**Product Brief**  
**Optical Multiservice Edge 6500**  
*Adaptive intelligent optical transport — simplifying your network*

**Introduction**

The network is connecting an ever-increasing number of devices. People want more — faster Internet speeds, higher bandwidth applications and better quality video. As the world becomes increasingly hyperconnected and traffic demands surge at an unpredictable growth rate, there is a compelling business case to continue to evolve the metro towards a scalable, adaptive packet-based infrastructure that moves through an agile all-optical long haul network.

In this volatile and very competitive environment, what if there was one platform that could meet all functionality requirements for both the metro and long haul sections of the network, simplifying the design to drive down costs in both the capital and operating infrastructure?

Nortel Optical Multiservice Edge 6500 consolidates layers of networking functions and platforms, addressing a wide variety of applications with a reduced number of nodes. The same platform can be employed for wireless backhaul, Ethernet aggregation or business service delivery, can act as an optical transit node with multi-way branching and is leading the market with 40G/100G wavelength transport.

**Metro and long haul DWDM infrastructure**

With its integrated photonic capabilities, the Optical Multiservice Edge 6500 offers an architecture with fewer network element types and simplified operations for faster deployment in metro, regional and long haul areas.

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*Figure 1. Service diversity and flexibility with Optical Multiservice Edge 6500*
alike. Service providers and enterprises are able to reduce recurring operating expenses through an overall reduction in managed network elements and a reduction in the cost of network management, equipment sparing, technician training and document control.

Wavelength-Selective Switch (WSS)-based Reconfigurable Optical Add-Drop Multiplexers (ROADMs) are integrated into the shelf for flexible per-wavelength add/drop/passthrough and per-wavelength switching. Both cost-optimized 100GHz-spaced and scalable 50GHz-based ROADMs are available with up to nine degrees of branching, maximizing the “connectability” of the node without regeneration.

Multi-port, multi-protocol transponders with per-port service selectability offer increased versatility and flexibility. Service providers and enterprises, for example, can deploy the Optical Multiservice Edge 6500 to support their business continuity and data center connectivity needs, while continuing to offer a varying mix of TDM/WDM/Ethernet services over a single converged network.

Nortel offers unique network simplification benefits with its high-performance DWDM capabilities on the Optical Multiservice Edge 6500, solving optical transmission complexity using advanced electronics and modem technology integrated into its equipment.

10Gbps and 10GbE transponders operate with electronic Dynamically Compensating Optics (eDCO) that support per-wavelength dispersion compensation directly on the transmitting optical interfaces. Significant CAPEX and OPEX reduction is realized from extending wavelengths without any dispersion compensation equipment or the associated amplifiers and engineering that would otherwise be involved. Each individual wavelength may be routed through the network independent of distance, fiber type or number of intermediate add/drop nodes.

10G/10GE DWDM interfaces provide transparent mapping onto G.709 OTU2 frame interfaces. The OTN Wrapping used provides complete transparency for 10G or 10GbE service transport.

Nortel 40G: Any dispersion, any ROADM, any network path

As bandwidth demands continue to increase, operators can easily upgrade their networks with a Nortel 40G solution. Nortel’s industry-leading technology, based on the Nortel 40G/100G Adaptive Optical Engine, can deliver both 40G and 100G network capacity, enabling four times the network throughput immediately while providing the foundation to simply and affordably increase capacity ten-fold as required. This innovative capability equips carriers to keep pace with dramatically increasing demand from bandwidth-sapping applications like IPTV, Internet video, HD programming and mobile video phones.

Some of the key firsts of Nortel’s 40G solution include Dual Polarization Quadrature Phase Shift Keying with coherent detection that allows 40Gbps operation over a 10G network as well as advanced digital signal processing that removes all compensation requirements from the network, along with their associated capital and operational expenditures. Much of the functionality is integrated into the world’s first 40Gbps...
coherent digital receiver, developed using Nortel’s unique in-depth experience in optical propagation, wireless transmission and component design.

