

OTP10G OTN/DWDM Optical Transport Platform

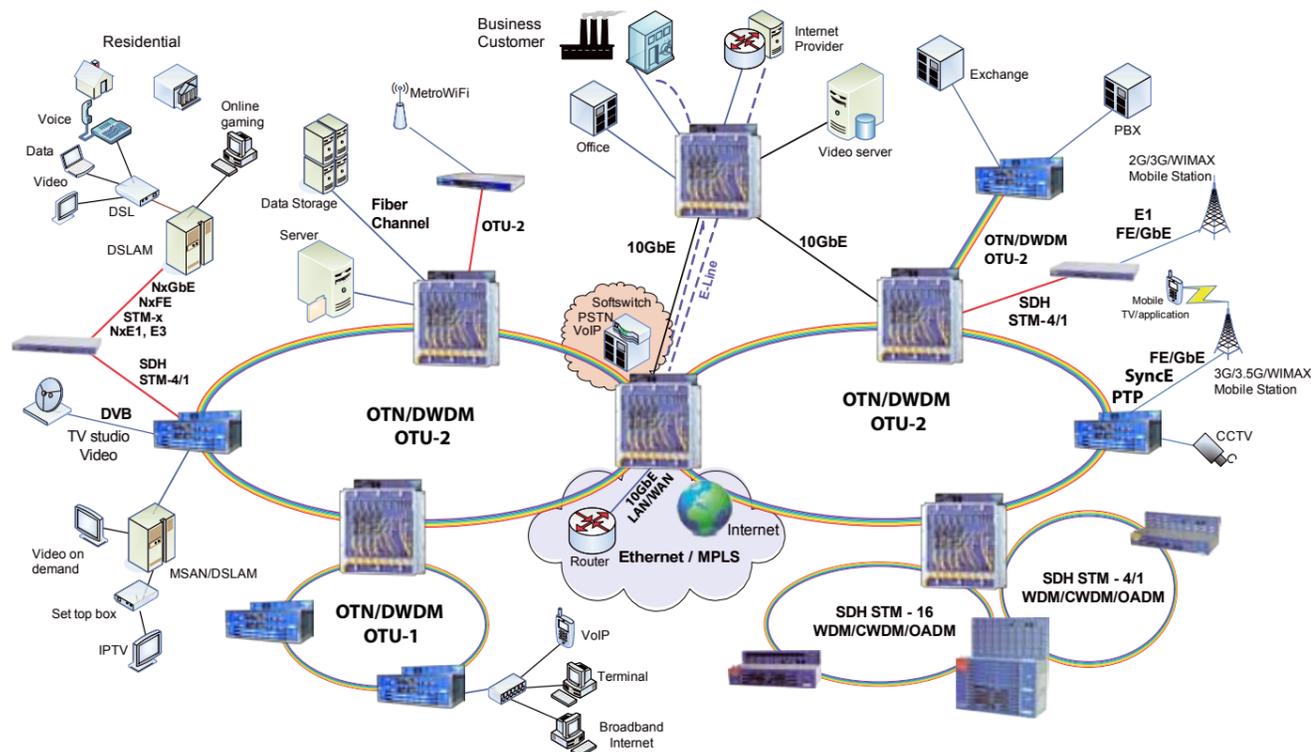
APPLICATIONS IN TRANSPORT NETWORKS

The optical transport platform OTP10G is line of IRITEL's devices for digital signal transmission over optical fibers, based on OTN and DWDM technologies, designed for implementation of local, metropolitan and regional networks of various configurations:

- Point-to-point connections
- Linear add/drop networks
- Ring networks at different hierarchy levels
- For inter-connecting networks based on different technologies
- Mesh networks
- Regeneration systems
- For local switching at ODUk level
- For implementation of passive and active optical networks
- For local switching at optical wavelength level

The OTP10G enables inter-connecting networks based on different technologies: OTN, SDH, Ethernet, SAN (ESCON, FICON, Fibre Channel), video, bit-transparent protocol-independent client services, etc.

The OTP10G platform is designed and manufactured with modern modular technology, making it a very flexible solution for building, expanding and upgrading networks. It enables efficient and profitable delivery of telecommunications services.



