## PROCEEDINGS OF SPIE

# Network Architectures, Management, and Applications VI

Weisheng Hu Shoa-Kai Liu Ken-ichi Sato Lena Wosinska Editors

27–30 October 2008 Hangzhou, China

Sponsored by
SPIE
COS—Chinese Optical Society (China)
CIC—China Institute of Communications (China)
Joint Research Center of Photonics of the Royal Institute of Technology (Sweden) and Zhejiang University (China)

Cooperating Organizations

Zhejiang Optical Society (China)

Hangzhou Municipal Government (China)

Municipal Government of Fuyang City (China)

Published by SPIE

Part One of Two Parts

**Volume 7137** 

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in Network Architectures, Management, and Applications VI, edited by Weisheng Hu, Shoa-Kai Liu, Ken-ichi Sato, Lena Wosinska, Proceedings of SPIE Vol. 7137 (SPIE, Bellingham, WA, 2008) Article CID Number.

ISSN 0277-786X ISBN 9780819473776

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445 SPIE.org

Copyright © 2008, Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/08/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.



**Paper Numbering:** Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

## **Contents**

### Part One

xv xix	Conference Committee Introduction
SESSION 1A	BROADBAND ACCESS I
7137 02	Reliable architectures for next-generation broadband access networks (RANGBAN) (Invited Paper) [7137-01]  B. Mukherjee, Univ. of California, Davis (United States)
7137 04	Integration of EPON and WiMAX networks: uplink scheduler design [7137-03] Y. Yan, H. Yu, H. Wang, L. Dittmann, Technical Univ. of Denmark (Denmark)
7137 05	Design and implementation of scalable IPv4-IPv6 internetworking gateway [7137-04] G. Zhu, Huazhong Univ. of Science and Technology (China) and State Key Lab. for New Optical Communication Technologies and Networks (China); S. Yu, Huazhong Univ. of Science and Technology (China) and Wuhan Research Institute of Posts and Telecommunications (China); J. Dai, Huazhong Univ. of Science and Technology (China) and State Key Lab. for New Optical Communication Technologies and Networks (China)
7137 06	Research on optical access network remote management technology [7137-05] W. Wang, Wuhan Research Institute of Posts and Telecommunications (China); C. Zou, W. Luo, Fiberhome Telecommunication Technologies Co., Ltd. (China)
SESSION 1B	OPTICAL TRANSPORT NETWORK
7137 08	Recent transport network development using ROADMs and 40G transmission (Invited Paper) [7137-08] K. Hagimoto, NTT Corp. (United States)
7137 09	Experimental performance evaluation of inter-domain path provisioning with multiple PCEs [7137-06] S. Ishida, Y. Iizawa, I. Nishioka, S. Araki, NEC Corp. (Japan)
7137 0A	Wavelength converter placement in optical networks with dynamic traffic [7137-07] J. Buron, S. Ruepp, H. Wessing, Technical Univ. of Denmark (Denmark); N. Andriolli, Scuola Superiore Sant'Anna (Italy); A. V. Manolova, L. Dittmann, Technical Univ. of Denmark (Denmark)
SESSION 2A	FTTX
7137 0D	GPON system with user controlled port-ID assignment method [7137-13] N. Zhang, H. Yoshiuchi, Hitachi Research and Development Corp. (China)

