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Optical networks special issue based on selected IEEE ICOCN 2014 papers

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The 13th International Conference on Optical Communications and Networks—IEEE ICOCN 2014 (http://www.ontrc.org/icocn/) was held in Suzhou on November 9–10, 2014.

IEEE ICOCN aims to provide a premier opportunity for professionals, experts, engineers, scientists, and industrial people worldwide in the field of research, development, and applications of photonics to share and exchange their experience. IEEE ICOCN 2014 included three technical tracks: (1) optical networks, (2) optical transmission subsystems and techniques, and (3) photonic devices and integration.

IEEE ICOCN 2014 was a two-day event organized by Optical Network Technology Research Center (ONTRC) in School of Electronic and Information Engineering, Soochow University. IEEE ICOCN 2014 was technically sponsored by IEEE Photonics Society. The conference was also supported by National Natural Science Foundation of China (NSFC), Zhongtian Broadband Technology, Electronic Institute of Suzhou, and the City Government of Suzhou.

We accepted more than 120 papers by the authors from more than 13 countries and regions, among which 59 are invited talks. All the papers were carefully reviewed by more than 30 Technical Program Committee (TPC) members and external reviewers, with each paper evaluated by at least two reviewers. All these papers and talks are organized into eight lecture-style oral sessions and one interactive poster session.

Based on the comments received from the reviewers, the authors of nine accepted papers that are in the area of optical networks were invited to submit an extended version of their work for possible publication in this Optical Networks Special Issue of the Springer Photonic Network Communications (PNET) journal. After a thorough review process, eight papers have been selected for publication. In addition, this Special Issue includes invited papers that went through the same review process of the other accepted papers. A brief summary on the accepted papers is provided next.

In "Backup Reprovisioning with Partial Protection for Disaster-Survivable Software-Defined Optical Networks," S. S. Savas, C. Ma, M. Tornatore, and B. Mukherjee propose a Backup Reprovisioning with Partial Protection (BRPP) scheme supporting dedicated path protection, where backup resources are reserved but not provisioned (as in shared-path protection), such that the amount of bandwidth reserved for backups as well as their routings is subject to dynamic changes, given the network state, to increase utilization.

In "Optical Quorum Cycles for Efficient Communication," C. J. Kleinheksel and A. K. Somani propose to apply the distributed efficiency of the quorum sets to route optical cycles based on light-trails. With this new method of topology construction, unicast and multicast communication requests do not need to be known or even modeled a priori.

In "Correlation-based Virtual Machine Migration in Dynamic Cloud Environments," L. Liu, S. Zheng, H. Yu, V. Anand, and D. Xu establish a service level agreement (SLA)-based soft migration mechanism to significantly reduce the number of virtual machine (VM) migrations, and develop two algorithms to solve the VM and server selection issues, in which the correlation between the VMs and the servers is

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used to identify the appropriate VMs to be migrated and the destination servers for them.

In "Cloud Service Provision in Two Types of DCN with Awareness on Delay and Link Failure Probability," Y. Li, J. Xiao, B. Wu, H. Wen, H. Yu, S. Yang, S. Xin, and J. Guo study the performance of service provisioning in two types of datacenter networks. Considering the failure probability and transmission delay on each link, the authors aim to minimize the total service cost based on two cost scaling factors and to design the access routes for the demands originated from each node.

In "CapEx Advantages of Multi-Core Fiber Networks," Y. Li, N. Hua, and X. Zheng investigate capital expenditure (CapEx) advantages of multi-core fiber (MCF) networks by modeling and solving a CapEx-minimized planning problem. With the help of MIMO-based inter-core crosstalk suppression, the negative impact of inter-core crosstalk can be mitigated, and MCF can still show its CapEx advantages when the traffic load is heavy.

In "Efficient Software-Defined Passive Optical Network with Network Coding," R. Gu, S. Zhang, Y. Ji, T. Guo, and X. Wang propose a software-defined passive optical network architecture with network coding (NC) to reduce downstream bandwidth consumption and thus increase the throughput and network efficiency. The experiments and evaluation results show that the software-defined passive optical networks with network coding reduces nearly 50 % occupied downstream bandwidth.

In "Software-Defined Dynamic Bandwidth Optimization (SD-DBO) Algorithm for Optical Access and Aggregation Networks," Y. Zhao, B. Yan, J. Wu, and J. Zhang propose a software-defined dynamic bandwidth optimization (SD-DBO) algorithm in optical access and aggregation networks. The proposed algorithm can support unified optimizations and efficient scheduling by allocating bandwidth resources from a global network view in real time.

In "Experimental Assessment of a Cognitive Mechanism to Reduce the Impact of Outdated TEDs in Optical Networks," R. J. Durán, N. Fernández, D. Siracusa, A. Francescon, I. de Miguel, I. Rodríguez, J. C. Aguado, E. Salvadori, and R. M. Lorenzo employ the elapsed time matrix (ETM) technique in the framework of the CHRON (Cognitive Heterogeneous Reconfigurable Optical Network) architecture to reduce the blocking probability when establishing lightpaths on demand and to increase the percentage of successful restorations in case of optical link failure.

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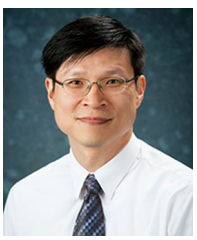

Calvin C. K. Chan received his B.E., M.Phil., and Ph.D. degrees from the Chinese University of Hong Kong, all in Information Engineering. Upon graduation, he joined the Department of Electronic Engineering at the City University of Hong Kong as a Research Assistant Professor. In June 1999, he joined Bell Laboratories, Lucent Technologies, Holmdel, NJ, as a Member of Technical Staff. Before moving back to Hong Kong, he served as Senior Optical System Engineer at Jedai Broadband Networks, Inc. in NJ, USA. In August 2001, he joined Department of Information Engineering at the Chinese University of Hong Kong and now serves as a Professor. He has served as members of the Technical Program Committees of many international conferences. He was an Associate Editor for OSA Journal of Optical Networking and IEEE/OSA Journal of Optical Communications and Networking. He served as the Chairman for IEEE Photonics Society Hong Kong Chapter during 2012–2013. He has published more than 200 technical papers in refereed international journals and conferences, two book chapters on passive optical networks, and one edited book on optical performance monitoring. He holds two issued US patents. His research interests include enabling technologies for optical metro/access networks, high-speed optical signal processing techniques, optical performance monitoring, and optical network design.

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