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OTP10G OTN/DWDM Optical Transport Platform up to 800 Gbit/s



OTN/DWDM Optical Transmission Systems

■ Multiservice OTN/DWDM Platform

■ Universal Ports

Any service – Any rate – Any port – Any λ

■ Universal Unit

Single Unit Solution => Muxponder, Transponder, ODUk Cross connect, 3R Regeneration

■ Unified Platform for 80 Optical Channels

DWDM multiplexers, optical amplifiers, dispersion compensation modules

■ Integrated Optical Transport Solution

<i>OTN</i>	<i>SDH/SONET</i>	<i>point-to-point</i>
<i>DWDM</i>	<i>Ethernet</i>	<i>chain</i>
	<i>Fibre Channel</i>	<i>ring</i>
	<i>Video</i>	<i>mesh</i>

■ All You Need Is OTP10G



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bright connections

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MAIN FEATURES

- 10G client/line interfaces support **Any service – Any rate – Any port – Any λ** using XFP modules:
 - OTN OTU2/OTU2e/OTU1e/OTU2f/OTU1f
 - Ethernet 10GE LAN, 10GE WAN
 - SDH STM-64 SONET OC-192
 - Fibre Channel 8GFC, 10GFC
- Client/line interfaces for bitrates up to 5 Gb/s are implemented using SFP modules as **Any service – Any rate – Any port – Any λ**:
 - OTN OTU1
 - Ethernet GE, FE
 - SDH STM-16/4/1, SONET OC-48/12/3
 - SAN: ESCON, FICON, Fibre Channel FC-12/25/50/100/200/400
 - Video DVB-ASI, SD-SDI, HD-SDI
 - Bit-transparent protocol-independent client services
- All SFP and XFP interfaces are universal and software configurable with fixed (1310nm, 1550nm, CWDM, DWDM) or tunable (DWDM) lasers
- Support for client signals mapping into OTN ODU0, ODUflex, ODU1, ODU2, ODU2e structures
- Mapping into ODU1/OPU1 tributary slots of n x 155.52 Mb/s capacity for efficient mapping of client signals at sub-ODU0 granularity
- OTN client signal mapping procedures
 - AMP – Asynchronous Mapping Procedure
 - BMP – Bit-synchronous Mapping Procedure
 - GMP – Generic Mapping Procedure
 - GFP – Generic Framing Procedure: Framed and Transparent
- Traffic grooming based on client signal requirements by using ODUflex, OTN VCAT (Virtual Concatenation) (OPUK-Xv, k=0, 1, 2), and/or n x 155Mb/s tributary slots
- OTN non-blocking ODUk cross connect supports arbitrary mix of ODUk traffic for each muxponder/transponder unit, down to ODU0 granularity
- FEC (Forward Error Correction) functionality for detecting and correcting transmission errors, supports: ITU-T G.709 FEC, ITU-T G.975.1 I.4 FEC and ITU-T G.975.1 I.7 FEC
- Transparent transfer of timing information for all client signals
- Synchronization support
 - SyncE
 - PTP1588v2

- Carrier class traffic protection is implemented at multiple levels and protocols on optical and electrical levels
- DWDM multiplexing supports up to 80 channels of C-band wavelengths (192THz – 196THz) with 50GHz spacing
- DWDM filters with low attenuation upgrade ports allow DWDM multiplex configuration in steps of 4 or 8 wavelengths, up to 80 wavelengths
- The system can utilize active and/or passive optical filters. Active multiplexers are implemented using software configurable variable optical attenuators (VOA)
- Use of EDFA and RAMAN optical amplifiers extends the maximum length of optical sections
- Module for chromatic dispersion compensation is based on FBG (Fiber Bragg Gratings)
- Up to 8 degrees ROADM connectivity
- DCN is implemented using GCC and OSC channels
- Support for in-system optical parameters monitoring
- External monitoring points provide access for OSA instrument measurements
- Performance monitoring
- 100G ready platform

EMS/NMS Software

- SUNCE+ Module OTN
- Based on client-server architecture
- SNMPv3 based Network Management System (NMS) Element Management System (EMS)

BASIC CONFIGURATION

- OTP10Gs is compact 1U system with:
 - up to 2 OTN OTU2/2e/1e/2f/1f,
 - up to 8 OTN OTU1,
 - up to 2 universal 10G clients,
 - up to 16 universal clients with bitrates from 16Mb/s to 5Gb/s each

Applications: Implementing OTN networks at different hierarchy levels, inter-connecting networks based on different technologies, regeneration systems and local ODUk cross connect