budget margin for dual-band RSOA-based WDM-PON [7137-14] W. Xie, Y. Dong, Q. Lin, Y. Jin, W. Hu, Shanghai Jiao Tong Univ. (China); H. Huang, J. Wu, National Defence Science and Technology Key Lab. for Avionics System Integration Technology (China) **SESSION 2B** WDM NETWORK I 7137 0G Capacity allocation for time-varying traffic in survivable WDM mesh networks [7137-16] M. Wu, W. Ni, Tsinghua Univ. (China); Y. Ye, Create-Net (Italy); X. Zheng, Y. Guo, H. Zhang, Tsinghua Univ. (China) 7137 OH A novel multi-granularity OXC architecture with minimum resource first assignment algorithm [7137-17] X. Wu, M. Xin, M. Chen, H. Chen, S. Xie, Tsinghua Univ. (China) 7137 OI Lambda utility project (Invited Paper) [7137-18] S. Araki, NEC Corp. (Japan); A. Maruta, Osaka Univ. (Japan); M. Doi, Fujitsu Ltd. (Japan); T. Mizuochi, Mitsubishi Electric Corp. (Japan); H. Murai, Oki Electric Industry Co., Ltd. (Japan) 7137 OJ A study of self-adaptive transmission control architectures in impairment-aware transparent **WDM networks** [7137-19] Y. Liu, W. Gu, J. Zhang, L. Wang, H. Zhang, J. Ren, Beijing Univ. of Posts and Telecommunications (China) 7137 OK Performance analysis and optimization of various MG-OXCs multi-granularity WDM optical networks based on waveband switching [7137-20] Y. Qi, Hanazhou Dianzi Univ. (China); Y. Zhu, The Univ. of Texas at Dallas (United States); T. Wang, X. Zhou, S. Qian, Q. Li, Hangzhou Dianzi Univ. (China) SESSION 3A **BEST STUDENT PAPER SESSION** A novel joint scheduling algorithm for multiple services in 10G EPON (Best Student Paper 7137 OL **Award)** [7137-21] J. Chen, KTH-Royal Institute of Technology (Sweden) and Zhejiang Univ. (China); B. Chen, Zhejiang Univ. (China); L. Wosinska, KTH-Royal Institute of Technology (Sweden) 7137 OM Demonstration of time-wavelength co-allocation (TWCA) problem in novel dynamic wavelength scheduled WDM-PON for distributed computing applications [7137-22] M. Zhu, Shanghai Jiao Tong Univ. (China) and Lab. Electronique et Informatique, École Nationale Supérieure de Techniques Avancées (France); W. Guo, S. Xigo, Shanahai Jigo Tong Univ. (China); B. Geller, Lab. Electronique et Informatique, École Nationale Supérieure de Techniques Avancées (France); W. Sun, Y. Jin, W. Hu, Shanghai Jiao Tong Univ. (China) 7137 ON A postponement strategy for short lightpath teardown in wavelength-routed WDM mesh networks under dynamic traffic [7137-23] N. Hua, Tsinghua Univ. (China); H. Buchta, Fraunhofer Institute for Telecommunications, Heinrich-Hertz-Institute (Germany); X. Zheng, H. Zhang, B. Zhou, Tsinghua Univ. (China)

Limit beat-frequency noise by employing receive low-pass filter and earn extra power

7137 OE

7137 00	A metro-access integrated network with all-optical virtual private network function using DPSK/ASK modulation format [7137-24] Y. Tian, Shanghai Jiao Tong Univ. (China); L. Leng, New York City College of Technology, CUNY (United States); Y. Su, Shanghai Jiao Tong Univ. (China)
7137 OP	Proposal of dynamic protection/restoration schemes for QoS support in labeled optical burst switching networks [7137-25] Y. Yin, S. Chi, J. Shi, J. Wu, X. Hong, J. Lin, Beijing Univ. of Posts and Telecommunications (China)
7137 0Q	A novel re-modulation method in a WDM-PON to enhance extinction ratio with considering Rayleigh and Brillouin backscattering [7137-26]  B. Huang, Y. Liang, Huazhong Univ. of Science and Technology (China) and Fudan Univ. (China); X. Wang, D. Huang, Huazhong Univ. of Science and Technology (China); N. Chi, Fudan Univ. (China)
SESSION 3B	OPTICAL NETWORK FOR BROADBAND SERVICE
7137 OR	Server vision: a new perspective for next generation optical networks (Invited Paper) [7137-27] Z. Zhang, Peking Univ. (China) and Guangxi Univ. (China); Z. Li, C. Yuan, A. Xu, Peking Univ. (China)
7137 OS	Optical service level agreement based on service plane of adaptive multi-service optical
	<b>network</b> [7137-28] H. Liu, W. Gu, J. Zhang, W. Zhao, Y. Chen, X. Chen, H. Zhang, L. Wang, Beijing Univ. of Posts and Telecommunications (China)
7137 OT	Study of self-adaptation service plane extension in next-generation optical network (NGON) [7137-29]
	J. Zhao, W. Bian, Z. Tang, Hebei Univ. of Engineering (China); W. Zhao, Research Institute of Communication Standards (China)
SESSION 4A	WDM-PON
7137 OV	Performance analysis of OCDMA-WDM-PON system with chaotic logistic-map spread spectrum sequences [7137-31] L. Yang, Beijing Univ. of Posts and Telecommunications (China) and The Univ. of Electro-Communications (Japan); G. Shou, Z. Qian, Y. Hu, Beijing Univ. of Posts and Telecommunications (China); T. Miki, The Univ. of Electro-Communications (Japan)
7137 OW	A WDM-PON architecture with NRZ/CW polarization multiplexed downstream and remodulated upstream using injection-locked FP laser [7137-32] X. Li, C. Hong, M. Li, C. Zhang, W. Hu, Z. Chen, Peking Univ. (China)

