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## Numerics

- 1+1 protection** A card protection scheme that pairs a single working card with a single dedicated protection card.
- 2R functions** reshape and retransmit. A 2R optical signal regenerator performs these functions when regenerating signals.
- 3R functions** reshape, retime, and retransmit. A 3R optical signal regenerator performs these functions when regenerating signals.

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## A

- absorption** That portion of attenuation in optical fiber that results from converting optical power to heat. One cause of absorption is the impurities introduced in the fiber manufacturing process.
- add/drop multiplexer** See [ADM](#); [OADM](#).
- ADM** add/drop multiplexer. Digital equipment that provides an interface between higher and lower rate signals. A SONET ADM is capable of extracting or inserting lower rate signals from a higher rate multiplexed signal without demultiplexing the entire signal.
- all-optical network** See [AON](#).
- ALS** automatic laser shutdown. A protocol that shuts down the optical output power of remote transmitters automatically if a remote link is broken.
- AON** all-optical network. This term was first used to describe the world's first WDM network testbed, which was designed and implemented at MIT's Lincoln Laboratory. Today, AON and the term all-optical network describe optical network environments that exploit multiple channel wavelengths for switching, routing, or distribution, using light to the almost total exclusion of electronics.
- APS** Automatic Protection Switching. A switching mechanism that switches traffic between a primary and secondary link when component failures or fiber cuts occur. APS was standardized in SONET Phase II.
- attenuation** The decrease in signal strength along an electrical or optical cable. Attenuation is caused by a combination of absorption and scattering, and is usually expressed in decibels per kilometer (dB/km).
- automatic laser shutdown** See [ALS](#).
- Automatic Protection Switching** See [APS](#).

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**B**

- BER** bit error rate. The fraction of bits transmitted that are received incorrectly.
- bit error rate** See [BER](#).
- Bragg grating** A technique for building optical filtering functions directly into a piece of optical fiber based on interferometric techniques. Regions of higher and lower refractive indices in the fiber core are formed by exposing photosensitive fiber to deep UV light through a mask.

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**C**

- cable** Used in reference to optical fiber strands, a cable is composed of one or more optical fibers enclosed within cladding and an absorptive jacket.
- center wavelength** A wavelength measured at the central point of a laser's effective optical power.
- channel** A communications path or the signal sent over that path. Using multiplexing, several channels can be transmitted over a single medium (copper or fiber). In wavelength division multiplexing (WDM) technology, a channel is assigned to a specific wavelength, or lambda.
- chromatic dispersion** A property of optical fiber whereby different wavelengths in an optical pulse travel at different speeds and arrive at different times, resulting in a smearing of the received signal.
- cladding** The material that surrounds the core of an optical fiber. The cladding has a lower index of refraction than the core and forces the transmitted light to travel down the core.
- CLEC** competitive local exchange carrier. A local service provider, formerly a telephone company, that competes against incumbent local exchange carriers (ILECs).
- coating** A protective material that surrounds the cladding of an optical fiber.
- competitive local exchange carrier** See [CLEC](#).
- core** The light-conducting central portion of an optical fiber. The core has a higher index of refraction than the cladding.
- critical angle** When traveling from optically denser material to optically less dense material, the angle of incidence at which light stops being refracted and is totally internally reflected.

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**D**

- dark fiber** An inactive optical fiber. Typically when fiber is laid some initially remains dark, or in reserve, for future use.
- data communications channel** See [DCC](#).

