

2007 Fourth International Conference on Broadband Communications, Networks & Systems

**Raleigh, NC
10-14 September 2007**

Pages 1-485



**IEEE Catalog Number:
ISBN 13:**

**CFP07356-PRT
978-1-4244-1432-1**

Table of Contents

Contention resolution and scheduling - Session 1

Efficient Optical Burst-Switched Networks using only Fiber Delay Line Buffers for Contention Resolution <i>Joao Pedro, Paulo Monteiro, Joao Pires,</i>	2
Resource Consumption Based Preemption for Providing Fairness in Optical Burst Switching Networks <i>Tananun Orawiwattanakul, Yusheng Ji,</i>	12
Optimal Timeslot Size for Synchronous Optical Burst Switching <i>Artprecha Rugsachart, Richard Thompson,</i>	17

TCP and burst assembly - Session 2

Burstification effect on the TCP Synchronization and Congestion Window mechanism <i>Kyriakos Vlachos,</i>	24
Effect of burst assembly on synchronization of TCP flows <i>Anna Maria Guidotti, Carla Raffaelli, Oscar GonzAlez de Dios,</i>	29
Dynamic Service Differentiation in OBS Networks <i>Antonio Pantaleo,</i>	37

Routing and performance - Session 3

Weight Functions for Shortest Path Routing of Periodically Scheduled Burst Flows <i>Srinivas Sampalli, Li Lei,</i>	41
Weight Functions for Shortest Path Routing of Periodically Scheduled Burst Flows <i>Srinivas Sampalli, Li Lei,</i>	41
Using Closed Loop Feedback Control Theoretic Techniques to Improve OBS Networks Performance <i>Wael Hosny Fouad Aly, Mohamed Faten Zhani, Halima Elbiaze,</i>	46
On the Fairness Issue in OBS Loss-Free Schemes <i>Anna Agusti-Torra, Cristina Cervello-Pastor, Miquel Fiol,</i>	55

Reliable Transmission Protocols - Wireless Symposium

TCP Dynamics over IEEE 802.11e WLANs: Modeling and Throughput Enhancement <i>Jeonggyun Yu, Sunghyun Choi, Daji Qiao,</i>	66
XBC: XOR-based Buffer Coding for Reliable Transmissions over Wireless Networks <i>Zizhan Zheng, Prasun Sinha,</i>	76
Designing a Rate-based Transport Protocol for Wired-Wireless Networks <i>Romit Roy Choudhury, Shravan Gaonkar, Luiz Magalhaes, Robin Kravets,</i>	86
Energy-aware Scheduling with Deadline and Reliability Constraints in Wireless Networks <i>Sudha Anil Gathala, Manimaran Govindarasu, Zhengdao Wang,</i>	96

Optical Grids - Optical Symposium

Design and Control of Optical Grid Networks <i>Marc De Leenheer, Chris Develder, Tim Stevens, Bart Dhoedt, Mario Pickavet, Piet Demeester,</i>	107
SIP-empowered OBS Network Architecture for Future IT Services and Applications <i>Georgios Zervas, Dimitra Simeonidou, Reza Nejabati, Franco Callegati, Aldo Campi, Walter Cerroni,</i>	116
Topology Discovery and Performance Information Services for Optical Grids <i>Luca Valcarengi, Francesco Paolucci, Piero Castoldi, Filippo Cugini, Davide Adami, Domenico Ficara, Stefano Giordano,</i>	124
Generic Optical Network Provisioning Services to Support Emerging Grid Applications <i>Yufeng Xin, Lina Battestilli, Gigi Karmous-Edwards,</i>	131

Survivability and Recovery - Internet Symposium

IP Fast Rerouting for Single-Link/Node Failure Recovery <i>Kang Xi, Jonathan Chao,</i>	142
Redundant Trees for Fast IP Recovery <i>Ole Kristoffer Apeland, Tarik Cicic, Audun Fossellie Hansen,</i>	152
A Biologically Inspired Policy Based Management System for Survivability in Autonomic Networks <i>Sasitharan Balasubramaniam, Dmitri Botvich, William Donnelly, John Strassner,</i>	160
Path Switching and Call Protection for Reliable IP Telephony <i>Bengi Karacali, Mark Karol, P. Krishnan, Jean Meloche, Yanming Shen,</i>	169

