Glossary

AM

> **Amplitude modulation**. Modulation technique whereby information is conveyed through the amplitude of the carrier signal.

application layer

> Layer 7 of the OSI reference model. This layer provides services to application processes (such as electronic mail, file transfer, and terminal emulation) that are outside of the OSI model. The application layer identifies and establishes the availability of intended communication partners (and the resources required to connect with them), synchronizes cooperating applications, and establishes agreement on procedures for error recovery and control of data integrity. Corresponds roughly with the *transaction services layer* in the SNA model.

ARPA

> **Advanced Research Projects Agency**. Research and development organization that is part of DoD. ARPA is responsible for numerous technological advances in communications and networking. ARPA evolved into DARPA, and then back into ARPA again (in 1994).

ARPANET

> **Advanced Research Projects Agency Network**. Landmark packet-switching network established in 1969. ARPANET was developed in the 1970s by BBN and funded by ARPA (and later DARPA). It eventually evolved into the Internet. The term ARPANET was officially retired in 1990.

ATM

> **Asynchronous Transfer Mode**. International standard for cell relay in which multiple service types (such as voice, video, or data) are conveyed in fixed-length (53-byte) cells. Fixed-length cells allow cell processing to occur in hardware, thereby reducing transit delays. ATM is designed to take advantage of high-speed transmission media such as E3, SONET, and T3.

baud

> Unit of signaling speed equal to the number of discrete signal elements transmitted per second. Baud is synonymous with bits per second (bps), if each signal element represents exactly 1 bit.

bit-oriented protocol

> Class of data link layer communication protocols that can transmit frames regardless of frame content. Compared with byte-oriented protocols, bit-oriented protocols provide full-duplex operation and are more efficient and reliable.

BNC connector

> Short for British Naval Connector or Bayonet Nut Connector or Bayonet Neill Concelman, a type of connector used with coaxial cables such as the RG-58 A/U cable used with the 10BASE2 Ethernet system. The basic BNC connector is a male type mounted at each end of a cable. This connector has a center pin connected to the center cable conductor and a metal tube connected to the outer cable shield. A rotating ring outside the tube locks the cable to any female connector.

bridge

> Device that connects and passes packets between two network segments that use the same communications protocol. Bridges operate at the data link layer (Layer 2) of the OSI reference model. In general, a bridge will filter, forward, or flood an incoming frame based on the MAC address of that frame.

bus topology

> Linear LAN architecture in which transmissions from network stations propagate the length of the medium and are received by all other stations.

byte-oriented protocol

Class of data-link communications protocols that use a specific character from the user character set to delimit frames. These protocols have largely been replaced by bit-oriented protocols.

Category 1 cabling

One of five grades of UTP cabling described in the EIA/TIA-568B standard. Category 1 cabling is used for telephone communications and is not suitable for transmitting data.

Category 2 cabling

One of five grades of UTP cabling described in the EIA/TIA-568B standard. Category 2 cabling is capable of transmitting data at speeds up to 4 Mbps.

Category 3 cabling

One of five grades of UTP cabling described in the EIA/TIA-568B standard. Category 3 cabling is used in 10BASE-T networks and can transmit data at speeds up to 10 Mbps.

Category 4 cabling

One of five grades of UTP cabling described in the EIA/TIA-568B standard. Category 4 cabling is used in Token Ring networks and can transmit data at speeds up to 16 Mbps.

Category 5 cabling

One of five grades of UTP cabling described in the EIA/TIA-568B standard. Category 5 cabling is used for running CDDI and can transmit data at speeds up to 100 Mbps.