<b>dB</b>	decibel. A logarithmic scale used as a measure of relative power. In optical signal transmission, attenuation (loss) is expressed as dB/km.
<b>dBm</b>	decibel referenced to one milliwatt. dBm is used in communication work as a measure of absolute power values. Zero dBm equals one milliwatt.
<b>DCC</b>	data communications channel. Used to transport information about operation, administration, maintenance, and provisioning (OAM&P) over a SONET interface. DCC can be located in section DCC (SDCC) or line overhead (LDCC).
<b>decibel</b>	See <a href="#">dB</a> .
<b>demultiplexer</b>	A module that separates two or more signals that were combined by compatible multiplexing equipment. Also called demux.
<b>dense wavelength division multiplexing</b>	See <a href="#">DWDM</a> .
<b>DFB</b>	distributed feedback laser. An injection laser diode constructed with a Bragg reflection grating outside the active region to suppress multiple longitudinal modes and enhance a single longitudinal mode.
<b>dichroic filter</b>	An optical filter that transmits light according to wavelength; light that is not transmitted is reflected.
<b>dielectric</b>	A nonconducting or insulating substance that resists passage of electric current.
<b>diffraction grating</b>	A ray of fine, parallel, equally spaced reflecting or transmitting lines that mutually enhance the effects of diffraction to concentrate the diffracted light in specific directions determined by the spacing of the lines and by the wavelength of the light.
<b>diode</b>	An electronic device that conducts electricity in one direction only. The simplest semiconductor devices are diodes.
<b>dispersion</b>	The spreading of a light signal caused by light signals traveling at different speeds through an optical waveguide. Dispersion can be caused by modal or chromatic effects.
<b>dispersion-shifted fiber</b>	See <a href="#">DSF</a> .
<b>distributed feedback laser</b>	See <a href="#">DFB</a> .
<b>DSF</b>	dispersion-shifted fiber. A type of single-mode fiber designed to have zero dispersion in the 1550-nm region. DSF works poorly for DWDM applications because of high nonlinearities at the zero dispersion point.
<b>DWDM</b>	dense wavelength division multiplexing. The transmission of multiple signals over closely spaced wavelengths in the 1550-nm region on a single fiber or fiber pair. See also <a href="#">WDM</a> .

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**E**

- EDFA** erbium-doped fiber amplifier. A device used to amplify optical signals. EDFAs, unlike regenerators, do not convert the signal back to electric before boosting it. In an EDFA, optical fibers are doped with the rare earth element erbium, which can amplify light in the 1550-nm region when pumped by an external laser. See also [OA](#).
- Enterprise System Connection** See [ESCON](#).
- erbium-doped fiber amplifier** See [EDFA](#).
- ESCON** Enterprise System Connection. An IBM protocol used to link mainframes with peripherals and other mainframes at 10 to 17 Mbps over fiber optic cable.
- Ethernet** The baseband LAN specification invented by Xerox Corporation and developed jointly by Xerox, Intel, and Digital Equipment Corporation. Ethernet networks use CSMA/CD and run over a variety of cable types at 10 Mbps. The IEEE 802.3 series of standards is very similar. See also [Fast Ethernet](#); [Gigabit Ethernet](#).

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**F**

- Fast Ethernet** Based on an extension to the IEEE 802.3 specification, Fast Ethernet offers a speed of 100 Mbps over Cat-3 or UTP. It preserves many of the attributes of Ethernet, including frame format, MAC mechanisms, and MTU. See also [Ethernet](#).
- FDDI** Fiber Distributed Data Interface. A LAN standard, defined by ANSI X3T9.5, specifying a 100-Mbps token-passing network using fiber-optic cable, with transmission distances up to 2 km. FDDI uses a dual-ring architecture to provide redundancy.
- FE** See [Fast Ethernet](#).
- fiber** The structure that guides light in a fiber optic system.
- fiber connection** See [FICON](#).
- Fiber Distributed Data Interface** See [FDDI](#).
- fiber-optic cable** A data transmission medium that uses glass or plastic fibers, rather than copper wire, to carry modulated pulses of light. Also called optical fiber.
- fiber optics** A medium for the transmission of information (audio, video, data). Light is modulated and transmitted over high purity, hair-thin fibers of glass. The bandwidth capacity of fiber optic cable is much greater than that of conventional cable or copper wire.
- Fibre Channel** A technology for transmitting data between computer devices at data rates from 100 to 400 MBps over optical fiber or copper. Fibre Channel is optimized for connecting servers to shared storage devices and for interconnecting storage controllers and drives.

