Cisco ONS 15808 Long-Haul / Extended Long-Haul DWDM Transport Platform

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

The Cisco ONS 15808 Long-Haul (LH)/Extended Long-Haul (ELH) DWDM Transport Platform provides innovative optical solutions to meet Internet demand for high-capacity circuits at a lower cost per bit. It provides further economical benefits via superior reduction in network operational costs and accelerated service velocity, leading to speed to revenue and competitive advantage. (See Figure 1.)

Figure 1: Cisco ONS 15808 DWDM System

Product Description

The Cisco ONS 15808 is a 2.5- and 10-Gbps DWDM transmission platform designed to support applications in the LH (0 to 600 km range) and ELH (600 to 2000 km range) markets. Technology enhancements in the Cisco ONS 15808 allow for tighter channel spacing, higher channel capacity, higher bit rate, and greatly extended transmission distances, which enable the platform to support more than 160 channels, with an architecture that further scales to over 300 channels and to a 40-Gbps transmission rate.

You can achieve service and application management by deploying the Cisco ONS 15808 in the network and growing the system to carry LH optimized traffic, ELH optimized traffic—or both. High platform modularity allows scaling the system without affecting service. Complete band independence allows capacity to be optimized by fiber type and application, offering the customer a scalable, cost-effective platform.

The Cisco ONS 15808 platform provides 80 channels in the C band (LH configuration) and 40 channels in the L band (ELH configuration) with growth plans to support more than 160 x 10-Gbps channels across various applications. The product supports 50-GHz channel spacing and 2.5/10-Gbps transmission rates; however, the system is also designed to support 25-GHz channel spacing for increased channel counts.

Together with outstanding optical performances, the Cisco ONS 15808 features a new supervision and control architecture. Software and firmware can be remotely downloaded on the system without affecting service. The Cisco ONS 15808 control system supports B1 and J0 non-intrusive monitoring when the client signal is Synchronous Optical Network/Synchronous Digital Hierarchy (SONET/SDH) framed, and manages and monitors Path Trace and Forward Error Correction (FEC) overhead for all supported client services and bit rates. It also eases system installation and upgrades by supporting automatic amplifier power provisioning. End-to-end amplifier output power is monitored and automatically adjusted by the supervision system based on physical network data (fiber type, spans length, and so on) and real-time channel count to reduce commissioning time and to optimize system capacity on all fiber types.

Summary of Advanced Product Features

- Single DWDM platform supports both LH and ELH applications, with superior service-management and band-management capabilities
- New platform specifically designed and optimized to carry 10-Gbps traffic with 50-GHz channel spacing
- 25-GHz channel spacing to be introduced with enhanced FEC
- Complete band independence allows capacity to be optimized by application, offering customers a scalable, cost-effective platform
- Single platform for both ANSI and ETSI markets for a truly global solution
- Non-service affecting growth and upgrade path via C and L bands
- Platform supports up to 2000-km non-regenerated signals
- Out-of-band FEC coding for transported signals to provide high system capacity and to improve system robustness against non-linear effects and performance degradation
- B1 and J0 non-intrusive monitoring for SONET/SDH-framed client signal to allow performance monitoring and regeneration section tracing by wavelength
- 1+1 system and wavelength protection/redundancy to enable 99.999-percent availability and bit error rate (BER) better than 10^{-15} at the channel level
- Automated optical power provisioning to simplify system installation and spare management
- Optical add/drop multiplexers (OADM): 10-percent capacity for LH and 50 percent for ELH
- Single domain manager for all optical transport technologies (SONET, SDH, Metro DWDM, LH DWDM) via Cisco Transport Manager (CTM), leading to operational efficiencies and cost savings
- System performance/capacity optimized for Enhanced Large Effective Area Fiber (E-LEAF), Single-Mode Fiber (SMF) and TrueWave-Reduced Slope (TW-RS) fibers; all fiber types supported
- 20 bidirectional 10-Gbps channels per 7-ft bay
- Raman-assisted amplification for ELH applications
- NEBS Level 3 and EMC compliant
- The Cisco ONS 15808 is a key element in the Cisco COMET (Complete Optical Multi-service Edge and Transport) networking solution