SESSION 4B	CARRIER ETHERNET	
7137 10	Research on T-MPLS signaling mechanism with different resource reservation strategies [7137-36] D. Tan, B. Li, S. Huang, Y. Zhang, W. Gu, Beijing Univ. of Posts and Telecommunications (China)	
7137 11	A rapid protection switching method in carrier ethernet ring networks [7137-37] L. Yuan, M. Ji, Wuhan Research Institute of Posts and Telecommunications (China) and State Key Lab. for New Optical Communication Technologies and Networks (China)	
7137 12	A design of TDM in transport MPLS based on FPGA [7137-39] Z. Zhang, Y. Zhang, W. Jia, Y. Yao, W. Gu, Beijing Univ. of Posts and Telecommunications (China)	
SESSION 5A	OPTICAL GRID I	
7137 13	GRID computing and a role of photonic networks (Invited Paper) [7137-40]  T. Kudoh, National Institute of Advanced Industrial Science and Technology (Japan)	
7137 14	Dynamic QoS-based task scheduling with packing and partial cloning in optical grid [7137-41] H. Yuan, L. Liu, J. Wu, X. Hong, J. Lin, Beijing Univ. of Posts and Telecommunications (China)	
7137 15	Scheduling strategies for multiple optical grid applications based on scheduling span and fairness [7137-42] C. Qin, W. Guo, W. Sun, Y. Jin, W. Hu, Shanghai Jiao Tong Univ. (China)	
7137 16	Fault-tolerant policies for optical grid (Invited Paper) [7137-43] W. Guo, Y. Jin, W. Sun, W. Hu, Shanghai Jiao Tong Univ. (China)	
SESSION 5B	WDM NETWORK II	
7137 17	Performance evaluation of a resource-efficient provisioning framework (RPF) in service differentiated survivable WDM networks subject to wavelength-continuity constraint [7137-44] W. Ni, Q. Li, Tsinghua Univ. (China); Y. Ye, Create-Net (Italy); Y. Li, Y. Guo, H. Zhang, X. Zheng, Tsinghua Univ. (China)	
7137 18	Traffic grooming with span constraints in WDM optical networks [7137-45] F. Liu, Nanjing Univ. of Posts and Telecommunications (China); Q. Zeng, Shanghai Jiao Tong Univ. (China)	
7137 1A	A new evolutionary algorithm for traffic grooming in WDM mesh network [7137-47] YS. Han, Z. Ao, B. Xu, Guangdong Univ. of Technology (China)	

7137 1B	A signaling-based approach to implement self-adaptive transmission control in impairment-aware transparent WDM networks [7137-48] X. Wu, D. Han, J. Zhang, W. Gu, L. Wang, G. Gao, Beijing Univ. of Posts and Telecommunications (China); W. Zhao, Research Institute of Telecommunications Transmission (China)	
SESSION 6A	METRO NETWORK	
7137 1C	Analysis of reliability for multi-ring interconnection of RPR networks [7137-49] J. Liu, D. Jin, L. Zeng, Y. Li, Tsinghua Univ. (China)	
7137 1D	Minimum capacity dimensioning in diff-serv-aware MPLS networks [7137-50] F. Rong, L. Li, H. Yu, D. Liao, H. Luo, Univ. of Electronic Science and Technology of China (China)	
7137 1E	Packet transport network in metro (Invited Paper) [7137-51] F. Huang, X. Yi, H. Zhang, P. Gong, Alcatel Shanghai Bell Co., Ltd. (China)	
7137 IF	The research of MSTP service encapsulation based on SDH [7137-52] X. Yun, Fiberhome Telecommunication Technologies Co., Ltd. (China); Z. Wang, Huazhong Univ. of Science and Technology (China) and Wuhan Institute of Technology (China)	
7137 1G	Multi-modular optimal capacity algorithm for SDH mesh networks [7137-53] X. Ling, L. Li, H. Yu, X. Zhang, H. Luo, Univ. of Electronic Science and Technology of China (China)	
SESSION 6B	DYNAMIC OPTICAL NETWORK	
7137 1H	Challenges of dynamic networking (Invited Paper) [7137-54] A. Von Lehman, Telcordia Technologies, Inc. (United States)	
7137 11	Layer based approach for self organizing optical burst switching networks [7137-55] A. Nawaz, X. B. Hong, J. Wu, J. T. Lin, Beijing Univ. of Posts and Telecommunications (China)	
7137 IJ	Physical and functional awareness in optical networks (Invited Paper) [7137-57] H. Waldman, Federal Univ. of ABC (Brazil)	
SESSION 7A	BROADBAND ACCESS II	
7137 1K	Multimode fibers with asymmetric impulse response for an improved Shannon capacity [7137-58] C. H. Kwok, Univ. of Cambridge (United Kingdom); D. G. Cunningham, Avago Technologies Ltd. (United Kingdom); I. H. White, Univ. of Cambridge (United Kingdom)	
7137 1L	An approach for passive testing of SFSM-based systems [7137-59] M. Lv, X. Chen, C. Wang, Beijing Univ. of Posts and Telecommunications (China)	

