Cisco ONS 15800 Series

Cisco ONS 15800—ANSI Version
Cisco ONS 15801—ETSI Version

Cisco Systems, the worldwide leader in networking for the Internet, provides solutions for service providers to cost-effectively build and evolve to Internet scale, carrier class optical networks. To accomplish this endeavor, service providers must maximize use of all previously installed optical fiber as well as any used in the future. The time-proven technology of dense wavelength division multiplexing (DWDM) has greatly improved the efficiency of optical transmission in optical fiber.

Product Description

The Cisco ONS 15800 is based on a modular design that easily scales from 1 to 64 channels. By using common modules throughout the system, operators can minimize sparing costs. This common platform accommodates tributaries of OC-12/STM-4, OC-48/STM-16, and OC-192/STM-64. Multiplexed wavelengths can be transmitted up to 500 km through the use of distributed optical amplifiers along the optical route. Line extender modules (LEM) are used to regenerate the optical signal when necessary, thereby eliminating the need for intermediate SONET (SDH) electrical regenerators, consequently saving operators large sums of additional capital expenditures. Integrated, non-intrusive B1 and Bit Error Rate (BER) monitoring are available to assure high QoS levels and to allow for constant system monitoring of it's integral components. By using its multi-band architecture, special system design features can be used such as mid-band, distributed dispersion compensation. This compensation allows for tighter management of optical fiber non-linear effects, which can limit a system's capability. Other design parameters such as gain tilt adaptation, system application separation, and add/drop anomalies can all be addressed effectively, efficiently, and with little to no service disruptions. The system also features an optical service channel that provides the medium through which many of the vital system parameters are transmitted to the optional, element management system. It also features a local craft interface that is useful for maintenance.

The flexible ONS 15800 adapts well to different network architectures such as point-to-point, mesh, star, and ring.

Figure 1   Cisco ONS 15800 Platform
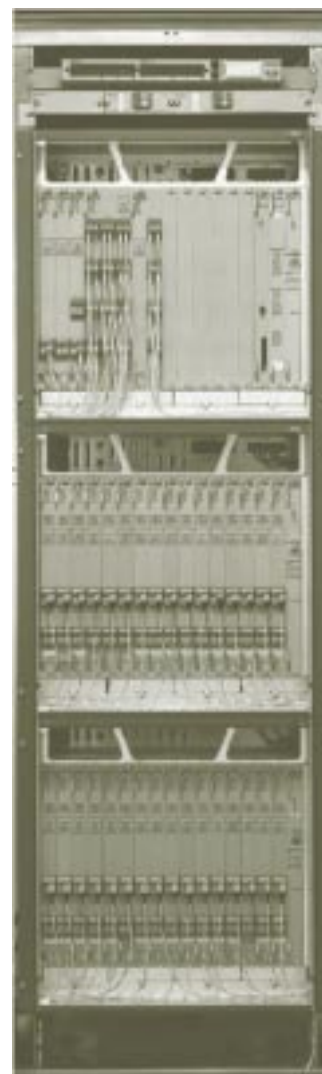
Solution Overview

With the ONS 15800 system, Cisco offers a network solution that can scale with the rapid growth of the Internet while providing unrivaled reliability. Up to five spans are supported through the use of optical amplifiers. The ONS 15800 can reach distances of up to 6,000 km through the use of LEMs. The integral LEMs eliminate the need for SONET (SDH) regenerators and consolidate this functionality onto a single plug-in module. The LEM provides a view into network performance through B1 monitoring. And, forward-error correction (FEC) improves the reliability of the signal. Both the B1 monitoring and FEC are non-intrusive. Performance monitoring is crucial to powering an error-free network and provides a standardized approach to address ongoing maintenance issues.

Technology Overview

The Cisco ONS 15800 DWDM system is a field-proven, Internet-scale, carrier-class optical transport platform that allows service providers to maximize the use of installed fiber over long-haul networks and can scale with the exponential growth of the Internet traffic. Combined with other Cisco products, the ONS 15800 enables carriers to build a flexible end-to-end optical solution that meets the requirements of carrier-class reliability. The multiple band design of the ONS 15800 allows carriers incomparable flexibility when deploying applications and additional wavelengths as needed. This feature, combined with an open systems architecture, makes the ONS 15800 the most adaptable DWDM system available.

Key Benefits

The ONS 15800 system offers flexibility, scalability, and enhanced performance in an economical design. The system architecture facilitates fast network install as a result of the following features:

- Transmission control protocol TCP/IP Ethernet-based craft access
- An optical backplane that minimizes internal system fiber cabling
- Integrated fiber management trays that store excess fiber for simplified expansion

In addition, each module contains an on-board power converter that eliminates costly power supplies, frees up rack slots, and eliminates a single point of failure. The ONS 15800 system is built with future growth in mind; it includes space for additional racks and shelves.

Figure 2   Line Extender Modules (LEM) eliminate SONET Regens and Extend a Route up to 6000 km

ONS 15800
Terminal Site

LEM Site

ONS 15800
Terminal Site
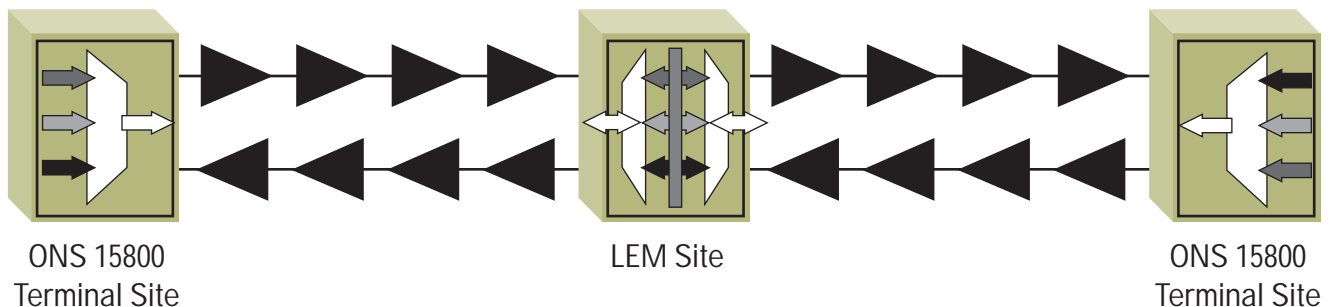
All ONS 15800 System Modules are Retained: 100 Percent Use of All Modules Purchased

