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Working Group: Architecture & Signaling Working Groups

Title: Proposal to form a Project on Configurable All-Optical Networks

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Source:

Adel A. M. Saleh (Editor)	David Foote	Brian Brown
Jane M. Simmons	Hitachi Telecom	Richard Lauder
Lotfi Benmohamed		Malin Premaratne
Corvis	Robert Nadon	Redfern Broadband Networks
	Innovance	
Jim Jones		Rao Tatavarti
Dimitri Papadimitriou	Daniel Awduche	Solinet Systems
Alcatel	Movaz Networks	
		Zhensheng Zhang
John Strand	Sudheer Dharanikota	Sorrento Networks
AT&T	Raj Jain	
	Nayna Networks	Yang Cao
Olga Aparicio	Rauf Izmailov	Sycamore Networks
Cable & Wireless	Yoshiharu Maeno	
	Yoshihiko Suemura	Bala Rajagopalan
Jonathan Lang	NEC	Tellium
Calient Networks		
		Dono van-Mierop
Angela Chiu	Subra Ambati	Trellis-Photonics
Robert W. Tkach	Joe Parker	
Celion Networks	Ophos	Yong Xue
		UUNET/WorldCom
Ling-Zhong Liu	Jacob Tanay	
Edgeflow	Optivera	

ABSTRACT: Long-reach optics and configurable all-optical networks provide economic benefits for carriers in terms of both capital and operating expenses by significantly reducing the amount of equipment required in the network. Such networks are currently entering the marketplace, and there is a desire in the OIF and other standards organizations to generalize their respective architectural models to include configurable all-optical networks. This contribution is a proposal for initiating a new project in the OIF to address the specific features of such networks as they relate to signaling for automatic provisioning and restoration of optical paths. The scope of the project is to propose the first phase of extensions to the current OIF Optical UNI to include a universally accepted reference model of a configurable all-optical network layer. The scope of the project also includes establishing a roadmap for future work, e.g., other reference models and multi-domain aspects of all-optical networks.

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For additional information contact:
The Optical Internetworking Forum, 39355 California Street,
Suite 307, Fremont, CA 94538
510-608-5990 phone ♦ info@oiforum.com

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1. Working Group Project

Configurable all-optical networks.

2. Working Group(s)

Architecture and Signaling.

3. Problem Statement

Automatic provisioning in networks with transponders and O-E-O crossconnects is being addressed by the current OIF signaling effort. Configurable all-optical networks, however, have specific properties (e.g., routing schemes intimately tied to the underlying technology) that are not adequately captured by the current OIF model. Thus, the signaling specifications of this model need to be extended to address these properties of all-optical networks.

4. Scope

The scope of this project is to identify the required interfaces and develop the signaling specification for supporting and maximizing the benefits of configurable all-optical networking within a single-domain. Future phases of this project will extend this work to take into account the multi-domain aspects of such networks. We will not be addressing physical requirements of an all-optical layer.

5. Expected Outcome

An implementable signaling specification that accommodates the specific properties of configurable all-optical networks.

6. Proposed Schedule

- Agreeing on a reference model by 3Q01
- Definition of specifications that addresses provisioning in all-optical networks by 1Q02
- Establish a roadmap for future work (e.g., other reference models, multi-domain, etc.) by 2Q02

7. Merits of the Project

This signaling specification will be within the scope of the OIF mission and will allow for interoperable implementations of signaling for automatic provisioning of optical paths across both O-E-O and all-optical networks.

8. Relation to other OIF Working Groups

The specifications defined in this project will be an extension of that developed in UNI 1.0. We will interact with the Carrier Working Group to establish the services desired from an all-optical layer.

9. Relation to other Standards Bodies and Forums

This work will complement and be coordinated with the IETF IPO and MPLS working groups as well as the ITU-T.

10. Work Items for this Project

- Define a universally acceptable reference model for a configurable all-optical network. To adequately cover this area, more than one model may be considered.
- Define the special characteristics of the all-optical layer that need to be addressed, e.g., extended all-optical reach, the need for regeneration outside the all-optical layer, waveband routing, etc.
- Define the services that need to be provided by an all-optical layer, e.g., all-optical multicasting.
- Define extensions to the current OIF O-UNI to address the establishment of connections through a configurable all-optical network.
- Define new control messages that need to be exchanged to and from the all-optical layer, e.g., costing of paths in the all-optical layer, all-optical reachability, shared-risk link group information, etc.
- Establish a roadmap for future work, e.g., other reference models, routing extensions that include advertising physical transmission parameters, multi-domain and multi-vendor aspects of all-optical networks, the need for an NNI interface, etc.