Workshops

**October 2, 2006 [Monday]** GOSP, WOBS, and GRIDNETS Workshops

October 3, 2006 [Tuesday]	Time	Wireless (San Martin)	Optical (San Simeon)	General (Sierra)
	8:30 AM - 10:00 AM	Welcome Address and Keynote. "The Next Tier of the Internet" by Prof. David Culler, University of California at Berkeley/Arch Rock Corporation. (San Martin/San Simeon)		
	10:00 AM - 10:30 AM	Break		
	10:30 AM - 12:00 Noon	MAC-I	Optical Network Survivability	Multicast and Multihop
	12:00 Noon - 1:30 PM	Lunch (City Foyer)		
	1:30 PM - 3:00 PM	Multihop Networks - I	Optical Burst Switching	Routing and Traffic Engineering
	3:00 PM - 3:30 PM	Break		
	3:30 PM - 5:00 PM	<b>PANEL:</b> Optical Networking Research: Decline or Resurgence? (San Martin/San Simeon)		

October 4, 2006 [Wednesday]	Time	Wireless (San Martin)	Optical (San Simeon)	General (Sierra)
	8:30 AM - 9:15 AM	Invited Talk: "Building Ethernet/IP Service Awareness into NG Optical Transport Networks" by Dr. Enrique Hernandez-Valencia, Lucent Technologies. (San Martin/San Simeon)		
	9:15 AM - 10:00 AM	Invited Talk: "Interactions Between the Physical Layer and Upper Layers in Wireless Networks: The Devil is in the Details" by Prof. Fouad Tobagi, Stanford University. (San Martin/San Simeon)		
	10:00 AM - 10:30 AM	Break		
	10:30 AM - 12:00 Noon	Wireless Sensor Networks	Modeling of Optical Networks and Systems	Congestion Control and Reliability
	12:00 Noon - 1:30 PM	Lunch (Club MAX)		
	1:30 PM - 3:00 PM	Handoffs/ Adaptive Association/ QoS	Distributed Computing Over Optical Overlaid Networks	Next Generation Internet Architecture and Services
	3:00 PM - 3:30 PM	Break		
	3:30 PM - 5:00 PM	<b>PANEL:</b> Future Internet Architecture: Issues and Non-Issues (San Martin/San Juan)		
6:00 PM - 8:30 PM	Banquet Dinner (Donner)			

October 5, 2006 [Thursday]	Time	Wireless (Silicon Valley)	Optical (Donner)	General (Sierra)
	8:30 AM - 10:00 AM	Wireless TCP/ Miscellaneous	Traffic Grooming and Processing	
	10:00 AM - 10:30 AM	Break		
	10:30 AM - 12:00 Noon	MAC-II	Optical Network Operation and Management	Performance Evaluation and Measurement
	12:00 Noon - 1:30 PM	Lunch (City Foyer)		
	1:30 PM - 3:00 PM	Cross Layer/PHY	Optical Network Design	
	3:00 PM - 3:30 PM	Break		
3:30 PM - 5:00 PM	Multihop Networks - II	The Changing Face of Traffic Grooming		



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## Wireless Communications, Networks, and Systems Symposium

**OCTOBER 3, 2006 [Tuesday]**

**Room: San Martin**

**October 3, 2006 [Tuesday] 10:30 AM – 12:00 Noon**  
**MAC-I**

**Prithwish Basu (BBN Technologies)**

- MAX: A Maximal Transmission Concurrency MAC for Wireless Networks with Regular Structure  
Rahul Mangharam & Raj Rajkumar (Carnegie Mellon University)
- AMCM: Adaptive Multi-Channel MAC Protocol for IEEE 802.11 Wireless Networks  
Paul Tan and Mun Choon Chan (Institute for Infocomm Research, National University of Singapore)
- CAM-MAC: A Cooperative Asynchronous Multi-Channel MAC Protocol for Ad Hoc Networks  
Tie Luo, Mehul Motani, Vikram Srinivasan (National University of Singapore)
- A MAC Layer Protocol for Priority-based Reliable Multicast in Wireless Ad Hoc Networks  
Murat Demirbas, Muzammil Hussain (State University of New York, Buffalo)

**October 3, 2006 [Tuesday] 1:30 – 3:00 PM**  
**Multi-hop Networks – I**

**Pin-Han Ho (University of Waterloo)**

- ♦ How to Specify and How to Prove Correctness of Secure Routing Protocols for MANET  
P. Papdimitratos, Z.J. Haas, J-P. Hubaux (Cornell University)
- Proportional Service Differentiation for Multichannel Wireless Networks  
S. Pandey, Niranjana, A. Ganz (University of Massachusetts, Amherst)
- Multipath Selection in Multi-radio Mesh Networks  
Irfan Sheriff, Elizabeth Belding-Royer (University of California, Santa Barbara)
- Broadcast Storm Mitigation Techniques in Vehicular Ad Hoc Networks  
O. Tonguz, N. Wisitpongphan, P. Mugalide, J. Parikh, F. Bai, and V. Sadekar (Carnegie Mellon University)