Figure 3   An Example of a Fully Configured System: Beginning with the Red Band, New Modules are Added as the ONS 15800 Grows
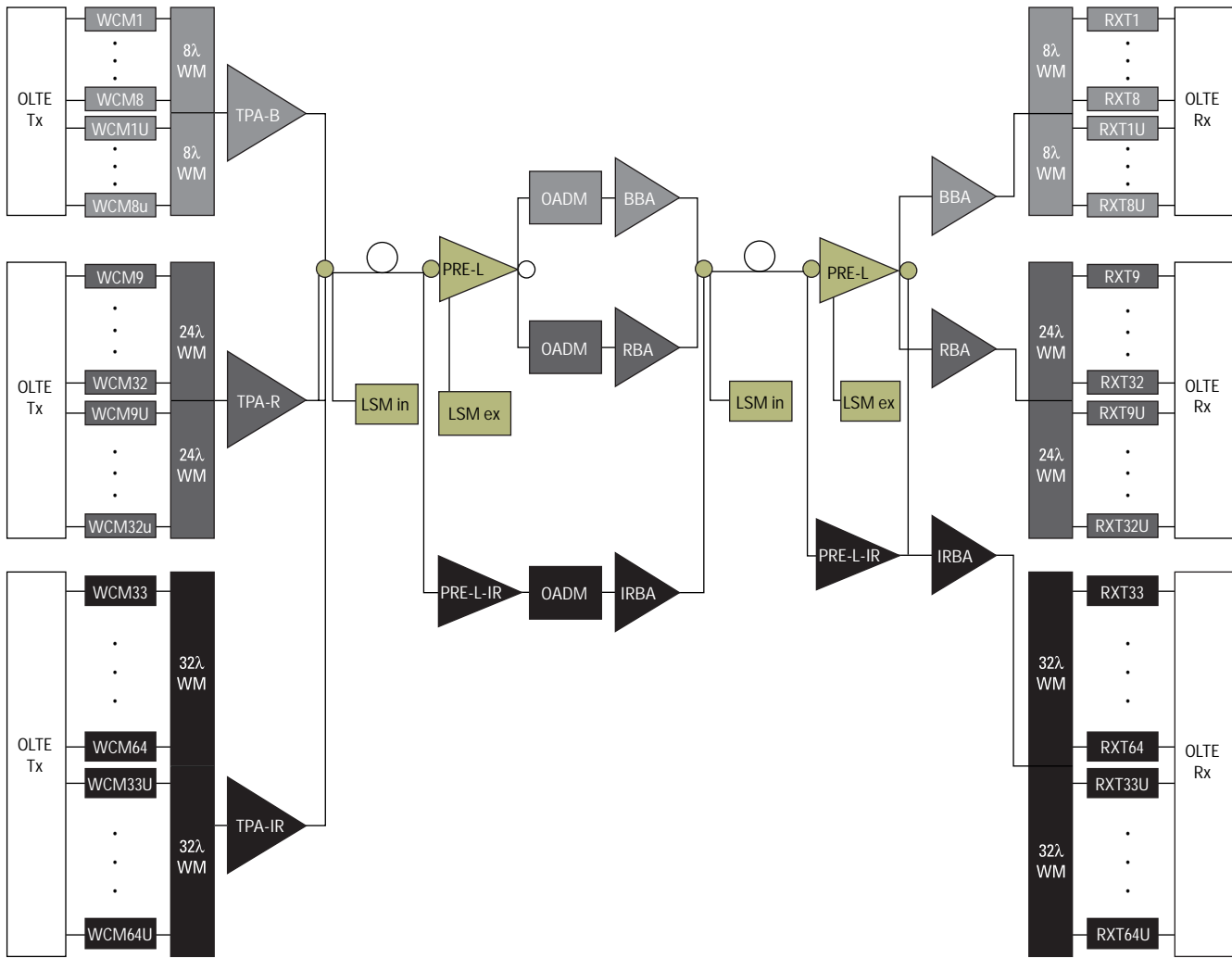
Technical Specifications

Channel Input:	OC-12/STM-4, OC-48/STM-16, OC-192/SCM-64
Supported Services:	IP, ATM, SONET, and SDH
Number of Channels:	1 to 64
Channel Spectrum:	1529–1602 nm
Optical Service Channel:	2.048 Mbps
Input Power Range:	–8 dBm to 0 dBm
Physical Dimensions:	standard 23" mechanics (ANSI) standard ETS 300 119 mechanics (ESTI)
Network Fiber Connections:	Front Access
Fiber Types Supported:	SMF-28, DSF, LEAF, E-LEAF, TWC, TWP, TW, LS
SONET/SDH Monitoring:	B1, BER through OOBFEC
SONET/SDH Regeneration:	Integrated (LEM)
Typical ONS 15800 DWDM unidirectional route:	Five spans at 25 dB per span x 64 channels
Add drop supported at any line site	8, 12, 24, 32 channels
System dispersion tolerance (without LEM):	12,800 ps/nm at 2.5 GBps

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