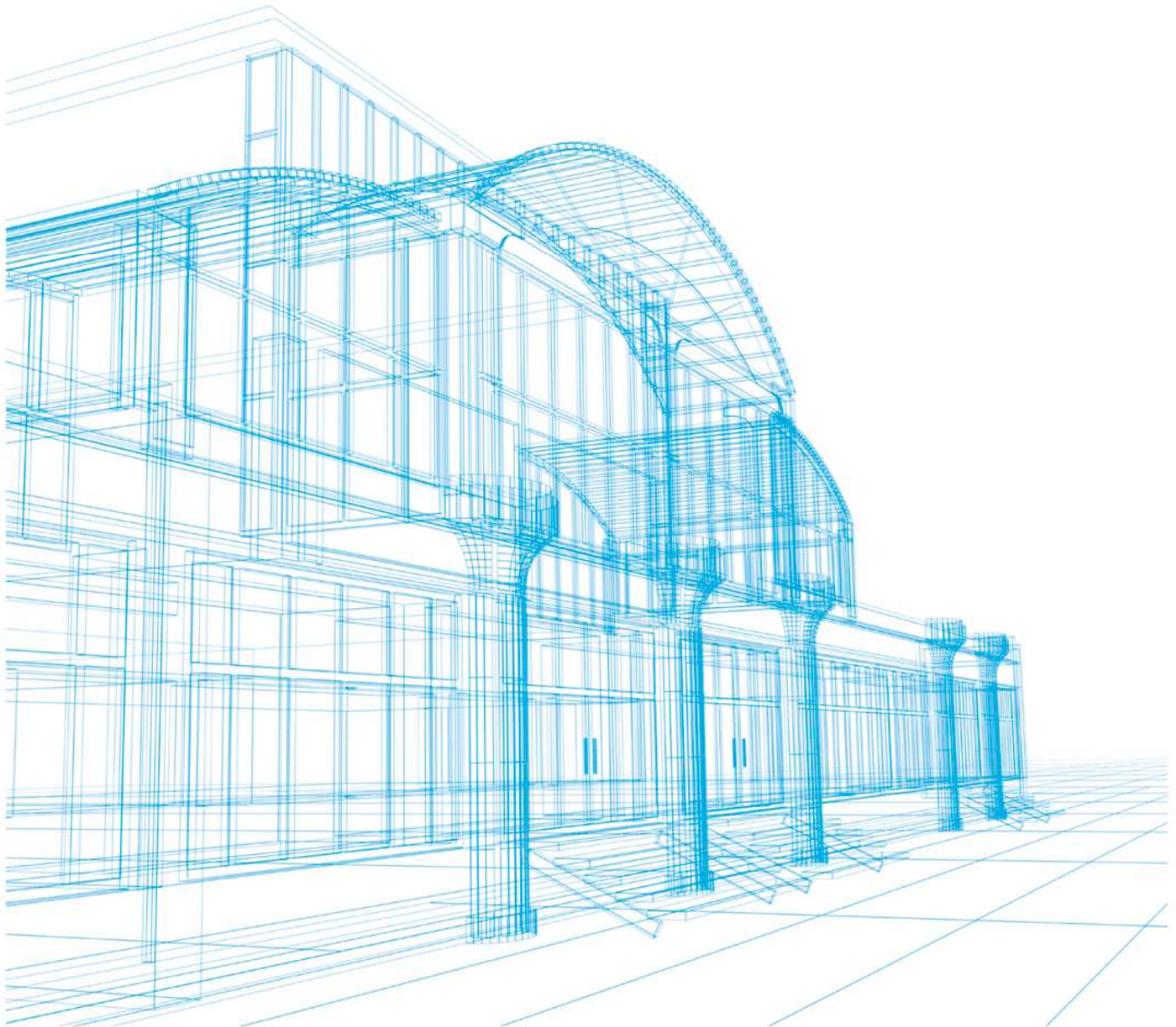


IT Cabling & Networking Glossary of Terms



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Glossary of Terms

The following glossary offers explanations for a number of terms frequently used within the networking and cabling industries.