<b>FICON</b>	fiber connection. An IBM protocol. FICON channels provide 100-MBps bidirectional link rates at unrepeated distances of up to 20 km over fiber optic cables (compared with ESCON channels that support 17-MBps link rates at maximum unrepeated distances of up to 3 km).
<b>filter</b>	An arrangement of electronic components designed to pass signals in one or more frequency bands while attenuating signals in other frequency bands.
<b>forward laser control</b>	When loss of light occurs on the receive signal of a transparent or wave interface, the corresponding transmitting laser on the other side of the transponder module continues to function and might send unreliable information. Forward laser control provides a means to quickly shut down a transmitting laser when such a receive signal failure occurs. The receive signal loss of light can result from a failure in the client equipment, a receiver failure in the transponder module, or a laser shutdown on another node in the network. This feature is convenient for configurations, such as sysplex, where signal protection is performed in the client hardware and quick laser shutdown causes quick path switchover.
<b>four-wave mixing</b>	See <a href="#">FWM</a> .
<b>frequency</b>	The number of cycles per unit of time, denoted by hertz (Hz). One Hz equals one cycle per second.
<b>FWM</b>	four-wave mixing. A nonlinearity that occurs in DWDM systems when multiple wavelengths mix together to form new wavelengths. Four-wave mixing is most prevalent near the zero-dispersion point and at close wavelength spacings.

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## G, H

<b>Gbps</b>	gigabits per second.
<b>GBps</b>	gigabytes per second.
<b>GE</b>	See <a href="#">Gigabit Ethernet</a> .
<b>GHz</b>	Gigahertz (one billion hertz).
<b>Gigabit Ethernet</b>	Standardized in IEEE 802.3z, GE is a backbone LAN technology offering data speeds up to 1000 Mbps. GE can use either a shared or switched medium. See also <a href="#">Ethernet</a> .
<b>graded-index fiber</b>	An optical fiber in which the refractive index of the core decreases toward the cladding.
<b>hot-swappable</b>	A failed component that is capable of being replaced while the rest of the system continues to function normally.
<b>hubbed ring</b>	In a hubbed ring topology, all channels originate and terminate on the hub node. The other nodes on the ring, sometimes called <i>satellite nodes</i> , add and drop one or more channels. The added and dropped channels terminate at the node, while the channels that are not being dropped, sometimes called <i>express channels</i> , are passed through optically, without being electrically terminated.
<b>Hz</b>	Hertz. Cycles per second. See also <a href="#">GHz</a> ; <a href="#">kHz</a> ; and <a href="#">MHz</a> .

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<b>ILEC</b>	incumbent local exchange carrier. A term used to describe the primary existing carriers, formerly known as Regional Bell Operating Companies (RBOCs); distinguished from new competitive carriers coming out of deregulation of the telecommunications industry.
<b>incumbent local exchange carrier</b>	See <a href="#">ILEC</a> .
<b>index of refraction</b>	The ratio of the velocity of light in a vacuum to the velocity of light in a material. See also <a href="#">refractive index</a> .
<b>insertion loss</b>	The loss of power that results from inserting a component, such as a connector or splice, into a previously continuous path.
<b>interexchange carrier</b>	See <a href="#">IXC</a> .
<b>intermediate reach</b>	See <a href="#">IR</a> .
<b>International Organization for Standardization</b>	See <a href="#">ISO</a> .
<b>International Telecommunication Union</b>	See <a href="#">ITU</a> .
<b>Intersystem channel</b>	See <a href="#">ISC</a> .
<b>IR</b>	Intermediate reach. A distance specification for optical systems that operate effectively from 3 to 20 km.
<b>ISC</b>	Intersystem channel. An IBM storage protocol. Also called coupling link.
<b>ISO</b>	International Organization for Standardization. The international organization that is responsible for a wide range of standards, including those relevant to networking. ISO developed the OSI reference model.
<b>ITU</b>	International Telecommunication Union. A specialized agency of the United Nations for telecommunications. The International Telecommunication Union Standardization Sector (ITU-T) is the successor to the CCITT (Consultative Committee for International Telegraph and Telephone).
<b>ITU grid</b>	The ITU standard wavelength designation for lasers with many spacings available.
<b>IXC</b>	interexchange carrier. A long distance telecommunications carrier that offers a range of circuit switched, packet switched, leased line, and enhanced communications services; any provider of communications services between exchanges on a long-haul basis.