CCITT

Consultative Committee for International Telegraph and Telephone. International organization responsible for the development of communications standards. Now called the ITU-T.
Carrier Detect. Signal that indicates whether an interface is active. Also, a signal generated by a modem indicating that a call has been connected.

checksum

1.) Method for checking the integrity of transmitted data. A checksum is an integer value computed from a sequence of octets taken through a series of arithmetic operations. The value is recomputed at the receiving end and compared for verification. 2.) Calculated checksum of the header and data fields.

client

Node or software program (front-end device) that requests services from a server.

coaxial cable

Cable consisting of a hollow outer cylindrical conductor that surrounds a single inner wire conductor. Two types of coaxial cable are currently used in LANs: 50-ohm cable, which is used for digital signaling, and 75-ohm cable, which is used for analog signal and high-speed digital signaling.

collision

In Ethernet, the result of two nodes transmitting simultaneously. The frames from each device impact and are damaged when they meet on the physical media.

connectionless

Term used to describe data transfer without the existence of a virtual circuit.

connection-oriented

Term used to describe data transfer that requires the establishment of a virtual circuit.

CRC

Cyclic redundancy check. Error-checking technique in which the frame recipient calculates a remainder by dividing frame contents by a prime binary divisor and compares the calculated remainder to a value stored in the frame by the sending node.

CSMA/CD

Carrier sense multiple access collision detect. Media-access mechanism wherein devices ready to transmit data first check the channel for a carrier. If no carrier is sensed for a specific period of time, a device can transmit. If two devices transmit at once, a collision occurs and is detected by all colliding devices. This collision subsequently delays retransmissions from those devices for some random length of time. CSMA/CD access is used by Ethernet and IEEE 802.3.

CTS

1. **Clear To Send**. Circuit in the EIA/TIA-232 specification that is activated when DCE is ready to accept data from DTE.
2. **Common transport semantic**. Cornerstone of the IBM strategy to reduce the number of protocols on networks. CTS provides a single API for developers of network software and enables applications to run over APPN, OSI, or TCP/IP.

DARPA

Defense Advanced Research Projects Agency. U.S. government agency that funded research for and experimentation with the Internet. Evolved from ARPA, and then, in 1994, back to ARPA.

datagram

Logical grouping of information sent as a network layer unit over a transmission medium without prior establishment of a virtual circuit. IP datagrams are the primary information units in the Internet. The terms *frame*, *message*, *packet*, and *segment* are also used to describe logical information groupings at various layers of the OSI reference model and in various technology circles.

data link layer

Layer 2 of the OSI reference model. This layer provides reliable transit of data across a physical link. The data link layer is concerned with physical addressing, network topology, line discipline, error notification, ordered delivery of frames, and flow control. The IEEE has divided this layer into two sublayers: the MAC sublayer and the LLC sublayer. Sometimes simply called *link layer*. Roughly corresponds to the *data link control layer* of the SNA model.

differential encoding

Digital encoding technique whereby a binary value is denoted by a signal change rather than a particular signal level.

differential Manchester encoding

Digital coding scheme where a mid-bit-time transition is used for clocking, and a transition at the beginning of each bit time denotes a zero. The coding scheme used by IEEE 802.5 and Token Ring networks.

DQDB

Distributed Queue Dual Bus. Data link layer communication protocol, specified in the IEEE 802.6 standard, designed for use in MANs. DQDB, which permits multiple systems to interconnect using two unidirectional logical buses, is an open standard that is designed for compatibility with carrier transmission standards, and is aligned with emerging standards for BISDN. SIP (SMDS Interface Protocol) is based on DQDB.

encapsulation

> The wrapping of data in a particular protocol header. For example, Ethernet data is wrapped in a specific Ethernet header before network transit. Also, when bridging dissimilar networks, the entire frame from one network is simply placed in the header used by the data link layer protocol of the other network.

Ethernet

> 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. Ethernet is similar to the IEEE 802.3 series of standards.

FCS

> **Frame check sequence**. Refers to the extra characters added to a frame for error control purposes. Used in HDLC, Frame Relay, and other data link layer protocols.