Medium Access Control & Scheduling - Wireless Symposium

A Traffic Load Adaptive Fair Scheduler for MIMO Systems <i>Masoomeh Torabzadeh, Yusheng Ji,</i>	178
Adaptive Contention Access Suspension in IEEE 802.15.3 MAC <i>Zhanping Yin, Victor Leung,,</i>	187
Joint Monitoring and Routing in Wireless Sensor Networks using Robust Identifying Codes <i>Moshe Laifenfeld, Ari Trachtenberg, Reuven Cohen, David Starobinski,</i>	197
Capacity Analysis of 802.11 Multi-Channel Multi-Radio Wireless Mesh Networks <i>Jinling Wang, Yong Xia, Zhengzhong Wang, Hui Wang,</i>	207

Optical Burst Switching - Optical Symposium

Key Parameters for Contention Resolution in Multi-Fiber Optical Burst/Packet Switching Nodes <i>Walter Cerroni, Franco Callegati, Gustavo Pavani,</i>	217
Group Schedule Serialized Traffic in Optical Burst Switching Networks <i>XiaoJun Cao, James Josephy, Jikai Li, Chunsheng Xin,</i>	224
Source-Ordering for Improved TCP Performance over Load-Balanced Optical Burst-Switched (OBS) Networks <i>Vinod Vokkarane, Bharat Komatireddy,</i>	234
Retransmission in OBS Networks with Fiber Delay Lines <i>Kyung Joon Kwak, Edward Coffman,</i>	243

Network Architectures and Traffic - Internet Symposium

Cross-Over Spanning Trees: Enhancing Metro Ethernet Resilience and Load Balancing <i>Minh Huynh, Prasant Mohapatra, Stuart Goose,</i>	251
Separating Routing and Forwarding: A Clean-Slate Network Layer Design <i>Kenneth Calvert, James Griffioen, Leonid Poutievski,</i>	261

Rendezvous-Based Directional Routing: A Performance Analysis	<i>Bow-Nan Cheng, Murali Yuksel, Shivkumar Kalyanaraman,</i>	271
Modeling and Generating TCP Application Workloads	<i>Kevin Jeffay, FA@lix Hernandez-Campos, F. Smith,</i>	280

Demos - Posters/Demos

Multi-Layer Traffic Engineering Experiments in MPLS/GMPLS Networks	<i>Kohei Shiimoto, Eiji Oki, Daisaku Shimazaki, Takashi Miyamaura,</i>	291
Improving Medium-Sized Media Clip Distribution Through Transparent Tail Synchronization	<i>A. Striegel, D. Salyers, D. Moore, Y. Jiang, A. Blaich,</i>	294

Posters - Posters/Demos

Optimum Spectrum Utilization Through Auctions	<i>Y. Reddy,</i>	297
Rate-based Pacing for Optical Packet Switched Networks with Very Small Optical RAM	<i>Onur Alparlan, Shinichi Arakawa, Masayuki Murata,</i>	300
A Key Management Protocol for Hybrid Wireless Sensor Networks	<i>Yong Wang, Byrav Ramamurthy,</i>	303
Intrusion-Resilient, DDoS-Resistant and Agent-Assisted Network Security System	<i>Tong Liu, Chwan-Hwa Wu,</i>	306
Traffic-Aware Packet Matching for Intrusion Detection Systems	<i>Atsushi Yoshioka, Min Sik Kim,</i>	309
Route Diversity: A Future For Transmission Protocols?	<i>Foued Melakessou, Ulrich Sorger, Zdzislaw Suchanecki, Charles King,</i>	311
Providing end-to-end Connectivity with QoS Guarantees in Integrated Wireless/Wired Networks	<i>Isabella Cerutti, Luca Valcarengi, Piero Castoldi, Ramzi Tka, Farouk Kamoun,</i>	314
A Practical Approach for Channel Assignment in Multi-Channel Multi-Radio Wireless Mesh Networks	<i>Jinling Wang, Zhengzhong Wang, Yong Xia, Hui Wang,</i>	317
A Scheduling Algorithm for IEEE 802.16 and IEEE 802.11 Hybrid Networks	<i>Srivathsan Soundararajan, Prathima Agrawal,</i>	320
Applying Compartmentalisation Techniques to Communication Protocols of Biological Nano and MEMS Devices	<i>Sasitharan Balasubramaniam, Dmitri Botvich, Frank Walsh, Frank Walsh, Sergey Sergeev, Stephen Bush,</i>	323