**OCTOBER 4, 2006 [Wednesday]**

**Room: San Martin**

**October 4, 2006 [Wednesday] 10:30 AM – 12:00 Noon**  
**Wireless Sensor Networks**

**Deepa Kundur (Texas A&M University)**

- ♦ Secure Diffusion for Wireless Sensor Networks  
Hao Yang, Starsky H. Y. Wong, Songwu Lu, Lixia Zhang (University of California, Los Angeles)
- A role dynamic management algorithm for prolonging lifetime in Wireless Sensor Networks  
V. Loscrì, V. Mantuano, S. Marano (University of Calabria, Italy)
- Securing Sensor Networks Using A Novel Multi-Channel Architecture  
Chao Gui, Ashima Gupta, and Prasant Mohapatra (University of California, Davis)
- An Energy Efficient and Accurate Slot Synchronization Scheme for Wireless Sensor Networks  
Lillian Dai, Prithwish Basu, Jason Redi (BBN Technologies)



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**October 4, 2006 [Wednesday] 1:30 PM – 3:00 PM**

**Handoffs/Adaptive Association/QoS**

**Rudra Dutta (North Carolina State University)**

Network discovery mechanisms for fast-handoffs

Ashutosh Dutta, Sunil Madhani, Tao Zhang (Telecordia Technologies), Yoshiro Ohba, Kenichi Taniuchi (Toshiba America Research Inc.) , Henning Schulzrinne (Columbia University)

A study on vertical handoff for WLAN and WWAN integration with micro-mobility prediction

Ying Wang, Fen Hou, Pin-Han Ho, and Sherman Shen (University of Waterloo, Canada)

QoS-Aware Adaptive Internet Gateway Selection in Ad Hoc Wireless Internet Access Networks

Bok-Nyong Park, Wonjun Lee , Choonhwa Lee (Korea University), and Christian Shin (State University of New York at Geneseo)

Signaling Protocols for Wireless ATM Networks

Anthony Burrell (Oklahoma State University), Titsa Papantoni (University of Colorado, Denver)

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**OCTOBER 5, 2006 [Thursday]**

**Room: Silicon Valley**

**October 5, 2006 [Thursday] 8:30 – 10:00 AM**

**Wireless TCP/Miscellaneous**

**Ezhan Karasan (Bilkent University, Turkey)**

Impact of Interference on the Throughput of a Multihop Path in a Wireless Network

Amit K. Vyas and Fouad A. Tobagi (Stanford University)

♦ Experimental Validation of Middleware-Based QoS Control in 802.11 Wireless Networks

Wenbo He, Hoang Nguyen, Klara Nahrstedt (University of Illinois, Urbana-Champaign)

Modeling TCP over Ad hoc Wireless Networks using Multi-dimensional Markov Chains

Shyamnath Gollakota, B. Venkata Ramana, and C. Siva Ram Murthy (Indian Institute of Technology Madras, Chennai, India)

TCP with Delayed Ack for Wireless Networks

Jiwei Chen, Yeng Zhong Lee, Mario Gerla, M.Y. Sanadidi (University of California, Los Angeles)

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**October 5, 2006 [Thursday] 10:30 AM – 12:00 Noon**

**MAC-II**

A MAC protocol for QoS support in MI-UWB based wireless network

Yuechun Chu, Aura Ganz (University of Massachusetts, Amherst)

Retransmission and Back-off Strategies for Broadcasting in Multi-hop Wireless Networks

J. Arango, A. Efrat, S. Ramasubramanian, M. Krunz, and S. Pink (University of Arizona)

Load based Contention resolution Media Access Control (LOCO-MAC) Protocol

Yehuda Ben-Shimol, Yoav Ben-Yehzekel

On The Quasi-Interference Modeling Issue for Coordinated Distributed Scheduling in IEEE 802.16 Mesh Mode

Hua Zhu (San Diego Research Center) and Kejie Lu (University of Puerto Rico at Mayagüez)

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**October 5, 2006 [Thursday] 1:30 – 3:00 PM**

**Cross-Layer/PHY**

**Izhak Rubin (University of California, Los Angeles)**

♦ **On the Use of Smart Antennas in Multi-hop Wireless Networks**

Karthikeyan Sundaresan, Sriram Lakshmanan, Raghupathy Sivakumar (Georgia Institute of Technology)