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**J, K**

<b>jitter</b>	Small and rapid variations in the timing of a signal or waveform due to noise, changes in component characteristics, voltages, circuit synchronization, and so on.
<b>KB</b>	Automatic protection switching bytes. K bytes are located in the SONET line overhead and are monitored by equipment for an indication to switch to protection.
<b>kbits</b>	kilobits per second.
<b>kHz</b>	kilohertz, or 1,000 cycles per second.

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**L**

<b>lambda</b>	A wavelength used to carry one or more data channels in a WDM or DWDM system. Also called wavelength.
<b>LAN</b>	local area network. A high-speed, low-error data network covering a relatively small geographic area. <a href="#">Ethernet</a> , <a href="#">FDDI</a> , and Token Ring are widely used LAN technologies. See also <a href="#">MAN</a> ; <a href="#">WAN</a> .
<b>laser</b>	Originally an acronym for light amplification by stimulated emission of radiation, laser is a light source that produces coherent, near monochromatic light.
<b>laser diode</b>	A semiconductor device that emits coherent light when forward biased.
<b>LEC</b>	local exchange carrier. A local provider of primarily voice services to business and residential customers. A LEC provides intra-LATA (local access transport area) telecommunications services.
<b>link integrity</b>	The network communications channel is intact.
<b>local area network</b>	See <a href="#">LAN</a> .
<b>local exchange carrier</b>	See <a href="#">LEC</a> .
<b>long reach</b>	See <a href="#">LR</a> .
<b>loopback test</b>	A test that sends signals then directs them back toward their source from some point along the communications path. Loopback tests are often used to test network interface usability.
<b>loss budget</b>	The amount of overall attenuation allowable in a system.
<b>LR</b>	long reach. A distance specification for optical systems that operate effectively from 20 to 100 km.

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**M**

<b>MAN</b>	metropolitan area network. A network that covers an area larger than a LAN, usually a metropolitan area. MANs exist between, and interconnect, the long-haul and access segments of the global network. See also <a href="#">WAN</a> .
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<b>material dispersion</b>	The dispersion resulting from the different velocities of each wavelength in a fiber medium.
<b>Mbps</b>	megabits per second, or one million bits per second.
<b>MBps</b>	megabytes per second, or one million bytes per second.
<b>mean time between failure</b>	See <a href="#">MTBF</a> .
<b>metropolitan area network</b>	See <a href="#">MAN</a> .
<b>MHz</b>	megahertz, or one million cycles per second. See also <a href="#">Hz</a> .
<b>MM fiber</b>	multimode fiber. An optical fiber in which the core is large enough to propagate more than one mode of light. A multimode fiber core is either 50 nm or 62 nm in diameter. See also <a href="#">SM fiber</a> .
<b>modal dispersion</b>	The dispersion caused by the different transit lengths of different propagating modes in a multimode fiber and resulting in different arrival times. Also called multimode dispersion.
<b>modulation</b>	The process of varying some characteristic of a carrier wave as the information to be transmitted on that carrier wave varies. Examples include amplitude modulation (AM), frequency modulation (FM), and pulse-coded modulation (PCM).
<b>MTBF</b>	mean time between failure. Time at which 50% of the units of interest will have failed; used as a measure of the time a user might reasonably expect a device or system to work before a fault occurs.
<b>multimode fiber</b>	See <a href="#">MM fiber</a> .
<b>multiplexer</b>	A module that combines two or more signals into a single output to be carried over one line or fiber. Also called mux.
<b>mux/demux</b>	See <a href="#">multiplexer</a> .
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<b>N</b>	
<b>nanometer</b>	See <a href="#">nm</a> .
<b>NAS</b>	network attached storage. A central data storage system that is attached to the network that it serves. See also <a href="#">SAN</a> .
<b>NDSF</b>	non-dispersion-shifted fiber. A type of single-mode fiber designed to have zero dispersion in the 1310-nm region.
<b>NE</b>	network element. In an Operations Support System, a single piece of telecommunications equipment used to perform a function or service integral to the underlying network.
<b>network attached storage</b>	See <a href="#">NAS</a> .
<b>network element</b>	See <a href="#">NE</a> .
<b>nm</b>	nanometer, or one billionth ( $10^{-9}$ ) of a meter.