Wireless Sensor Networks - Wireless Symposium

Optimal Sleep-Wakeup Algorithms for Barriers of Wireless Sensors	<i>Santosh Kumar, Ten Lai, Marc Posner, Prasun Sinha,</i>	327
Practical Time Synchronization for Bluetooth Scatternets	<i>Kay Roemer, Matthias Ringwald,</i>	337
Data Gathering in Ultra Wide Band based Wireless Sensor Networks using a Mobile Node	<i>Krishna Sivalingam, Deepak Bote, Prathima Agrawal,</i>	346
SMART: A Selective Controlled-Flooding Routing for Delay Tolerant Networks	<i>LEI TANG, Qunwei Zheng, Jun Liu, Xiaoyan Hong,</i>	356

Optical Network Design Techniques - Optical Symposium

Cost-Effective Heuristics for Planning GMPLS Transport Networks		367
---	--	-----

Nabil Naas, Hussein Mouftah,

Resource Dimensioning in WDM Networks under State-Based Routing Schemes	375
<i>Xiaolan Zhang, Sun-il Kim, Steven Lumetta,</i>	
Service Provisioning under a Scheduled Traffic Model Using Light-trails in WDM Optical Networks	385
<i>Bin Wang, Xubin Luo,</i>	
Reduced Flow Routing: Leveraging Residual Capacity to Reduce Blocking in GMPLS Networks	394
<i>Xiaolan Zhang, Sun-il Kim, Steven Lumetta,</i>	

Video and Peer-to-Peer - Internet Symposium

Simulation Study of the Spectral Capacity Requirements of Switched Digital Broadcast	405
<i>Jim Martin James, Jiong Gong, Daniel Vivanco,</i>	
Extending Parallel Index Clustering for Multi-Operator Mobile Peer-to-Peer Services	415
<i>Nicklas Beijar,</i>	
Assessing the Impact of BitTorrent on DOCSIS Networks	423
<i>Jim Martin James, James Westall,</i>	
DIMPLE: Dynamic Membership Protocol for Epidemic protocols	433
<i>Byung Choi, Jin Sun, Paul Weber, Roger Kieckhafer,</i>	

Detection and Optimization - Wireless Symposium

Assessing discreet packet-dropping attacks using nearest-neighbor and path-vector attribution	444
<i>A. Das, George Kesidis, V. Pothamsetty,</i>	
Detecting Protected Layer-3 Rogue APs	449
<i>Hongda Yin, Guanling Chen, Jie Wang,</i>	
Utility-based Cross Layer Optimization for OFDMA Systems using the Beta-Min-Sum Belief Propagation Algorithm	459
<i>Marilynn Green, Peter Wang,</i>	
Pricing Spectrum Access in Cellular CDMA Networks with Heterogeneous Demand	469
<i>Ashraf Al Daoud, David Starobinski, Murat Alanyali,</i>	

Routing & Assignment Problems in Optical Networks - Optical Symposium

New Class of Strictly Nonblocking WDM Multicast Switching Networks	477
<i>Jitender Deogun, Haitham Hamza,</i>	
Thorough Analysis of the IPACT Dynamic Bandwidth Allocation Algorithm for EPONs	486
<i>Bart Lannoo, Lieven Verslegers, Didier Colle, Mario Pickavet, Maurice Gagnaire, Piet Demeester,</i>	
Demand Allocation Without Wavelength Conversion Under a Sliding Scheduled Traffic Model	495
<i>Arunita Jaekel, Ying Chen,</i>	
Online Broadcasting and Multicasting in WDM Networks with Shared Light Splitter Bank	504
<i>Weifa Liang, Yuzhen Liu,</i>	

Network Security - Internet Symposium

Exploiting Approximate Transitivity of Trust	515
<i>Ruggero Morselli, Bobby Bhattacharjee, Jonathan Katz, Michael Marsh,</i>	
Strategic Deployment of Network Monitors for Attack Attribution	525
<i>Young Pyun, Douglas Reeves,</i>	

Computer Worm Ecology in Encounter-based Networks <i>Sapon Helmy, Tanachaiwiwat, Ahmea</i>	535
SAABCOT: Secure Application-Agnostic Bandwidth COnservation Techniques <i>Chad Mano, David Salyers, Qi Liao, Andrew Blaich, Aaron Striegel,</i>	544

