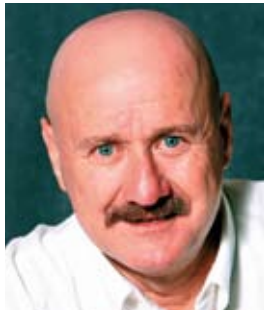


# Maximizing Fiber Deployments

JOHN McHUGH



**OPASTCO Technical Director John McHugh receives a steady stream of calls and e-mails from OPASTCO members looking for answers to their technical questions. McHugh & A shares some of these questions and answers with the OPASTCO Roundtable readership.**

**T**o maximize the capability of fiber deployments, technologies such as Dense Wavelength Division Multiplexing (DWDM), Course Wavelength Division Multiplexing (CWDM), Reconfigurable Optical Add/Drop Multiplexers (ROADMs), and Wavelength Selective Switches (WSS) are being deployed.

## **What can these technologies accomplish, and can rural fiber deployments utilize them?**

WDM is not new to the optical world: it is the ability to transmit two or more different wavelengths over a single fiber. The expanded versions of WDM are DWDM, where many closely spaced wavelengths (up to 40) can be transmitted over a single fiber, and CWDM, where fewer wavelengths are transmitted (usually eight), and are a substantial reduction in product cost. These technologies have allowed for the transmission of greater bandwidth from point-to-point, as well as maximum utilization of limited fiber counts.

As DWDM and CWDM technologies started being deployed in many fiber networks, the ability to transmit large amounts of traffic over a single fiber became necessary. The capability to “drop off” or “add on” some quantity of traffic along the path of the fiber route also became needed. This is where ROADM and WSS technologies come in.

Once thought to be only for large optical transport networks, ROADMs are finding their way into metropolitan and some smaller service providers’ optical networks. ROADMs give network planners and operations personnel the ability to deploy a fiber network and remotely configure it on an as-needed basis. Many

well-know telecom vendors, such as ECI, Cisco, Nortel, Siemens and Alcatel-Lucent, have ROADM products available.

With broadband deployments in rural areas on the rise, this is a technology rural providers may want to investigate to cost-effectively manage their fiber distribution networks. “ROADM solutions have started to impact rural networks and will have a major role in building next-generation rural flexible infrastructure,” says Daniel Coran, speaker coordination manager of ECI Telecom, noting that Emery Telecommunications and Utah Fiber Network (UFN) offer two examples of rural service providers that have been deploying ROADM networks. “As rural service providers migrate to Internet protocol (IP) networks and start to offer triple play services, including IPTV and high-bandwidth Ethernet-based services to enterprises and government institutions, there is a need for a scalable infrastructure that can dynamically adopt to changes in customer demand.”

Ultimately, ROADM makes DWDM and CWDM capacity more usable, and delivers services that are not suitable for a synchronous optical networks (SONET), such as Gigabit-Ethernet (GigE), 10GigE and storage area networks (SANs), notes Coran. He points out that rural service providers deploying ROADM technology also benefit from remotely provisionable network infrastructure, which results in lower cost of ownership. “Building regional and state-wide rural ROADM networks allows independent operating carriers to share content and cost, while cost-effectively operating a very large network from a single location,” he says. This may be especially attractive when operating such networks in unmanned locations |

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Have a technical question about any aspect of your telco business? Your name will not be revealed, but please include it in your e-mail. Questions may be edited in order to provide more relevance to a larger audience. Send your question to [roundtable@opastco.org](mailto:roundtable@opastco.org).