Power control for interference mitigation between DS and MB-OFDMA UWB systems

Yongjing Zhang (Beijing University of Posts and Telecommunications, China), Haitao Wu (Microsoft Research Asia, Beijing, China), Qian Zhang (Hong Kong University of Science and Technology, China), Ping Zhang (Beijing University of Posts and Telecommunications, China)

Cross-Layer Design for Combining Adaptive Modulation and Coding with Hybrid ARQ

Dalei Wu, Song Ci (University of Massachusetts, Boston)

UWB versus 802.11 – a Network Perspective

Gyouhwan Kim, Arjunan Rajeswaran, Rohit Negi (Carnegie Mellon University)

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**October 5, 2006 [Thursday] 3:30 – 5:00 PM**

**Multi-hop Networks – II**

**Murat Demirbas (State University of New York at Buffalo)**

♦ **Multicasting in Energy Aware Mobile Backbone Based Wireless Ad Hoc Networks**

Choo Chin Tan, Izhak Rubin (University of California, Los Angeles)

Robust Demand-Driven Video Multicast over Ad hoc Wireless Networks

D. Agrawal, T. Bheemarjuna Reddy, and C. Siva Ram Murthy (Indian Institute of Technology Madras, Chennai, India)

Performance Evaluation of Mobile Ad-hoc Networks in the Presence of Energy-based Selfishness

Ehsan Ataie, Ali Movaghar (Sharif University of Technology, Iran)

Throughput and Delay Analysis in Single Hop and Multi-hop IEEE 802.11 Networks

Rima Khalaf and Izhak Rubin (University of California, Los Angeles)

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♦ – Invited Paper



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## Optical Communications, Networks, and Systems Symposium

**OCTOBER 3, 2006 [Tuesday]**

**Room: San Simeon**

**October 3, 2006 [Tuesday] 10:30 AM – 12:00 Noon**

**Optical Network Survivability**                      **C. Siva Ram Murthy (Indian Institute of Technology–Madras, India)**

Optical Network Design to Minimize Switching and Transceiver Equipment Costs

Benjamin K. Chen and Fouad A. Tobagi (Stanford University, USA)

Approximating Optimal Survivable Scheduled Service Provisioning in WDM Optical Networks with Iterative Survivable Routing

Tianjian Li and Bin Wang (Wright State University, USA)

Multi-Constrained Routing in Networks with Shared Risk Link Groups

Xubin Luo and Bin Wang (Wright State University, USA)

Partial Protection in Optical WDM Networks: Enhanced Support for Dynamic Traffic

Mahesh Sivakumar, Krishna M. Sivalingam, (University of Maryland, Baltimore County)  
and Arun Somani (Iowa State University, USA)

**October 3, 2006 [Tuesday] 1:30 – 3:00 PM**

**Optical Burst Switching**

**Bin Wang (Wright State University, USA)**

A Framework for Absolute QoS Guarantees in Optical Burst Switched Networks

Li Yang and George Rouskas

Wavelength and Offset Window Assignment Schemes to Avoid Contention in OBS Rings

A. Agusti–Torra, Cervello–Pastor, and M.A. Fiol (Universitat Politècnica de Catalunya, Spain)

Relaxing Delayed Reservations: An Approach for Quality of Service differentiation in Optical Burst Switching Networks

Kostas Christodoulopoulos, Kyrikakos Vlachos, Kostas Yiannopoulos, Emmanuel Varvarigos  
(University of Patras, Greece)

Optimal Wavelength Scheduling in Optical Burst–Switched Networks Using Constant Time Burst Resequencing

Yuhua Chen (University of Houston, USA), Jonathan S. Turner (Washington University, USA), and  
Pu–Fan Mo (University of Houston, USA)

**OCTOBER 4, 2006 [Wednesday]**

**Room: San Simeon**

**October 4, 2006 [Wednesday] 10:30 AM – 12:00 Noon**

**Modeling of Optical Networks and Systems**

**Pin–Han Ho (University of Waterloo, Canada)**

The Performance of Periodic Link–State Update in Wavelength–Routed Networks

Shu Shen (Shanghai R&D Center, China), Gaoxi Xiao, and Tee Hiang Cheng (Nanyang Technological  
University, Singapore)

Performance Analysis of Soft–State Lightpath Management in GMPLS–Based WDM Networks

Shinya Ishida, Shinichi Arakawa, and Masayuki Murata (Osaka University, Japan)





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TCP Performance over OBS Networks with Multiple Flows Input

Xiang Yu and Chunming Qiao (State University of New York, Buffalo, USA)