FDDI

> **Fiber Distributed Data Interface**. LAN standard, defined by ANSI X3T9.5, specifying a 100-Mbps token-passing network using fiber-optic cable, with transmission distances of up to 2 km. FDDI uses a dual-ring architecture to provide redundancy.

fiber-optic cable

> Physical medium capable of conducting modulated light transmission. Compared with other transmission media, fiber-optic cable is more expensive, but is not susceptible to electromagnetic interference, and is capable of higher data rates. Sometimes called *optical fiber*.

FM

> **Frequency modulation**. Modulation technique in which signals of different frequencies represent different data values.

fragment

> Piece of a larger packet that has been broken down to smaller units.

fragmentation

> Process of breaking a packet into smaller units when transmitting over a network medium that cannot support the original size of the packet.

frame

> Logical grouping of information sent as a data link layer unit over a transmission medium. Often refers to the header and trailer, used for synchronization and error control, that surround the user data contained in the unit. The terms *datagram*, *message*, *packet*, and *segment* are also used to describe logical information groupings at various layers of the OSI reference model and in various technology circles.

gateway

> In the IP community, an older term referring to a routing device. Today, the term *router* is used to describe nodes that perform this function, and *gateway* refers to a special-purpose device that performs an application layer conversion of information from one protocol stack to another.

half duplex

> Capability for data transmission in only one direction at a time between a sending station and a receiving station.

handshake

> Sequence of messages exchanged between two or more network devices to ensure transmission synchronization.

HDLC

High-Level Data Link Control. Bit-oriented synchronous data link layer protocol developed by ISO. Derived from SDLC, HDLC specifies a data encapsulation method on synchronous serial links using frame characters and checksums.

header

Control information placed before data when encapsulating that data for network transmission. Compare with *trailer*.

header checksum

Field within an IP datagram that indicates the integrity check on the header.

hello packet

Multicast packet that is used by routers for neighbor discovery and recovery. Hello packets also indicate that a client is still operating and network-ready.

host

Computer system on a network. Similar to the term *node* except that *host* usually implies a computer system, whereas node generally applies to any networked system, including access servers and routers.

HTML

Hypertext markup language. Simple hypertext document formatting language that uses tags to indicate how a given part of a document should be interpreted by a viewing application, such as a WWW browser.

HTTP

Hypertext transfer protocol. The protocol used by Web browsers and Web servers to transfer files, such as text and graphic files.

hub

1. Generally, a term used to describe a device that serves as the center of a star-topology network.
2. Hardware or software device that contains multiple independent but connected modules of network and internetwork equipment. Hubs can be active (where they repeat signals sent through them) or passive (where they do not repeat, but merely split, signals sent through them).
3. In Ethernet and IEEE 802.3, an Ethernet multiport repeater, sometimes referred to as a *concentrator*.

hypertext

Electronically-stored text that allows direct access to other texts by way of encoded links. Hypertext documents can be created using HTML, and often integrate images, sound, and other media that are commonly viewed using a WWW browser.

IEEE 802.2

IEEE LAN protocol that specifies an implementation of the LLC sublayer of the data link layer. IEEE 802.2 handles errors, framing, flow control, and the network layer (Layer 3) service interface. Used in IEEE 802.3 and IEEE 802.5 LANs.

IEEE 802.3

IEEE LAN protocol that specifies an implementation of the physical layer and the MAC sublayer of the data link layer. IEEE 802.3 uses CSMA/CD access at a variety of speeds over a variety of physical media. Extensions to the IEEE 802.3 standard specify implementations for Fast Ethernet. Physical variations of the original IEEE 802.3 specification include *10BASE2*, *10BASE5*, *10BASE-F*, *10BASE-T*, and *10Broad36*. Physical variations for *Fast Ethernet* include *100BASE-T*, *100BASE-T4*, and *100BASE-X*.

IEEE 802.4

IEEE LAN protocol that specifies an implementation of the physical layer and the MAC sublayer of the data link layer. IEEE 802.4 uses token-passing access over a bus topology and is based on the token bus LAN architecture.