<b>non-dispersion-shifted fiber</b>	See <a href="#">NDSF</a> .
<b>non-zero dispersion-shifted fiber</b>	See <a href="#">NZ-DSF</a> .
<b>nonlinearity</b>	A deviation from linearity in an electronic circuit, electro-optic device, or fiber, that generates undesired components in a signal.
<b>NZ-DSF</b>	non-zero dispersion-shifted fiber. A dispersion-shifted SM fiber that has the zero dispersion point near the 1550-nm window, but outside the actual window used to transmit signals. NZ-DSF is designed to maximize bandwidth while minimizing fiber nonlinearities.
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<b>O</b>	
<b>OA</b>	optical amplifier. A device that amplifies an input optical signal without converting it to electrical form. See also <a href="#">EDFA</a> .
<b>OADM</b>	optical add/drop multiplexer. A multiplexer used in optical networks that can add and drop wavelengths into and out of an optical signal without converting them back to electrical form. See also <a href="#">ADM</a> .
<b>OAM&amp;P</b>	Operations, Administration, Maintenance, and Provisioning. Provides the facilities and personnel required to manage a network.
<b>OC</b>	optical carrier. A series of physical protocols (such as OC-1, OC-3, OC-12) defined for SONET optical signal transmission.
<b>OC-x</b>	This is the base unit found in the SONET hierarchy; the “x” represents increments of 51.84 Mbps (so, OC-1 is 51.84 Mbps; OC-3 is 155 Mbps, and OC-12 is 622 Mbps). See also <a href="#">SONET</a> .
<b>OFA</b>	optical fiber amplifier. A device that amplifies an optical signal directly, without the need to convert it to an electrical signal, amplify it electrically, and reconvert it to an optical signal.
<b>OFC</b>	open fiber control. An open-fiber port safety mechanism standardized in Fibre Channel.
<b>OMD</b>	optical mux/demux. A filter that multiplexes and demultiplexes optical signals onto a fiber. Unlike an OADM, the OMD does not allow some signals to pass through. See also <a href="#">OADM</a> .
<b>open fiber control</b>	See <a href="#">OFC</a> .
<b>Operations, Administration, Maintenance, and Provisioning</b>	See <a href="#">OAM&amp;P</a> .
<b>optical add/drop multiplexer</b>	See <a href="#">OADM</a> .
<b>optical amplifier</b>	See <a href="#">OA</a> .
<b>optical carrier</b>	See <a href="#">OC</a> ; <a href="#">OC-x</a> .