Design and Analysis of a New Class of WDM Optical Interconnect Architectures

Haitham S. Hamza and Jitender S. Deogun (University of Nebraska – Lincoln, USA)

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**October 4, 2006 [Wednesday] 1:30 PM – 3:00 PM**

**Distributed Computing over Overlaid Optical Networks**

**Hiroaki Harai (NIICT, Japan)**

**– A Reality Check**

♦ **LambdaBridge: A Scalable Architecture for Future Generation Terabit Applications**

Xi Wang, Venkatram Vishwanath, Byungil Jeong, Ratko Jagodic, Eric He, Luc Renamnot, Andrew Johnson, Jason Leigh (Electronic Visualization Laboratory, University of Illinois at Chicago, USA)

♦ **Network Resource Management in High-Quality Networks**

Piero Castoldi, Luca Valcarenghi, Francesco Paolucci, Valerio Martini (Scuola Superiore Sant' Anna, Italy), Fabio Baroncelli, Filippo Cugini, Barbara Martini (CNIT National Lab. of Photonic Networks, Italy)

♦ **The DRAGON Project and Application Specific Topologies**

Fiona Leung, Jaroslav Flidr, Chris Tracy (Mid-Atlantic Crossroads, USA), Xi Yang, Tom Lehman (USC/ Information Sciences Institute-East), Bijan Jabbari (George Mason University), Don Riley (University of Maryland), Jerry Sobieski (Mid-Atlantic Crossroads)

♦ **Performance Estimation of Overlaid Lightpath Networks for Lambda Users**

Hiroaki Harai (NICT, Japan), Takuji Tachibana (NAIST, Japan)

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**OCTOBER 5, 2006 [Thursday]**

**Room: Donner**

**October 5, 2006 [Thursday] 8:30 – 10:00 AM**

**Traffic Grooming and Processing**

**George Rouskas (North Carolina State University, USA)**

A heuristic approach for dynamically reducing the number of Light Trials in Survivable Optical Networks

Zaeem Hasan Ansari and Salim Tariq (Lahore University of Management Sciences, Pakistan)

Limited Grooming Architectures and Groomer-port Placement in Optical WDM Mesh Networks

Mahesh Sivakumar and Krishna M. Sivalingam (University of Maryland – Baltimore County, USA)

Spare Capacity Provisioning for Dynamic Traffic Grooming in Optical Networks

Shu Huang and Rudra Dutta (North Carolina State University, USA)

All-Optical Signal Processing Using Integrated Mach Zehnder Interferometric Switches for 40 Gb/s All-Optical Label-Swapped Networks

D. Tsiokos, E. Kehayas, P. Bakopoulos, D. Apostolopoulos, D. Petrantonakis, N. Pleros, and H. Avramopoulos (National Technical University of Athens, Greece)

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**October 5, 2006 [Thursday] 10:30 AM – 12:00 Noon**

**Optical Network Operation and Management**

**Jitender Deogun (University of Nebraska, USA)**

Dynamic Wavelength Assignment Using Wavelength Spectrum Separation for Crosstalk Limited Networks

Jun He and Maite Brandt-Pearce (University of Virginia, USA)



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### **A Management Architecture for Layer 1 VPN Services**

Neumar C. Malheiros, Edmundo R. M. Madeira, Fábio L. Verdi, and Maurício F. Magalhães (University of Campinas, Brazil)

### **Minimum Rejection Scheduling in All-Photonic Networks**

Nahid Saberi and Mark J. Coates (McGill University, Canada)

### **Reinforcement Learning Based Path Selection and Wavelength Selection in Optical Burst Switched Networks**

Y. V. Kiran, T. Venkatesh, and C. Siva Ram Murthy (Indian Institute of Technology – Madras, India)

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### **October 5, 2006 [Thursday] 1:30 – 3:00 PM**

#### **Optical Network Design**

**Salim Tariq (University of Management and Technology, Pakistan)**

#### **Physical Topology Design for All-Optical Networks**

Huan Liu and Fouad A. Tobagi (Stanford University, USA)

#### **Complexity of Converter Placement Supporting Broadcast in WDM Networks**

Rudra Dutta and Carla Savage (North Carolina State University, USA)

#### **Wavelength Assignment for Optical Networks with Partial Wavelength Conversion**

Satyajeet Ahuja, Marwan Krunz, and Srinivasan Ramasubramanian (University of Arizona, USA)

#### **SLIP-IN Architecture: A new Hybrid Optical Switching Scheme**

Kostas Ramantas, Kostas Christodouloupoulos, Kyrikakos Vlachos (University of Patras, Greece), Erik Van Breusegem, and Mario Pickavet (Ghent University, Belgium)