10BASE-T

10 Mbps Ethernet using 2-pairs of Category 3 cable.

100BASE-T4

100 Mbps Fast Ethernet using 4-pairs of Category 3 cable.

100BASE-TX

100 Mbps Fast Ethernet using 2-pairs of Category 5 cable.

100VG-AnyLAN

100 Mbps LAN using Demand Priority Protocol originally developed by Hewlett Packard and AT&T for Category 3 cable.

1000BASE-T

1000 Mbps (1 Gbps) Ethernet using 4-pairs of Category 5e cable.

1000BASE-TX

A low cost alternative to 1000BASE-T developed by TIA for Category 6 cabling.

1000BASE-SX

1000 Mbps (1 Gbps) Ethernet operating on multimode fibre with short wave lasers (850 nm).

1000BASE-LX

1000 Mbps (1 Gbps) Ethernet operating on multimode fibre with long wave lasers (1300 nm).

10GBASE-T

10 Gbps Ethernet using 4-pairs of Category 6 or better cabling.

10GBASE-LR

10 Gigabit Ethernet operating at long wavelength (1300 nm) on singlemode optical fibre. 10GBASE-LR is the LAN version, 10GBASE-LW is the WAN version. Up to 10 Km reach.

10GBASE-LX4

10 Gigabit Ethernet operating at long wavelength (1300 nm) on multimode or singlemode optical fibre. Designed to overcome the imperfections of legacy multimode fibre, by utilising 4 lasers and 4 detectors operating at different wavelengths. Up to 300 m reach on multimode, 10 Km on singlemode.

10GBASE-SR

10 Gigabit Ethernet operating at short wavelength (850 nm) on laser optimised (OM3) multimode fibre. The lowest cost transceiver alternative, taking advantage of the advances in multimode fibre technology that eliminate the imperfections of legacy multimode. Up to 300 m reach on laser optimised (OM3) multimode fibre (up to 550 m supported on enhanced OM3 fibre).

Ad hoc cabling

Cabling scheme where different types of cabling components from different vendors are linked together to form a cabling system.

Alien Crosstalk

Signal coupling between adjacent cabling components (cables, connectors) or between adjacent links or channels.

Analogue transmission

A method of signal transmission in which the shape of the signal is a continuously variable and directly measurable physical quantity such as voltage.

Application

A system, with its associated transmission method which is supported by telecommunications cabling.

Application layer

The uppermost layer (layer 7) of the open systems interconnection (OSI) model. This layer is concerned with support to the user application and is responsible for managing the communication between applications, e.g. Email, File transfer, etc.

ASCII

The American Standard Code for Information Interchange. A widely used 7 or 8 bit binary code used to represent alphabetic and numeric characters in computer understandable form.

Asynchronous

Two or more signals sourced from independent clocks, therefore having different frequency and phase relations.

Asynchronous data transfer

A method of data transfer in which each alphabetic or numeric character (represented by 7 or 8 bits) is preceded by 'start' and 'stop' bits to delineate

the 7/8 bit pattern from the ideal pattern which otherwise occupies the (digital) transmission medium.

Asynchronous transfer mode (ATM)

A high-speed cell-based switching and multiplexing technology based on segmentation of voice, data and video into fixed packets (cells). These cells are transferred along switched paths and are not received on a regular basis (hence the term asynchronous).

Attenuation

The effect of signal dwindling, experienced with accumulating line length or distance of radio transmission.

Backbone(s)

The part of a premises distribution system that includes a main cable route and facilities for supporting the cable from the equipment room to the upper floors, or along the same floor to the wiring closets.

Balanced circuit

A circuit where equal and opposite signals are generated and sent on to two conductors. The better the balance of a circuit, the lesser is its emissions and the greater is its noise immunity (hence the better is its EMC performance).

