

# Glossary

**Alien Crosstalk (AXT):** Unwanted signal coupling from one component, channel, or permanent link to another is defined as alien crosstalk. Alien crosstalk is only specified by the Standards as a power sum parameter for components and cabling to approximate the energy present when all pairs are energized. Power sum alien measured at the near-end is called Power Sum Alien Near-End Crosstalk loss (PSANEXT) and power sum alien crosstalk at the far-end is called Power Sum Alien Attenuation to Crosstalk Ratio, far-end (PSAACRF). High power sum alien crosstalk levels can compromise the operation of 10G Base-T applications.

**American Wire Gauge (AWG):** A system used to specify wire size. The greater the wire diameter, the smaller the value (e.g., 24 AWG [0.51 mm {0.020 in}]).

**Asynchronous Transfer Mode (ATM):** A high-speed switching transmission protocol that utilizes payload packages organized into 53-byte cells to carry data.

**Attenuation:** The decrease in magnitude of transmission signal strength between points, expressed as the ratio of output to input. Measured in dB, usually at a specific frequency for copper or wavelength for optical fiber, the signal strength may be power or voltage.

**Attenuation-to-Crosstalk Ratio (ACR):** The difference between attenuation and crosstalk, measured in dB at a given frequency. This difference is critical to ensure that the signal sent down the twisted-pair cable is stronger at the receiving end of the cable than any interference signals (crosstalk) from other cable pairs.

**Bandwidth:** A range of frequencies, usually the difference between the upper and lower limits of the range, expressed in Hz. It is used to denote the potential capacity of the medium, device or system. In copper and optical fiber cabling, the bandwidth decreases with increasing length.

**Baseband transmission:** A transmission technique in which all of the available bandwidth is dedicated to a single communications channel. Only a single message transfer can occur at a given time.

**Bit Error Rate (BER):** The ratio of incorrectly transmitted bits to total transmitted bits. A primary specification for all transmission systems, it is usually expressed as a power of 10. The number of errors made in a digital transmission as compared to complete accuracy.

**Broadband transmission:** The transmission of multiple signals on a medium at the same time, sharing the entire bandwidth of the medium. The signals are multiplexed into channels with a bandwidth of 6 kHz each and occupy a different frequency on the cable. The signals are divided, usually by frequency divisions, to allow more than one channel on the cable at any time.

**Broadcast:** A technique for sending data simultaneously to all devices attached to a network with a single transmission. See multicast and unicast.

**Capacitance:** The tendency of an electronic component to store electrical energy. Pairs of wire in a cable tend to act as a capacitor. The charge on one of two conductors of a capacitor divided by the potential difference between them (measured in farads).

**Common-mode noise (and longitudinal):** The noise voltage that appears between each signal conductor to ground, caused by electrostatic induction and/or electromagnetic induction.

**Cross-connect:** A facility enabling the termination of cable elements and their interconnection or cross-connection.

**Crosstalk:** The unwanted reception of electromagnetic signals on a communications circuit from another circuit.

**Decibel (dB):** A logarithmic unit used for expressing the loss or gain of signal strength. One dB is the amount by which the pressure of a pure sine wave of sound must be varied in order for the change to be detected by the average human ear.

**Delay skew:** The difference in the propagation delay between any two pairs within the same cable sheath.

**Dielectric constant:** The ratio of capacitance of an insulated wire measured against the same wire uninsulated, but using air as the dielectric, which is equal to one.

**Elongation:** The fraction increase in the length of a material stressed in tension.

**Equal Level Far-End Crosstalk (ELFEXT):** A measure of the unwanted signal coupling from a transmitter at the near end into another pair measured at the far end, relative to the received signal level.

**Ethernet:** A LAN protocol using a logical bus structure and carrier sense multiple access with collision detection.

**Far-end crosstalk loss:** A measure of the unwanted signal coupling from a transmitter at the near end into another pair measured at the far end, relative to the transmitted signal level.

**FEP:** Fluorinated Ethylene Propylene

**Frequency:** The measure of the number of cycles (waves) per second, expressed in Hz.

**Full Duplex:** Simultaneous two-way transmission utilizing all 4 pairs.

**Gigabits per second (Gb/s):** A transmission rate denoting one billion bits per second.

**Gigabit Ethernet:** A carrier sense multiple access with collision detection LAN standard developed by the IEEE 802 group operating at one Gb/s.