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### **October 5, 2006 [Thursday] 3:30 – 5:00 PM**

#### **The Changing Face of Traffic Grooming**

**Rudra Dutta (North Carolina State University, USA)**

##### ♦ **Traffic Grooming Techniques in Optical Networks**

Yabin Ye, Hagen Woesner, and Imrich Chlamtac (CreateNet, Italy)

##### ♦ **Wavelength Converter Placement for Dynamic Traffic Grooming in Optical Networks**

Chunsheng Xin (Norfolk State University, USA)

##### ♦ **On Traffic Grooming Choices for IP over WDM networks**

Srivatsan Balasubramanian and Arun K. Somani (Iowa State University, USA)

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♦ – Invited Paper





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## General Symposium

**OCTOBER 3, 2006 [Tuesday]**

**Room: Sierra**

**October 3, 2006 [Tuesday] 10:30 AM – 12:00 Noon**

**Multicast and Multihop**

**Mikael Johansson (Royal Institute of Technology, Stockholm, Sweden)**

Optimizing IP Multicast through Delayed Pruning

Y. Li and J. Wang (Guangzhou Radio & Television University)

Network-Coding Based Topology Design for Multicast Networks

K. Chi, X. Jiang, and S. Horiguchi (Tohoku University, Japan)

OPSENET: A Security-Enabled Routing Scheme for a System of Optical Sensor Networks

U. Okorafor and D. Kundur (Texas A&M)

Scout: Outdoor Localization Using Active RFID Technology

X. Huang, R. Janaswamy, and A. Ganz (University of Massachusetts)

**October 3, 2006 [Tuesday] 1:30 – 3:00 PM**

**Routing and Traffic Engineering**

**Weiping Zhu (University of New South Wales, Australia)**

Optimal Bandwidth Allocation for Dynamically Priced Network Services

S. Shelford, G. Shoja, E. Manning, (University of Victoria)

Distributed Job Scheduling Based on Multiple Constraints Anycast Routing

T. Stevens, M. Leenheer, F. Turck, B. Dhoedt, P. Demeester (Ghent University, Belgium)

Data-Driven Traffic Engineering: Techniques, Experience and Challenges

M. Johansson, A. Gunnar (KTH and CICS, Sweden)

Accuracy and Dynamics of Hash-based Load Balancing Algorithms for Multipath Internet Routing

R. Martin, R. Menth, M. Hemmkepler (University of Würzburg)

**OCTOBER 4, 2006 [Wednesday]**

**Room: Sierra**

**October 4, 2006 [Wednesday] 10:30 AM – 12:00 Noon**

**Congestion Control and Reliability**

**S. Q. Zheng (University of Texas at Dallas)**

Capacity Requirements for the One-to-One Backup Option in MPLS Fast Reroute

R. Martin, R. Menth, K. Canbolat (University of Würzburg, Germany)

Self-Tuning Utility-Based Controller for End-to-End Congestion in the Internet

Y. Hong and O. Yang (University of Ottawa)

A Study on Dynamic Survivable Routing with Availability Constraint for GMPLS-Based Recovery

P. Ho, J. Tapolcai, A. Haque (University of Waterloo)



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**October 4, 2006 [Wednesday] 1:30 PM – 3:00 PM**

**Next-Generation Internet Architecture and Services**

**Hao Che (University of Texas at Arlington)**

- ♦ Next Generation Optical Access Networks  
David Gutierrez, Wei-Tao Shaw, Gordon Wong, and Leonid G. Kazovsky (Stanford University)
- ♦ A Secure Programming Paradigm for Network Virtualization  
Ana Milanova (Rensselaer Polytechnic Institute), Sonia Fahmy (Purdue University), David Musser and Bulent Yener (Rensselaer Polytechnic Institute)
- ♦ Next Generation Packet Network Architectures with Decoupled Service Plane and Transport Plane  
Indra Widjaja (Bell Laboratories, Lucent Technologies)
- ♦ SMART: An Optical Infrastructure for Future Internet  
S. Q. Zheng (University of Texas at Dallas) and Ashwin Gumaste (Indian Institute of Technology)

**OCTOBER 5, 2006 [Thursday]**

**Room: Sierra**

**October 5, 2006 [Thursday] 10:30 AM – 12:00 Noon**

**Performance Evaluation and Measurement**

**Hagen Woesner (CreateNet, Italy)**

- Divide and Conquer in Loss Tomography – Top Down vs. Bottom Up  
Weiping Zhu (University of New South Wales)
  - Toward a More Practical Marking Scheme for IP Traceback  
C. Gong, K. Sarac (University of Texas, Dallas)
  - A Statistical Approach to Anomaly Detection in Interdomain Routing  
S. Deshpande, M. Thottan, T. Ho, B. Sikdar (RPI and Bell Laboratories)
  - Loss Rate Estimation in General Topologies  
W. Zhu (University New South Wales)
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♦ – Invited Paper