The Optical Multiservice Edge 6500’s 40G has the ability to ride over the same number of 50GHz-spaced ROADMs as exist in networks today, providing operators the ability to gracefully integrate this next-generation solution into a hybrid network with an incredible level of photonic layer scaling. With its integrated compensation capabilities for both chromatic and polarization mode dispersion, Nortel’s 40G delivers both economic and operational benefits through reduction and elimination of equipment (regenerators, RAMAN, compensators) and the ability to use existing fiber. The same technology will be reused to meet commercial requirements for 100Gbps transmission with respect to reach and dispersion tolerance characteristics.

**Ethernet Aggregation services**

A key aspect of enabling the transition to a packet-based transport infrastructure is the ability to achieve aggregation/statistical muxing on packet interfaces. Optical Multiservice Edge 6500 offers two interface variants with Layer 2 switching capabilities, both of which are MEF certified. Firstly, the Layer 2 service switch (L2SS) provides excellent Ethernet QoS and traffic management functionality on a per-customer flow basis and allows the delivery of services with stringent SLAs. Very granular customer flows of as low as 64 kbps can be supported. Secondly, the Optical Multiservice Edge 6500 has a Resilient Packet Ring (RPR) interface which allows Ethernet switching over a packet-based ring, which forms a geographically distributed Ethernet bridge. The RPR offering is standards-compliant with the latest RPR standards (IEEE 802.17 and IEEE 802.17b), and has the same basic traffic management capabilities as the L2SS.

**Ethernet Virtual Private LAN or multicast/broadcast video distribution applications**

Because they both support any-to-any connectivity, the L2SS and RPR interfaces can also be used for Ethernet Virtual Private LAN or multicast/broadcast video distribution applications, bringing the same values of statistical muxing, Ethernet QoS and traffic management to these applications. For video broadcast applications, the Optical Multiservice Edge 6500 affords carrier-grade resiliency with Ethernet Private Line drop-and-continue capability with differentiating equipment and facility protection.

**Ethernet Private Line (EPL) for a variety of services such as business services delivery, Ethernet wholesale, etc.**

Bridging the TDM transport network and Ethernet world, a variety of Ethernet interfaces encapsulate Ethernet in standard Generic Framing Procedure...
(GFP) over the SONET/DWDM carrier infrastructure. Given the prevalence of these interfaces in the business services delivery area, the IEEE 802.3ah EFM (Ethernet in the First Mile) standard is supported, allowing customer-located demarc devices to be remotely managed and monitored without having to manage these devices as distinct network elements. In addition, Ethernet and TDM performance measurements are available to provide clear customer demarcation and proof of Service Level Agreement (SLA) compliance, enabling first-class customer guarantees in managed services situations. For high-bandwidth consumer service applications, such as Video on Demand (VoD), efficient transport is provided through native 10GE LAN PHY interfaces.

**Ethernet services over existing copper network**

With the Optical Multiservice Edge 6500’s PDH Gateway function, service providers can cost-effectively start delivering Ethernet services over their existing PDH-based (T1/E1/T3/E3) private line copper access infrastructures, without requiring any upgrades to the already-deployed access network. The PDH Gateway is based upon industry standard GFP, VCAT (Virtual Concatenation) and LCAS (Link Capacity Adjustment Scheme) technologies that can interoperate with any standards-compliant customer located equipment (CLE). The Optical Multiservice Edge 6500 can terminate hundreds of customer-located Ethernet devices on a single shelf, resulting in a highly scalable and cost-effective solution for service providers to extend their metro Ethernet service footprint and deliver Ethernet to customers who need bandwidth in the range of 1Mbps to 50Mbps, including bundled T1/E1 links. The fact that the Ethernet service is going over the existing T1/E1/T3/E3 leased line access network is completely transparent to the end customer — he is simply enjoying native Ethernet connectivity with the Quality of Service he needs and demands.

**Full support of TDM — wireless backhaul and next-generation cross-connect replacement**

The Optical Multiservice Edge 6500 supports established TDM services with excellent densities and flexibility. High-density copper services (DS1/E1, DS3/E3, EC-1/STS-1), modular and per-port selectable optical services (OC-3/STM-1, STM-1e, OC-12/STM-4, OC-48/STM-16, OC-192/STM-64 and 40G OC-768/STM-128 DWDM interfaces provide carriers with a robust service offering and the peace of mind that comes with service forecast tolerance. Unrestricted bandwidth management capabilities on the cross connect result in a more efficient use of the optical network and prevent premature overlays of equipment that result from limited grooming capabilities.