<b>optical cross-connect</b>	See <a href="#">OXC</a> .
<b>optical fiber</b>	See <a href="#">fiber-optic cable</a> .
<b>optical fiber amplifier</b>	See <a href="#">OFA</a> .
<b>optical link loss budget</b>	The total loss allowable between an optical transmitter and its corresponding receiver before the signal becomes undetectable.
<b>optical network</b>	The optical network provides all basic network requirements in the optical layer; namely capacity, scalability, reliability, survivability, and manageability. Today, the wavelength is the fundamental object of the optical network. Currently, basic network requirements can be met through a combination of the optical transport layer (DWDM today), which provides scalability and capacity beyond 10 Gbps, and the SONET/SDH transport layer, which provides the reliability, survivability, and manageability needed for public networks. The long-term vision of an “all optical network” is of a transparent optical network where signals are never converted to the electrical domain between network ingress and egress. The more practical implementation for the near term will be of an opaque optical network, that is, one that works to minimize but still includes optical/electrical/optical conversion. Optical network elements will include terminals, dynamic add/drop multiplexers, and dynamic optical cross-connects.
<b>optical networking</b>	The natural evolution of optical transport from a DWDM-based point-to-point transport technology to a more dynamic, intelligent networking technology. Optical networking will use any one of a number of optical multiplexing schemes (for example, WDM) to multiplex multiple channels of information onto a fiber and will add intelligence to the optical transport layer that will provide the reliability, survivability, and manageability today provided by SONET/SDH. Optical networking enables the creation, configuration, and management of lightpaths within the optical domain. A key goal of the optical network over today's SONET/SDH-based network is to bring the cost of network nodes down by reducing the number of network elements required and by increasing the granularity of core network operations such as switching and routing to the wavelength level.
<b>optical receiver</b>	An opto-electric circuit that detects incoming lightwave signals and converts them to the appropriate signal for processing by the receiving device.
<b>optical time domain reflectometer</b>	See <a href="#">OTDR</a> .
<b>OTDR</b>	optical time domain reflectometer. An instrument used in design and diagnostics that locates faults or infers attenuation in optical networks.
<b>OXC</b>	optical cross-connect. An optical network element that provides for incoming optical signals to be switched to any one of a number of output ports. Some OXCs connect fibers containing multichannel optical signals to the input, demultiplex the signals, switch the signals, and recombine/remultiplex the signals to the output ports. Other OXCs connect fibers with single channel optical signals to the input and output ports and simply switch between the two. OXCs can have optical or electrical switch matrices. Also called OCS.

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P

<b>passive device</b>	Component that does not require external power to manipulate or react to electronic output. Passive devices include optical mux/demux modules.
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<b>PDH</b>	Pleisiochronous Digital Hierarchy. Asynchronous multiplexing scheme in which multiple digital synchronous circuits run at different clock rates. See also <a href="#">SDH</a> .
<b>photodetector</b>	An optoelectronic transducer such as a PIN photodiode or avalanche photodiode.
<b>photodiode</b>	A semiconductor device that converts light to electrical current.
<b>photon</b>	A quantum of electromagnetic energy; a particle of light.
<b>photonic</b>	A term used to describe communications using photons, analogous to <i>electronic</i> for electronic communications.
<b>physical layer</b>	The first layer of the OSI reference model. All-optical technologies such as DWDM work at the physical layer.
<b>Pleisiochronous Digital Hierarchy</b>	See <a href="#">PDH</a> .
<b>PMD</b>	polarization mode dispersion. An inherent property of optical media, caused by the difference in the propagation velocities of light in the orthogonal principal polarization states of the transmission medium.
<b>polarization mode dispersion</b>	See <a href="#">PMD</a> .
<b>protocol transparency</b>	The ability of systems to transport information without being aware of higher layer protocols. Also called protocol agnostic.
<b>PSTN</b>	public switched telephone network. A generic term for the collection of networks that provide public telephone switching service.
<b>public switched telephone network</b>	See <a href="#">PSTN</a> .

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## R

<b>Rayleigh scattering</b>	The scattering of light that results from small inhomogeneities of material density or composition.
<b>receiver</b>	A device at the destination end that includes a detector and signal processing electronics to perform optical-to-electrical conversion. A receiver has a maximum acceptable value of average received power (receiver overload) and a minimum acceptable value of received power (receiver sensitivity).
<b>refraction</b>	The changing of direction of a wavefront as it passes through a boundary between two dissimilar media.
<b>refractive index</b>	A property of optical materials that relates to the speed of light in the material. See also <a href="#">index of refraction</a> .
<b>regenerator</b>	A device that regenerates optical signals by converting incoming optical pulses to electrical pulses, cleaning up the electrical signal to eliminate noise, and reconvert them to optical pulses for output. Also called regenerative repeater. See also <a href="#">2R functions</a> ; <a href="#">3R functions</a> .
<b>revertive switching</b>	A process that sends electrical interfaces back to the original working card after the card comes back online.