IEEE 802.5

IEEE LAN protocol that specifies an implementation of the physical layer and MAC sublayer of the data link layer. IEEE 802.5 uses token passing access at 4 or 16 Mbps over STP cabling and is similar to IBM Token Ring.

IEEE 802.6

IEEE MAN specification based on DQDB technology. IEEE 802.6 supports data rates of 1.5 to 155 Mbps.

Internet

Term used to refer to the largest global internetwork, connecting tens of thousands of networks worldwide and having a "culture" that focuses on research and standardization based on real-life use. Many leading-edge network technologies come from the Internet community. The Internet evolved in part from ARPANET. At one time, called the *DARPA Internet*. Not to be confused with the general term *internet*.

internet

Short for internetwork. Not to be confused with the *Internet*.

internetwork

Collection of networks interconnected by routers and other devices that functions (generally) as a single network. Sometimes called an *internet*, which is not to be confused with the *Internet*.

interNIC

Organization that serves the Internet community by supplying user assistance, documentation, training, registration service for Internet domain names, and other services. Formerly called Network Information Center (NIC).

IP

Internet Protocol. Network layer protocol in the TCP/IP stack offering a connectionless internetwork service. IP provides features for addressing, type-of-service specification, fragmentation and reassembly, and security. Documented in RFC 791.

IP address

1.) 32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as 4 octets separated with periods (dotted decimal format). Each address consists of a network number, an optional subnetwork number, and a host number. The network and subnetwork numbers together are used for routing, while the host number is used to address an individual host within the network or subnetwork. A subnet mask is used to extract network and subnetwork information from the IP address. Also called an Internet address. 2.) Command used to establish the logical network address of this interface.

ISDN

Integrated Services Digital Network. Communication protocol, offered by telephone companies, that permits telephone networks to carry data, voice, and other source traffic.

ISO

International Organization for Standardization. International organization that is responsible for a wide range of standards, including those relevant to networking. ISO developed the OSI reference model, a popular networking reference model.

ISOC

Internet Society. International nonprofit organization, founded in 1992, that coordinates the evolution and use of the Internet. In addition, ISOC delegates authority to other groups related to the Internet, such as the IAB. ISOC is headquartered in Reston, Virginia, U.S.A.

ITU-T

International Telecommunication Union Telecommunication Standardization Sector (ITU-T) (formerly the Committee for Internatiional Telegraph and Telephone ([CCITT]). An international organization that develops communication standards.

LAN

Local-area network. High-speed, low-error data network covering a relatively small geographic area (up to a few thousand meters). LANs connect workstations, peripherals, terminals, and other devices in a single building or other geographically limited area. LAN standards specify cabling and signaling at the physical and data link layers of the OSI model. Ethernet, FDDI, and Token Ring are widely used LAN technologies.

LLC

Logical Link Control. Higher of the two data link layer sublayers defined by the IEEE. The LLC sublayer handles error control, flow control, framing, and MAC-sublayer addressing. The most prevalent LLC protocol is IEEE 802.2, which includes both connectionless and connection-oriented variants.

MAC

Media Access Control. Lower of the two sublayers of the data link layer defined by the IEEE. The MAC sublayer handles access to shared media, such as whether token passing or contention will be used.

MAC address

Standardized data link layer address that is required for every port or device that connects to a LAN. Other devices in the network use these addresses to locate specific ports in the network and to create and update routing tables and data structures. MAC addresses are 6 bytes long and are controlled by the IEEE. Also known as a *hardware address*, a *MAC-layer address*, or a *physical address*.

MAN

Metropolitan-area network. Network that spans a metropolitan area. Generally, a MAN spans a larger geographic area than a LAN, but a smaller geographic area than a WAN.