**Hertz (Hz):** A unit of frequency equal to one cycle per second.

**Insertion loss:** The signal loss resulting from the insertion of a component, link or channel between a transmitter and receiver (often referred to as attenuation).

**Insulation:** The dielectric material that physically separates wires and prevents conduction between them.

**Megabits per second (Mb/s):** A unit of measure used to express the data transfer rate of a system, device or communications channel.

**Megahertz (MHz):** A unit of frequency equal to one million cycles per second (hertz).

**Near-end crosstalk (NEXT):** The unwanted signal coupling between pairs. It is measured at the end of a cable nearest the point of transmission. Contrast with far-end crosstalk.

**Nominal velocity of propagation (NVP):** The speed of transmission along a cable relative to the speed of light in a vacuum.

# Glossary

**Ohm:** The standard unit of electrical resistance that measures the opposition to the flow of direct current, called resistance, or opposition to the flow of alternating current, called impedance. One volt will cause one ampere of current to flow through one ohm of resistance. The symbol is W.

**Plenum:** A designated area used for transport of environmental air as part of the air distribution system. Because it is part of the air distribution system, cables installed in this space require a higher fire rating.

**Plenum cable:** A cable with flammability and smoke characteristics that meet the safety requirements of the National Electrical Code® (NEC®) that allow it to be routed in a plenum area without being enclosed in a conduit.

**Polyolefin:** A thermoplastic insulation material having excellent properties and moisture resistance, used in the construction of some communications cable.

**Polyvinyl Chloride (PVC):** A tough, flame-retardant, thermoplastic, water-resistant insulator. Its dielectric losses are higher than polyethylene.

**Polyvinylidene Difluoride (PVDF):** A highly non-reactive and pure thermoplastic fluoropolymer. It is tough and has low friction.

**Power Sum Attenuation-to-Crosstalk Ratio (PSACR):** The difference between attenuation and power sum crosstalk measured in dB at a given frequency. This difference is critical to ensure that the signal sent down the twisted-pair cable is stronger at the receiving end of the cable than any interference signals (crosstalk) from other cable pairs.

**Power Sum Equal Level Far-End Crosstalk (PSELFEXT) Loss:** A computation of the unwanted signal coupling from multiple transmitters at the near end into a pair measured at the far end and normalized to the received signal level.

**Power Sum Near-End Crosstalk (PSNEXT) Loss:** A computation of the unwanted signal coupling from multiple transmitters at the near end into a pair measured at the near end.

**Propagation delay:** The time interval required for a signal to be transmitted from one end of the circuit to the other.

**Restriction on Hazardous Substances (RoHS):** The European Commission's Directive 2002/95/EC adopted January 27, 2003, also known as "RoHS," which restricts the use of certain hazardous substances in electrical and electronic equipment.

**Return loss:** A ratio of the power of the outgoing signal to the power of the reflected signal, expressed in dB.

**Rip cord:** A small filament cord used to rip through the outer cable sheath.

**Riser:** Term applied to vertical sections of cable, such as changing from underground or direct-buried plant to aerial plant. Term also applies to the space used for cable access between floors.

**Separator:** A layer of insulating material, which is placed between pairs inside a cable to enhance crosstalk. This could be in a form of tape, cross-web or just single filler.

**Signal-to-Noise Ratio (SNR):** The ratio between the detected signal power and noise in a receiver, expressed in dB. The prime determining factor in bit error rate. See Bit Error Rate.

**Star Topology:** A Local Area Network (LAN) topology in which end points of the network are connected to a common central switch by point-to-point links.

**Structural Return loss:** A measure of reflected energy of a transmitted signal due to impedance variations along the length of the cable, expressed in dB.

**T-1:** A digital transmission link with a bandwidth capacity of 1.544 Mb/s. Typical medium is 2-pair telephone wire; however, T-1 is not indicative of transmission medium.

**Token ring:** Allows attached devices to share a common cabling system for communications purposes without the possibility of a collision between transmissions. A device is only able to send a message when it is in possession of a special electronic sequence of bits called a token.

**Velocity of propagation:** The speed of transmission along a cable relative to the speed of light in a vacuum.

**VoIP:** A term used in IP telephony for voice delivered using the Internet Protocol.