Vol. 8 Issue No. 17, 8 - 14 March 2002

NEWS

Let's do the lambda

By Tan Ee Sze

The development of a unified control plane, which is expected to gain market traction within two to four years, will pave the way for network provisioning by the wavelength (or lambda) as well as dynamic wavelength routing.

These are just some of the many developments in the pipeline as researchers and vendors work to achieve greater intelligence in optical networks.

Speaking at the Infocomm Development Authority's technology roadmap symposium last week, Associate Professor Cheng Tee Hiang, director of Nanyang Technological University's Network Technology Research Centre, noted that future optical networks need to be optimised for data traffic and cater to the dominance of IP (Internet protocol).

According to Cheng, today's optical networks are relatively dumb, with multiple wavelength DWDM (dense wavelength division multiplexing) systems implemented mainly as point-to-point connections. For the short haul, optical networks are mainly based on single-wavelength SONET/SDH (synchronous optical network/synchronous digital hierarchy) systems. The next step would be to move from these to DWDM with optical cross connect, which will allow dynamic wavelength routing and provision by wavelength, he said. And playing an important role in this is the development of a unified control plane.

Dr Mohamed El-Sayed, manager of Advanced Optical Networking Design in Bell Labs, Lucent Technologies, said an intelligent optical network has to built and architected at three levels. At the transport plane, a robust and scalable transport infrastructure will facilitate the carriage of desired services. A management plane complements the control plane in facilitating the deployment and management of services and service policies, while the distributed control plane will support protocols based on existing and emerging protocols of the data world.

Unified control plane

Idris Vasi (left), director of Optical and Storage Networking, Asia Pacific, at Cisco Systems, defined the unified control plane as a software comprising addressing, routing and signaling protocols. It runs on IP routers and optical network elements, unifying control functions across disparate technology layers, making control independent of underlying transport.

A key protocol type at the unified control plane is O-UNI (optical user network interface), which handles the user-to-network interface. It enables circuit/wavepath signalling and setup to be initiated by a client device. O-UNI 1.0 has been finalised by the Optical Networking Forum, and is expected to gain market traction in one to two years.

Another protocol type, at the node-to-node or network-to-network interface, is GMPLS (generalised multiprotocol label switching), which handles path signalling, set up and integrated routing.

GMPLS, which is expected to take off in two to four years, extends MPLS (multiprotocol label switching) to address optical layer constraints and attributes.

The two key bodies working on GMPLS are the International Telecommunications Union and the Internet Engineering Task Force (IETF).

According to Vasi, the unified control plane reduces the cost of operations through the automation of inventory, provisioning and new service delivery.

It assumes cross connects can be controlled by signalling, and allows applications to MPLS programming interfaces to provide different services.

Back to previous page