Manchester encoding

Digital coding scheme, used by IEEE 802.3 and Ethernet, in which a mid-bit-time transition is used for clocking, and a 1 is denoted by a high level during the first half of the bit time.

message

Application layer (Layer 7) logical grouping of information, often composed of a number of lower-layer logical groupings such as packets. The terms *datagram*, *frame*, *packet*, and *segment* are also used to describe logical information groupings at various layers of the OSI reference model and in various technology circles.

modem

Modulator-demodulator. Device that converts digital and analog signals. At the source, a modem converts digital signals to a form suitable for transmission over analog communication facilities. At the destination, the analog signals are returned to their digital form. Modems allow data to be transmitted over voice-grade telephone lines.

modulation

Process by which the characteristics of electrical signals are transformed to represent information. Types of modulation include AM, FM, and PAM.

MTU

Maximum transmission unit. Maximum packet size, in bytes, that a particular interface can handle.

network layer

Layer 3 of the OSI reference model. This layer provides connectivity and path selection between two end systems. The network layer is the layer at which routing occurs. Corresponds roughly with the *path control layer* of the SNA model.

OSI

Open System Interconnection. International standardization program created by ISO and ITU-T to develop standards for data networking that facilitate multivendor equipment interoperability.

OSI reference model

Open System Interconnection reference model. Network architectural model developed by ISO and ITU-T. The model consists of seven layers, each of which specifies particular network functions such as addressing, flow control, error control, encapsulation, and reliable message transfer. The highest layer (the application layer) is closest to the user; the lowest layer (the physical layer) is closest to the media technology. The next to lowest layer are implemented in hardware and software, while the upper five layers are implemented only in software. The OSI reference model is used universally as a method for teaching and understanding network functionality. Similar in some respects to *SNA*.

packet

Logical grouping of information that includes a header containing control information and (usually) user data. Packets are most often used to refer to network layer units of data. The terms *datagram*, *frame*, *message*, and *segment* are also used to describe logical information groupings at various layers of the OSI reference model and in various technology circles.

PCM

Pulse code modulation. Transmission of analog information in digital form through sampling and encoding the samples with a fixed number of bits.

physical layer

Layer 1 of the OSI reference model. The physical layer defines the electrical, mechanical, procedural and functional specifications for activating, maintaining, and deactivating the physical link between end systems. Corresponds with the *physical control layer* in the SNA model.

piggybacking

Process of carrying acknowledgments within a data packet to save network bandwidth.

port

1.) Interface on an internetworking device (such as a router).
2.) In IP terminology, an upper-layer process that is receiving information from lower layers.
3.) To rewrite software or microcode so that it will run on a different hardware platform or in a different software environment than that for which it was originally designed. 4. A female plug on a patch panel which accepts the same size plug as an RJ-45 jack. Patch cords are used in these ports to cross connect computers wired to the patch panel. It is this cross connection which allows the LAN to function.
4.) A female plug on a patch panel which accepts the same size plug as an RJ-45 jack. Patch cords are used in these ports to cross connect computers wired to the patch panel. It is this cross connection which allows the LAN to function.

PPP

Point-to-Point Protocol. A successor to SLIP, PPP provides router-to-router and host-to-network connections over synchronous and asynchronous circuits.

presentation layer

Layer 6 of the OSI reference model. This layer ensures that information sent by the application layer of one system will be readable by the application layer of another. The presentation layer is also concerned with the data structures used by programs and therefore negotiates data transfer syntax for the application layer. Corresponds roughly with the *presentation services layer* of the SNA model.

protocol

1.) Formal description of a set of rules and conventions that govern how devices on a network exchange information.
2.) Field within an IP datagram that indicates the upper layer (Layer 4) protocol sending the datagram.

redundancy

1.) In internetworking, the duplication of devices, services, or connections so that, in the event of a failure, the redundant devices, services, or connections can perform the work of those that failed.
2.) In telephony, the portion of the total information contained in a message that can be eliminated without loss of essential information or meaning.

repeater

Device that regenerates and propagates electrical signals between two network segments.