WiMax and Cellular Networks - Wireless Symposium

Analysis of Contention Based Access for Best Effort Traffic on Fixed WiMAX <i>Harsha Sirisena, Shehan Perera,</i>	552
Integrated Scheduling and Interference Coordination in Cellular OFDMA Networks <i>Marc Necker,</i>	559
Integrating Admission Control and Packet Scheduling for Quality Controlled Streaming Services in HSDPA Networks <i>Joseph Gomes, Hyeong-Ah Choi, Jae-Hoon Kim, JungKyo Sohn, Hyeong In Choi,</i>	567
Routing and Packet Scheduling in WiMAX Mesh Networks <i>Fanchun Jin, Amrinder Arora, Jinho Hwang, Hyeong-Ah Choi,</i>	574

Optical Network Survivability - Optical Symposium

Dedicated path protection for waveband switching in WDM networks (Invited Paper) <i>Byrav Ramamurthy, Mengke Li,</i>	584
Performance Study of Multiple Link Failure Restorability of Shared Protection trees <i>Shahram Shah-Heydari, Oliver Yang,</i>	594
Approximating Optimal Survivable Scheduled Service Provisioning in WDM Optical Networks with Shared Risk Link Groups <i>Bin Wang, Tianjian Li,</i>	601
Performance Study of Self-repairing Unicast Hierarchical Protection Trees in Mesh Networks <i>Shahram Shah-Heydari, Oliver Yang,</i>	611

Network Performance and Security - Internet Symposium

DATALITE: a Distributed Architecture for Traffic Analysis via Light-weight Traffic Digest <i>Wing Cheong Lau, Murali Kodialam, T.V. Lakshman, H. Jonathan Chao,</i>	622
Optimizing Dimensionality and Accelerating Landmark Positioning for Coordinates Based RTT Predictions <i>Dragan Milic, Torsten Braun,</i>	631
A Novel Statistical Model of Users' Behavior in Key Distribution Schemes <i>Massimo Tornatore, Paolo Giacomazzi, Simone Ceresa,</i>	641
Modeling and Analysis of Worm Interactions (War of the Worms) <i>Sapon Tanachaiwiwat, Ahmed Helmy,</i>	649

Traffic Modeling and QoS - Wireless Symposium

Wireless Traffic: The Failure of CBR Modeling <i>Stefan Karpinski, Elizabeth Belding, Kevin Almeroth,</i>	660
Improving VoIP Call Capacity over IEEE 802.11 Networks <i>Yeonsik Jeong, Sandeep Kakumanu, Cheng-Lin Tsao, Raghupathy Sivakumar,</i>	670
High-speed wireless backbones: measurements from MagNets <i>Alessio Botta, Antonio Pescapè, Roger Karrer, Giorgio Ventre,</i>	680
On Energy Aware Routing in Wireless Networks <i>Venkatesh Sarangan, Aravind Mohanoor, Sridhar Radhakrishnan,</i>	690

On the Scalability of Multicast Location Service in Mobile Ad Hoc Networks	<i>Sumesh Philip,</i>	698
--	-----------------------	-----

Optical Network Architectures - Optical Symposium

Cross-Layer Optimized Optical Grid Networks	<i>Ioannis Tomkos, Stelios Sygletos, George Markidis,</i>	707
Optical Grid Infrastructure: Establishing Multiple End-to-End Lightpaths in Optical Networks	<i>Hiroaki Harai, Sugang Xu, Mamoru Sekido,</i>	714
Design and Implementation of OpenMP Library for Lambda Computing Environment	<i>Ken-ichi Baba, Keigo Goda, Mai Imoto, Noriyuki Fujimoto, Masayuki Murata,</i>	722

Wireless Networks - Internet Symposium

Cross-Layer Optimization Made Practical	<i>Ajit Warrior, Long Le, Injong Rhee,</i>	733
MIST: Cellular Data Network Measurement for Mobile Applications	<i>Mike Wittie, Brett Stone-Gross, Kevin Almeroth, Elizabeth Belding,</i>	743
Energy-efficient Transmission for Multimedia Streams in Last-hop Wireless Internet	<i>Albert Harris, Robin Kravets, Robin Snader,</i>	752
On Supporting High Quality 3D Geometry Multicasting over IEEE 802.11 Wireless Networks	<i>Hui Li, Ming Li, B. Prabhakaran,</i>	762

