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6400 OTP

Metro/Regional





6400 OTP

- Metro core/regional transport component of Xtera's Agile Optical Networking portfolio
- Industry's first wavelength selective switch (WSS)-based ROADM
- Cost-efficient optical transport platform
- Modular and expandable architecture
- Integrated GMPLS-based control plane
- Sub-rate multiplexing for Ethernet, SONET/SDH and SAN
- Intelligent network planning and management tools.

Delivering flexible high-speed services in metro core/regional optical networks

6400 OTP (Optical Transport Platform)

The Xtera Communications 6400 Optical Transport Platform (OTP) provides the most flexible metro core/regional optical transport solution for network service providers and mission-critical infrastructures. By dynamically allocating TDM, Ethernet, data and optical services, the 6400 OTP removes the uncertainties and risks associated with solving and managing bandwidth demands arising out of unpredictable traffic patterns and emerging service demands. The 6400 OTP has been field-proven to meet the global requirements for an agile metro optical service platform that significantly reduces OPEX expenses while serving current and future network needs by delivering:

- Simple, fast service activation, through a fully automated optical layer and GMPLS control plane
- Jumperless provisioning with a robust integrated optical backplane
- Flexible network configurations that can be adapted as requirements change
- Enhanced bandwidth efficiency, by eliminating stranded or under-utilized bandwidth
- Integrated SONET/SDH and WDM layers that simplify the network.

Overview

The Xtera 6400 Optical Transport Platform (OTP) system supports 2-fiber linear and ring configurations with up to 64 nodes. Each node uses a reconfigurable optical add/drop multiplexer (ROADM) sub-system – the Xtera patented Versicolor™ – to add/drop or pass-through any wavelength at any node without O-E-O regeneration, independent of any other wavelength. The modular design of the 6400 OTP can be used to cost effectively address diverse point-to-point, linear add/drop, and ring applications. The 6400 OTP is a 2-fiber ITU-T C-Band unidirectional WDM system with a capacity of 32 wavelengths per fiber for a total system capacity of 64 wavelengths. The initial installation of the 6400 OTP provides a unidirectional system that grows from a minimum capacity of 8 wavelengths up to 64 wavelengths.

Versicolor™

The Xtera 6400 OTP Versicolor™ ROADM line card provides fully flexible and remotely configurable optical add/drop capabilities – allowing a wavelength to be added or dropped on the fly at any network node. The Versicolor™, the industry's first WSS-based ROADM, achieves superior performance at lower cost by incorporating several key system functions within one optical subsystem:

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- Optical Add/Drop – the ability to add/drop any wavelength on the fly, with no impact on neighboring wavelengths, no restrictions on wavelength re-use and no user intervention required at any node.
- Dynamic Gain Equalization – automatic per wavelength power optimization, eliminating the need for the user to manually adjust signal levels as new services are added. This significantly speeds up provisioning time, reduces risk to existing services and eliminates a potential source of human error.
- Signal Monitoring – continuous monitoring of every wavelength connection traversing the node, enabling real time physical layer performance monitoring to quickly diagnose and isolate faults.

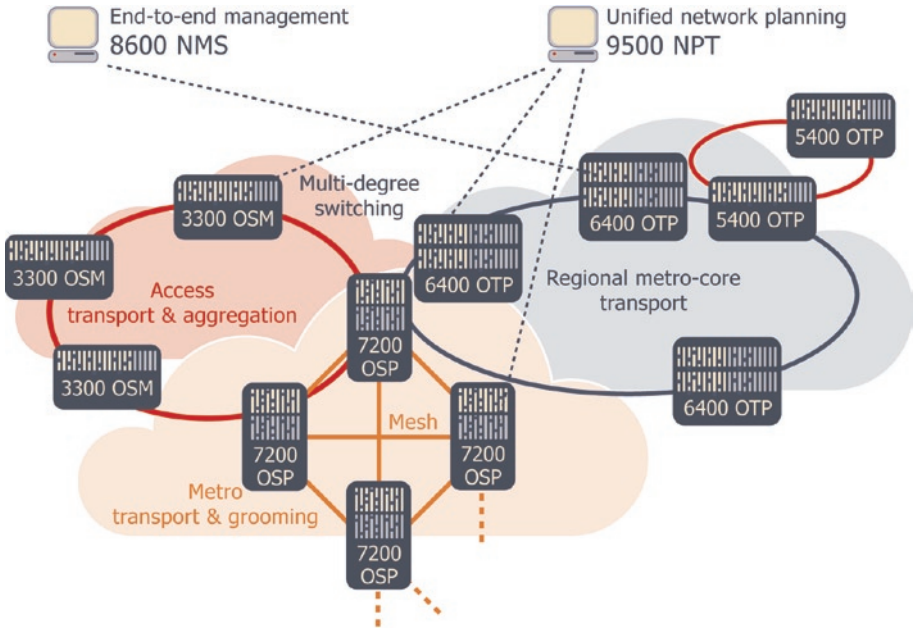
Amplifiers

The Xtera 6400 OTP optical amplifiers are variable-gain amplifiers with automatic configuration for a wide range of fiber span losses. No user intervention is required to adjust the amplifiers at any time. The amplifiers are designed to adjust operating parameters to limit output power excursions created by transients, when adding and removing wavelengths, or by failures, such as fiber cuts. The optical amplifiers automatically adjust their operating parameters such that the downstream signals maintain stable power. All amplifiers are integrated in the 6400 OTP system – no extra shelf or housing is required.