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## Workshop on Broadband Advanced Sensor Networks [BASENETS]

**OCTOBER 1, 2006 [Sunday]**

**Room: San Martin**

- 8:30 AM – 8:45 AM** Welcome Address
- 8:45 AM – 10:00 AM** **KEYNOTE:** IriNet: A Planetary-Scale Architecture for Multimedia Sensors  
Philip Gibbons, Intel Research
- 10:00 AM – 10:30 AM** Break
- 10:30 AM – 12:00 Noon** **Session 1**  
Trade-off between Reliability and Energy Cost for Content-Rich Data Transmission in Wireless Sensor Networks  
Youssef Charfi, Naoki Wakamiya, Masayuki Murata Osaka University, Japan  
Snapshot: A Self-Calibration Protocol for Camera Sensor Networks  
Xiatao Liu, Purusottam Kulkarni, Prashant Shenoy and Deepak Ganessan, University of Massachusetts, Amherst  
Sensor Localization and Camera Calibration in Distributed Camera Sensor Networks  
Andrew Barton-Sweeney, Dimitrios Lymberopoulos and Andreas Savvides, Yale University
- 12:00 Noon – 1:30 PM** Lunch
- 1:30 PM – 3:00 PM** **Session 2**  
SeeMote: In-Situ Visualization and Logging Device for Wireless Sensor Networks  
Leo Selavo, Gang Zhou, John A. Stankovic, University of Virginia  
  
Efficient Integration of Web Services in Ambient-aware Sensor Network Applications  
Isaac Amundson, Xenofon Koutsoukos, Manish Kushwaha, Sandeep Neema and Janos Sztipanovits, Vanderbilt University  
  
Rule Based Decision Framework for Sensor Networks  
Sowmya Manjanatha, Azer Bestavros, Mark Gaynor and Carol Theokary, Boston University
- 3:00 PM – 3:30 PM** Break
- 3:30 PM – 4:00 PM** **Session 3**  
Coverage with Connectivity in wireless sensor networks  
Xin Liu, UC Davis  
Optimal Load Balanced Clustering in Two-Tiered Sensor Networks  
A. Bari, A. Jaekel and S. Bandyopadhyay, University of Windsor, Canada



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## Workshop on Guaranteed Optical Service Provisioning [GOSP]

**OCTOBER 2, 2006 [Monday]**

**Room: San Martin**

- 8:30 AM – 10:00 AM**      **Session 1: Network Survivability**  
Dynamic Lightpath Allocation in Survivable Multifiber WDM Networks  
A. Jaekel and Y. Chen  
Segment-based Partial Protection Scheme for Routing Reliability Guaranteed Connections in WDM Optical Networks  
Chava Vijaya Saradhi, Mohan Gurusamy, and Zhou Luying  
Routing and Wavelength Assignment for Prioritized Demands Under a Scheduled Traffic Model  
A. Jaekel and Y. Chen  
Restorability Analysis of Two Protection Cycles in Random Mesh Networks  
Wail Mardini and Oliver Yang
- 10:00 AM – 10:30 AM**      Break
- 10:30 AM – 12:00 Noon**      **Session 2: Resource Provisioning and Dimensioning**  
A Dynamic Modeling And Dimensioning Approach For All-Optical Networks  
Wenhong Tian  
Design and Dimensioning of a Novel composite-star WDM Network with TDM Channel Partitioning  
Stefano Secci and Brunilde Sans`o  
Evaluation of OCDM-Switching and Code Conversion for All-Optical End-to-End Path Provisioning in Multi-granularity Networks  
S. W. Huang, K. Baba, M. Murata, and K. Kitayama
- 12:00 Noon – 1:30 PM**      Lunch
- 1:30 PM – 3:00 PM**      **Session 3: QoS Provisioning**  
Multi-layer Performance Measurements over Optical Testbeds and QoS Provisioning for High-Bandwidth Video Applications  
Susanne Naegele-Jackson, Peter Holleczeck, and Jochen Reinwand  
  
End-to-End QoS of Video Streaming Service on Joint SUCCESS DWA PON and Modified RPR Network  
W.-T. Shaw, S.-W. Wong, Y.-L. Hsueh, Leonid G. Kazovsky, Akira Agata, and Shu Yamamoto



