Computer Science Seminar

Optical Layer-Driven Network Restoration and Redesign for Improved Fast Reroute Reliability

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Fast Reroute (FRR) is a local restoration technique available in Multi-Protocol Label Switching (MPLS). With FRR, data traffic over a failing MPLS-link is swiftly rerouted through a pre-provisioned restoration tunnel. The FRR solution works well so long as the restoration tunnel is not adversely affected by other concurrent failures. Additional protection against this drawback is offered by the lower (optical) layer, which can provide restoration lightpaths to replace the failing MPLS-link(s). Through Software Defined Networking (SDN) orchestration, the optical layer can also provide a second remedy, which consists of redesigning a portion of the MPLS-topology on-the-fly. This presentation investigates the reliability improvement that these two optical layer-driven approaches can yield.

Bio: Andrea Fumagalli is a Professor of Electrical Engineering at the University of Texas at Dallas (UT-Dallas) and the Head of the Open Networking Advanced Research (OpNeAR) Lab at UT-Dallas. He holds a Ph.D. in Electrical Engineering (1992) and a Laurea Degree in Electrical Engineering (1987), both from the Politecnico di Torino, Torino, Italy. From 1992 to 1998 he was an Assistant Professor of the Electronics Engineering Department at the Politecnico di Torino, Italy. He joined UT-Dallas as an Associate Professor of Electrical Engineering in August 1997. He served as the Head of the Telecommunications Engineering Program (TE) from 2007 to 2012. Dr. Fumagalli's research interests include aspects of wireless, optical, cloud networks, and related protocol design and performance evaluation. He has published close to two hundred papers in refereed journals and conferences. Dr. Fumagalli has been involved in a number of research projects focusing on packet switched, circuit switched, and survivable network architectures.

Dr. Fumagalli has been involved in a number of professional activities. He served as Associate Editor of the IEEE/OSA Journal of Optical Communications and Networking (JCON) [formerly IEEE JSAC Optical Communication and Networking (OSN) Series]. He served on the Editorial Board of ACM/IEEE Transactions on Networking. He served as Guest Editor for the OSA Journal of Optical Networking, the European Transactions on Telecommunications (ETT), the IEEE Journal on Selected Areas in Communications, the Journal on Communications, the Journal of High Speed Networks, and the SPIE Optical Networks Magazine. He served as General Co-Chair for the 11th IEEE International Conference on High Performance Switching and Routing, which was held at UT-Dallas in 2010.

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