Balanced twisted pair cable

A cable consisting of one or more metallic symmetrical cable elements (twisted pairs or quads).

Balun

An adapter used to convert balanced to unbalanced signals in order to connect legacy equipment or video devices to structured cabling.

Bandwidth

The range of frequencies that can be used for transmitting information on a channel. It indicates the transmission-carrying capacity of a channel. Thus, the larger the bandwidth, the greater the amount of information that can pass through the circuit. Measured in hertz or bits per second or MHz-Km (for fibre).

Bit error rate (BER)

A measure of quality of a digital transmission line, either quoted as a percentage, or more usually as a ratio, typically 1 error in 10E8 or 10E9 bits carried. The lower the number of errors, the better the quality of the line.

Bridge(s)

A device used to link two sub-networks using the same communications method and

sometimes the same kind of transmission medium.

Building backbone cable

A cable that connects the building distributor to a floor distributor. Building backbone cables may also connect floor distributors in the same building.

Building distributor

A distributor in which the building backbone cable(s) terminate(s) and at which connections to the campus backbone cable(s) may be made.

Building entrance facility

A facility that provides all necessary mechanical facility and electrical services, that complies with all relevant regulations, for the entry of telecommunications cables into a building.

BUS

Consists of a common transmission path with a number of nodes attached to it. Sometimes referred to as linear network topology.

Cable fill

The ratio of cable installed into a conduit/trunking against the theoretical maximum capacity of the conduit/trunking.

Cable routing diagram

A detailed drawing showing the layout of the cable routes.

Cabling

A system of telecommunications cables, cords and connecting hardware that can support the connection of information technology equipment.

Campus

A premises containing more than one building adjacent or near to one another.

Campus backbone cabling

A cable that connects the campus distributor to the building backbone distributor(s). Campus backbone cables may also connect building cabling distributors directly.

Carrier sense multiple access/collision (CSMA/CD)

Network access method in which nodes contend for the right to send data. If two or more nodes attempt to transmit at the same time, they abort their transmission until a random time period of microseconds has transpired and then attempt to resend.

Category 3

Industry standard for cable and connecting hardware products with transmission characteristics specified to 16 MHz, designed to support digital transmission of 10 Mbps.

Category 5

Industry standard for cable and connecting hardware products with transmission characteristics specified to 100 MHz, designed to support digital transmission of 100 Mbps.

Category 5e

Enhanced Category 5 specifications for cable and connecting hardware products with transmission characteristics specified to 100 MHz, intended to support digital transmission of 1000 Mbps.

Category 6

Industry standard for cable and connecting hardware products with transmission characteristics specified to 250 MHz, designed to support digital transmission in excess of 1000 Mbps.

Category 6A

Specification currently in draft to become an industry standard for cable and connecting hardware products with transmission characteristics specified to 500 MHz, designed to support digital transmission of 10 Gbps.

Category 7

Industry standard for cable and connecting hardware products with transmission characteristics specified to 600 MHz, and requiring individually shielded pair cables. May require either a switched RJ-45 or a non-RJ-45 connector.

Ceiling distribution

Distribution system that uses the space between the false or suspended ceiling and the structural ceiling for housing horizontal cable routes.

Cell relay

A fast packet switching technique which uses fixed-length cells. Generic name for ATM, SMDS and BISDN.

CENELEC

European committee for electrotechnical standardisation.

CENELEC EN50173

The European standard for generic cabling for customer premises.

CENELEC EN50174

A proposed European cabling systems planning & installation standard being developed by CENELEC.

Channel

The end-to-end transmission path connecting any two pieces of application-specific equipment. Equipment cables and work area cables are included in the channel.

Churn

The relocation of an individual or a group of individuals within a building such that the workspace or services to the workspace require change.