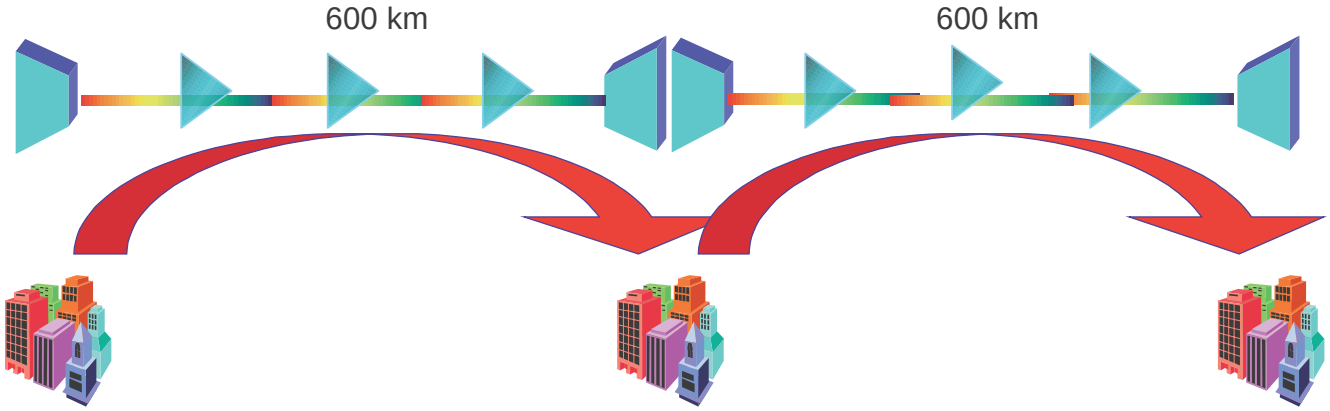
Product Applications

The Cisco ONS 15808 is cost optimized for a multitude of LH and ELH applications.

LH DWDM Transmission

The LH configuration is optimized for traditional LH and regional applications such as connectivity between carrier points of presence (POPs) within and between major metropolitan cities. This application offers a highly scalable optical transport infrastructure that allows carriers to offer multiple transport services within major cities. Long-haul transmission is generally considered to range from spans of 0 to 600-km, although use and applications vary and this range may be extended beyond 600-km. The Cisco ONS 15808 system performance is optimized for a 600-km span reach. (See Figure 2.)

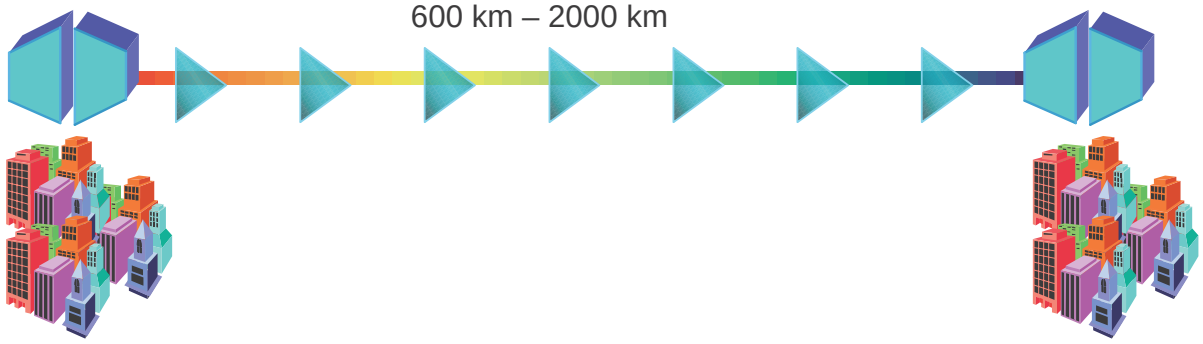
Figure 2: LH Application for the Cisco ONS 15808



ELH DWDM Transmission

The ELH configuration is optimized for applications such as the interconnectivity of major data centers and POPs in carrier networks between major metropolitan cities. Extended long-haul transmission is generally considered to range from spans of 600- to 2000-km, although use and applications vary and this range may be extended beyond 2000-km. Most ELH traffic tends to be in the 1600- to 1700-km range, which is where the Cisco ONS 15808 system performance is optimized. (See Figure 3.)

