

Control of Switched Optical Networks: Pragmatic Issues

Daniel Awduche, Movaz Networks

Abstract

An automatic switched optical network (ASON) generally refers to an optical network that has dynamic connection capability. The ASON concept is becoming a practical and economic reality, driven by advancements in technology. The control plane is the centerpiece of the ASON concept, providing the functionality to effectively and efficiently control the optical network. This entails the realization of fundamental capabilities within the network itself for state information management, decision making, and action invocation. Furthermore, the peculiar characteristics of optical networks, such as wavelength contention and impairment accumulation, must be taken into consideration in relation with the ability to dynamically establish optical connections on demand. The control plane must also address issues of vertical coordination and control integration between the optical domain and digital clients (such as IP/MPLS routers), and issues of horizontal or spatial control interworking and collaboration across technical, administrative, and business domains.

In this talk, we survey some of the key technical considerations in the control of switched optical networks, paying particular attention to pragmatic issues surrounding control plane design, control interconnection models, and control integration. We also provide a preview of the emerging field of “integrated traffic engineering” in IP-over-optical networks, which refers to a new philosophy of collaborative decision making geared towards operational network performance optimization that advocates consideration and coordination of various control and management capabilities at different levels in the network hierarchy

Biography of Keynote Speaker

Daniel Awduche is Vice President of Network Architecture at Movaz Networks, an optical networking equipment company. Prior to Movaz, he served as “Distinguished Technical Member” and acting Director of Global Network Architecture at UUNET, a Worldcom Company and a global provider of Internet communications services. At UUNET, Daniel led a team of engineers engaged in architecture, design, and development activities aimed at UUNET’s next generation network. He has also served as Manager of Advanced Technology, Technical Manager of Core Network Architecture, and Senior Engineer in Traffic Engineering, all at UUNET. He played a significant role in the design and implementation of UUNET’s backbone network, which is presently one of the largest Internet backbones in the world. Daniel Awduche is active in the Internet Engineering Task Force (IETF) where he serves as Co-Chair of the IP-Over-Optical (IPO) Working Group. He helped to establish the IETF Internet Traffic Engineering Working Group and served as its initial Chairman. Within the IETF, he has made fundamental contributions towards the advancement of Multiprotocol Label Switching, Multiprotocol Lambda Switching (MPLambdaS), Internet Traffic Engineering, and IP-Over-Optical control technologies. He is active in the Optical Internetworking Forum (OIF) as well.