Client/server

A technique by which processing can be distributed between nodes requesting information (clients) and those maintaining data (servers).

Coaxial Cable (COAX)

A cable with a centre conductor surrounded by a thick insulation, surrounded by an outer conductor made of metal braid. An outer jacket insulation is optional.

Collapsed backbone

This architecture is a backbone topology where wiring concentrators located at floor levels are attached in a star configuration to a central high performance switching concentrator.

Consolidation point

An interconnection point in horizontal cabling, typically used to support the re-arrangement of furniture cloisters.

Cords

A short length of copper wire or fibre optic cable with connectors on each end. Used to connect equipment to cabling, or to connect cabling segments (cross-connection).

Cross-connect

A facility enabling the termination of cable elements and their connection, primarily by means of patch cords or jumpers.

Crosstalk

An electromagnetic coupling between two physically isolated circuits in a system. This coupling causes a signal on one circuit to induce a noise voltage on adjacent circuits, thereby causing signal interference.

CSMA/CD

See Carrier Sense Multiple Access/Collision Detect.

Customer premises equipment (CPE)

Customer owned equipment used to terminate or process information from the public network (i.e. Multiplexor or PABX).

Data circuit terminating equipment (DCE)

The equipment terminating and controlling the transmission line, and often marking the end point of the public data network. Data terminal equipment's (DTEs) such as computers are connected directly to DCE. Data terminating equipment (DTE) The term used to describe any type of computer or other equipment, when connected to a data communications network.

Datalink layer

Layer 2 of the OSI model. This layer is responsible for error free transmission of bits on a physical interface. Also known as the link layer. The best known layer 2 protocol is HDLC (High Level Data Link Control).

Decibel (dB)

A unit used to measure relative increase or decrease in power, voltage or current, using a logarithmic scale.

Digital transmission

A technique in which all information is converted into binary digits for transmission.

Distributor

The term used for the functions of a collection of components (i.e. patch panels, patch cords) used to connect cables.

EIA/TIA

North American Standards organisation.

EIA/TIA 568B

North American commercial building telecommunications wiring standard.

EIA/TIA 569A

North American commercial building standard for telecommunications pathways and spaces. Its purpose is to standardise specific design and construction practices within and between buildings which are in support of telecommunications media and equipment.

EIA/TIA 606

North American administration standard for the telecommunications infrastructure of commercial buildings. Its purpose is to provide guidelines for a uniform administration scheme for the cabling infrastructure.

Electromagnetic compatibility (EMC)

The ability of a system, equipment or device to operate

satisfactorily in its environment without introducing unacceptable electromagnetic disturbance, or being affected by that environment.

Electromagnetic flux

Electric and magnetic fields (commonly referred to as emissions) generated by equipment or system. Electromagnetic interference (EMI) The interference in signal transmission or reception caused by the radiation of electric and magnetic fields.

Equipment cable

A cable connecting equipment to a distributor.

Equipment room

A room dedicated for housing distributors and application specific equipment.

Ethernet

A LAN originally developed by DEC, Xerox and Intel. It uses the CSMA/CD protocol.

Fast Ethernet

A 100 Mbps LAN based on CSMA/CD protocol. See 100BASE-T.

Fibre

See Optical Fibre.

Fibre channel

This is an ANSI standard describing point to point and switched point to point physical interface, transmission protocol, signalling protocol, services and command set mapping of a high performance serial link for uses between mainframe computers and computer peripherals.

Fibre distributed data interface (FDDI)

An American National Standards Institute standard for fibre-based token passing access protocol that operates at a 100 Mbps data transfer rate.

Flood wiring

The concept of wiring for future growth, by providing full coverage of information outlets.

Flood distributor

The distributor used to connect between the horizontal cable and other cabling subsystems or equipment (see telecommunications closet).

Foil screened twisted pair cable (FTP)

A cable that uses a metallic foil to surround the conductors in a twisted pair cable.

