

## Glossary

**Access Network:** Last link in a network between the customer premises and the first point of connection to the network infrastructure—a point of presence (PoP) on the edge of a metropolitan network or a central office (CO). Access networks have, up to now, consisted primarily of passive, twisted-pair copper wires, but there is a strong trend towards optical-fiber connections either directly or very close to the customer (fiber-to-the-curb).

**Bandwidth:** Represents the amount of data that can be transmitted through a communications channel in a fixed amount of time. For digital devices, bandwidth is usually expressed in bits (or bytes) per second. For analog devices, it is expressed in cycles per second, or in hertz (Hz). The greater the bandwidth, the greater the information-carrying capacity and the faster the speed.

**Backbone:** Part of the communications network that carries the heaviest traffic. The backbone is also the part of the network that joins several local area networks, either inside a building or across a city or country.

**Dense Wavelength-Division Multiplexing (DWDM):** A technology that enables a single optical fiber to carry multiple data channels (or wavelengths). Commercial DWDM systems can have as many as 160 separate channels.

**Ethernet:** Protocol for data networking. Ethernet networks typically operate at 10, 100 or 1000 Mb/s.

**Fiber-to-the-x (FTTx) Technology:** The x in fiber-to-the-x is a variable indicating the point at which the fiber in a network stops and copper (coaxial or twisted-pair) cabling takes over. The further the fiber goes, the wider the bandwidth, the quicker the speed, and the more applications and services can be offered.

**Fiber-to-the-Curb (FTTC):** Network in which fiber is installed typically within 1000 feet of the premises, leaving the curb-to-building section made out of twisted-pair copper cable.

**Fiber-to-the-Home (FTTH):** Also known as fiber-to-the-premises (FTTP) and fiber-to-the-building (FTTB). FTTH refers to a carrier network's optical fiber that is connected directly to the subscriber's home or enterprise.

**Fiber-to-the-Node (FTTN):** Network in which fiber is used for part, but not all, of the link from the fiber distribution hub to the end-user. An optical to electrical conversion takes place at an active device called a node, which typically serves a neighborhood or geographically similar area. Most current cable TV and telephony networks have FTTN architectures.

**Fibre Channel:** The *de facto*, serialized protocol developed specifically for storage-area-network communications by the American National Standards Institute. Fibre Channel technology provides an inexpensive and scalable way of using fiber-optic cables to connect storage devices, thus allowing network operators to combine the best features of storage and networking techniques.

**Gigabit Ethernet:** A version of Ethernet that operates at 1 Gb/s (1000 Mb/s).

**Internet Protocol (IP):** Method or protocol by which data is sent from one computer to another on the Internet. Each computer on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet. Because of these standardized IP addresses, the gateway receiving the data can keep track of, recognize and route messages appropriately.

**Metro Network:** Metropolitan area network (MAN). A network, often ringed in structure, that covers an entire city and its suburbs.

**Nanometer-Scale Positioning:** Also known as nanopositioning. A positioning technique used during optical component manufacturing to align components with a precision measured in nanometers (one billionth of a meter).

**Optical Layer:** Commonly used to refer to specific wavelengths or channels of a DWDM network. Each wavelength carries a separate stream of data encoded in a light signal.

**Passive Optical Network (PON):** Network in which fiber-optic cabling (instead of copper) brings signals all or most of the way to the end-user. It is described as passive because no active equipment (electrically powered) is required between the central office (or hub) and the customer premises. Depending on where the PON terminates, the system can be described as an FTTx network, which typically allows a point-to-point or point-to-multipoint connection from the central office to the subscriber's premises; in a point-to-multipoint architecture, a number of subscribers (for example, up to 32) can be connected to just one of the various feeder fibers located in a fiber distribution hub, dramatically reducing network installation, management and maintenance costs.

**Physical Layer:** Commonly used to refer to the propagation medium of an optical network, including the fiber and all in-line active and passive components. Light signals, which are forms of encoded data, are transmitted over this layer.

**Piezoelectric (PZT) Technology:** Technology of piezoelectricity, which refers to the electrical field created by some ceramic materials when subjected to pressure. Precision positioning devices use the inverse effect; that is, when an electric field is applied to a piezoelectric material, it changes shape, and this shape change is used to create precise mechanical movements.

**Protocol:** A formal set of rules governing the format, timing, sequencing and error control of data exchange across a network. Many protocols may be required and used on a single network.

**Protocol Layer:** Commonly used to refer to the formatting rules for transmitting data over an optical network. Networks send and receive data using industry-wide formats; some examples are SONET, SDH, ATM and Ethernet.

**SDH:** Synchronous Digital Hierarchy. Standardized by the International Telecommunication Union (ITU-TSS). A protocol for transmitting information over optical fiber.

**SONET:** Synchronous Optical Network. Standardized by the American National Standards Institute (ANSI). A protocol for backbone networks, capable of transmitting at extremely high speeds and accommodating gigabit-level bandwidth.

**Spot Curing:** Technology by which a dose of energy of a specific wavelength band and irradiance is used to cause an adhesive, encapsulant or sealant to change from a liquid to a solid in a small area.

**Storage Area Network (SAN):** A special high-speed network that interconnects different kinds of data storage devices with associated data servers on behalf of a larger network of users. Within an enterprise, the data is typically stored in other on-site computers, but can also be archived in a geographically remote location for disaster recovery.

**Triple-Play Services:** Also known as bundled services. The ability of a telecommunications carrier to supply voice, data and video applications at once. A typical example of a triple-play proposal would include one or multiple phone lines, a high-speed Internet connection and television/video services (such as HDTV), all offered by the same provider.

**Voice-over-Internet-Protocol (VoIP):** Refers to communications services—voice, facsimile and/or voice-messaging applications—that are transported via the Internet, rather than the public switched telephone network. In an Internet-based telephone call, the voice signals are converted to digital format and compressed/translated into Internet protocol (IP) packets for transmission over the Internet; the process is reversed at the receiving end.

**Wireline:** A term associated with a land or underwater network or link that uses metallic wire conductors (and/or optical fibers) for telecommunications. While wireline access interfaces with the network via a physical wired connection, the connection itself can be employed by either a wired or wireless terminal operating in a wired mode via a standard physical interface.