RFC

Request For Comments. Document series used as the primary means for communicating information about the Internet. Some RFCs are designated by the IAB as Internet standards. Most RFCs document protocol specifications such as Telnet and FTP, but some are humorous or historical. RFCs are available online from numerous sources.

ring

Connection of two or more stations in a logically circular topology. Information is passed sequentially between active stations. Token Ring, FDDI, and CDDI are based on this topology.

ring topology

Network topology that consists of a series of repeaters connected to one another by unidirectional transmission links to form a single closed loop. Each station on the network connects to the network at a repeater. While logically a ring, ring topologies are most often organized in a closed-loop star.

RJ connector

Registered jack connector. Standard connectors originally used to connect telephone lines. RJ connectors are now used for telephone connections and for 10BASE-T and other types of network connections. RJ-11, RJ-12, and RJ-45 are popular types of RJ connectors.

router

Network layer device that uses one or more metrics to determine the optimal path along which network traffic should be forwarded. Routers forward packets from one network to another based on network layer information. Occasionally called a *gateway* (although this definition of gateway is becoming increasingly outdated).

routing table

Table stored in a router or some other internetworking device that keeps track of routes to particular network destinations and, in some cases, metrics associated with those routes.

EIA/TIA-232

Common physical layer interface standard, developed by EIA and TIA, that supports unbalanced circuits at signal speeds of up to 64 kbps. Closely resembles the V.24 specification. Formerly known as *RS-232*.

RS-232

Popular physical layer interface. Now known as *EIA/TIA-232*.

RTS

Ready To Send. EIA/TIA-232 control signal that requests a data transmission on a communications line.

segment

1.) Section of a network that is bounded by bridges, routers, or switches.
2.) In a LAN using a bus topology, a segment is a continuous electrical circuit that is often connected to other such segments with repeaters.
3.) Term used in the TCP specification to describe a single transport layer unit of information. The terms *datagram*, *frame*, *message*, and *packet* are also used to describe logical information groupings at various layers of the OSI reference model and in various technology circles.

sequence number

Number used to ensure correct sequencing of the arriving data.

session layer

Layer 5 of the OSI reference model. This layer establishes, manages, and terminates sessions between applications and manages data exchange between presentation layer entities. Corresponds to the *data flow control layer* of the SNA model.

simplex

Capability for data transmission in only one direction between a sending station and a receiving station.

SLIP

Serial Line Internet Protocol. Standard protocol for point-to-point serial connections using a variation of TCP/IP. Predecessor of PPP.

SMTP

Simple Mail Transfer Protocol. Internet protocol providing electronic mail services.

SNMP

Simple Network Management Protocol. Network management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security

socket

Software structure operating as a communications end point within a network device.

socket number

An 8-bit number that identifies a socket. A maximum of 254 different socket numbers can be assigned in an AppleTalk node.

source and destination IP addresses

Field within an IP datagram that indicates the 32-bit source and destination IP addresses.

STP

Shielded twisted-pair. Two-pair wiring medium used in a variety of network implementations. STP cabling has a layer of shielded insulation to reduce EMI.

subnet address

Portion of an IP address that is specified as the subnetwork by the subnet mask.

subnet mask

32-bit address mask used in IP to indicate the bits of an IP address that are being used for the subnet address. Sometimes referred to simply as *mask*..

subnetwork

1.) In IP networks, a network sharing a particular subnet address. Subnetworks are networks arbitrarily segmented by a network administrator in order to provide a multilevel, hierarchical routing structure while shielding the subnetwork from the addressing complexity of attached networks. Sometimes called a *subnet*.
2.) In OSI networks, a collection of ESs and ISs under the control of a single administrative domain and using a single network access protocol.

switch

1.) Network device that filters, forwards, and floods frames based on the destination address of each frame. The switch operates at the data link layer of the OSI model.
2.) General term applied to an electronic or mechanical device that allows a connection to be established as necessary and terminated when there is no longer a session to support.