Full duplex

Simultaneous two-way communication on the same link or cabling channel.

Full duplex Ethernet

Full duplex Ethernet allows nodes to transmit and receive data at the same time, doubling throughput between workstation and switch.

Generic cabling

A structured telecommunications cabling system, capable of supporting a wide range of applications. Generic cabling can be installed without prior knowledge of the required applications. Application-specific hardware is not a part of generic cabling.

Grid Computing

Grid computing makes spare CPU horsepower available across the network to large jobs that require it, by harnessing the capabilities of dispersed devices across the network.

Half duplex

Two-way transmission on a single link or cabling channel, one direction at a time.

Horizontal cable

A cable connecting the floor distributor to the telecommunications outlet(s).

Horizontal runs

See horizontal subsystem.

Horizontal subsystem

The part of the premises distribution system installed on one floor that includes the cabling and distribution components connecting the riser backbone or equipment wiring to the information outlet.

Hub

A concentrator or repeater in a star topology at which node connections meet.

Hybrid cable

An assembly of two or more different types of cable units, cables or categories covered by an overall sheath. It may be covered by an overall shield.

IEC 60332

The international standard covering fire performance of cables.

IEEE

Institute of Electrical and Electronic Engineers in the USA. This organisation is also involved in producing Local Area Network standards such as Ethernet.

Individual pair screened

Where each twisted pair in one overall cable has its own screen.

InfiniBand™ architecture

A high bandwidth switched network topology currently being developed for Storage Area Networks (SANS).

Integrated services digital network (ISDN)

Integrated voice and data network based on digital communications technology and standards interfaces.

Intelligent buildings

Buildings that maximise the efficiency of its occupants and allow effective management of resources with minimum life-time costs (Source: European Intelligent Building Group).

Interconnect

A location at which equipment cables are terminated and interconnected to the cabling subsystems without using a patch cord or jumper.

Interface cards

See Network Interface Cards.

Interference

A signal impairment caused by the interaction of another unwanted signal.

ISO

International Standards Organisation.

ISO seven layer model

A 7 layer hierarchical reference structure model developed by the ISO for defining, specifying and relating communications protocol.

ISO/IEC IS 11801

The international standard for generic cabling for customer premises.

ISO/IEC 14763-1

The international standard for basic administration of generic cabling.

Jumper

A cable unit or cable element without connectors used to make a connection on a cross-connect.

Keying

A mechanical feature of a connector system which guarantees correct orientation of a connection or prevents the connection to a jack or optical fibre adapter of the same type intended for another purpose.

Permanent link

The transmission path between two mated interfaces of

generic cabling, excluding equipment cables, work area cables and cross-connections.

Local area network(s) (LANs)

A LAN allows users to share information and computer resources. Typically, a local area network is limited to a single building.

Multimedia

A means of conveying information with components in different media such as voice, music, text, graphics, image and video.

Multimode fibre

Optical fibres that have a large core and that permit non-axial rays or modes to propagate through the core.

Network architecture

Network topology and design.

Network interface cards (NICs)

The piece of equipment that is installed into the expansion port of a personal computer and allows communication between the PC and the network.

Network layer

The network layer is layer 3 of the OSI model. This layer sets up an end-to-end connection across a network determining which permutation of individual links to be used. Thus the network layer performs overall routing functions.

Node(s)

A piece of communications equipment on the network.

Noise

The term used for spurious signals produced in a conductor by sources other than the transmitter to which it is connected. Noise can affect a legitimate signal to the extent that it is inaccurate or indecipherable when it reaches the receiver. The higher the speed of data transmission, the worse the effects of noise become.

Open system interconnection (OSI)

A conceptual model specified by CCITT recommendations in the X200 series. The model describes the 7-layer process of communication between co-operating computers. The model provides a standard for the development of communication protocols allowing for computers of different manufacturers to be interconnected.