# BROADNETS 2006

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## Workshop on Networks for Grid Applications [GRIDNETS]

OCTOBER 1, 2006 [Sunday]

Room: San Juan

- 8:30 AM – 10:00 AM**      **KEYNOTE:** Network in EGEE: Building end-to-end network services for the Grid  
Mathieu Goutelle
- 10:00 AM – 10:30 AM**      Break
- 10:30 AM – 12:00 Noon**      **Session 1: Network Service Provisioning System for Grid Applications**  
End to End Bandwidth Allocation and Reservation for Grid applications  
Charaka Palansuriya, Maarten Büchli, Kostas Kavoussanakis, Anand Patil,  
Chrysostomos Tziouvaras, Arthur Trew, Alan Simpson, Robert Baxter  
TeraPaths: End-To-End Network Path QoS Configuration Using Cross-Domain  
Reservation Negotiation  
Dimitrios Katramatos, Bruce Gibbard, Dantong Yu, Shawn McKee  
Lambda Station: On-Demand Flow Based Routing for Data Intensive Grid  
Applications over Multitopology Networks  
Andrey Bobyshev, Xun Su, Harvey Newman, Matt Crawford Crawford, Phil DeMar,  
Vyto Grigaliunas, Maxim Grigoriev, Alexander Moibenko, Don Petravick, Ron  
Rechenmacher, Michael Thomas, Yang Xia, Julian Bunn, Conrad Steenberg, Frank  
Van Lingen, Sylvain Ravot  
Intra and Interdomain Circuit Provisioning Using the OSCARS Reservation System  
Chin Guok, David Robertson, Mary Thompson, Jason Lee, Brian Tierney,  
William Johnston
- 12:00 Noon – 1:30 PM**      Lunch
- 1:30 PM – 3:00 PM**      **Session 2: Network Monitoring and Performance Measurement**  
Federated Network Performance Monitoring for the Grid  
Kostas Kavoussanakis, Alistair Phipps, Charaka Palansuriya, Arthur Trew,  
Alan Simpson, Robert Baxter  
Transparent Optimization of Grid Server Selection With Real-Time Passive Network  
Measurements  
Marcia Zangrilli, Bruce Lowekamp  
Evaluation of network distance properties: NDS the Network Distance Service  
Julien Gossa  
XIOPerf : A Tool For Evaluating Network Protocols  
John Bresnahan, Rajkumar Kettimuthu, Ian Foster
- 3:00 PM – 3:30 PM**      Break



# BROADNETS 2006

Third International Conference on Broadband Communications, Networks, and Systems  
October 1-5, 2006 ♦ San José, California, USA

3:30 PM – 5:00 PM

## Session 3: Grid Resource Reservation: Model and Algorithm

Grid Resource Management by means of Ant Colony Optimization

Gustavo Pavani, Helio Waldman

Triumph of the Bandwidth Commons: Elastic Reservations, Price Incentives, and Request Realignment in LambdaGrids

Sumit Naiksatam, Silvia Figueira, Stephen Chiappari

Graded Channel Reservation with Path Switching in Ultra High Capacity Networks

Reuven Cohan, Niloofar Fazlollahi, David Starobinski

A Flexible Advance Reservation Model for Multi-domain WDM Optical Networks

Eric He, Xi Wang, Jason Leigh

A Dynamic Data Grid Replication Strategy to Minimize the Data Missed

Ming Lei, Susan Vrbsky, Xiaoyan Hong

**OCTOBER 2, 2006 [Monday]**

**Room: San Juan**

8:30 AM – 10:00 AM

**KEYNOTE:** Grid Networking Technologies for Next Generation Architectures and Applications by Michiaki Hayashi

10:00 AM – 10:30 AM

Break

10:30 AM – 12:00 Noon

## Session 4: New Architecture

The Design and Demonstration of the Ultralight Testbed

Harvey Newman, Julian Bunn, Richard Cavanaugh, Iosif Legrand, Steven Low, Shawn McKee, Dan Nae, Sylvain Ravot, Conrad Steenberg, Xun Su, Michael Thomas, Frank van Lingen, Yang Xia

Grid services over IP Multimedia Subsystem

Antoine Pichot, Olivier Audouin

An Integrated Accounting and Charging Architecture for Mobile Grids

Cristian Morariu, Martin Waldburger, Burkhard Stiller

A Hybrid Optical Burst/Circuit Switched Ingress Edge Router for Grid-enabled Optical Networks

Georgios Zervas, Reza Nejabati, Dimitra Simeonidou, Anna Tzanakaki, Siamak Azodolmolky, Ioannis Tomkos