TCP

Transmission Control Protocol. Connection-oriented transport layer protocol that provides reliable full-duplex data transmission. TCP is part of the TCP/IP protocol stack

TCP/IP

Transmission Control Protocol/Internet Protocol. Common name for the suite of protocols developed by the U.S. DoD in the 1970s to support the construction of worldwide internetworks. TCP and IP are the two best-known protocols in the suite.

token

Frame that contains control information. Possession of the token allows a network device to transmit data onto the network.

token bus

LAN architecture using token passing access over a bus topology. This LAN architecture is the basis for the IEEE 802.4 LAN specification.

Token Ring

Token-passing LAN developed and supported by IBM. Token Ring runs at 4 or 16 Mbps over a ring topology. Similar to IEEE 802.5.

topology

Physical arrangement of network nodes and media within an enterprise networking structure.

transport layer

Layer 4 of the OSI reference model. This layer is responsible for reliable network communication between end nodes. The transport layer provides mechanisms for the establishment, maintenance, and termination of virtual circuits, transport fault detection and recovery, and information flow control. Corresponds to the *transmission control layer* of the SNA model.

twisted pair

Relatively low-speed transmission medium consisting of two insulated wires arranged in a regular spiral pattern. The wires can be shielded or unshielded. Twisted pair is common in telephony applications and is increasingly common in data networks.

UDP

User Datagram Protocol. Connectionless transport layer protocol in the TCP/IP protocol stack. UDP is a simple protocol that exchanges datagrams without acknowledgments or guaranteed delivery, requiring that error processing and retransmission be handled by other protocols. UDP is defined in RFC 768.

URL

Universal Resource Locator. Standardized addressing scheme for accessing hypertext documents and other services using a WWW browser.

UTP

Unshielded twisted-pair. Four-pair wire medium used in a variety of networks. UTP does not require the fixed spacing between connections that is necessary with coaxial-type connections. There are five types of UTP cabling commonly used: *Category 1 cabling*, *Category 2 cabling*, *Category 3 cabling*, *Category 4 cabling*, and *Category 5 cabling*.

V.24

ITU-T standard for a physical layer interface between DTE and DCE. V.24 is essentially the same as the EIA/TIA-232 standard.

V.25bis

ITU-T specification describing procedures for call setup and tear down over the DTE-DCE interface in a PSDN.

V.32

ITU-T standard serial line protocol for bidirectional data transmissions at speeds of 4.8 or 9.6 Kbps.

V.32bis

ITU-T standard that extends V.32 to speeds up to 14.4 Kbps.

V.34

ITU-T standard that specifies a serial line protocol. V.34 offers improvements to the V.32 standard, including higher transmission rates (28.8 Kbps) and enhanced data compression.

V.35

ITU-T standard describing a synchronous, physical layer protocol used for communications between a network access device and a packet network. V.35 is most commonly used in the United States and in Europe, and is recommended for speeds up to 48 Kbps.

V.42

ITU-T standard protocol for error correction using LAPM.

VCN

Virtual circuit number. 12-bit field in an X.25 PLP header that identifies an X.25 virtual circuit. Allows DCE to determine how to route a packet through the X.25 network. Sometimes called *LCI (logical channel identifier)* or *LCN (logical channel number)*.

virtual circuit

Logical circuit created to ensure reliable communication between two network devices. A virtual circuit is defined by a VPI/VCI pair, and can be either permanent (a PVC) or switched (an SVC). Virtual circuits are used in Frame Relay and X.25. In ATM, a virtual circuit is called a *virtual channel*. Sometimes abbreviated *VC*.

WAN

Wide-area network. Data communications network that serves users across a broad geographic area and often uses transmission devices provided by common carriers. Frame Relay, SMDS, and X.25 are examples of WANs.

WWW

World Wide Web. Large network of Internet servers providing hypertext and other services to terminals running client applications such as a WWW browser.