7137 1M	Theoretic and experimental study on mm-wave radio over fiber system based on OFM (Invited Paper) [7137-60] R. Lin, M. Zhu, Z. Zhou, J. Ye, Shanghai Univ. (China)	
7137 IN	A novel EPON architecture for supporting direct communication between ONUs [7137-61] L. Wang, X. Chen, Z. Wang, Beijing Univ. of Posts and Telecommunications (China)	
7137 10	A dynamic bandwidth allocation scheme for EPON [7137-62] X. Li, Shandong Univ. (China) and Shandong Economic Univ. (China); X. Wu, Shandong Univ. (China); M. Ma, Nanyang Technological Univ. (Singapore); W. Li, Y. Zhang, Shandong Univ. (China)	
SESSION 7B	NETWORK SURVIVABILITY I	
7137 1Q	Catastrophe model construction and verification for network anomaly detection [7137-64] J. Lin, X. Yang, K. Long, Y. Peng, Univ. of Electronic Science and Technology of China (China)	
7137 IR	Non-adaptive fault diagnosis for low-degree networks via lightpath probing method [7137-65] H. Zhang, Y. Li, Y. Guo, H. Zhang, X. Zheng, Tsinghua Univ. (China)	
SESSION 8A	FUTURE OPTICAL NETWORK	
7137 IT	GMPLS inter-domain signaling and routing to control LSPs based on per-domain policy [7137-67] S. Okamoto, H. Guo, T. Otani, KDDI R&D Labs, Inc. (Japan)	
7137 1U	Resource assignment for sliding scheduled lightpath demands [7137-68] R. Tang, G. Zhang, H. Zhang, Research Institute of Telecommunication Technology (China)	
7137 1W	A reliable and energy-efficient wave routing algorithm based on cluster for sensor networks [7137-70] F. Wu, Z. Tan, Y. Chen, C. Xie, Huazhong Univ. of Science and Technology (China)	
7137 1X	A novel hybrid optical switching network and its impact on TCP performance [7137-71] Y. Zhang, S. Wang, P. Li, Univ. of Electronic Science and Technology of China (China)	
SESSION 8B	NETWORK DESIGN	
7137 1Y	PCE-based distributed reservation in multi-domain optical network [7137-09] B. Guo, S. G. Huang, P. Luo, B. Li, W. Gu, Beijing Univ. of Posts and Telecommunications (China)	
7137 1Z	Dynamic DWDM channel blocking/equalizing based on liquid crystal technology [7137-10] Z. Huang, Y. Lu, Nanjing Univ. (China); S. Wang, Univ. of North Texas (United States)	

	Technology (China)		
7137 22	Network planning under uncertainties (Invited Paper) [7137-75] K. S. Ho, K. W. Cheung, The Chinese Univ. of Hong Kong (Hong Kong China)		
Part Two			
SESSION 9A	SCALABLE OPTICAL NETWORK		
7137 24	Optical path dynamic routing algorithm based on traffic prediction [7137-77] K. Obara, H. Hasegawa, K. Sato, Nagoya Univ. (Japan)		
7137 25	Self-organized call admission control for optical communication networks [7137-78] B. Zuo, L. Liu, J. Wu, J. Lin, Beijing Univ. of Posts and Telecommunications (China)		
7137 26	Implementation of bandwidth on-demand service on adaptive service provisioning platform of transport networks [7137-79] F. Yuan, D. Han, J. Zhang, H. Zhang, X. Chen, W. Gu, Beijing Univ. of Posts and Telecommunications (China); W. Zhao, Research Institute of Telecommunications Transmission (China)		
7137 27	A fast path-based approach to infer link loss rates by explicit estimation [7137-80] H. Su, W. Chen, Y. Li, S. Lin, L. Su, D. Jin, L. Zeng, Tsinghua Univ. (China)		
SESSION 9B	GMPLS/ASON		
7137 28	An experimental analysis on OSPF-TE convergence time [7137-81] S. Huang, K. Kitayama, Osaka Univ. (Japan); F. Cugini, Consorzio Nazionale Interuniv. per le Telecomunicazioni (Italy); F. Paolucci, A. Giorgetti, L. Valcarenghi, P. Castoldi, Scuola Superiore Sant' Anna (Italy)		
7137 29	Experimental demonstration of OSPF-TE extensions in muiti-domain OBS networks connected by GMPLS network [7137-82] C. Tian, Y. Yin, J. Wu, J. Lin, Beijing Univ. of Posts and Telecommunications (China)		
7137 2A	Performance evaluation of differentiated-resilience provisioning scheme for the GMPLS/ASON networks [7137-83]  Z. Tan, Beijing Univ. of Civil Engineering and Architecture (China); H. Cao, Beijing Univ. of Posts and Telecommunications (China)		
7137 2B	A novel differentiated-resilience provisioning scheme of service level agreements for the GMPLS/ASON network [7137-84]  Z. Tan, Beijing Univ. of Civil Engineering and Architecture (China); H. Cao, Beijing Univ. of Posts and Telecommunications (China)		
7137 2C	GMPLS control plane failure recovery (Invited Paper) [7137-85] J. Wu, M. Savoie, Communications Research Ctr. (Canada)		