Network planning and management

Xtera's Agile Optical Networking includes the Xtera 8500 Element Management System (EMS) and the Xtera 9500 Network Planning Tool (NPT). In combination with the GMPLS-based control plane integrated within each 6400 OTP node, the network itself possesses powerful and flexible provisioning as well as comprehensive alarm and performance monitoring capabilities. The Xtera 9500 NPT software design toolset provides optimized node equipment configurations based on span engineering data, cost targets and traffic demands. The intelligent 6400 OTP system software is capable of quickly performing complex operations tasks such as, an optical ring node add or delete, or an ADM segment add or delete without interrupting protected traffic on the ring.

Xtera's Agile Optical Networking portfolio comprises the 3300 OSM at the access layer, 7200 OSP for multi-degree switching in the metro core and the 6400 OTP for flexible transport in metro core/regional networks as well as a comprehensive suite of management and planning software-based tools.



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Specifications

System capacity

- 32 Protected Wavelengths, 64 Unprotected Wavelengths, 64 nodes, up to 1000 km ring circumference.

Client interfaces

- OC-192/STM-64, OC-48/STM-16, OC-12/STM-4, OC-3/STM-1, 10GbE LAN/WAN, GbE (full and rate limited), ESCON, FICON (1 Gb/s and 2 Gb/s), FC (1 Gb/s and 2 Gb/s), DVB-ASI, "Any Rate".

Protection

- Line side: Per-wavelength selectable Optical Dedicated Protection, ADM-on-a-wavelength UPSR/SNCP, Optical Shared Protection, Unprotected, Link Node Disjoint
- Client side: Optional SONET 1+1 Linear APS, or 1x1 Splitter/Combiner Protection.

Topology

- Point-to-Point, Linear ROADM Chain, ROADM Ring
- Hubbed Ring (Ring Interconnect), Meshed Ring.

Sonet and SDH add/drop multiplexing

- OC-48/STM-16, OC-12/STM-4, OC-3/STM-1 into an OTU-1 or OUT-2 line
- Provisionable transparent SONET/SDH OC-48/STM-16 overhead mapping.

Sonet/SDH ADM on a wavelength™

- Any system wavelength can be provisioned to perform as a SONET/SDH ADM Ring.
- Each wavelength and service can be individually provisioned with unique SONET/SDH characteristics.
- Each SONET/SDH ring can make use of a different set of the ring nodes.

Optical

- System Transmission – any combination of 2.5Gb/s and 10Gb/s wavelengths
- Dynamic power equalization
- Automatic gain control, ultra-fast, automated transient suppression
- Per-wavelength, automatic monitoring and power control
- Optical backplane eliminates the need for customer installed jumper cables
- Tunable Lasers (full C-Band tunable)
- Optional integrated DCM (Dispersion Compensation Modules).

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6400 OTP

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Dynamic ring structure

- ROADM and SONET/SDH ADM nodes can be added/deleted from the ring
- with no service interruption.

Optical amplifiers

- Pre-amplifier and optional booster amplifiers for up to 36 dB spans
- Optional Raman amplifiers for extended reach.

System management

- Craft interface – CIT, CLI, TL1
- Element management – Xtera 8500 EMS
- OSS protocols – CORBA, TL1 (dual gateways), SNMP
- Supervisory channel – 1510 nm, 100 Mb/s
- Ethernet customer data channel – 10 Mb/s Ethernet.

Optical layer, service and system design

- Xtera 9500 NPT: Optical layer configuration and network planning tool.

Control plane NE software

- Based on GMPLS with RSVP, OSPF, and LMP.

Environmental/compliance

- NEBS Level 3, UL, CE Mark, CUL, UL1950, FCC Part 15 Class A, ETSI.

Availability

- Five 9's Availability: Additional details available on request.

Mechanical

- 17" x 20.5" x 21.5" (WxHxD) system shelf
- 17" x 18.25" x 21.5" (WxHxD) transponder shelf
- 17" x 18.25" x 21.5" (WxHxD) expansion shelf
- Mounts in industry standard 19" or 23" racks
- Weight – approximately 184 lbs/84 kgs for fully loaded system shelf.

Power input

- -48 VDC nominal, -40 to -60 VDC operating range (independent A and B feeds, independent breakers).

Client density (7' bay)

- SONET/SDH: 48 OC192/STM64, 192 OC48/STM16
- Gb ethernet: 432 full rate, 480 rate limited
- Fiber channel: 240 FC2, 480 FC1.

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