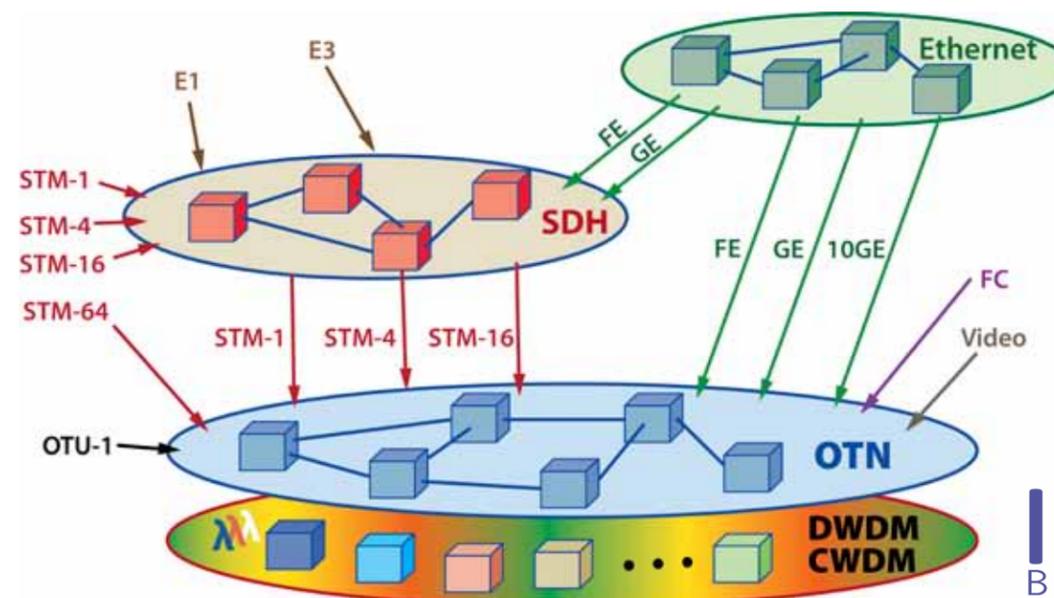
- OTP10G-C4 is four-slot subrack (shelf) module with:

- up to 12 OTN OTU2/2e/1e/2f/1f,
- up to 16 OTN OTU1,
- up to 12 universal 10G clients,
- up to 32 universal clients with bitrates from 16Mb/s to 5Gb/s each,
- up to 16 DWDM channels add/drop in two directions

Applications: In building OTN at different hierarchy levels, inter-connecting networks based on different technologies, regeneration systems, local ODUk cross connect and building passive DWDM optical networks with local wavelength switching

- OTP10G-C15 is 15-slot subrack (shelf) with the basic application in building OTN/DWDM networks with the maximum traffic capacity of the device is up to 80 wavelengths per pair of optical fibers, and with several hundreds of client interfaces

Applications: Implementing all network configurations with all interface types, at different hierarchy levels, inter-connecting networks based on different technologies, regeneration systems, local ODUk cross connect, building DWDM optical networks and local wavelength switching



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MECHANICAL DESIGN

- **OTP10G-C15 subrack:**
Dimensions (H x W x D) 586.2mm x 437mm x 298mm
- **OTP10G-C4 subrack:**
Dimensions (H x W x D) 225mm x 485.5mm x 298.6mm
- **OTP10Gs system:**
Dimensions (H x W x D) 44.4mm x 437mm x 280mm

UNITS

- OT-CMU unit is the system control-management unit
- OT10G-3 unit has the following interfaces: 16 universal software-configurable client/line SFP interfaces and 3 universal software-configurable client/line 10G XFP interfaces. OT10G-3 features muxponder, transponder, cross connect, synchronization and traffic protection functionalities
- OT10G-4 is a transponder unit with 4 software-configurable client/line XFP interfaces. OT10G-4 features transponder, cross connect, synchronization and traffic protection functionalities
- OT10G-8 is high density transponder unit with 8 software-configurable client/line XFP interfaces. OT10G-8 features transponder, cross connect, synchronization and traffic protection functionalities
- pDWDM-4Cx and pDWDM-8Cx are passive units for DWDM multiplexing and demultiplexing of 4 or 8 optical signals. The upgrade ports enable capacity increase
- DWDM-4Cx and DWDM-8Cx are units for DWDM multiplexing and demultiplexing of 4 or 8 optical signals with variable optical attenuator and photo detector for optical signal level adjustment. The upgrade ports enable capacity increase
- OMA-xy unit performs the function of amplification optical signal using EDFA and RAMAN amplifiers with Booster, Preamplifier and Inline applications
- DCM-DxDy unit performs chromatic dispersion compensation based on FBG
- OTVOA-x unit has 4 or 8 variable optical attenuators and photo detectors for optical signal level adjustments
- OPS-x unit implements of 1+1 protection of up to 4 or 8 optical signals

XFP INTERFACES

- OI.10G-x 1310nm, 1550nm 10-80km
- OI.D10G-x-CHx DWDM band 40-88km
- OI.D10G-x-CHT tunable DWDM 40-80km

POWER SUPPLY

- DC power supply -48V DC or -60V DC