Analyzing and designing of reliable multicast based on FEC in distributed switch [7137-73] T. Luo, Huazhong Univ. of Science and Technology (China); S. Yu, Wuhan Research Institute of Posts and Telecommunications (China); X. Wang, Huazhong Univ. of Science and

7137 20

SESSION 10A	OPTICAL GRID II	
7137 2D	Scheduling and routing algorithm for aggregating large data files from distributed databases to super-computers on lambda grid [7137-86] S. Sun, W. Guo, W. Sun, Y. Jin, W. Hu, Shanghai Jiao Tong Univ. (China)	
7137 2E	Demonstration of an improved P2P-based optical grid architecture on LOBS testbed [7137-87] X. Hu, X. Hong, L. Liu, J. Wu, J. Lin, Beijing Univ. of Posts and Telecommunications (China)	
7137 2F	Application-driven grid node architecture for intensive data services on grid based ASON [7137-88] R. Wu, North China Electric Power Univ. (China); Y. Ji, Beijing Univ. of Posts and Telecommunications (China)	
7137 2G	Resource parallel provisioning scheme for collaborating service in optical grid network [7137-89] R. Wu, North China Electric Power Univ. (China); Y. Ji, Beijing Univ. of Posts and Telecommunications (China)	
7137 2H	Grid-oriented resource optimization and control of intelligent optical network (Invited Paper) [7137-90] H. Li, Y. Ji, Beijing Univ. of Posts and Telecommunications (China)	
SESSION 10B	NETWORK SURVIVABILITY II	
7137 21	Novel performance monitoring techniques and their applications to 160-Gb/s ultra high-speed transmission system (Invited Paper) [7137-91] M. Kagawa, H. Murai, Oki Electric Industry Co., Ltd. (Japan)	
7137 2J	Horizontal protection for multicast optical virtual private networks [7137-92] Y. Peng, K. Long, Univ. of Electronic Science and Technology of China (China)	
7137 2K	<ul><li>p-cycle-based strategy for adaptive PWCE design [7137-93]</li><li>Z. Zhang, Peking Univ. (China) and Guangxi Univ. (China); Z. Li, Y. He, A. Xu, Peking Univ. (China)</li></ul>	
7137 2L	The research of invulnerability in complex optical networks [7137-94] Y. Zhao, J. Zhang, L. Li, D. Han, Y. Yao, W. Gu, Beijing Univ. of Posts and Telecommunications (China)	
7137 2M	CE dual-homing protection in layer 1 VPN [7137-95] S. Du, Y. Peng, K. Long, Univ. of Electronic Science and Technology of China (China)	
SESSION 11	ROUTING AND WAVELENGTH ASSIGNMENT	
7137 2N	An effective algorithm for routing with node inclusion constraint [7137-96] J. Wu, S. Wang, H. Yu, L. Wang, H. Luo, Univ. of Electronic Science and Technology of China (China)	

7137 20	Research on a light tree generating algorithm applied to optical layer dynamic multicast traffic grooming [7137-97]  J. Zhao, S. Zhang, Z. Tang, Hebei Univ. of Engineering (China); L. Wang, Hebei Univ. of Engineering (China) and Handan Polytechnic College (China)	
7137 2P	<b>BoD services in layer 1 VPN with dynamic virtual concatenation group</b> [7137-98] S. Du, Y. Peng, K. Long, Univ. of Electronic Science and Technology of China (China)	
7137 2Q	Blocking analysis of dynamic lightpath establishment based on multi-states reservation for wavelength-routed networks [7137-99] Y. Zhao, J. Zhang, L. Li, D. Han, Y. Yao, T. Liang, W. Gu, Beijing Univ. of Posts and Telecommunications (China)	
7137 2R	A distributed multicast label switched path setup scheme to solve the multi-destination reservation collision [7137-100] S. Du, Y. Peng, K. Long, Univ. of Electronic Science and Technology of China (China)	
SESSION 12	OPTICAL SWITCHING AND ROUTING	
7137 2\$	Performance evaluation of TCP over OBS networks with multiple TCP input flows [7137-101] Y. Yu, X. Hong, L. Liu, J. Wu, J. Lin, Beijing Univ. of Posts and Telecommunications (China)	
7137 2T	Flow-oriented dynamic assembly algorithm in TCP over OBS networks [7137-102] S. Peng, Z. Li, Y. He, A. Xu, Peking Univ. (China)	
7137 2U	Transmission properties of a novel ASK/FSK orthogonal labelled signal based on two conjugated IM modulation [7137-103] H. Liu, Fudan Univ. (China) and Huazhong Univ. of Science and Technology (China); Z. He, L. Wang, X. Wang, Fudan Univ. (China); B. Huang, Y. Liang, D. Huang, Huazhong Univ. of Science and Technology (China); N. Chi, Fudan Univ. (China)	
7137 2V	A novel link architecture for optical burst switched networks [7137-104] C. Yuan, Z. Li, A. Xu, Peking Univ. (China)	
7137 2W	An optimizing configuration scheme of asynchronous OPS node based on DLOB [7137-105] K. Gao, X. Sheng, C. Wu, Q. Ha, Beijing Jiaotong Univ. (China)	
	POSTER SESSION	
7137 2X	Research the dynamical large file transmitting in optical network using Lagrangian relaxation [7137-56] H. Wang, W. Guo, Y. Jin, W. Sun, W. Hu, Shanghai Jiao Tong Univ. (China)	
7137 2Y	On segment-shared protection for dynamic connections in multi-domain optical mesh networks [7137-106] X. Zhang, D. Liao, S. Wang, H. Yu, Univ. of Electronic Science and Technology of China (China)	