Optical Multiservice Edge 6500 introduces unprecedented 80Gbps unconstrained single-stage (non-blocking) VT1.5/VC12 grooming and switching which, along with its high optical (with
short reach options), DS1/E1 and DS3/E3/STM1e densities in a compact frame, offer maximum capital and operational expense savings in DCS replacement and wireless backhaul applications. The Optical Multiservice Edge 6500 also supports an integrated 48-channel portless transmux interface that provides conversion between DS3-channelized and E1/DS1 traffic, processing up to 5G of traffic in one slot, further reducing requirements for external digital cross connect equipment in the network. Full remote troubleshooting capabilities such as optical and electrical loopback, test access and test signal generation capabilities have been added to the platform, ensuring it meets all operational requirements.

Managing the Optical Multiservice Edge

Underpinning its capabilities, the Optical Multiservice Edge 6500 enhances the manageability of Ethernet networks by delivering a comprehensive management solution that provides full OAM capabilities and the same carrier-grade capabilities across Layers 0, 1 and 2, while preserving the operational values of circuit-based networks and paradigm operators are familiar with.

With the convergence of Optical and Ethernet, Nortel continues to evolve its management offering into a single scalable platform solution providing full OAM capabilities across Layer 0 through Layer 2 for the entire Metro Ethernet Networks portfolio, including both optical and carrier Ethernet products. Capabilities of Nortel’s management system include:

- Centralized fault, event and performance monitoring
- Historical query and reports
- End-to-end provisioning, visualization and troubleshooting across Layer 0 through Layer 2
- Embedded IBM Tivoli product line to provide a Web-based client architecture as well as high-rate fault management
- Industry-standard XML and Corba northbound interfaces adhering to the TMF 814/854 (MTOSI 2.0) standards
- Optional and customizable service fault correlation and service management

In addition, a full suite of sophisticated design tools such as Optical Planner and Optical Modeler are available to customers to evaluate various deployment scenarios over multiple periods, comparing network cost, availability and utilization to decide on the best network architecture to evolve towards. Network resilience to single, dual and multiple failures can be simulated, providing the user with additional data points to compare network deployment scenarios. A powerful GUI interface allows the visualization of a large number of network parameters, such as bandwidth usage per segment, services routing before and after failure, system utilization using color schemes, etc. These graphical outputs are complemented by detailed reports that can be exported for further analysis. Optical Modeler allows the user to simplify and accelerate photonic network design and expansion to provide an end-to-end photonic solution from planning to modeling to implementation. With Optical Modeler, the user can perform detailed photonic simulation, creating ready-to-deploy designs and guaranteed end-of-life designs. These tools provide an invaluable aid in the planning of customer moves, changes and migration to the latest optical and data networking technologies.

Throughout the transition to next-generation packet-based networks, Nortel provides one network and domain management system for Optical and Ethernet services, bringing the best of the circuit-based operational paradigm forward and retaining the characteristics operators desire and are familiar with.

Many network applications. One platform.

The Optical Multiservice Edge 6500 uses technology innovation to simplify networking for service providers and enterprises. With full integration of TDM, WDM and Ethernet capabilities into the platform, Nortel’s Optical Multiservice Edge 6500 provides the business model tolerance and service flexibility operators need to seamlessly evolve their networks towards resilient and optimized Ethernet-based infrastructures.
Nortel is a recognized leader in delivering communications capabilities that make the promise of Business Made Simple a reality for our customers. Our next-generation technologies, for both service provider and enterprise networks, support multimedia and business-critical applications. Nortel’s technologies are designed to help eliminate today’s barriers to efficiency, speed and performance by simplifying networks and connecting people to the information they need, when they need it. Nortel does business in more than 150 countries around the world. For more information, visit Nortel on the Web at www.nortel.com. For the latest Nortel news, visit www.nortel.com/news.

For more information, contact your Nortel representative, or call 1-800-4 NORTEL or 1-800-466-7835 from anywhere in North America.

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