Optical fibre

A transmission medium consisting of a core of glass or plastic

surrounded by a protective cladding. Signals are transmitted as light pulses, introduced into the fibre by a light transmitter (i.e. Laser or an LED).

Outlets

A term used to describe the sockets provided in the work location of a structured cabling system. These are usually 8-pin modular sockets which can support a variety of services (i.e. voice, video and data).

PABX

Private Automatic Branch Exchange. A private switching system that switches calls both internally within a building or premises and outside to the telephone network.

Packet switching

A type of exchange or network which conveys a string of information from origin to destination by cutting it up into a number of packets and carrying each independently. A packet-switched effect could be achieved by sending individual pages of a book through the post separately. The receiving device re-assembles the message. Thus a direct connection between origin and destination does not exist at any point.

Patch cord(s)

Flexible cable unit or element with connector(s), used to establish connections on a patch panel.

Patch panel(s)

Termination and administration hardware designed to accommodate the use of patch cords. It facilitates administration for moves and changes.

Pathway(s)

Designated cable routes and/or support structures in a false floor or ceiling.

Peripheral(s)

Additions to a system, a resource (i.e. printer, scanner, etc).

Physical layer

Layer 1 of the open systems interconnection (OSI) model. The physical layer protocol is the hardware and software in the line terminating device which converts the databits needed by the datalink layer into the electrical pulses, modem tones, optical signals or other means which will transmit the data.

Physical topology

Physical cabling layout (i.e. ring, bus, star wired etc).

Ports

A computer interface capable of transmitting and or receiving information.

PowerSum

A method of testing and measuring crosstalk in multi-pair cables that accounts for the sum of crosstalk affecting a pair when all other pairs are active. This is the only method of specifying crosstalk performance that is suited to cables with more than four pairs.

Presentation

Layer 6 of the OSI model. Responsible for identifying the syntax of layer the data being transmitted.

Proprietary networks

Networks that are not designed or installed to standard based guidelines and do not relate specifically to any relevant standard.

Proprietary

Systems that are not standards specific and therefore are not interoperable with standards based equipment.

Protocol(s)

A rule of procedure by which computer devices intercommunicate. Thus a protocol is the equivalent of a human language, with punctuation and grammatical rules.

Public network interface

A point of demarcation between public and private network. In many cases the public network interface is the point of connection between the network provider's facilities and the customer premises cabling.

Raceway

Any distribution method designed for holding cables, (i.e. conduit, metal or plastic trunking, cable trays, etc).

Redundancy risers

A fail-safe method of splitting and routing riser/backbone cables via two or more riser cores. Also known as diverse routing.

Ring

A closed loop network topology.

Riser(s)

The term used to describe a space utilised by backbone cabling to house communications cabling and other building services. This space should preferably be specified, or allowed for, at the time of the building design.

Router(s)

An intermediate system between two or more networks capable of forwarding data packets at the network layer (layer 3).

Scaleable

The ability to adapt to different bit rates.

Screened cable

See foil screened twisted pair cable.

Serial communications

See serial data transmission.

Serial data transmission

Data transmission between computer devices using only a single circuit path. Whole bytes of information (8 bits) are sent in sequential pattern. Compares with parallel transmission. Parallel transmission is often used internally within computing devices because of the higher processing speeds which are possible, but for long-distance telecommunication, serial transmission is more economic in terms of line plant.

Serial port(s)/transmission

Normally a DB 9-pin connector located on the mother board of a PC. A technique in which each bit of information is sent sequentially on a single channel.

Server(s)

Host computer(s).

Session layer

Layer 5 of the OSI model. Responsible for establishment and control of dialogues between users on different machines. Synchronisation for reliable data transfer and token management to control use of the connection are services provided by this layer.

Shielded twisted pair cable (STP)

An electrically conducting cable comprising one or more elements each of which is individually shielded. There may be an overall shield in which case the cable is referred to as a shielded twisted pair cable with an overall shield.