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**S**

<b>SAN</b>	storage area network. A dedicated, centrally managed, secure information infrastructure that enables any-to-any interconnection of servers and storage systems. See also <a href="#">NAS</a> .
<b>SDH</b>	Synchronous Digital Hierarchy. The European standard that defines a rate and format for transmission of optical signals over fiber using ATM and SONET. In contrast to PDH, SDH provides for a synchronous multiplexing scheme. See also <a href="#">PDH</a> ; <a href="#">SONET</a> .
<b>short reach</b>	See <a href="#">SR</a> .
<b>signal degrade</b>	The errors in the SONET signal that exceed the threshold for normal operations but are less than the threshold for signal failure.
<b>signal failure</b>	The errors in the SONET signal that exceed the threshold defined for failure.
<b>signal-to-noise ratio</b>	See <a href="#">SNR</a> .
<b>single-mode fiber</b>	A small-core optical fiber through which only one mode can propagate. See also <a href="#">MM fiber</a> .
<b>SM fiber</b>	See <a href="#">single-mode fiber</a> .
<b>SNR</b>	signal-to-noise ratio. A measure of signal quality as the ratio of the total signal to the total noise. This effectively shows how much higher the signal level is than the noise level.
<b>SONET</b>	Synchronous Optical Network. An interface standard developed by Bellcore and widely used by the telecommunications industry for high-speed synchronous transport over optical fiber. See also <a href="#">SDH</a> .
<b>splitter</b>	A device that creates multiple optical signals from a single optical signal.
<b>SR</b>	short reach. A distance specification for optical systems that operate effectively up to 3 km.
<b>step-index fiber</b>	Fiber that has a uniform index of refraction throughout the core.
<b>storage area network</b>	See <a href="#">SAN</a> .
<b>Synchronous Digital Hierarchy</b>	See <a href="#">SDH</a> .
<b>Synchronous Optical Network</b>	See <a href="#">SONET</a> .

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**T**

<b>T-carrier</b>	A generic designator for any of several digitally multiplexed telecommunications carrier systems. The two most common are T1, which transmits DS-1 formatted data at 1.544 Mbps, and T3, which transmits DS-3 formatted data at 44.736 Mbps.
<b>TDM</b>	time-division multiplexing. A technique in which information from multiple channels can be allocated bandwidth on a single transmission medium based on assigned time slots. SONET is a TDM technology.

<b>time-division multiplexing</b>	See <a href="#">TDM</a> .
<b>transponder</b>	In a DWDM system, a module that receives an input signal and converts that signal to a wavelength to be optically multiplexed with other wavelengths.
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<b>U-W</b>	
<b>upstream</b>	A set of frequencies used to send data from a subscriber to the headend.
<b>WAN</b>	wide area network. A physical or logical network that serves users across a broad geographic area and often uses transmission devices provided by common carriers. See also <a href="#">MAN</a> .
<b>waveguide</b>	A material medium that confines and guides a propagating electromagnetic wave. An optical fiber is an example of a waveguide.
<b>waveguide dispersion</b>	A component of chromatic dispersion that occurs because of the different refractive indices of the core and the cladding of fiber, resulting in a propagation delay in one or more of the wavelengths relative to others.
<b>wavelength</b>	The distance between points of corresponding phase of two consecutive cycles of a wave. In DWDM systems, wavelength is also called lambda.
<b>wavelength division multiplexer</b>	A passive device that combines light signals with different wavelengths on different fibers onto a single fiber. The wavelength division demultiplexer performs the reverse function.
<b>wavelength division multiplexing</b>	See <a href="#">WDM</a> .
<b>WDM</b>	wavelength division multiplexing. The transmission of two or more signals over (relatively) widely spaced wavelengths, typically at 850 and 1310 nm or 1533 and 1577 nm, on a single fiber or fiber pair. See also <a href="#">DWDM</a> .
<b>wide area network</b>	See <a href="#">WAN</a> .