7137 2Z	The secure transmission criterion of practical polarization coding QKD systems under PNS attacks [7137-107] Y. Chen, H. Yang, K. Deng, Z. Yao, Univ. of Electronic Science and Technology of China (China)
7137 30	Study on working vacation polling system for WDM [7137-108] H. Chen, Yanshan Univ. (China) and Northeastern Univ. at Qinhuangdao (China); N. Tian, Yanshan Univ. (China); D. Lu, Qinhuangdao Institute of Technology (China)
7137 31	Performance analysis of WDM-based coherent time-spreading optical CDMA system
	[7137-109] J. Ji, Shenzhen Univ. (China); Z. Chen, Univ. of Shanghai for Science and Technology (China); M. Xu, Shenzhen Univ. (China)
7137 32	Traffic grooming in all-optical network based on adaptive immune evolutionary algorithm [7137-110]
	YS. Han, Z. Ao, B. Xu, Guangdong Univ. of Technology (China)
7137 33	Analysis and design on node of control plane in transport MPLS [7137-111] Y. Yao, Y. Zhang, L. Tan, W. Jia, Y. Zhao, S. Huang, W. Gu, Beijing Univ. of Posts and Telecommunications (China)
7137 34	On lightpath scheduling in service differentiated survivable WDM mesh networks [7137-112] Q. Li, W. Ni, Tsinghua Univ. (China); Y. Ye, Create-Net (Italy); Y. Li, Y. Guo, H. Zhang, X. Zheng, Tsinghua Univ. (China)
7137 35	The implementation of wireless access in EPON system [7137-113] Y. Chang, D. Liu, G. Wu, Huazhong Univ. of Science and Technology (China)
7137 36	Failure probability analysis of optical grid [7137-114] Y. Zhong, W. Guo, W. Sun, Y. Jin, W. Hu, Shanghai Jiao Tong Univ. (China)
7137 37	Optical resilient packet ring (ORPR) buffer model and delay analysis [7137-115] Q. Wang, C. Wu, M. Cheng, Y. Wang, Beijing Jiaotong Univ. (China)
7137 38	Research on multi-access interference in 2.5 Gb/s symbol overlapping optical fast frequency-hopping CDMA system [7137-116]  Z. Zhang, J. Ji, S. Yang, Shenzhen Univ. (China)
7137 39	Implementation of IGMPv3 and its application to IPTV carrying network [7137-117] M. Zhou, Wuhan Research Institute of Posts and Telecommunications (China); X. Dong, Fiberhome Networks Co., Ltd. (China)
7137 3A	Distributed wavelength reservation method research and analysis in dynamic optical network [7137-118] L. Li, D. Han, Y. Zhao, M. Wang, J. Zhang, W. Gu, Beijing Univ. of Posts and Telecommunications (China)
7137 3B	A novel survivable WDM passive optical networks [7137-119] X. Cheng, Q. Fang, Y. Zhang, B. Chen, F. Lu, Jiangxi Univ. of Finance and Economics (China)