Signal to noise ratio (SNR)

The ratio of the signal magnitude to the noise magnitude and is usually expressed in dB. The higher the SNR of a system, the better is its performance.

Simplex

A transmission means allowing only one direction of transmission. (i.e. public broadcast radio.)

An intermediate system between two or more networks capable of forwarding data packets at the network layer (layer 3).

Singlemode

Optical fibre with a small core diameter in which only singlemode is capable of propagation. 8.3 micron is the common standard core size.

Splice

A joining of conductors or fibres, generally from separate cables.

Star

A physical point to point network topology.

Star physical topology

See Star.

Star quad

A cable element which comprises four insulated conductors twisted together. Two diametrically facing conductors form a transmission pair.

Star topology

See Star.

Storage Area Network (SAN)

A high speed network or subnetwork of shared storage devices.

STP

See shielded twisted pair cable.

Structured cabling

Flexible cabling scheme which allows rapid reconfiguration for office moves through patching.

Switching

A function carried out by a switching hub, alleviating traffic by making virtual connections between transmitting and receiving nodes.

Synchronisation

The method by which the bit patterns appearing on digital line systems may be properly clocked and interpreted – allowing the beginning of particular patterns and frame formats to be correctly identified.

Synchronous

Signals that are sourced from the same timing reference and hence are identical in frequency.

Synchronous data transfer

Data transfer employing synchronised transmit and receive clocks, rather than using start and

stop bits to distinguish character patterns from idle line operation.

Telecommunications

A branch of technology concerned with the transmission, emission and reception of signs, signals, writing, images and sounds; that is, information of any nature by cable, radio, optical or other electromagnetic systems.

Telecommunications closet

An enclosed space for housing telecommunications equipment, cable terminations, and cross-connect cabling. The telecommunications closet is a recognised cross-connect point between the backbone and horizontal cabling subsystems.

Telecommunications outlet

A socket where the horizontal cable terminates. The telecommunications outlet provides the interface to the work area cabling.

Thick coax

The transmission medium used for Ethernet or IEEE 802.3 10BASE-2 LANs. It is a 50 ohm thick coax cable (commonly referred to as the thick yellow cable).

Token ring

The transmission medium used for IEEE 802.3 10BASE-2 LANs (sometimes referred to as CheaperNet). It is a 50 ohm thin coax cable.

Token ring LAN

A 4 or 16 Mbps LAN standard based on token passing access protocol originally developed by IBM. Sometimes referred to as IEEE 802.5 or ISO 8802-5 standard.

Topology

The physical or logical configuration of a telecommunications system.

TP-PMD

Twisted Pair Physical Medium Dependant. A twisted pair version of the FDDI standard that allows 100 Mbps transmission over Category 5 copper cable.

Transducer

A sensing device that converts a signal from one form to another (i.e. mechanical to electrical).

Transport layer

Layer 4 of the OSI model. The transport layer provides for end-to-end data relaying service across any type of data network and is responsible for end-to-end reliability.

Twinaxial cable (TWINAX)

Twinaxial cable is similar to coax except that the centre of the cable contains a twisted pair rather than a single conductor.

Twisted pair(s)

A cable element which consists of two insulated conductors twisted together in a determined fashion to form a balanced transmission line.

Unshielded twisted pair cable

An electrically conducting cable comprising one or more pairs none of which is shielded.

UTP

See unshielded twisted pair cable.

VCSEL

Vertical Cavity Surface Emitting Laser
Video conferencing Real time communications via video between two or more users at separate locations.

Wide area networks (WANS)

Networks that are linked across a large geographical area generally using leased lines from a public operator.

Wireless LAN

Local area network that communicates using radio technology.

Work area

A building space where the occupants interact with telecommunications terminal equipment.
A user's work area which is typically 9 sq. meter or 100 sq. ft.

Work area cable

A cable connecting the telecommunications outlet to the terminal equipment.