X.25

ITU-T standard that defines how connections between DTE and DCE are maintained for remote terminal access and computer communications in PDNs. X.25 specifies LAPB, a data link layer protocol, and PLP, a network layer protocol. Frame Relay has to some degree superseded X.25.

10BASE2

10-Mbps baseband Ethernet specification using 50-ohm thin coaxial cable. 10BASE2, which is part of the IEEE 802.3 specification, has a distance limit of 185 meters per segment.

10BASE5

10-Mbps baseband Ethernet specification using standard (thick) 50-ohm baseband coaxial cable. 10BASE5, which is part of the IEEE 802.3 baseband physical layer specification, has a distance limit of 500 meters per segment.

10BASE-F

10-Mbps baseband Ethernet specification that refers to the 10BASE-FB, 10BASE-FL, and 10BASE-FP standards for Ethernet over fiber-optic cabling.

10BASE-FB

10-Mbps baseband Ethernet specification using fiber-optic cabling. 10BASE-FB is part of the IEEE 10BASE-F specification. It is not used to connect user stations, but instead provides a synchronous signaling backbone that allows additional segments and repeaters to be connected to the network. 10BASE-FB segments can be up to 2000 meters long.

10BASE-FL

10-Mbps baseband Ethernet specification using fiber-optic cabling. 10BASE-FL is part of the IEEE 10BASE-F specification and, while able to interoperate with FOIRL, is designed to replace the FOIRL specification. 10BASE-FL segments can be up to 1000 meters long if used with FOIRL, and up to 2000 meters if 10BASE-FL is used exclusively.

10BASE-FP

10-Mbps fiber-passive baseband Ethernet specification using fiber-optic cabling. 10BASE-FP is part of the IEEE 10BASE-F specification. It organizes a number of computers into a star topology without the use of repeaters. 10BASE-FP segments can be up to 500 meters long.

10BASE-T

10-Mbps baseband Ethernet specification using two pairs of twisted-pair cabling (Category 3, 4, or 5): one pair for transmitting data and the other for receiving data. 10BASE-T, which is part of the IEEE 802.3 specification, has a distance limit of approximately 100 meters per segment. See also *Ethernet* and *IEEE 802.3*.

10Broad36

10-Mbps broadband Ethernet specification using broadband coaxial cable. 10Broad36, which is part of the IEEE 802.3 specification, has a distance limit of 3600 meters per segment

100BASE-FX

100-Mbps baseband Fast Ethernet specification using two strands of multimode fiber-optic cable per link. To guarantee proper signal timing, a 100BASE-FX link cannot exceed 400 meters in length. Based on the IEEE 802.3 standard.

100BASE-T

100-Mbps baseband Fast Ethernet specification using UTP wiring. Like the 10BASE-T technology on which it is based, 100BASE-T sends link pulses over the network segment when no traffic is present. However, these link pulses contain more information than those used in 10BASE-T. Based on the IEEE 802.3 standard.

100BASE-T4

100-Mbps baseband Fast Ethernet specification using four pairs of Category 3, 4, or 5 UTP wiring. To guarantee proper signal timing, a 100BASE-T4 segment cannot exceed 100 meters in length. Based on the IEEE 802.3 standard.

100BASE-TX

100-Mbps baseband Fast Ethernet specification using two pairs of either UTP or STP wiring. The first pair of wires is used to receive data; the second is used to transmit. To guarantee proper signal timing, a 100BASE-TX segment cannot exceed 100 meters in length. Based on the IEEE 802.3 standard.

100BASE-X

100-Mbps baseband Fast Ethernet specification that refers to the 100BASE-FX and 100BASE-TX standards for Fast Ethernet over fiber-optic cabling. Based on the IEEE 802.3 standard.

100VG-AnyLAN

100-Mbps Fast Ethernet and Token Ring media technology using four pairs of Category 3, 4, or 5 UTP cabling. This high-speed transport technology, developed by Hewlett-Packard, can be made to operate on existing 10BASE-T Ethernet networks. Based on the IEEE 802.12 standard.