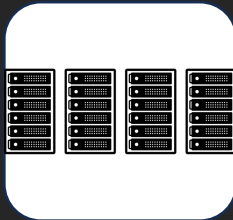# transceiver USA ©

Optical Networks and
Communication

Industry and Business

Datacommunications
- Enterprise
- Datacenter

Telecommunications
- Mobile Networks
- Metro Networks
- Long-Haul Networks

Aerospace and Defense
- Military Communications
- Satellite and Space

Optical Transmission for Enterprise and Datacenter

OSI Model (Open System Interconnection)

The Open Systems Interconnection (OSI) model describes seven layers that computer systems use to communicate over a network. It was the first standard model for network communications, adopted by all major computer and telecommunication companies in the early 1980s.

7	Application Layer	Human computer interaction layer where applications can access the network services
6	Presentation Layer	Ensures that data is in a usable format and is where data encryption occurs
5	Session Layer	Maintains connections and is responsible for controlling ports and sessions
4	Transport Layer	Transmits data using transmission protocols including TCP and UDP
3	Network Layer	Decides which physical path the data will take
2	Data Link Layer	Defines the format of data on the network
1	Physical Layer	Transmits raw bit stream over the physical medium (Fiber, Copper, Free-Space…)

Optical Transmission for Telecommunications

OTN Model (Optical Transport Network)

The ITU's Optical Transport Network (OTN), as defined by recommendation G.709, provides a network-wide framework that adds SONET/SDH features to WDM equipment. Functions of transport, multiplexing, routing, management, supervision, and survivability are defined.

| 6	OPU	Optical Channel Payload Unit. This contains the encapsulated client data, and a header describing the type of that data. It is analogous to the 'Path' layer in SONET/SDH.
5	ODU	Optical Data Unit. This level adds optical path-level monitoring, alarm indication signals and automatic protection switching. It performs similar functions to the 'Line Overhead' in SONET/SDH.
4	OTU	Optical Transport Unit. This represents a physical optical port (such as OTU2, 10Gbps), and adds performance monitoring (for the optical layer) and the FEC .
3	OCh	Optical Channel. This represents an end-to-end optical path.
2	OMS	Optical Multiplex Section. This deals with fixed wavelength DWDM (Dense Wavelength Division Multiplexing) between OADMs (Optical Add Drop Multiplexer).
1	OTS	Optical Transport Section. This deals with fixed wavelength DWDM between relays.
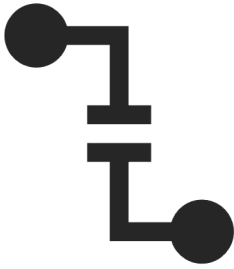
Engineering and Services

Layer 1 Engineering

- Bit-by-bit or symbol by symbol transmission
- Signal Modulation
- Line Coding
- Bit Synchronization (CDR Recovery)
- Start-stop signaling
- Multiplexing
- Optical Attenuation
- Extinction Ratios
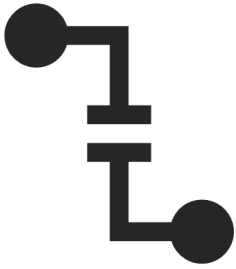
Engineering and Services

Fiber Network Engineering

- Transceiver Evaluation
- Digital Diagnostics Firmware Monitoring
- PHY Layer Network Topologies
- Wavelength Tuning for ITU Grids

Product Linecard and Vendors

FINISAR

LUMENTUM

II-VI | COHERENT

OCLARO

CORNING