7137 3C	A novel survivable traffic grooming algorithm in WDM mesh networks [7137-120] L. Wang, L. Li, H. Yu, X. Zhang, H. Luo, Univ. of Electronic Science and Technology of China (China)
7137 3D	Impairment-aware dynamic RWA algorithm in multi-granularity WDM optical networks
	[7137-121] Y. Qi, Hangzhou Dianzi Univ. (China); Y. Zhu, The Univ. of Texas at Dallas (United States); T. Wang, X. Zhou, S. Qian, Q. Li, Hangzhou Dianzi Univ. (China)
7137 3E	The research of packet transmission network (PTN) based on T-MPLS [7137-122] Z. Wang, Huazhong Univ. of Science and Technology (China) and Wuhan Institute of Technology (China); X. Feng, Wuhan Institute of Technology (China)
7137 3F	Research and implementation on RLL (2, 12; 8, 15) run-length limited code [7137-123] L. Xiao, C. Xie, B. Ma, D. Hu, Huazhong Univ. of Science and Technology (China)
7137 3G	Multiple enhanced self-protected spanning trees based architecture for recovery from single failure in metro ethernet [7137-124] Y. Li, W. Chen, D. Jin, L. Su, L. Zeng, Tsinghua Univ. (China)
7137 3H	<b>Tech trends in standards concerning FTTx</b> [7137-125] F. J. Effenberger, W. Feng, Huawei Technologies Co., Ltd. (United States)
7137 31	A design-diversity service shift model for survivable IP networks [7137-126] X. Wu, X. Yang, J. Wang, J. Ji, J. Lin, K. Long, Y. Peng, Univ. of Electronic Science and Technology of China (China)
7137 3J	Design and implementation of wireless STB in DTV over EPON system [7137-127] Y. Chang, D. Liu, S. Zhang, Huazhong Univ. of Science and Technology (China)
7137 3K	On planning optical networks with the uncertainty of traffic demand [7137-128] K. C. Cruz, Federal Univ. of ABC (Brazil); K. D. R. Assis, Federal Univ. of Reconcavo of Bahia (Brazil); H. Waldman, Federal Univ. of ABC (Brazil)
7137 3L	A novel bidirectional R-SOA based WDM-PON using DPSK/OOK as downstream/upstream modulation architecture [7137-129] X. Yuan, J. Zhang, M. Zhang, Y. Zhang, Y. Huang, Beijing Univ. of Posts and Telecommunications (China)
7137 3M	Upper bound of BER performance in asynchronous coherent time-spreading optical CDMA system [7137-130] J. Ji, Q. Wu, Z. Zhang, S. Yang, Shenzhen Univ. (China)
7137 3N	The architecture and design of ethernet passive electronic network [7137-131] G. Wu, D. Liu, J. Luo, L. Zhang, C. Zhang, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China)
7137 30	The metropolitan VoD system based on ethernet/SCM PON [7137-132] W. Ji, H. Yang, D. Feng, Y. Liu, J. Sun, Shandong Univ. (China)

7137 3P	Radio-on-fiber integration with fiber-to-the-home transport systems [7137-133] WY. Lin, HC. Peng, KH. Chang, PY. Wu, HH. Lu, National Taipei Univ. of Technology (Taiwan)
7137 3Q	Research of home networking system based on XML/BACnet [7137-134] Z. Wang, Jianghan Univ. (China)
7137 3R	The home gateway used in FTTH which can implement triple play [7137-135] W. Ji, H. Yang, Y. Liu, Shandong Univ. (China); Y. Liu, W. Cui, Inspur Corp. (China)
7137 3\$	Group-multicast capable optical virtual private ring with contention avoidance [7137-136] Y. Peng, S. Du, K. Long, Univ. of Electronic Science and Technology of China (China)
7137 3U	Realizable multiclass QoS controlled optical buffer system in optical packet switching network [7137-138] X. Shao, P. Shum, Nanyang Technological Univ. (Singapore); L. Zhang, Univ. of South Australia (Australia)
7137 3W	Fault localization modeling extension for multidomain optical networks [7137-140] X. Zhang, W. Gu, Y. Zheng, B. Guo, Y. Zhao, R. Wang, Beijing Univ. of Posts and Telecommunications (China)
7137 3Z	Using IGMP V3 for controllable multicast over EPON [7137-143] C. Zhang, D. Liu, L. Zhang, G. Wu, Huazhong Univ. of Science and Technology (China)
	Author Index

#### **Conference Committee**

#### Symposium Chairs

Lars Thylén, Joint Research Institute of the Royal Institute of Technology (Sweden) and Zhejiang University (China)

Wei Yang, Zhejiang University (China)
Bingkun Zhou, Tsinghua University (China)

#### Conference Chair

Weisheng Hu, Shanghai Jiao Tong University (China)

#### Conference Cochairs

**Shoa-Kai Liu**, Rustic Canyon Partners (United States) **Ken-ichi Sato**, Nagoya University (Japan) **Lena Wosinska**, Royal Institute of Technology (Sweden)

#### Program Committee

**Achim Autenrieth**, Nokia Siemens Networks (Germany) **Lian-Kuan Chen**, The Chinese University of Hong Kong (Hong Kong, China)

Nan Chi, Huazhong University of Science and Technology (China) Tibor Cinkler, Budapest University of Technology and Economics (Hungary)

Gert Grammel, Alcatel-Lucent Deutschland AG (Germany)

Wei Guo, Shanghai Jiao Tong University (China)

Yuefeng Ji, Beijing University of Posts and Telecommunications (China)

Philip Nan Ji, NEC Laboratories America, Inc. (United States)

Masahiko Jinno, NTT Optical Network Systems Laboratories (Japan)

Young-wuk Lee, Korea Telecom (Republic of Korea)

**Zhengbin Li**, Peking University (China)

**Keping Long**, University of Electronic Science and Technology of China (China)

**Chunming Qiao**, University at Buffalo (United States)

Carla Raffaelli, Universitá di Bologna (Italy)

**Sridhar Sapparapu**, Bharat Sanchar Nigam, Ltd. (India)

Hideaki Tsushima, Hitachi, Ltd. (Japan)