Power Control and Scheduling - Wireless Symposium

Applying Opportunistic Medium Access and Multiuser MIMO Techniques in Multi-Channel Multi-Radio WLANs	<i>Yuanyuan Yang, Ming Ma, Miao Zhao,</i>	770
An Optimization Framework for Demand-based Fair Stream Allocation in MIMO Ad Hoc Networks	<i>Suraj Jaiswal, Aura Ganz, Ramgopal Mettu,</i>	780
A Combined Power-Controlled Protocol with Adaptive MIMO Gains for Wireless Networks	<i>Mohammad Siam, Marwan Krunz,</i>	789
Reconsidering Power-management	<i>Cigdem Sengul, Albert Harris, Robin Kravets,</i>	799

Transmission, Monitoring, & Control in Optical Networks - Optical Symposium

On the Stability of Virtual Network Topology Control for Overlay Routing Services	<i>Yuki Koizumi, Takashi Miyamura, Shin-ichi Arakawa, Eiji Oki, Kohei Shiimoto, Masayuki Murata,</i>	810
Connection Provisioning in QoS-Guaranteed Distributed All-Optical Networks	<i>Jun He, Maite Brandt-Pearce, Suresh Subramaniam,</i>	820
Monitoring and Alarm Management in Transparent Optical Networks	<i>Sava Stanic, Gokhan Sahin, Hongsik Choi, Suresh Subramaniam, Hyeong-Ah Choi,</i>	828
Connection Management Algorithm for Advance Lightpath Reservation in WDM Networks	<i>T. Daniel Wallace, Abdallah Shami,</i>	837

IP and Buffer Sizing - Internet Symposium

Measuring Queue Capacities of IEEE 802.11 Wireless Access Points	<i>Feng Li, Mingzhe Li, Rui Lu, Huahui Wu, Mark Claypool, Robert Kinicki,</i>	846
Bounded Prefix Expansion and Compression in Support of Fast TCAM Updating		854

Gesan Wang, Nian-Feng Tzeng,

Scheduling Routing Table Calculations to Achieve Fast Convergence in OSPF Protocol	863
<i>Mukul Goyal, Weigao Xie, Mohammad Soperi, Hossein Hosseini, K Vairavan,</i>	

MAC and Performance Evaluation - Wireless Symposium

Modeling and performance analysis of an improved DCF-based mechanism under noisy channel	874
<i>ksentini adlen, Marc Ibrahim,</i>	
Goodput Optimization in CSMA/CA Wireless Networks	880
<i>yusun chang, christopher lee, john copeland,</i>	
Design and Analysis of a Dual radio node architecture and Medium Access Control protocols for Ultra Wide Band based Sensor Networks	889
<i>Krishna Sivalingam, Karthikeyan Ravichandran, Prathima Agrawal,</i>	
Fair Bandwidth Allocation Framework for Heterogeneous Multi-Radio Wireless Mesh Networks	898
<i>Shree Raman, Aura Ganz, Ramgopal Mettu,</i>	

Optical Cross-Layer Design - Optical Symposium

OSNR Optimization with Link Capacity Constraints in WDM Networks: A Cross Layer Game Approach	909
<i>Yan Pan, Lacra Pavel,</i>	
Novel Gain Control in a Multichannel Semiconductor Optical Amplifier with Equivalent Circuit Using Nonlinear State-space Methods	915
<i>Scott Kuntze, Lacra Pavel, J. Stewart Aitchison,</i>	
Reinforcement Learning Based Routing in All-Optical Networks	919
<i>Yvan Pointurier, Fariba Heidari,</i>	
Solving Constrained OSNR Nash Game in WDM Optical Networks with a Fictitious Player	922
<i>Quanyan Zhu, Lacra Pavel,</i>	
Reinforcement Learning Based Routing in All-Optical Networks with Physical Impairments	928
<i>Yvan Pointurier, Fariba Heidari,</i>	

Congestion Control - Internet Symposium

Client-Side Web Acceleration for Low-Bandwidth Hosts	932
<i>Tae-Young Chang, Zhenyun Zhuang, Aravind Velayutham, Raghupathy Sivakumar,</i>	
Performance Analysis of the Quick-Start TCP Extension	942
<i>Michael Scharf,</i>	
Controller Design for TCP Rate Management in QoS Networks	952
<i>Harsha Sirisena, Sanjewa Athuraliya,</i>	
Keynote Speaker	959
Prof. Arun K. Somani	
Keynote Speaker	960
Claude Hamou	
Keynote Speaker	961
Prof. Kishore S. Trivedi	
Keynote Speaker	962
Wayne Clark	