OFC/NFOEC '12 Summary --Elastic Networks

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OFC'12 Technical Sessions with Papers Related to Elastic Networks

- OW3A: Impairment-Aware Networking
- **OTh3B: Elastic Optical Networks**
- NW3F: ROADM Network Architectures
- OTh4B: Next Generation Networks and Survivability
- NTu2J: Multi-layer Awareness and Management
- OTh1A: Traffic Grooming
- OM3G: Optical Network Control

Impairment-Aware Networking

Code	Title	Author/Affiliate	Topic	Trends
OW3A6	On the Benefits of Elastic Transponders in Optical Metro Networks	**Cristina E. Rottondi et. al.** Politechnico di Milano	Spectrum efficiency achievement through use of elastic transponders in Metro Networks. A novel multi-objective minimizes both spectrum utilization and no. of transponders.	Impairment-Aware Elastic Network Optimization
OW3A7	Experimental Demonstration of Mixed Formats and Bit Rates Signal Allocation for Spectrum-flexible Optical Networking	▪ Robert Borkowski et. al. ▪ AIT, DTU	Investigates the requirements on the physical layer parameters for a spectrum-flexible heterogeneous optical superchannel. The results provide the basis for cognitive control algorithms to implement heterogeneous reconfigurable optical networks.	

Impairment-Aware Networking

Code	Title	Author/Affiliate	Topic	Trends
OW3A4	Impact of intra-superchannel spectral constraints on thethroughput of the elastic WDM networks	**Thierry Zami** ALU	How to maximize the total network capacity by tuning different physical layer parameters such as WSS passband, power of the subcarriers, mitigation of crosstalk etc.	Impairment-Aware Elastic Network Optimization

Elastic Optical Networks

Code	Title	Author/Affiliate	Topic	Trends
OTh3B 5	Comparison of Optical Spectrum Utilization Between Flexgrid and Fixed Grid on a Real Network Topology	**Paul Wright et al.** BT, U. College London	Using network simulations, real network efficiency gains of Flexgrid compared to inverse multiplexing on a 50GHz fixed grid are presented. Results show Flexgrid will be beneficial for future networks, supporting up to 208% more traffic.	Traffic Engineering and Network Planning in Elastic Networks
OTh3B 2	Dynamic Operation of Flexi-Grid OFDM-based Networks	**C. (T.) Politi et al.** U. Pelopponese, BT, Telefonica I+D	Elastic networking based on flexi-grid technology has been proposed that utilizes the optical spectrum flexibly. It is shown that resources released due to the non-rigid spectrum allocation, allow betterspectrum utilization and better blocking performance.	

Elastic Optical Networks

Code	Title	Author/Affiliate	Topic	Trends
OTh3B 1	Efficiency of Adaptive and Mixed-Line-Rate IP over DWDMNetworks regarding CAPEX and Power Consumption	**Axel Klekamp** ALU	Optimization of IP over DWDM USA-core network is studied under constraints of energy consumption and CAPEX for MLR and Elastic Networks. No. of transponders and fibers used is less in elastic than in MLR.	Traffic Engineering and Network Planning in Elastic Networks
OTh3B 4	Resource Requirements in Mixed-Line Rate and ElasticDynamic Optical Networks	**A. Morea et al.** ALU	A simple formula is proposed to assess the reduction in number of transponders in dynamic elastic optical networks with respect to mixed-line rate networks relying on the same set of datarates. ER provides up to 40% transponder savings.	

Elastic Optical Networks

Code	Title	Author/Affiliate	Topic	Trends
OTh3B 6	Hierarchical Multi-granular Switchingin Flexible Grid WDM Networks	**A. Patel et al.** NEC Labs America	A hierarchical multi-granular switch architecture in FWDM networks is proposed, and the routing, spectrum allocation, and waveband assignment problem is investigated.	Traffic Engineering and Network Planning in Elastic Networks
OTh3B 7	Performance Analysis of Multicast Traffic over Spectrum Elastic Optical Networks	**Q. Wang et al.** CU of Hong Kong	Demonstrates that flexible spectrum allocation provides lower blocking probability for multicast compared to that in ITU-T grid-based WDM networks.	

Other Papers on Elastic Networks

Code	Title	Author/Affiliate	Topic	Trends
OTh4B 4	Shared-Path Protection in OFDM-based Optical Networkswith Elastic Bandwidth Allocation	**X. Shao et al.** Institute of Infocom. Research, Singapore	Conservative and aggressive backup sharing in OFDM-based optical networks are proposed. Extensive simulation results have shown that aggressive backup sharing can significantly improve capacity efficiency.	
NTu2J 7	CAPEX study for grid dependent multi-layer IP/MPLS-over-EON using relative BV-WSS costs	▪ O. Pedrola et al. ▪ UPC Spain, ▪ Telefonica I+D	The impact of the frequency grid on the CAPEX required to deploy a multi-layer IP/MPLS-over-EON is analyzed. Results showing significant savings at the electronic layer motivate the introduction of narrower grids with enhanced BV-WSS.	

Other Papers on Elastic Networks

Code	Title	Author/Affiliate	Topic	Trends
OM3G1	Experimental assessment of a combined PCE-RMA and distributed spectrum allocation mechanism for GMPLSElastic CO-OFDM Optical Networks	**Ramon Casellas et al.** CTTC, Spain KDDI, Japan	Deployment of a GMPLS control plane for elastic CO-OFDM optical networks,detailing its functional architecture combining PCE routing and modulation assignment (RMA)with distributed spectrum allocation, the protocol extensions and the experimental validation.	
NTu2J3	Routing and Spectrum Assignment by Means of Ant Colony Optimization in Flexible Bandwidth Networks	**Y. Wang et al.** BUPT, China	Dynamic ACO-based routing and spectrum assignment algorithm elastic optical networks. The novel strategy achieves a lower blocking probability with high adaptability to the traffic rate variation compared to K-shortest path RSA.	

Other Papers on Elastic Networks

Code	Title	Author/Affiliate	Topic	Trends
OTh1A 1	Optical Grooming in OFDM-Based Elastic Optical Networks	**G. Zhang et al.** UC Davis, China Academy of Telecom Research, Ghent University	A novel optical grooming approach to aggregate and distribute traffic directly at the optical level in OFDM-based elastic optical networks. Significant transmitter and spectrum saving is achieved compared to non-grooming scenario.	