Anna Tzanakaki, Athens Information Technology (Greece)

Krzysztof Wajda, University of Science and Technology AGH (Poland)

**Tiejun Xia**, Verizon Communications (United States)

Chenliang Zhang, China Telecom (China)

Xiaoping Zheng, Tsinghua University (China)

Wen-De Zhong, Nanyang Technological University (Singapore)

Session	Chairs
---------	--------

1a	Broadband Access I  Lena Wosinska, Royal Institute of Technology (Sweden)
1b	Optical Transport Network <b>Tibor Cinkler,</b> Budapest University of Technology and Economics (Hungary)
2a	FTTX <b>Biswanath Mukherjee,</b> University of California, Davis (United States)
2b	WDM Network I  Angela L. Chiu, AT&T Labs. Research (United States)
3a	Best Student Paper Session <b>Ken-ichi Sato</b> , Nagoya University (Japan)
3b	Optical Network for Broadband Service Feng Huang, Lucent Technologies Company, Ltd. (China)
<b>4</b> a	WDM-PON <b>Rujian Lin,</b> Shanghai University (China)
4b	Carrier Ethernet  Ann C. Von Lehman, Telcordia Technologies, Inc. (United States)
5a	Optical Grid I  Jing Wu, Communications Research Centre Canada (Canada)
5b	WDM Network II Soichiro Araki, NEC Corporation (Japan)
6a	Metro Network <b>Kazuo Hagimoto</b> , NTT Network Innovation Laboratories (Japan)
6b	Dynamic Optical Network  Zhengbin Li, Peking University (China)
7a	Broadband Access II  Jing Wu, Communications Research Centre (Canada)
7b	Network Survivability I <b>Masatoshi Kagawa</b> , Oki Electric Industry Company, Ltd. (Japan)
8a	Future Optical Network  Masatoshi Suzuki, KDDI R&D Laboratories, Inc. (Japan)

8b Network Design

A. Gumaste, Indian Institute of Technology, Bombay (India)

9a Scalable Optical Network

Helio Waldman, Universidade Federal do ABC (Brazil)

9b GMPLS/ASON

**Tibor Cinkler**, Budapest University of Technology and Economics (Hungary)

10a Optical Grid II

**Tomohiro Kudoh**, National Institute of Advanced Industrial Science and Technology (USA)

10b Network Survivability II

**Keping Long**, University of Electronic Science and Technology of China (China)

11 Routing and Wavelength Assignment

**Kwok-Shing Ho**, The Chinese University of Hong Kong (Hong Kong, China)

**Kwok-Wai Cheung**, The Chinese University of Hong Kong (Hong Kong, China)

12 Optical Switching and Routing

Hui Li, Beijing University of Posts and Telecommunications (China)

#### Introduction

Asia-Pacific Optical Communications (APOC) is the flagship conference of SPIE and one of the world's major conferences in the field of optical communication. APOC2008 took place in Hangzhou, China, October 26–30, 2008 under the technical co-sponsorship of SPIE, Chinese Optical Society (COS), China Institute of Communications (CIC), and the Joint Research Center of Photonics of the Royal Institute of Technology and Zhejiang University.

Nearly six hundred papers were presented throughout the five days in four subcategories. The 4th sub-category "Network Architectures, Management, and Applications" attracted 195 submissions including 24 invited speeches; among those, 145 papers were selected for presentation and poster at the conference. 22 technical sessions ran concurrently as follows: Broadband Access I, Optical Transport Network, FTTX, WDM Network I, Best Student Paper Session, Optical Network for Broadband Service, WDM-PON, Carrier Ethernet, Optical Grid I, WDM Network II, Metro Network, Dynamic Optical Network, Broadband Access II, Network Survivability I, Future Optical Network, Network Design, Scalable Optical Network, GMPLS/ASON, Optical Grid II, Network Survivability II, Routing and Wavelength Assignment, and Optical Switching and Routing. Furthermore, one poster session was held as well.

The technical program covered a wide spectrum of research topics on optical network architectures, management, and applications. The papers included in this volume were part of the technical conference and subject to review by the conference program committee and the editors. (Some conference presentations may not be included if they were not submitted for publication.) Six graduate students presented their papers in the Best Student Paper Session, and Ms. Jiajia Chen from the Royal Institute of Technology KTH, Sweden won the award with the paper entitled "A novel joint scheduling algorithm for multiple services in 10G EPON."

We wish to acknowledge the hard work of the authors, the reviewers, and SPIE in the preparation of this volume. We wish to thank the general chairs: Lars Thylén, Wei Yang, and Bingkun Zhou, the general technical chairs: Kwok-Wai Cheung, Dominique Chiaroni, and Chinlon Lin, and the conference sponsors and organizers for their efforts to create a great conference and these proceedings.

Weisheng Hu Shoa-Kai Liu Ken-ichi Sato Lena Wosinska