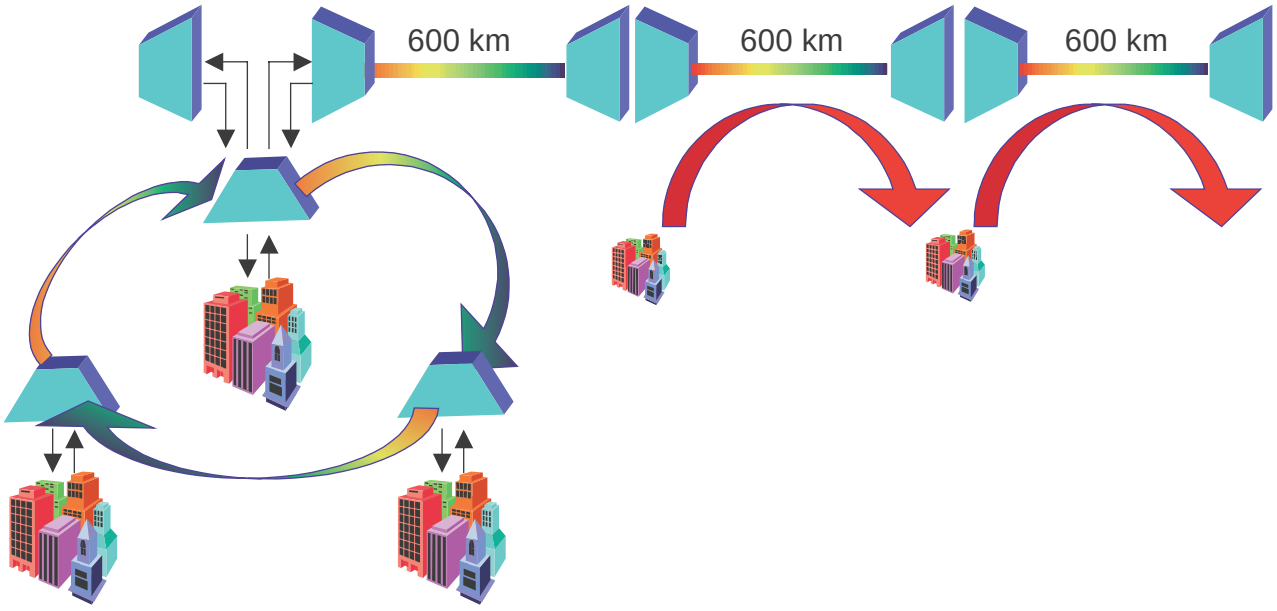
Figure 3: ELH Application for the Cisco ONS 15808



Inter-Office Transport

The Cisco ONS 15808, with its built-in optical transmission characteristics, provides an efficient solution for multi-lambda 10-Gbps inter-office transport in the metro core. These rings typically span a few hundred kilometers and can be easily addressed with Cisco ONS 15808 technology. The Cisco ONS 15808 and Cisco ONS 15216 share common ITU channel plans, making it simple to utilize the Cisco ONS 15808 for 10-Gbps ITU transmission alongside the industry-leading Cisco ONS 15454 for OC-48 ITU transport. (See Figure 4.)

Figure 4: Inter-Office 10-Gbps Transmission



Cisco Transport Manager

The Cisco Transport Manager (CTM) is the element management system for the Cisco ONS 15000 Series Optical Networking System. CTM streamlines and strengthens optical network operation, administration, maintenance, and provisioning by fully integrating fault, configuration, and performance management capabilities.

Technical Specifications

Channel Input	OC-48/STM-16 OC-192/STM-64 10-Gbps parallel VSR 4:1 OC-48 muxponder
Supported Services	IP, ATM, SONET, and SDH
Number of Channels	80 in the C band @ 50 GHz (LH) 40 in the L band @ 50 GHz (ELH) Growth path to 160+ channels Architecture scales to 300+ channels
Channel Spectrum	C band: 1529 to 1562 nm L band: 1570 to 1605 nm
Optical Service Channel	2.048 Mbps
Input Power Range (@10 Gbps)	–11 dBm to –1 dBm
Physical Dimensions	21-in. width 12-in. depth NEBS 2000
Network Fiber Connections	Front access
Fiber Type Supported	All
SONET/SDH Monitoring	B1, J0, BER through OOB-FEC
SONET/SDH Regeneration	Integrated LT
Reference ONS 15808 Spans	LH: 80 channels – 5 x 25 dB ELH: 40 channels – 20 x 22 dB
Add and Drop Supported at Any Line Site	LH: 8 channels ELH: 20 channels
System Dispersion Tolerance (without LT)	600 ps/nm @ 10 Gbps

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