12:00 Noon – 1:30 PM

Lunch

1:30 PM – 3:00 PM

**Industry Panel – Chaired by Bela Berde**

3:00 PM – 3:30 PM

Break

3:30 PM – 5:00 PM

**TUTORIAL:** Grid Networking by Michael Welzl



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## Workshop on Optical Burst/Packet Switching [WOBS]

**OCTOBER 2, 2006 [Monday]**

**Room: San Simeon**

- 8:00 AM – 8:20 AM** Breakfast
- 8:20 AM – 8:30 AM** Opening Remarks
- 8:30 AM – 10:00 AM** **Keynote**  
Optical Transport Networks: Bridging the Technological Gap in the Metro Network  
by Takeo Hamada Director, IP Networking Research, Fujitsu Labs of America  
Matisse Networks' EtherBurst™ Optical Switch  
by Oded Mor, Matisse Networks
- 10:00 AM – 10:30 AM** Break
- 10:30 AM – 12:00 Noon** **Session 1: Optical Switching Networks Evolution**  
♦ Optical-flow switching  
Vincent W.S. Chan, Guy Weichenberg, and Muriel Médard (MIT)  
A new approach to loss-free packet/burst transmission in all-optical networks  
A. Agustí-Torra, C. Cervelló-Pastor, and M.A. Fiol  
(Universitat Politècnica de Catalunya, Spain)  
Multi-granular stream optical burst switching  
Oliver Yu, Ming Liao, and Yuan Cao (University of Illinois at Chicago)  
Control-plane congestion in OBS networks  
Neil Barakat and Thomas E. Darcie (University of Victoria, Canada)  
Panel Discussion
- 12:00 Noon – 1:30 PM** Lunch
- 1:30 PM – 3:00 PM** **Session 2: Architecture and Routing**  
♦ Design considerations for photonic routers supporting application-driven bandwidth reservation at sub-wavelength granularity  
Dimitra Simeonidou, Georgios Zervas, and Reza Nejabati  
(University of Essex, Colchester, UK)  
Traffic engineering and restoration in optical packet switching networks by means of ant colony optimization  
Gustavo Sousa Pavani and Helio Waldman (State University of Campinas, Brazil)  
Small group multicast with deflection routing in optical burst switched networks  
Xiaodong Huang, Qingya She, Tao Zhang, Kejie Lu, and Jason P. Jue  
(The University of Texas at Dallas, New York Institute of Technology, and University of Puerto Rico at Mayaguez)



Architecture and performance of a next-generation optical burst switch  
 Muhammad T. Anan, G.M. Chaudhry, and D. Benhaddou (University of Missouri  
 and University of Houston)  
 Panel Discussion

**3:00 PM – 3:30 PM** Break

**3:30 PM – 5:00 PM** **Session 3: Performance Modeling**

♦ Jitter-based analysis and discussion of burst assembly algorithms  
 Javier Aracil, José Alberto Hernández, Kyriakos Vlachos, and  
 Emmanouel Varvarigos (Universidad Autónoma de Madrid, Spain, and  
 University of Patras)

Modeling and analysis of a shared channel architecture for performance  
 improvement in optical burst switched networks

Wyatt Chaffee, Bin Wang, and Haining Wang (The College of William and Mary  
 and Wright State University)

Performance evaluation of TCP Vegas over optical burst switched networks

Basem Shihada, Qiong Zhang, and Pin-Han Ho (University of Waterloo, Canada,  
 and Arizona State University)

Quantifying the impact of wavelength conversion on the performance of fiber delay  
 line buffers

W. Rogiest, K. Laevens, D. Fiems, and H. Bruneel (Ghent University, Belgium)

Panel Discussion

**5:00 PM – 5:30 PM** Break

**5:30 PM – 7:00 PM** **Poster Session**

On controlling the loss rate in optical burst switching networks

Mushi Jin and Oliver W.W. Yang (University of Ottawa, Canada)

Protection and spatial reuse in optical burst transport (OBT) networks

Saurav Das, Jaedon Kim, David Gutierrez, Leonid Kazovsky, Richard Rabbat,  
 Ching-Fong Su, and Takeo Hamada (Stanford University and Fujitsu  
 Laboratories of America)

Exploring node light-splitting capability for burst grooming in optical burst  
 switched networks

Yuqi Fan and Bin Wang (Wright State University)

Effect of number of burst assemblers on TCP performance in optical burst switching  
 networks

Guray Gurel and Ezhan Karasan (Bilkent University, Ankara, Turkey)

Burst switching metro-access ring integrated network

W.T. Shaw, S.W. Wong, Y.L. Hsueh, Ning Chang, and Leonid G. Kazovsky  
 (Stanford University)

♦ – Invited Paper



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